PROPOSED ROCKY HILL COALMINE – SSD – 5156

SUBMISSION BY GLOUCESTER SHIRE COUNCIL TO AN EXHIBITION OF THE ENVIRONMENTAL IMPACT STATEMENT AND DEVELOPMENT APPLICATION

October 2013

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Executive Summary

The objectives of the proposed Rocky Hill Coal Mine (as stated in the EIS) are;

- to *Maximise coal recovery* – but it fails to substantiate this because the geological information is flawed, as it is based on limited sampling and the mine plan proposes to change the mining activity to extract better priced coal at will, which could sterilise the remaining deposits.
- to *Undertake all operations in an environmentally responsible manner* – this will not occur because the proposal has major flaws and omissions with regard to planning for, assessment of, mitigation of water, air, noise transport and rehabilitation issues;
- to *Create a final land form that is safe, stable, visually and topographically sympathetic to the existing landform* – but this is not possible because there is no information to substantiate the final landform, or to assess the environmental impacts of this outcome;
- to *Provide a stimulus to the Gloucester and district economies* – but this is unlikely to happen to the extent suggested according to Council's economic consultant.
- to *Achieve the above objectives in a cost effective manner to ensure the Rocky Hill Project is viable* – two separate economic assessments (Economists at Large; GRIP) have both concluded that the project, as presented, is not viable.

This mining proposal, its plan and impact mitigation measures are unlikely to allow the proposal to meet these objectives. The proposal has limited details to enable some impact assessment to be undertaken. Many of the key issues that require impact analysis are not provided or are only partially analysed.

The EIS has failed to address the DGR's established for assessing noise impacts at night, the need to correctly identify the number of receptor levels (households/people affected), and to investigate alternative mitigation measures. This undermines the objective of being "*environmentally responsible"*

Modelling in the EIS indicates that air – blast impacts will exceed acceptable standards for at least four properties and this could be as many as 51 properties if a 1% error factor is considered in the calculations. This is not "environmentally responsible" or socially responsible mine planning.

The proponent suggests that the proposed "Visibility Barriers" will solve the problems of visible impacts in the Valley. The creation of 40 m high mounds of waste overburden material that will be difficult to revegetate, will be a blight on the landscape from every direction and not prevent the mine operations from being visible.

One vulnerable ecological community, and two (perhaps three) threatened animal species will be significantly affected by the proposed mine, and mitigation measures in the EIS are considered completely inadequate.

The proposal to backfill the mine void and create an aesthetic landscape is a concept that could be supported if enough information was provided to assess the likely success and the potential

impacts. Unfortunately there is no information on which to assess the suitability of the proposed final landscape. As such, the final landscape concept is an uncertain outcome with unknown consequences.

Building overburden waste disposal mounds on the floodplain and describing them as “Visibility Barriers” is misleading and environmentally irresponsible. There is inadequate assessment in the EIS of the flood damage that these structures could suffer and no assessment of the operational requirements for the sediment dams constructed on the floodplain at the base of the barriers.

It is acknowledged in the EIS that an indigenous restricted site exists in the mine area but the only mitigation is a suggestion to train mine equipment operators to look out for and report archaeological material. The extent of consultation with traditional owners was inadequate.

The cumulative impact of this mine in conjunction with other existing and proposed mining activity on non-indigenous heritage has not been adequately assessed because the study assumes that all individual impacts are small. The heritage assessment did not consider the principles of ESD as required by the DGRs, and no attempt was made to assess the impacts against the inconsistencies with the Gloucester LEP for development in the Environmental Management E3 zone.

Health risks are acknowledged in the EIS but not adequately assessed for maximum rates of production and not based on a self audit of residence that are likely to be affected by air quality. Proposed health mitigations are based largely on attempts to minimise air pollution without any innovative approaches to this problem, and without considering real cumulative impacts despite the current understanding of these issues in the Hunter Valley.

Geology in the proposed mine area is very complex and has been rejected by several other mining companies over the past 40 years. The current proponent proposes to “*undertake further resource training programs within the mine area to enable exact boundaries of the open cut pits to be defined so as to optimise coal recovery*”. This indicates that the mine planning is still at the concept stage and explains why the detail is lacking. This lack of detail means that the DGRs requiring justification of the mine plan and mine efficiency are not addressed.

Surface and groundwater studies provided in the annexures by consultants are complex, but not all of the information is used in the EIS and not all of the DGRs are addressed for these issues. There is no complete site water balance present for the mine proposal and in fact the surface water section is totally missing in the EIS and in the consultant studies.

Agricultural impacts addressed in the EIS relate only to the footprint of the mine site and do not address impacts from the large-scale purchasing of farms outside the mine area over the last five years.

The Rocky Hill mine proposal will be responsible for a significant increase in traffic flow on the Bucketts Way and other roads in the Shire, and the EIS has not adequately identified either vehicle numbers or load weights and safety issues at road intersections. The proposed

mitigation measures simply draw attention to the high risk situation without providing any real mitigation.

The economic data in the EIS provides estimates of local employment that are unlikely to be achieved based on data from other projects. Data from other Gloucester mining projects is ignored in the cumulative impact assessment of socio economic impacts. There is a poor economic case presented in the EIS for the project to develop. Even if financially viable, the project is likely to only provide limited benefits to the community which would be outweighed by the economic costs of social and environmental disruption. There is no analysis in the EIS of cumulative economic impacts with other mining projects or large employee industries.

The social analysis in the EIS acknowledges the large opposition to the proposal for another mine so close to town and discusses impacts on housing, employment, health and social fabric. However it suggests that a target of 75% of workers to reside in the Shire is achievable, but provides no data for this conclusion.

The EIS leaves many questions in regard to potential environmental impacts. Whilst there may be some economic benefits, the potential of the proposal to significantly impact other industries, residential amenity and the public perception of the town, remain of great concern to Council and the community. Accordingly, it is requested that the application be refused.

1. Introduction

Gloucester Shire Council is in the local government authority for the area in which the project is proposed to be located. Council has sought to develop a comprehensive submission to address its concerns, and the concerns of the local community. In preparing the submission Council has drawn on the resources of its staff, members of the local community and some limited external consultant advice. Council established a working group to discuss the development application and the comprehensive information contained in the EIS. A list of the people participating in this Working Group is attached as Appendix 4. Council sought an extension of time in preparing this submission, given the complexity of issues with the EIS documentation and the shortage of technical resources within a small "country" Council such as Gloucester Shire Council to deal with these issues within the relatively short timeframe however, no such extension was granted.

Councillors (of the previous Council) and staff received a briefing by representatives of Gloucester Resources Limited (GRL) on 19th March 2012, which also included a tour of the site of the proposed development. Council and community representatives have been participating in the Exploration Community Consultative Committee which has been operated by GRL over recent years.

Council has been consistently opposed to this development over all of the years it has been proposed. Council has made a significant number of representations to State Government Agencies and State Ministers regarding the issue and renewal of Exploration Licences over the land, the subject of this application. This ongoing opposition has been based on the fact that both Council and the State Government identified the immediate proximity of Gloucester township for Environmental Conservation purposes for preservation of the scenic integrity of the township within its delightful local landscape. Mining in close proximity to the town also has the potential for unacceptable health and community impacts

This intent was given effect legally in 2000 and again in 2010 when Local Environmental Plans were made which zoned the area around the township for environmental conservation purposes which prohibited open cut coalmining as a land use.

The fundamental concern with the proposed development is that the range of residual impacts - noise, light, dust, blasting, traffic, etc, will all impact town residents who have never experienced such impacts before. Attempts to mitigate these impacts cannot be successful, in particular because of the scale difference between the proposed development and the small-scale nature of the town. The relationship between the site of the proposed development and the southern extent of Gloucester township can only be appreciated standing on the site of houses in the residential estates at the southern end of town, and viewing the close proximity of the proposed development.

The rural residential estates forming the southern part of Gloucester township are located on the slightly elevated land between the Avon and Gloucester rivers which run in the eastern and western sides of the Gloucester Valley. The proposed development is located at the foothills of the Mograni Range to the east of the township and at a similar altitude to the residential estates. The slight "saucer shape" in the landscape provides a direct line of sight over the approximately

1.5 kilometre separation between the two land uses. There will simply be no way of hiding the mine or mitigating its impacts across this short distance and within this geographical context.

The scale differences between the proposed mine and the settlement of Gloucester, and the significant difference in the nature of these land uses is also important to appreciate. Gloucester's history is embedded in agricultural activity within its rural landscape. Many residents have been attracted to the area for this particular reason. The majority of tourists and casual visitors to the town are also attracted by the high scenic quality of the landscape in the immediate proximity of the town. Over recent years Gloucester has reinvented itself to attract lifestyle retirees and an increasing tourist market to enjoy these special qualities. Significant recent investments have occurred in tourism activity and by lifestyle retirees moving to the area.

Current coalmining which is occurring in the Gloucester Valley is located approximately 12 km south of the town. This activity has not significantly inhibited tourism and lifestyle retiree investment in the area over the last 18 years. There is an enormous difference however, in the town having a mine “down the valley” versus the town becoming a “mining town”. The reputation of Gloucester as a delightful and charming country town in beautiful natural surrounds is under serious threat by this proposed development. There is widespread and significant concern in the local community about the potential impacts on future growth in these economic sectors. There is likely to be a very significant impact on future growth of lifestyle retirees who have choice in terms of their destinations. The property market at Forbesdale Estate has virtually shut down in recent years, due to this proposed mining development.

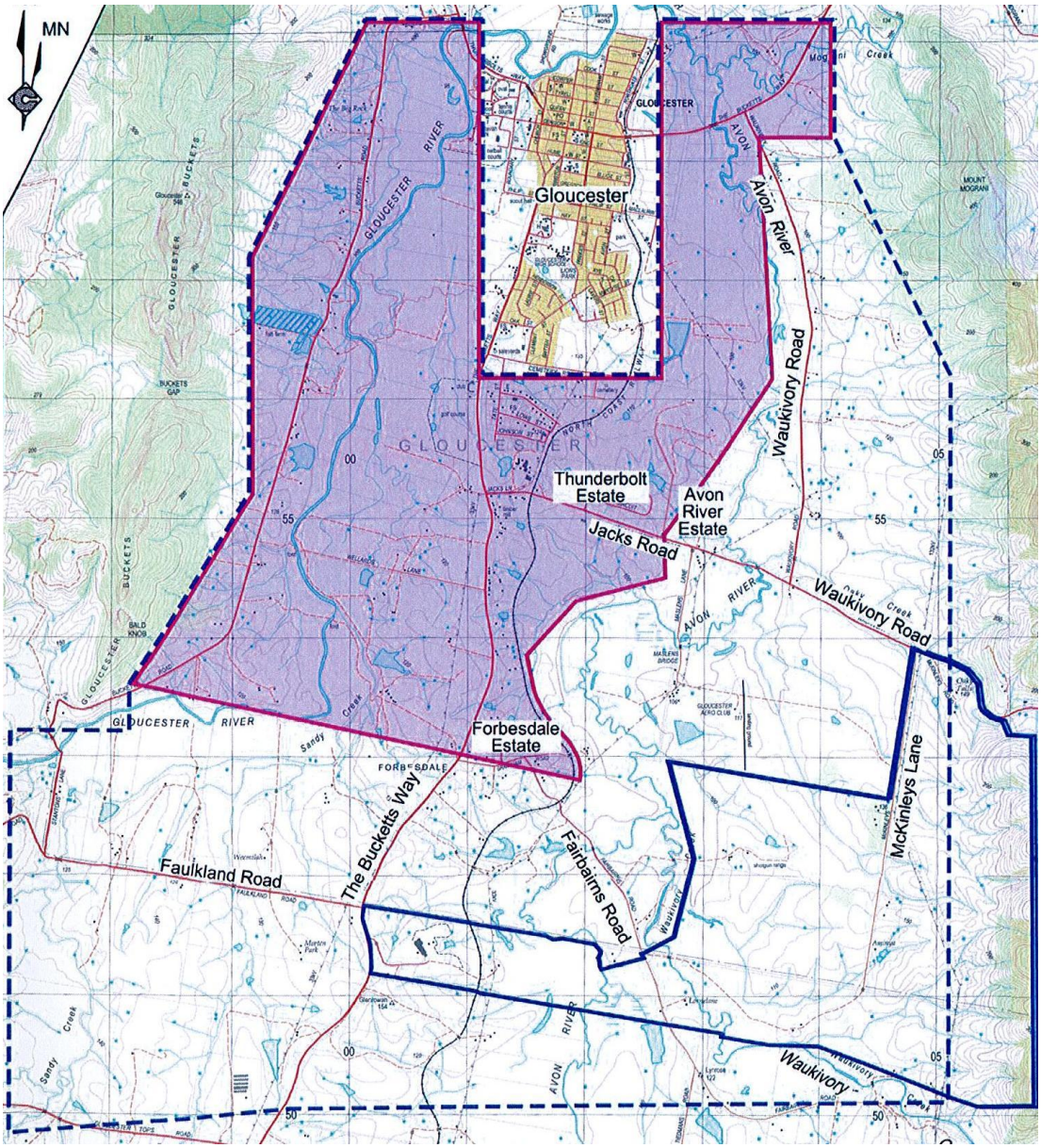
The socio economic evaluation commissioned by Council and an economic evaluation conducted by Gloucester Residents In Partnership (GRIP) have both raised significant concerns about the economic viability of the proposed mine. The proponent has recently relinquished part of their exploration licence closest to the Gloucester township, but has retained extensive land around the mine for future expansion. That area is increasingly closer to the town and seriously compromises planned expansion of the town (see map on the following page).

Council has major concerns with local infrastructure impacts of this proposal, particularly in regard to traffic accessing the site. The main access road has a level crossing of the main North Coast railway line, and it is adjacent to existing residential estates which are not presently subject to high volumes of heavy traffic.

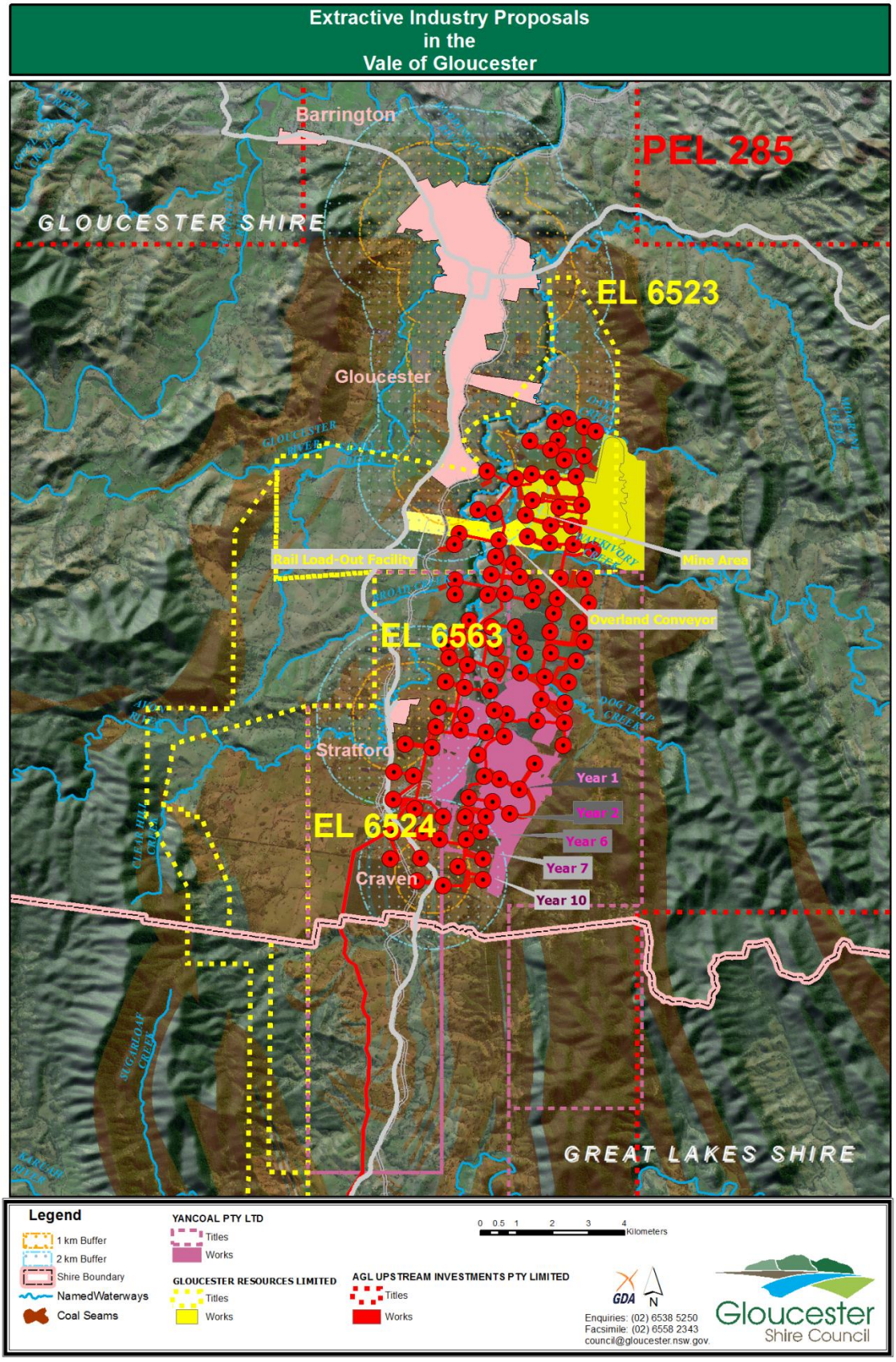
Council recognises that there may be economic contribution that employment of local residents and the engagement of local services bring to the local economy. The social and economic benefits of this proposal however, need to be carefully examined against the potential negative economic consequences to other sectors of the local economy.

Council has relied on the information contained in the EIS to inform its response to this proposal. We remain concerned that the residual impacts cannot be modified effectively to overcome the potential negative consequences of the development on the existing environment, the community or the local economy. We have established throughout this submission many reasons why the development should not proceed. Whilst we have come to this conclusion through detailed examination of the proposal, we have also sought to address, wherever

possible, improvements in proposed mitigation of impacts, and have included a list of conditions which we would request be applied to the development if a consent is to be contemplated. That however is certainly not Council's preferred position. Council is also significantly concerned with the potential cumulative impact of this development added to the existing approved open cut coalmine operated by Yancoal Australia at Stratford, and the coal seam gas development approved for AGL Pty Limited close to the town. The following map also shows the proposed mine and its proximity to Gloucester and its urban settlements. It is easy to appreciate from this map, the extent of concern held in the local community about the scale, complexity and interrelationships between these significant activities and the small-scale settlement of Gloucester.



Area of the EL6325 relinquished by GRL Pty Ltd around Gloucester – there remains a significant area outside of the proposed mine site for future expansion.


Extractive Industry Proposals
in the
Vale of Gloucester
Barrington
PEL 285
GLOUCESTER SHIRE
EL 6523
Gloucester
Rail Load-Out Facility
Mine Area
Overland Conveyor
EL 6563
Stratford
Year 1
Year 2
Year 6
Year 7
Year 10
EL 6524
Craven
GREAT LAKES SHIRE
Legend
1 km Buffer
2 km Buffer
Shire Boundary
NamedWaterways
Coal Seams
YANCOAL PTY LTD
Titles
Works
GLOUCESTER RESOURCES LIMITED
Titles
Works
AGL UPSTREAM INVESTMENTS PTY LIMITED
Titles
Works
0 0.5 1 2 3 4
Kilometers
GDA
N
Enquiries: (02) 6538 5250
Facsimile: (02) 6558 2343
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Gloucester
Shire Council

2. Council's position regarding the proposal

Council's long-standing opposition to the proposed mine has been consistently documented in resolutions of the Council and in representations to the State Government over many years. In preparing its current Community Strategic Plan (CSP) Council has reflected the broad community opposition to this proposed mine. During this process, Council undertook a community survey in regard to its intention to oppose the development and it identified that 78% of the local community supported Council in its position to oppose this mine.

The CSP identifies Council's commitment to*... research, monitor and* respond to, as appropriate, the long-term and cumulative impacts of resource extraction and also identifies the following as a specific strategy:

> *Oppose mining expansion within the environmental protection zones and/or in close proximity to urban areas.*

Gloucester Council understands the claimed potential for new development to increase economic investment activity and jobs; it is the net effect on the economy that is of significant concern. The development has a potential to negatively impact many sectors in the community, and as the economic consultants engaged by Council have identified, the proposed development is not viable and will only have minor beneficial effects in terms of job creation.

The proposed mine is relatively small in comparison to other mines yet its potential impact on Gloucester is significant. Given the relatively small output from this mine, Council questions why it is being proposed at all. There are mines in other parts of the State and in other States, which mine more than the total output of this mine over its entire life, in one year.

The fundamental concern for Council is that whilst impact management and mitigation might meet State standards, there will be residual impacts which will be felt by many new residences for the first time, if the mine is approved. These residents will be asked to live with those impacts for the entire proposed life of the mine, and potentially beyond.

The prospect of the mine has caused significant distress in the community, particularly for the closest residents and property owners in the residential estates forming the southern part of the town. Many have invested life savings in houses, only to find their valuations have significantly fallen and they are in a market that remains completely inactive. Whilst many wishing to sell have reduced prices on their properties, there remain no sales. There is also little interest in the development of vacant lots within these residential estates.

The impact of the mine on market activity is likely to extend well beyond the residential market into the overall reputation of the town. Gloucester is seen as a delightful country town with “a mine down the valley”; rather than as a “mining town”. The proposed development conflicts with the desire consistently expressed in the community for environmental conservation oriented land uses around the town – not open cut coal mines.

Council is also somewhat amazed that the State has prescribed setbacks from wind turbines, and recently in regard to coal seam gas activity, but has no prescribed setback for open cut coal

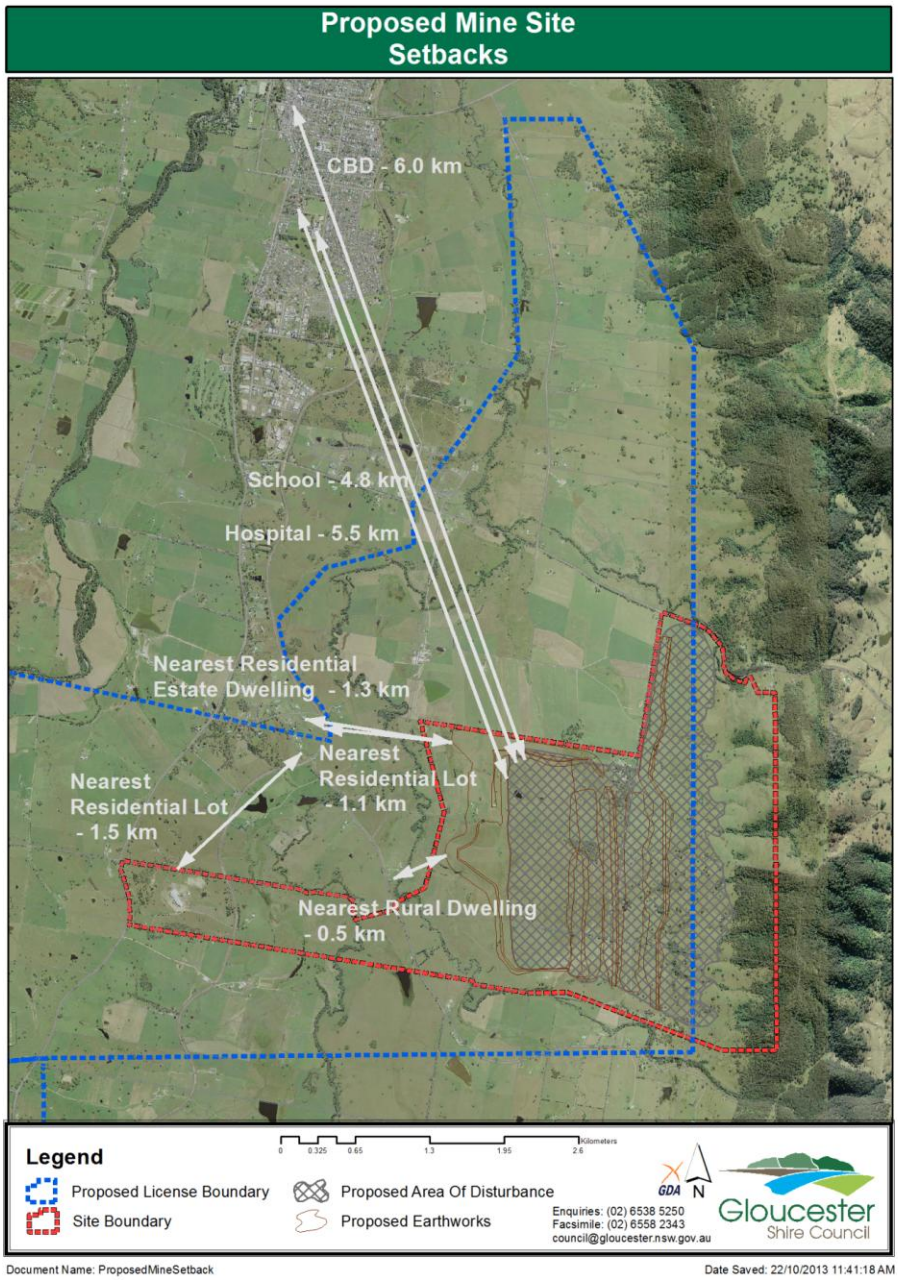
mines. The very close proximity of this mine to urban settlements in Gloucester is unacceptable to Council.

Council believes strongly that this mine should not be approved in this location, and that any approval will have the potential to significantly harm the status of the town as a desirable place to visit which then threatens the viability of this significant district Centre, in this part of the State.

Stratford Coal Mine in the Gloucester Valley

3. Planning context

The proposed development is located in the eastern side of the Gloucester Valley in close proximity to Gloucester township. There has been much debate about the separation of the site from components of the existing town. The following map has been prepared to clearly identify the site in its context, and in its separation from key features of the town.



As can be seen from the map, the development has the following setbacks to key features of the town:

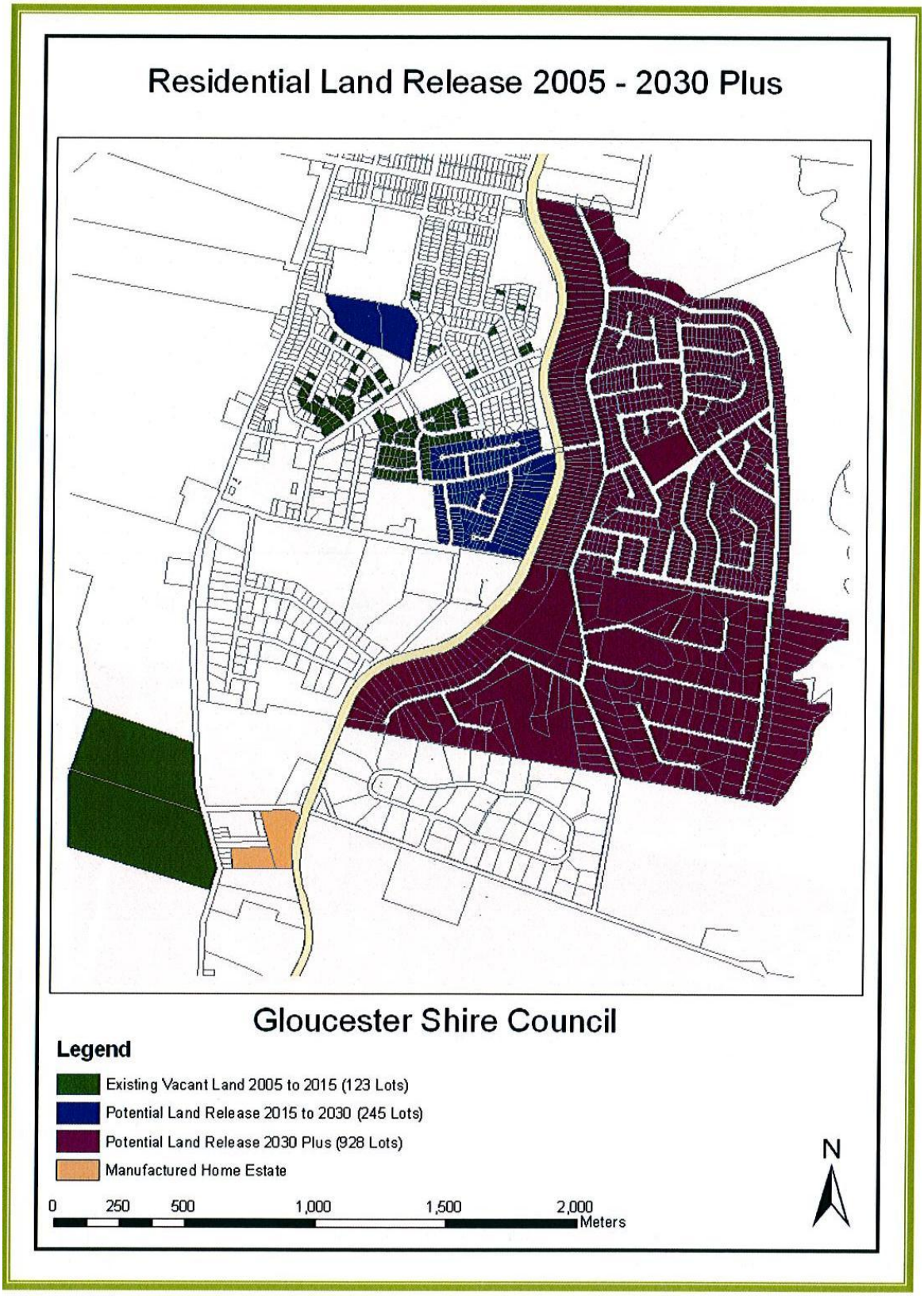
- distance to closest rural dwelling – 0.5km
- distance to closest dwelling in a rural residential estate – 1.3km
- distance to closest rural residential lot – 1.1 km
- distance to Gloucester district Hospital – 5.5 km
- distance to Gloucester High School – 4.8km

There has also been some inconsistent discussion about the edge of Gloucester township. Gloucester's urban area is located on the ridge between the Gloucester and Avon Rivers, which generally extends north/south in orientation. During the 1990s, there was demand for expansion of Gloucester and it was decided to provide additional land for housing development south of the existing town. Rather than extend sewage infrastructure in that direction, it was decided to create new housing opportunities as rural residential estates. Town water was extended to service these estates which are contiguous with the town boundaries and are considered part of the township.

In a Local Environmental Study prepared by consultants for Council in 2005, an argument was presented for *an optimum population of 8,000 to 10,000 persons serviced by the town of Gloucester*.… meaning ...*an additional 3000 dwellings would be required in Gloucester and surrounds...* with ...*approximately 2300 of these dwellings in the urban area*.

In 2006 Council prepared a residential land release map for the period 2005 – 2030+ which identified an area south of the golf course for release in the short term (2005 – 15; 123 lots); a second stage within the existing urban area; and significant long-term release east of the existing township and railway line. These areas are shown on the following map.

MAP 2: Gloucester



The significant area of future release east of the township would be seriously compromised by a mine such as that proposed in this development.

The areas surrounding the township of Gloucester have been zoned consistently for environmental conservation purposes. In 2000 Council completed a Local Environment Plan that zoned much of the area around the township 7(d) – Environmental Protection (Scenic) which had the following zone objectives;

a) *to encourage the preservation of existing wooded hilltops, parts of river valley systems, major scenic corridors and other local features of scenic attraction,*
b) to enable development of a similar nature to that intended for Zone 1(a), except for development that buy it's nature would be visually destructive or intrusive, provided such development is carried out in a manner which minimises the visual impact,
c) to ensure that development in this zone on land adjoining land in Zone 8(a) is compatible with the management objectives for that land.

When the LEP was revisited following completion of the 2005 Local Environmental Study, environment and conservation zones around town were extended to the south as shown on the second extract from the LEP following. The 7(d) zone was converted to E2/E3 zones, which have the following zone objectives;

Zone E2 Environmental Conservation

- *To protect, manage and restore areas of high ecological, scientific, cultural or aesthetic values.*
- *To prevent development that could destroy, damage or otherwise have an adverse effect on those values.*

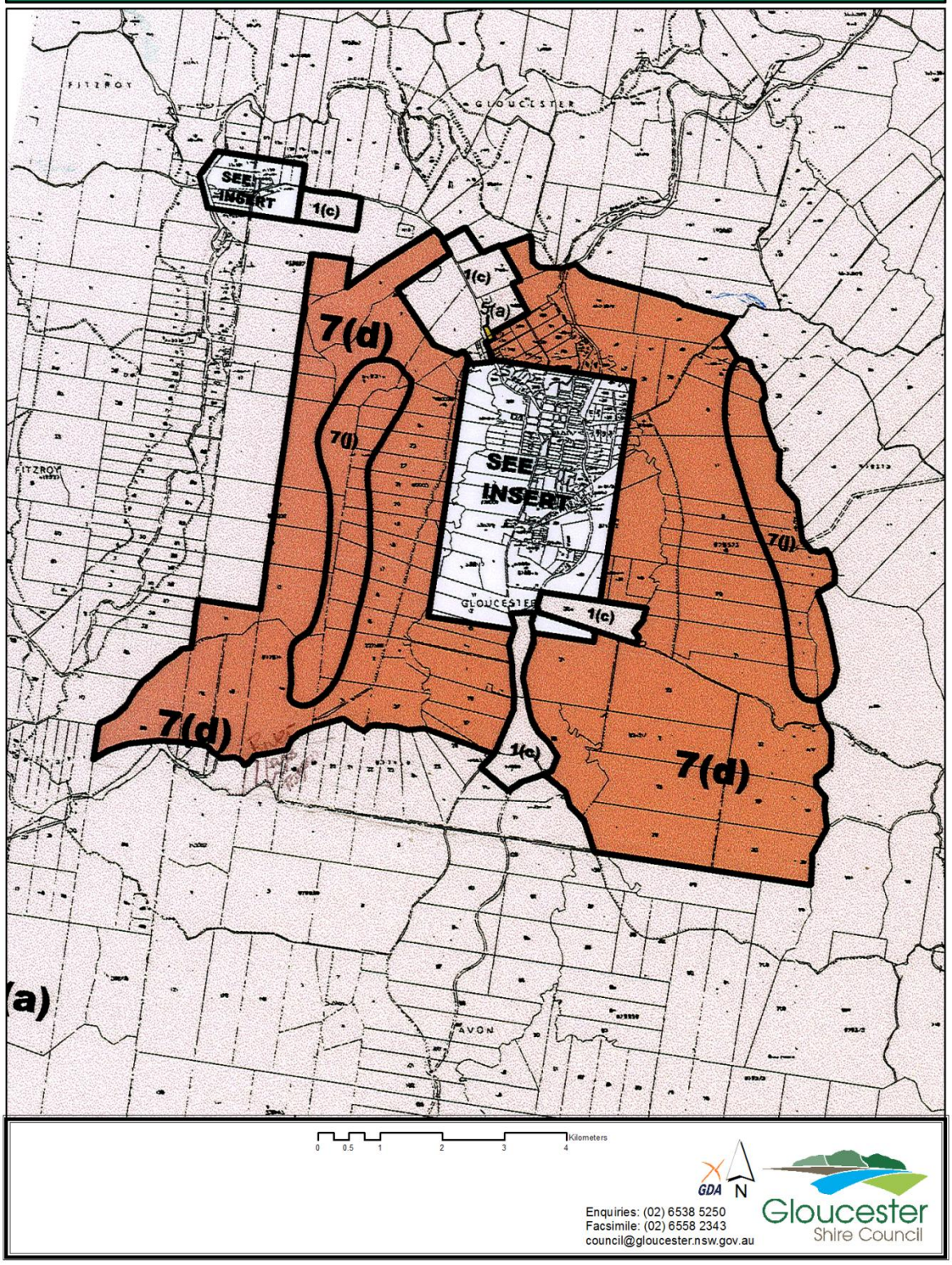
Zone E3 environmental management

- *To protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values.*
- *To provide for a limited range of development that does not have an adverse effect on those values.*
- *To conserve biological diversity and native vegetation corridors, and their scenic qualities, in a rural setting.*

The area is zoned are shown on the following maps together with a detailed site map showing the proposed development in relation to current zoning is on the land.

Under both LEP's, open cut coalmining was, and remains, a prohibited development. The circumstances where State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industry) 2007 enables the development to be considered despite the zoning in the LEP, causes significant concern in the local community.

Environmental Conservation Zoning in Gloucester Local Environment Plan 2000



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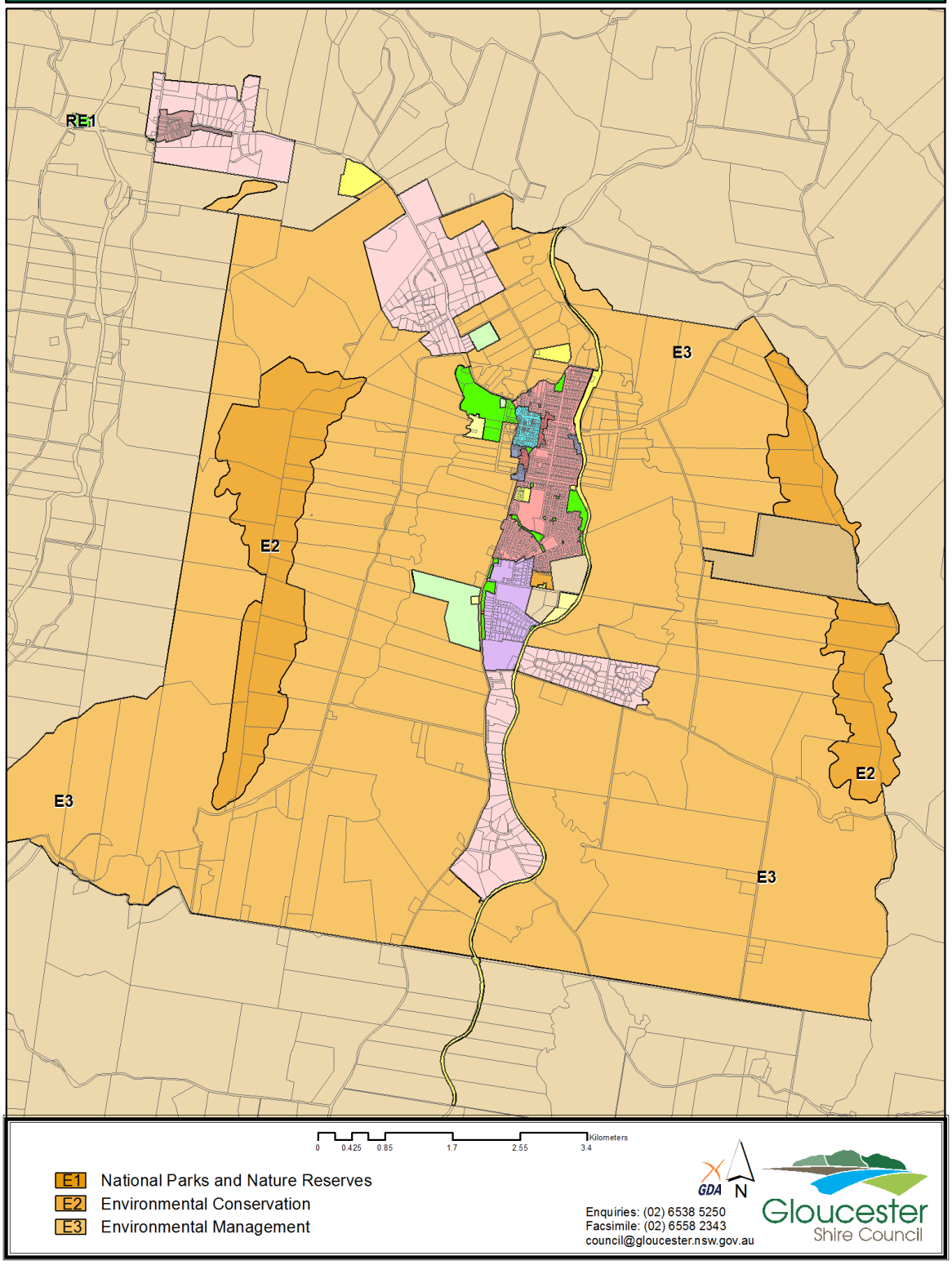
Environmental Conservation Zoning in Gloucester Local Environment Plan 2010



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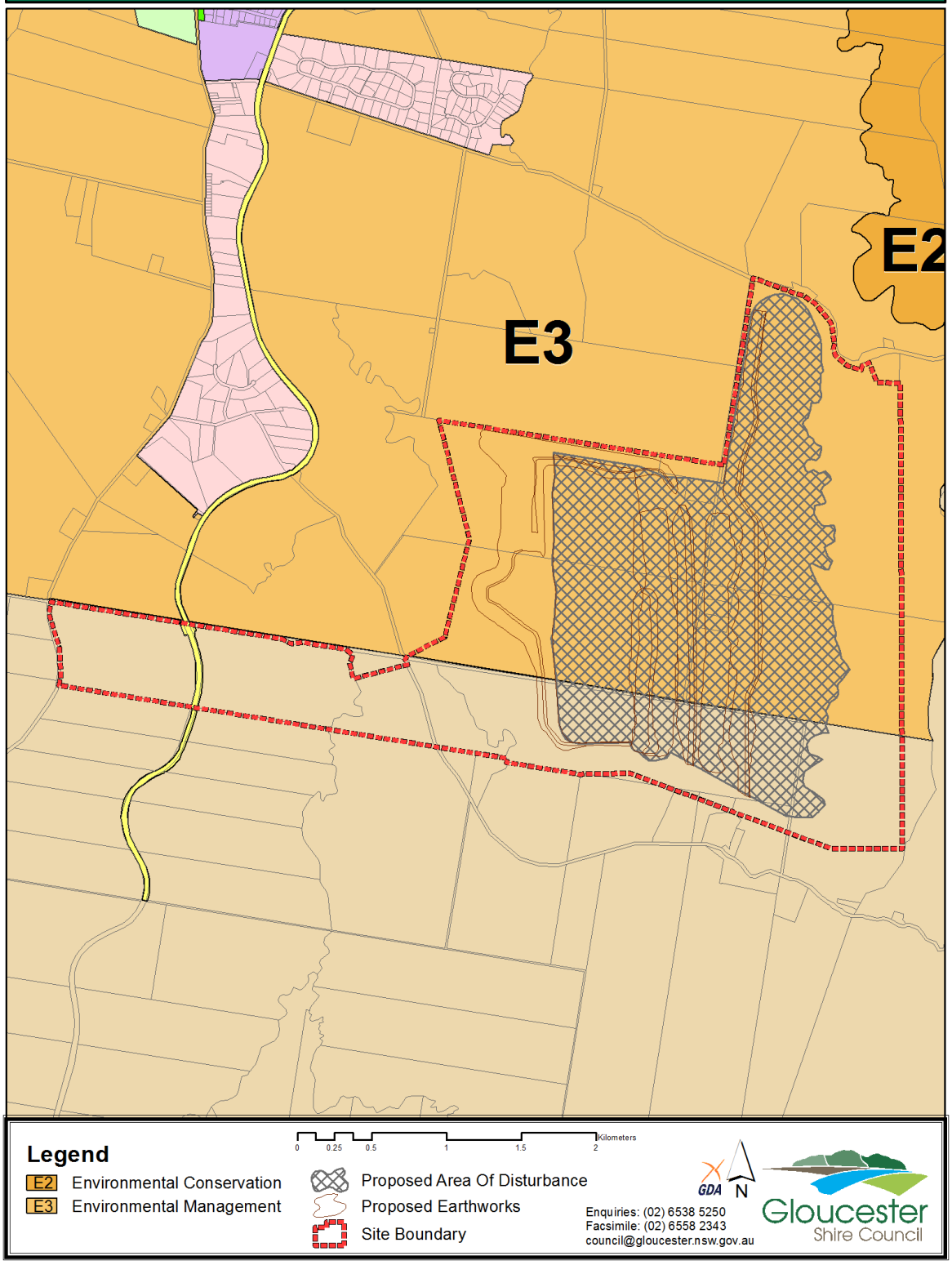
Proposed Mine Site
in relation to Zone Boundaries



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Council has made decisions to amend the environmental conservation zoning around the town of Gloucester on two occasions only. The first occasion was a minor amendment to the zone adjacent to the town centre in order to facilitate construction of a new supermarket facility that had difficulty locating on existing lots within the town centre. The second variation is a current proposal to change the zoning in accordance with the adopted Housing Development Strategy – 2006. That circumstance relates to the first stage residential release adjacent to the golf club in the southern part of the town and in accordance with the residential land release map presented earlier in this section. Council has resolved to support this rezoning which is being prepared for submission to the Gateway Panel.

These amendments are considered to be minor in scale compared to the scale of an open cut mine and are compatible with the urban context. If the area of land subject to the mine application (856ha) was "re-zoned" for housing (at a generous 1000m^2 lot size) it would result in approximately 8,560 lots (not including areas set aside for infrastructure etc).

Council has previously supported efforts to gain heritage recognition of the landscape in the Gloucester Valley. This matter is addressed in greater detail in the section of the submission on non-indigenous heritage (6.9.2).

Grounds for refusal

- The proposed mine compromises Council's ongoing intent to protect the scenic qualities of the town of Gloucester from inappropriate development, as specified in the Gloucester Local Environmental Plan 2010.
- The proposed mine will have an unacceptable impact on future planned development in the residential estates in the southern part of the town of Gloucester.
- The proposed mine will have an unacceptable impact on the future planned residential expansion east of the township and railway line beyond 2030 as identified in its housing development strategy – 2006.
- The proximity of the proposed development to the urban settlement of Gloucester will have an unacceptable impact on the health and community of local residents.

4. Council's position on extractive industries for the Gloucester LGA

Mining in the Gloucester Valley commenced in 1995 when a “boutique”"coalmine commenced mining adjacent to the village of Stratford. The mine was to operate for 8 years. The mine was granted an additional consent in 2003 to allow mining through to 2013, and is now subject to a further proposal which seeks to extend the mining activity for a further 11 years. This proposal brings the mine closer to the village and includes an intention to operate 24 hours a day. Council has not opposed an extension of mining in this location, but has sought to keep the mine a reasonable distance from the village, to limit the hours of operation and ensure an appropriate post-mining landform at the conclusion of mining.

In February 2011 the NSW government approved an application for coal seam gas extraction by AGL adjacent to the town of Gloucester. That approval is for 110 wells of a proposed total in excess of 300 wells for the entire Gloucester Gas Field. AGL is continuing to investigate aspects of the approval to meet statutory consent requirements for both the State and Federal governments.

The local community response to each and all of the development proposals has varied widely. At the time of the Stratford approval there was little opposition in the community, especially as the approval was for a boutique mine, small-scale, which was only to operate for a short period of time. The additional investment and the new jobs were seen as a significant benefit locally, particularly if the impacts were to be modest. It is also reasonable to say that there was limited understanding of issues related to CSG in the community at the time of the approval. Concern since the approval however, has continued to grow strongly in the community.

The major focus of community concerns remains the issue of local water resources. The community strongly understands the significance of these resources which have been fundamental to the core business of agriculture in the local area. Gloucester is exposed to extensive periods of drought and this country fares badly during such times. The Gloucester LGA is also a significant catchment in the headwaters of the Manning River which is the water supply to over 75,000 residents across a significant area of the Mid-North Coast from Crowdy Head (Greater Taree) to Pacific Palms (Great Lakes) and locally for residents at Gloucester and Barrington.

Council has recently partnered with AGL to complete studies that, together with the Federal Government’s Bioregional Assessment and AGL's project specific studies are expected to provide comprehensive knowledge and understanding of the nature and value of local water resources. The Bio Regional Assessment will specifically look at the potential impacts of existing and potential coalmining and coal seam gas extraction on the water resources of the Gloucester basin. The community finds it difficult to understand that approvals can be granted for major extractive industries where there remains uncertainty as to what the impacts might be on our precious water resources.

The scale and extent of the studies are significant and in the near future there should be very comprehensive information to inform major decisions such as the one being canvassed in this application.

In 2012 Council also established an Extractive Industries Working Group with representatives from Council and the community targeted to examine the role of extractive industries and its relationship to other land uses in our local community. Council has tasked this group to prepare an Extractive Industry Strategy for the area by the end of 2013. This work will also provide a valuable input to Council's intention to prepare an overall land use strategy for the local government area that will look broadly at how this significant district of Gloucester can build a sustainable future for its community, while protecting the strong environmental values of the area.

There is a strong sense of place and connection of Gloucester residents to their local area. Sense of place is comprised of the meanings, beliefs, symbols, values and feelings that individuals or groups associate with a particular locality. Gloucester residents, whether living in the area for generations or newly arrived, have developed strong connections to this area. That sense of place has been challenged by the potential significant changes that may result as a consequence of this large-scale extractive industry activity. Each major proposal has caused psychological distress for individuals in our community.

The Sydney-Gunnedah coalfield has been the centre of mining in NSW for decades. The Gloucester Basin is a recent entrant in this intensification of coal extraction. "*This current rapid expansion has seen a dramatic increase in negative impacts. It has brought significant changes to towns and the environment. This includes the landscapes, ecologies, communities and economies"*. (Evans, 2008; Higginbotham et al., 2010).

While the physical changes, being tangible, are recognised and accounted for, there are intangible psychological changes that are happening without recognition. For individuals caught up in the coal rush, the changes can be psychologically damaging. The damage to physical health through the negative impacts of coal extraction are known but rarely acknowledged, so too psychological damage has been ignored.

In recent years research has been conducted on the 'Sense of Place' individuals feel toward their home or environment. This attachment to a particular locality has been recognised as a human need, and a basis for wellbeing. 'Solastalgia', is the name given to the psychological pain caused to individuals who are attached to their landscape and grieve for the loss of that loved landscape, which gave them solace.

This concept was accepted by Chief Justice Preston in the Bulga– Milbrodale appeal as having particular relevance to communities where the residents often have a lengthy and a deep association with the land. Expert evidence was provided by Prof Glenn Albrecht, the person who coined the term solastalgia. He has studied the impact at Craven village, just south of Gloucester and stated the concept is very pertinent to our community. The landscape has family, cultural, working and many other personalised social settings. The unwanted and resented breaking down of this attachment gives rise to a long lasting, deep yearning, and grief, which includes feelings of depression and anxiety. As mentioned, this concept is just as applicable in the Gloucester Valley with its long heritage as at Bulga.

This psychological impact is being experienced in Gloucester by people who are in the direct line of Gloucester Resources Limited's land acquisitions. Since GRL's entry into the valley, landowners have been subjected to uncertainty which has created intense helplessness. People feel confused, overwhelmed and powerless when dealing with mining companies. The companies have the upper hand and use their power to their advantage. GRL's plans have taken away people's hopes, dreams and investment in the future. Financial remuneration is like a band-aid over a wound.

Undocumented accounts of residents experiencing extreme stress reactions are common. This includes sleeplessness, amnesia, heart palpitations, anxiety and depression. Some families have chosen to leave the Gloucester area. Others, after selling their home and farm and moving to another part of the valley, will not venture back to the home they loved. The pain is too great. Psychological distress, caused by 'loss of place', is a direct impact from proposed and actual coal extraction activities.

In the light of increasing community concern about mining proposals, Council has developed a Framework for Protecting and Enhancing our Community – Future Development Principles which seek to capture our community values and expectations in regard to new development. The framework is as follows;

The Framework for Protecting and Enhancing Our Community

– Future Development Principles

Gloucester Shire Council

The following table documents in our community's values and expectations in regard to future development. They have been developed by Council in response to potential significant changes resulting from major extractive industry activity, but can apply to any future development proposed in our community.

What we value –	What we expect –
Our fellow residents	– To live healthy lives – to have wide choices in occupations and activities – to be able to contribute to and engage in community activity – to support and care for each other
Our work	–job opportunities across all economic sectors – support of local businesses – priority for local employment
Our young people	– Building of skills and opportunities to meet local employment – opportunities for future prosperity
Our environment	– Respect for and preservation of our picturesque rural landscape –sustainable management of our soils and land

	– maintenance of clean air – preservation, conservation and protection of local water resources – understand, value and appreciate the night sky – protection of ecological communities
Our property and land	– Respect for property ownership – build value in land ownership – maintain the quality rural landscape
Our infrastructure	– Maintain and develop infrastructure to meet community needs –that new development contributes fairly infrastructure upgrades
Our services	– That a broad range of affordable services are available to meet the needs of the district population
Social harmony	– Build community through mutual respect – to maintain and support community through inevitable change – to speak freely and honestly without undue threat
Good governance	– To make well informed decisions with active engagement of all – That people will do the right thing – to consider cumulative impacts – to build trust through open and honest dialogue – to promote sharing of responsibility between all stakeholders
Our future	– To have security against known risks – to receive a 'risk premium' for hosting businesses that pose knowable risks
Energy	– To use energy resources wisely – to promote renewable energy forms
Amenity	– To respect and preserve the tranquillity of our rural landscape – understand, value and appreciate the night sky

Council recognises the potential economic contribution that large-scale mining can bring to our small community. We need to be careful however of its impact in terms of the local economy, environment and community. Council is not opposed per se to mining in our area. We are committed to our endeavour to protect the scenic qualities of the landscape in the immediate environs of Gloucester township, which is the reason for Council's long-term and consistent opposition to this particular proposal.

There are also strong local concerns about the liability for risks and benefits involved in resource extraction activity. Our community needs mineral resources and there are many companies happy to pursue the profits to be made in this business. The State Government also has strong benefits to be realised from the royalties paid on mineral resources extracted in this process. The great concern for local community is the potential imbalance in benefits and costs for them. Whilst there are direct jobs and other economic activity spinning off these projects, the risks and the impacts are fundamentally worn by the local community. Council prepared a matrix to examine the risks involved in this activity which is included in this submission on the following page.

We are committed to work with all stakeholders; including the State Government and its Agencies, the mining and petroleum industries and the community, to identify a clear strategy for future development in our area. There is a compelling need to get the balance right.

Risk Matrix for Current Participants in Mining Developments

The matrix rates, from the Community's perspective, the risk of adverse outcomes for the three participants in a mining development (low-green, moderate-orange, high-red).

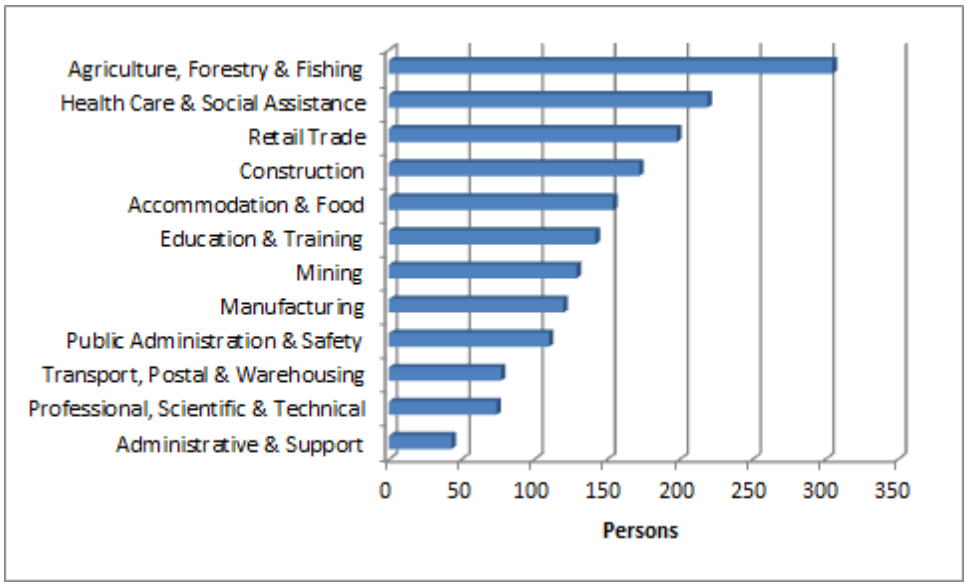
	Environmental		Social		Economic	
	Short term	***Long term***	***Short term***	***Long term***	***Short term***	***Long term***
Proponent	Liability limited to Conditions of License	Liability limited to largely inadequate Conditions of License	Generally ignored but may be mitigated by Conditions of License	No liability recognised	Liabilities limited to agreements Substantial profit potential with minimal risk	Liabilities usually not recognised in agreements Depending on the lifetime of the ongoing project, there may be substantial long term profit potential
State Government	License conditions remove liability, some potential short term political fallout if license conditions prove inadequate	Liabilities sparsely covered by license conditions but generally of little interest as they only become apparent to future governments	Generally ignored as they pose no real cost at the state level	Liabilities poorly considered as they only become fully apparent to future governments	No liability Significant revenue from royalties	Poorly considered as they only become fully apparent to future governments
Local Community	Any unmitigated environmental event is a direct cost to the Community Long history of environmental costs of mining operations accruing to local Communities	Long term and cumulative liabilities poorly considered and accrue directly to the local and regional Communities	Ignored costs are unmanaged by either the State or the Proponent and Communities left to manage as best they can	Serious long-term social dislocation with no explicit support for managing its effects	Significant short term economic costs for incompatible economic sectors Benefits may accrue to aligned economic sectors and through agreement to share profits	Economic upheaval associated with creation and withdrawal of an industry that is incompatible with many other important and sustainable economic sectors

5. Gloucester township

In its preparation for responding to this application, Council chose to engage economic consultants to prepare a Socio Economic Profile of the area so that we could better understand the current nature of our local community and economy. This work builds on previous studies done in the local area and updates information to the 2011 ABS data. The following summary has been taken from the report to help inform this assessment.

Gloucester has a population of around 4,900 people, making it one of the smaller local government areas by population in NSW. Gloucester's population has been steady through the last four censuses, although some commentators are expecting modest increases in coming years. Compared to NSW as a whole, Gloucester has fewer people aged 20-39, who leave for education and employment opportunities, and higher numbers of older residents or "tree changers" who have moved to the area for lifestyle and retirement reasons. Most neighbouring LGAs show a similar pattern.

The major industries for employment in Gloucester are:



Unemployment is low, as is workforce participation due to the proportion of retirees and lifestyle residents. Unemployed residents of Gloucester are largely long-term unemployed, with around 75% being on Newstart allowance for more than one year. Gloucester residents are more likely to receive lower incomes than the rest of NSW. However, demographic factors are important in understanding this pattern. The vast majority of low-income earners are over 65, often retirees who have low incomes - some intentionally for tax purposes – but often have significant assets. Home ownership is far higher than average across NSW and higher than neighbouring LGAs. Similarly, while business incomes are low, many own significant assets, and for others lifestyle considerations are a key motivation for maintaining their business.

Gloucester's housing occupancy rates are lower than surrounding LGAs. Some commentators suggest housing stock is too heavily focused on larger, three bedroom homes, with insufficient housing diversity. Median house prices have been reasonably steady for several years. However, the median measure overlooks significant changes in some areas, particularly to the south of Gloucester town where the Economists at Large (2013) Gloucester Socio-economic profile 4 Rocky Hill coal proposal is influencing the property market. Prices paid by the mine proponents for properties close to the proposed mine location have reportedly been generous, while properties in nearby housing estates have become difficult to sell. Residents in the Forbesdale Estate estimate that their properties have declined in value by 30-40% in recent years due to proximity and uncertainty over the project. This devaluation has major welfare implications for the residents of these areas. Over 60% of Forbesdale Estate's residents are "asset rich-income poor". The devaluation of their principle asset represents a serious financial and potentially mental burden.

Gloucester's education levels are similar to other LGAs nearby, with more people holding certificate level qualifications than the NSW average, but significantly fewer university graduates or postgraduates. Educational levels have been improving steadily through the last three censuses. Gloucester has higher rates of volunteering than the NSW average and most surrounding LGAs.

Interviewees felt that census data heavily underestimates the amount of volunteering in Gloucester and its importance to the community. There is some quantitative data to support this view. Gloucester's older residents contribute significantly as volunteers, a contribution often not recognised by economic indicators.

Agriculture

Beef and dairy are the main agricultural activities. Herd sizes have dropped significantly in recent years. Dairies have consolidated into a smaller number of larger operations and beef growers have faced several challenges:

• Changes in forestry practices, with reduced grazing in forests and eucalypt plantations taking

over other marginal grazing areas.

• Land owned by resource companies being taken out of production, or reduced stock

numbers.

• Expansion of the national park estate into former grazing land.

• Subdivision of some larger holdings into smaller hobby/lifestyle farms and demographic

change in the region.

Despite these challenges, most industry respondents considered current conditions and the long term outlook to be fairly positive.

Other agricultural activities and proposals include horticulture, aquaculture, hemp and bamboo growing. Some of these, particularly horticulture, have strong community interest and active support groups. Some also interact closely with the tourism industry.

Tourism

Tourism has developed to become a major employer and important industry in Gloucester. Data on visitor numbers, expenditure and employment is imperfect, but demonstrates the industry's significance. Destination NSW, the state tourism agency, estimates that 69,000 domestic visitors spent a night in Gloucester in 2011-12, mainly from regional NSW. National Park officers estimate 100,000 people visit the area's national parks annually.

Retail

Retail trade is also a significant employer and as the major town in the LGA Gloucester has a range of retail businesses. While some observers are concerned about particular businesses closing, there is strong interest in retail space in Gloucester. The most important change in recent times is the development of a Woolworths supermarket, the impacts of which are largely beyond the scope of this report.

Resources

Gloucester LGA has several resource projects including two operating coal mines (although one is just outside the LGA) a coal seam gas proposal and the Rocky Hill coal proposal. The existing mines opened with considerable local support and the jobs they provided were considered a "godsend" at a time when other industries were declining. Attitudes toward future developments are different, with a clear majority of residents opposed to the Rocky Hill project in particular. The industry is a considerable employer of Gloucester residents and some workers drive in to the projects. Wider economic contributions are difficult to gauge, although the vast majority of revenues leave the LGA, a situation not unique to Gloucester. Other resources such as limestone and rock quarries are active in the Gloucester area.

Industry and Manufacturing

Gloucester has an active light industry and manufacturing sector. Numbers of manufacturing businesses have increased steadily over the past three censuses, although total numbers of employees have shown some decline.

Government and professional services

The service sector and government sector are also considerable employers in Gloucester. They have both shown some growth in recent years.

Conclusions

Gloucester has generally sound socio-economic indicators, such as steady population, low unemployment and an engaged community. Challenges include long-term unemployment and managing the competing interests of different industries and groups. A thorough understanding

of the demographics of the LGA is important for planning in response to these challenges and we hope this report can contribute to this process.

The key point about the Gloucester economy is its relative small-scale and the generational nature of many businesses across all sectors of local economy. Much of the local economic activity relies on the natural landscape (agriculture) and maintenance of the environmental qualities of the area (tourism; lifestyle retirees).

6. Mine impact issues

6.1 Hours of Operation

6.1.1 Analysis of the issue

The hours of operation of the Rocky Hill coal mine are central to the issue of negative impacts, such as, noise, blasting and traffic movements.

As the Proponent acknowledges (4.2.3),… "*There is potential for the various operations associated with the Proposal to produce noise-related impacts at the surrounding receptors and sensitive receptors within Gloucester township*".

The following operations associated with the Proposal have been identified as sources of potential noise-related impacts:

- Construction (on-site and off-site) during the site establishment and construction phase.
- Mining operations (daytime, evening and night-time).
- Conveying, loading and dispatch of coal (24 hours per day).
- Traffic on local roads (both light and heavy vehicle movements).

The distance of receptors (people living in houses) from the 'closest area of disturbance' and 'closest open-cut pit' is one of the main factors in determining the impacts of the effects of the Proposal. These privately-owned residences are situated in a quiet rural area of the Gloucester valley. Any amount of industrial noise will impact on the health, lifestyle and enjoyment of the people living there.

6.1.2 Concerns/problems/issues

Definition of Sensitive 'Receptors'

The Proponent notes (4.1.4.2) that… "*Throughout this document, a distinction is made between privately-owned residences, hereafter referred to as receptors (of potential noise, vibration and air quality impacts) and residences on company-owned land, referred to throughout as residences*."

There is considerable confusion within the document in the use of the terms 'residences' and 'receptors'. Notwithstanding this confusion, the separate terms suggests that residences on company-owned land will somehow be differently impacted by the Proposal. Many of these residences are occupied under rental agreements, with, it is understood, a tenants covenant that prohibits the tenant from raising any objection or complaint about the proposed mine. The sensitivity of the occupiers to known health impacts is not dependent on ownership status or agreements under which they are occupied. They remain sensitive due to proximity.

Figure 4.6 (Page 4-13) displays 193 properties listed under the heading of 'Land Ownership'. Table 4.3 and figure 4.7 (page 4 – 16) are both labeled sensitive receptors and are a much smaller assortment of public buildings/places. It is of note that Gloucester Post Office is listed and it is indeed one of the buildings which will hear mining noise for the first time (see page 1 –

101). Of those, 173 are not owned by GRL and will be impacted by the proposed mine. A further subset of 66 residences (receptors) is identified as being most at risk. These qualify to be assessed in the noise and/or air quality assessments. These residences (receptors) are identified because they live from as close as 350m and as far as 2.51km from the '*closest area of disturbance*' and as close as 1.27km and as far as 3.49km from the '*closest open cut pit'*.

The Proponent notes that "*The closest rural-residential estate is the Forbesdale Estate..... The residences (receptors) in this estate are located between 1.2km and 2.0km west of the western edge of the western and northern visibility barrier and 1.7km and 2.5km west of the closest open cut pit. The residences on the southern side of the Forbesdale Estate are approximately 1.1km to 1.9km north of the Rail Load-out Facility*." The Forbesdale Estate has 50 resident families.

The Avon River Estate is located approximately 1.8km to 2.4km northwest of the Mine area and immediately north of Jacks Road, the main access route to the Mine area. The Estate contains 44 lots of which only 19 are occupied. The Avon Estate has the potential to house 25 more families.

The Thunderbolt Estate is located approximately 1.9km to 2.8km northwest of the Mine area also north of Jacks Road. The Estate contains 51 lots of which only 27 are occupied. The Thunderbolt Estate has the potential to house 24 more families.

It might be argued that vacant lots cannot be assessed but the occupation of these lots is an integral part of Gloucester's growth strategy. Sales and development of the rural residential estates south of Gloucester have stagnated since the announcement of the Rocky Hill proposal. The last house built on land in Forbesdale Estate was in 2009. It is not unreasonable to assert that the potential benefit of 51 families living in Gloucester has been delayed indefinitely due to this proposal.

If we add the 49 lots without homes, to the 193 receptors already identified then there are 242 sensitive receptors who must be considered by the Proponent. As the additional 51 lots are in close proximity they would also be added to the 66 residences (receptors) already identified as *most at risk*. This brings the total to 117 potential families most at risk from impacts because they live within 1.2km to 2.8km from the proposed mine workings.

This is 242 affected lots and 117 residences, not individuals. When a crude household multiplier is applied approximately 480 people will be at risk from the impacts of this mine due to their close proximity to the mine. With 480 people at risk the hours of operation become a crucial element in the EIS.

Local geography

The shape of the landscape between the mine site and nearby residential development is also significant in regard to this issue. The proposed mine is located at the foothills of the Mograni mountain range, whilst the rural residential estates are located on the rise in the centre of the Gloucester Valley, between the Mograni and Bucketts mountain ranges. This "saucer" shape of the landscape means that there is no physical barrier between the noise generating activity at the proposed mine site and the residential estates to the west. They will be clearly visible at all times and noise will directly transmit from the site to the residential properties. The proposed noise and visual mounds included in the mine plan are to be progressively constructed over a significant period of time in association with staging of the mine.

Hours of Operation

Table 2.10 outlines the operational times. They include Pre-start activities, Mining, CHPP, Coal Product Dispatch and Maintenance. Apart from public holidays, every day of the proposed 16 to 21 years of operation are included in the operational times.

At almost every hour of the day it is proposed that there will be noise generating activities at the mine "*Subject to confirmation by modeling and real-time monitoring that night-time and sleep disturbance criteria are satisfied at privately-owned receptors*."

It is asserted that there would be no mining activities *per se* between 4am and 7am, however start-up activities that commence at 6am are included, stretching the hours of operation from 6am - 4am. A two hour dawn break provides only token respite. The proposal is essentially an round-the-clock operation.

This is acknowledged by the Proponent (4.2.3), who states that the mining operations - conveying, loading and dispatch of coal and traffic on local roads, could potentially impact on sleep during the period between 10:00pm and 7:00am.

The health impacts associated with noise are covered extensively in another section in this submission. However, it is important to note that the noise impacts of the proposal are particularly offensive in these circumstances. Most of the residents in these estates have chosen to live in Gloucester at least in part because of its peaceful rural character. Any level of industrial noise will be considered intrusive and unacceptable.

Experience from residents living near the Yancoal Stratford mine

Noise has been the greatest cause of complaints from residents living close to the Stratford mine, situated to the south of the proposed Rocky Hill mine. The Stratford mine was initially allowed 24 hour operations. Neighboring residents found the night-time noise disturbance intolerable. The Stratford mine has underestimated noise in the EIS for that mine. One resident complainant lives approximately 5 km from the mine and his concerns are often about morning noise, during temperature inversions. The noise predictions for his property were well below the noise standard. As a consequence of community concern, the Department of Planning restricted consent to daytime only operations. The Stratford mine now operates under restricted hours.

On the basis of analysis of impacts reported through the CCC and letters to Council - particularly noise impacts on residents living in the vicinity of the nearby Stratford coal mine and previous experience of 24-hour mining there, Council has advised the Department of Planning that it is opposed to mining operations at Stratford being extended beyond the hours of 7.00am - 6.00pm.

The Rocky Hill proposal has a larger number of private receptors in the nearby residential estates. The proponent has made no convincing case that the noise complaints generated by 24 hour operation experienced at Stratford will not be repeated on the larger population in Gloucester.

Add to this the subjective perception of noise impacts, the potential psychological impacts and the known exacerbating topographic and climatic influences on noise and the potential to successfully mitigate noise is unlikely to be successful.

6.1.3 Adequacy of proposed mitigation

Mitigation Measures
The design features which will be used to contribute to the control of noise rely largely on the visibility barriers. There is genuine concern that the visibility barriers would be difficult if not impossible to construct in their proposed form. Even if it was possible to construct the visibility barriers, it is apparent that their construction would be a significant piece of work occurring over an extended period of time and would come with its own problems relating to noise, dust and visual impacts. It is not clear that the proposed mitigations are not a case of "the cure being worse than the disease".

Low-frequency noise
It is noted that, *"Wilkinson Murray (2013) notes that tonal, impulsive and low-frequency noise are unlikely to be a feature of the Proposal given the management measures proposed, and hence no additional mitigation measures are required for those noise sources."* This statement is of great concern and is responded to in the noise section of this submission.

Management Measures
The Management Measures rely heavily on communication between the mine personnel, contractors and residents. This reliance is unrealistic as it depends on the compliance of the proposed 150 mine workers, an unspecified number of contractors and the vigilance of managers and residents.

The example of Stratford clearly demonstrates the likely failure of dependence on day to day management measures. It is documented that breaches of consent conditions by mining companies are primarily raised by community members, not by the management, their staff or contractors. It is the 'sensitive receptors' who are left to report any breaches of conditions. This approach is not only unfair, but clearly disingenuous.

The residents of Stratford have found that their complaints have been unproductive. Their experience has been one of having their complaint managed through a process with no real outcome, rather than the source of their complaint being investigated and resolved. The lack of meaningful outcomes following complaint leads to frustration and to fewer complaints because the residents simply give up. Stratford Coal conceded that the number of recorded complaints did not correlate with the anecdotal evidence that neighboring residents experienced extensive and intensive noise disturbance.

A similar management approach is suggested for traffic related noise. The Proponent notes that "*Notwithstanding predicted compliance, there may be noticeable increases in traffic noise, particularly around shift change periods when mine-related traffic is concentrated."* They go on to propose that "… *the Applicant manage traffic noise levels through employee/contractor education and awareness and encourage considerate driver behavior by all personnel accessing the Site*."

The management of traffic noise pollution through education, awareness and encouragement is even more problematic than using this approach for mine generated noise pollution. Traffic noise is generated by individuals on public roads outside of the Proponent's control. Forbesdale

Estate residents have recently lodged a series of traffic related noise complaints associated with the AGL CSG development. The local experience of trying to influence contractor behavior on public roads through management processes has been frustrating and ultimately unsuccessful. The problems are exacerbated by the fact that mining traffic will be using small country roads in a rural and rural residential precinct.

There are six shift changes projected to occur at 4:00am, 7:00am, 2:00pm, 3:00pm, 5:30pm and 10:00pm. There is also going to be significant non-shift related traffic required to supply and manage the mine. The potential for noise pollution associated with mine traffic appears to be heavily understated and is of particular concern, given that the main access road (Jack's Road) runs adjacent to a significant number of properties in the rural residential estates in this locality.

6.1.4 Grounds for refusal

- The proposed development will have an unacceptable impact on the amenity of 242 rural, rural residential and rural properties in close proximity to the development, due to the extensive hours of operation proposed for mining and associated activities

6.1.5 Proposed Conditions of consent

1. A permanent curfew on all night time operations, including maintenance and coal loading.

2. Mining operations, including start-up activities, be confined to the hours 7.00am - 6.00pm.

3. Mitigation measures shall be available on request to all residents within the 'Noise Exceedance Zone" including enhanced glazing, insulation, air conditioning and subsidised power (to offset air conditioning costs) at full cost to the development.

4. Where mitigation proves to be inadequate the Proponent will be obliged to acquire impacted properties at the owner's request and regardless of the level of exceedance of the PSNL.

5. The proponent will negotiate a 'compensation agreement' with residents in the 'Noise Exceedence Zone' prior to project commencement.

6. The proponent shall fund the establishment of an independently chaired local complaints management committee/Community Consultative Committee comprised of community, industry and state and local government representatives to receive and investigate complaints, and determine and monitor corrective action.

7. Mitigation measures shall be applicable to all prospective residents within the 'Noise Exceedance Zone. Prospective residents means all new houses, constructed within the zone and after the project approval date, for the life of the mine.

6.1.6 Monitoring of impacts

The proponent is required to fund the preparation of an annual, comprehensive review of the Noise Management Plan by an independent Acoustic Consultant, for review by the Independently Chaired Local Complaints Committee/Community Consultative Committee.

6.2 Noise

In preparing this submission in response to the EIS Council considered noise one of the significant potential impacts of the development. Accordingly, Council engaged expert consultants, Wood & Grieve Engineers, to review the noise assessment to help inform our submission. A copy of their report is included as Appendix 2 to the submission.

6.2.1 Analysis of the issue

The proximity of the proposed mining operations to residential areas in and around Gloucester will lead to noise impacts that will be intrusive and will adversely affect the reasonable use, enjoyment and amenity of a large number of private homes and properties.

As this is a new mining development, it will lead to many residences being exposed to mine noise for the first time. On the basis of experience with the nearby Stratford Mine, that noise "footprint" is likely extend well into the Gloucester township (population approximately 2,500) and many residents would hear mining noise for the first time.

The impacts would be greatest in the closest rural residential estates of Forbesdale, Avon River and Thunderbolts, parts of which are within 1-2km of the mine project area and/or the proposed rail loading facility. The EIS proposes that four privately-owned receptors would be eligible for acquisition upon request, and another 8 may have access to some mitigation such as home insulation.

However more than 60 privately owned receptors are predicted to experience noise at different stages of the project that would be equal to or within 1dB(A) of the proposed noise limits. The EIS proposes that none of these will have access to any at-receiver mitigation, and would not be entitled to any acquisition-on-request provision.

The experience of the Stratford mine over the past eighteen years has demonstrated that the predicted noise impacts from that mine understated the area within which residents would experience intrusive noise, yet the same methodology has been applied in the preparation of the Rocky Hill EIS. Despite the application of at-source mitigation, and compliance with the noise criteria set out in the conditions of consent, intrusive noise – especially low frequency noise – affects residents up to 5km from the source. This is reflected in the high number of noise-related complaints lodged by residents.

On the basis of that experience, there is potential for intrusive noise impacts to extend to at least 242 residential properties (including vacant lots in the existing residential estates) in and around Gloucester, and neither the proposed mitigations nor compliance with the proposed noise criteria are likely to reduce noise impacts to levels that would be acceptable to the affected residents.

Taking account of annoying noise characteristics such as low frequency components and the effect of meteorological conditions, the noise impacts on those residents are likely to be

significant, intrusive and reduce the amenity of their properties.

People at increased risk of health impacts from noise include those living closest to the noise sources (mine & rail loader), those with already damaged hearing and those with inherent noise sensitivity.

The fact the majority of Gloucester residents are over 50 yrs old is very important in assessing the noise impacts and the associated sleep impacts.

Waking from sleep usually occurs with sudden increases of 15dB. Background noise levels for those houses with evening and night-time readings below 30dB are treated in the EIS as having a background noise of 30dB with the result that health-impacting noise disturbances will be allowed to occur because they are within criterion levels.

6.2.2 Concerns/problems/issues

The EIS notes that potential exists for various activities associated with the project to produce noise–related impacts at the surrounding receptors and sensitive receptors within the main town area. Those activities include construction work, mining operations, coal loading & dispatch, and vehicle movements.

The severity of the noise-related impacts will depend on a range of factors including the level of noise from project sources, the character of that noise, the time of day, distance to receptors, meteorological conditions and the effectiveness of noise mitigation measures.

At the Stratford mine, the persistence of intrusive noise impacts despite mitigation measures has led to a lack of confidence (among property owners that have registered complaints) in the adequacy of the noise criteria and the effectiveness of noise management at that mine.

The distances over which the intrusive noise is experienced, and the common descriptions of “roaring machine-like noise”, “low rumble”, “dozer or heavy truck noise”, “low hum behind a vehicle roaring noise” strongly indicate a significant low frequency component in the mine noise that is poorly attenuated by air and distance.

Despite the evidence based on eighteen years experience of the nearby mining operations at Stratford that low-frequency noise is a problem regardless of general compliance with the PSNL criteria, the Rocky Hill proposal includes no measures specifically directed at minimising that component of the noise spectra.

Low frequency noise is notorious for the distance it travels, particularly in quiet rural settings. The greater the distance from the mine the greater the percentage of the noise is low frequency. It has very different health impacts to middle and high frequency noise. It is very possible some people living up to 10km away may be impacted. (The EIS failed to distinguish between the different problems associated with the different noise frequencies and appear to have totally neglected to use C-weighted measurements which are necessary to properly capture low frequency noise.)

Rating Background Noise Levels (RBLs) during the evening and night were below the adopted level of 30dB(A) at all but one of the 16 monitoring sites used for measurement of the ambient noise environment. However, it is acknowledged that the adoption of 30dB(A) as the default background noise level is consistent with the Industrial Noise Policy (INP).

The proposed Intrusiveness criteria for specific receptors have used 30dB(A) + 5 dB(A) for evening & night-time, although higher daytime criteria (up to 43dB(A) are proposed for receivers where monitoring showed higher background noise levels, primarily due to exposure to traffic noise on the Bucketts Way.

The predicted noise impacts have been calculated on a “10% exceedance basis”, and the consultant’s report concludes that “it is possible to achieve the stringent criteria that are required for this project, on a 10% exceedance basis, at most receptors”.

No justification has been provided for the 10% exceedance allowance. Clearly the number of private receptors at which noise in excess of the PSNLs would be experienced on some days (up to 1 day in ten) would be significantly greater than the twelve that would experience the exceedances more frequently.

A similar allowance is made for exceedance of the criteria that relate to blasting: blasting must not exceed 115dB for more than 5% of blasts in any year. However the blasting criteria also apply a cap – no blast is to exceed 120dB at any private receptor. A similar cap needs to be applied to the noise criteria, so that an upper limit is applied to the noise that may be experienced at any private receptor regardless of the frequency of the occurrence. Different limits should apply at different times of day, and would appropriately be based on an increment over the RBL.

Noise modeling presented in the EIS predicts that 12 privately owned receptors would, at various stages of the project, experience operational noise above the PSN criteria: Five of those would experience exceedances of 1-2dB(A), a further three would experience exceedances of 3-5dB(A). Four other privately owned receptors would experience exceedances of more than 5dB(A) above the PSA.

No further noise mitigation measures are proposed that could avoid the noise criteria being exceeded at those receptors.

Instead, for the receptors in the first two categories, GRL proposes to undertake one or more of the following:

- *Monitor noise at agreed locations*

- *Discuss individual concerns with relevant landowners*

- *Respond promptly to individual concerns or complaints*

- *Refine on-site noise mitigation measures and mine operating procedures where practicable*

- *Implement feasible and reasonable acoustical mitigation at receptors*

It must be noted that only the last two of these present any prospect of a reduction in the noise impacts experienced by those receptors.

For receptors in the third category, i.e. exceedances >5dB(A), GRL proposes to undertake one or more of the following:

- *Discuss and assess concerns and define acceptable responses*

- *Implement acoustical mitigation at receptors*

- *Enter into negotiated agreements with landowners, potentially including acquisition.*

The prediction that only 12 privately owned receptors would, at various stages of the project, experience operational noise above the PSN criteria is based on predictive formulae, albeit formulae that are widely applied. It may therefore significantly underestimate the actual impact.

If a conservative margin of error of just +/- 1dB is applied to the predictions, then a potentially much larger number of private receptors could experience exceedances at various stages of the project. At year 2.5 for example, a further 21 private receptors are predicted to experience noise equal to the PSNL criterion, and yet another 21 are predicted to experience noise within 1dBA of the limit. (Those numbers are based on noise from the mine area alone. Additional receptors would be similarly affected by noise from the overland conveyor and rail load-out facility).

While the variance could go either way, a variance of only 1dB between predicted and observed noise levels could mean that the numbers of privately owned receptors at which noise criteria are exceeded was greatly underestimated. At year 4.25 for example, the data shows 37 private receptors expected to experience noise levels equal to the limiting criterion, and 25 more within 1dB of that limit.

The EIS notes that *a difference of 1-2dBA is not discernible by most people*. The effect of that would be that the 62 additional receptors predicted to experience noise equal to or within 1dB of the intrusive noise limit, but would not be eligible for any additional mitigation, and would be unable to discern any difference between the noise they experience and that experienced by other receptors recognised as being within the noise management zone (and hence having access to additional mitigation).

The EIS notes that as the source noise spectra for the equipment to be operated within the site are not dominated by low frequency noise, it is unlikely that the (low frequency) screening criteria would be exceeded (at a receptor where the intrusiveness criteria are satisfied). However no data supporting this claim has been provided.

There is extensive evidence that the effects of noise on individuals extend beyond simple annoyance and have well-documented impacts on health. The health impacts of noise can be divided between auditory and non-auditory effects.

Auditory effects include both excessive noise leading to deterioration of existing deafness and constant and/or sudden loud intermittent background noise interfering with communication.

When impaired communication happens repeatedly with those in a teaching environment (schools etc) it can lead to learning difficulties. Sleep disturbance effects may be cumulative with learning difficulties if a child both lives and goes to school in an impacted area. Gloucester Public School, a primary school, has the worst predicted noise levels of the 'sensitive receptors'.

Non-auditory effects include frequent wakening, sleep deprivation, reduced sleep quality e.g. reduced REM sleep, stress effects from noise whilst asleep, annoyance (a variety of stress) effects during the day time etc. Sleep impairment may lead to a variety of health problems including disturbances of emotional, behavioral and cognitive (learning, memory, concentration, decision making etc) brain functions.

Cardiovascular stress effects include hypertension and increased risk of atherosclerosis leading to more strokes and heart attacks. The elderly have a cardiovascular system more sensitive to stress effects from noise.

Hearing declines in several ways with older age, e.g. as well as typical loss of auditory acuity, there is greater difficulty communicating (being heard and comprehending speech) when there is background noise.

WHO Guidelines for Community Noise advise that in addition to sleep disturbance, (including a reduction in the proportion of REM sleep) other physiological effects can include increased blood pressure; increased heart rate; increased finger pulse amplitude; vasoconstriction; changes in respiration; and cardiac arrhythmia. For each of these physiological effects, both the noise threshold and the noise response relationships may be different. Different noises may have different information content and this could affect physiological threshold and noise response relationships [Edworthy1989].

The WHO guidelines note in s3.4 that "*sources with low frequency components require special attention. Disturbances may occur even if the sound pressure level during exposure is below 30dBA,*" and in s3.9 "*The evidence on low frequency noise is sufficiently strong to warrant immediate concern. Health effects due to low frequency components in noise are estimated to be more severe than for community noise in general"* [Berglund et al 1996].

A 2004 report by Commonwealth Department of Health & Aging on health effects of environmental noise other than hearing loss observed that while it is sometimes difficult to distinguish between the physiological and psychological effects of noise - especially when the physiological symptoms may be the underlying cause of the psychological stress - "*Noise, acting as a stressor, is thought to have an impact on the cardiovascular system through certain stress response mechanisms such as the release of cortisol, adrenalin and noradrenalin which have cascade effects, including raising blood pressure and increasing vasoconstriction*." (p26).

Both auditory and non-auditory impacts will cause many people to need health checks and treatment. If this is not acknowledged and catered for the resulting frustration will just serve to exacerbate stress effects.

A baseline measurement of noise tolerance, sleep quality and hearing problems needs to be done before the impacts of mining noise on health can be estimated.

The EPA required an estimate of the number of residents who will hear mining noise in future who currently cannot hear it. This estimate was not provided in the EIS. As the new noise (Predicted 10% exceedance LAeq 15min page 1-101) contour map extends far into Gloucester urban areas this number could exceed 1000.

6.2.3 Proposed mitigation

Project design features that would contribute to control of noise "at source" include:

- Construction of visibility barriers that would also serve as barriers to reduce noise created by mining equipment operating behind the barriers;

- positioning haul roads as much as possible below the natural land level or as close as possible to the visibility barriers; and

- locating the train load-out bin in an 18m deep trench.

Operational measures would include:

- application of an active noise management strategy that would incorporate a meteorological forecasting system; and

- the operation of a reduced fleet during evening and night-time mining operations.

Assessment of potential noise impacts on amenity indicate that twelve privately-owned receptors are predicted to receive noise levels exceeding criteria, during one or more years of operations. Those impacts would be managed through "*community engagement, real-time noise monitoring, investigations into acoustical mitigation measures, and if required, acquisition of property*".

The EIS proposes a "*noise management zone*" where noise levels are 1 to 2dB(A) above project specific criteria (marginal exceedance) or 3 to 5dB(A) above project-specific criteria (moderate exceedance), and a "*noise affectation zone*" where exceedances are >5dB(A) above project-specific criteria.

Wilkinson Murray (2013) notes that tonal, impulsive and low-frequency noise are unlikely to be a feature of the project given the management measures proposed, and hence no additional mitigation measures are required for those noise sources. However the experience of noise impacts around the Stratford mine is that if monitoring there is accurate and the approved PSNL is not being exceeded, then it is apparent that significant noise disturbance occurs at levels below the PSNL. This is likely to be at least partly a function of the low frequency character of the noise.

To establish that this issue would not arise with the Rocky Hill project, the noise assessment should be re-presented with comprehensive assessment of noise characteristics that would be generated by the project including presentation of C-weighted data and the noise signature of the fixed and mobile plant to be used.

6.2.4 Adequacy of proposed mitigation

Much reliance is placed on the efficacy of the visibility barriers in shielding residential areas to the north and west of the project area from noise exposure. If for any reason those barriers were not built as designed, the noise projections would be invalidated.

As the noise mitigation effects of topographic barriers are greatly reduced under temperature inversions – which occur with high frequency at the project location – the noise mitigation effects of the proposed visibility barrier would be virtually nullified under those meteorological conditions.

In this regard it is important to note that the meteorological data collected on site established that temperature inversion conditions are commonly 4oC/100m, and inversions greater than 4oC/100m are predicted to occur during 39% of night-time periods in winter. However the noise criteria would not apply under those conditions. Clarification of how the proponent intends to measure inversions at each receiver location is required. This is relevant as the meteorological conditions will trigger the operational activities during the nighttime.

Further, topographic barriers are less effective at attenuating low frequency noise than they are at attenuating higher frequency noise. This will have the effect of increasing the low frequency component of the noise spectra perceived beyond the topographic barriers.

This compounds concerns that the poor attenuation of low frequency noise over distance will result in a low-frequency noise nuisance in areas as far as 4 or 5km from the project area. At around 3.5km from the source, low frequency noise of 20Hz to 250Hz will become the dominating characteristic of the noise and farther away, infrasound below 20Hz will be more significant in the noise signal because of the attenuation of the higher frequencies.

The fact that no specific measures are proposed to minimise the low-frequency component of noise at-source is a major deficiency in the noise mitigation measures proposed.

The EIS states (p4-57) that one of the possible responses to a situation where monitoring showed low-frequency noise to be an issue would be “the development and implementation of controls either at the source or the receptor”. If potential mitigating measures are available, as the comment above implies, those measures should have been identified and assessed in the EIS.

The Director General’s Requirements stipulate that in relation to noise, vibration and blasting, the EIS must include a quantitative assessment of reasonable and feasible mitigation measures (including assessments of restricted night time operations, not operating at night and not operating during evening and night-time hours), including evidence that there are no such measures available other than those proposed.

No assessment of the feasibility of not operating at night has been presented. Cessation of mining operations between 6.00pm and 7.00am is a mitigation measure that could very substantially reduce the impacts of mine noise on private receptors.

It is proposed to reduce the mining fleet at night, but this may not significantly reduce noise from the operations. For example, reducing the night use of two trucks each generating 114db noise, to one truck, would change the noise output from 117db to 114db. That is, only a small reduction in noise would be achieved despite halving the number of sources.

Restricting the rail loading hours (as well as the mining operations) to the hours of 6.00am – 7.00pm could reduce the overall noise impacts, particularly the potential for sleep-disturbance – but this possibility has not been adequately assessed.

There is no acknowledgement in the EIS of the particular difficulties of those with existing noise sensitivity and/or hearing problems, nor of the special problems that would likely be experienced by residents who are used to very quiet rural evening and night-time sound levels.

The currently proposed program which only takes into account absolute noise levels as a gateway to negotiating with the company for compensation is too restrictive.

6.2.5 Grounds for refusal

- The EIS has failed to provide adequate information in regard to additional and further mitigation measures for noise impacts in relation to hours of operation, as required by the DGR's.
- The EIS has failed to identify the location and number of receivers that will be exposed to mine noise for the first time as required by EPA in the DGR's.
- The significant number of private receptors that would experience intrusive noise without mitigation outweighs the relatively small predicted net benefits of the project to the local community or the State.
- The proposed development will have a negative impact on the targeted residential growth in the locality.
- The proposal fails to propose equitable mitigation, compensation or property acquisition to all private receptors that will be affected by unacceptable noise levels.

6.2.6 Proposed Conditions of consent

1. All noise sources associated with the project shall be assessed to identify noise characteristics of tonality, impulsiveness, intermittency, irregularity or dominant low-frequency content, prior to being utilised in operational activity with both A- and C-weightings being used to determine the low-frequency components.

   Where analysis of noise sources identifies any of the characteristics listed above, the correction factors listed in the INP must be added to the predicted noise levels at the receiver before comparison with the criteria.

2. The method to used to assess the extent of low frequency noise shall be that set out in the INP, i.e. a 5dB correction is to be applied in the event of a >15dB difference between C and A weighted noise levels.

3. C-weighted measurements shall be included in all noise monitoring. Where those measurements indicate a significant low-frequency component in noise at a receiver, the correction factors listed in the INP must be added to the measured noise levels at the receiver before comparison with the criteria.

4. Noise reduction measures in relation to selection and operation of both fixed and mobile plant shall include measures to minimise, at source, the low frequency component of noise created by that plant.

5. A 10% exceedance allowance shall not form the basis of relevant conditions of consent. The proponent shall offer at-receiver mitigations at all private residences where the PSNL is exceeded. These should include acoustic insulation, air-conditioning and/or negotiation of a Landowner Agreement.

6. At-receiver noise mitigation such as enhanced glazing, insulation and air conditioning, and / or negotiation of Landowner Agreements in respect of properties where the modeling predicts exceedance of PSNLs shall be completed prior to project commencement.

7. Where the PSNL is exceeded by 5dBA or more at a private receiver, the proponent shall acquire the affected property if so requested by the landowner. The acquisition procedures should be the same as those set out in condition 11.2 of the Bowens Road North development consent (DA-39-02) relating to the Stratford Mine.

8. In the categorisation of properties according to degree of exceedance of the PSNL, the category ranges shall be amended to describe exceedances up to 2dBA above PSNL, and exceedances 2dBA and above. Similarly, the threshold for inclusion in the Noise Affectation zone shall be expressed as 5dBA and above, rather than >5dBA as proposed in the EIS.

9. Where the predicted noise levels at a receiver exceed the PSNL, the intrusive noise criteria shall be set at the PSNL – not at the predicted level.

10. The location and operation of real time noise monitoring shall ensure that it is possible to discern mine-related noise from other sources, and data from that monitoring shall be included in ongoing assessments of compliance with noise criteria.

11. The real-time noise monitoring shall include response-triggers for immediate operational action to address the cause / source of excessive noise.

12. If a landowner considers the development to be exceeding the impact assessment criteria then he/she shall be entitled to ask the Director-General for an independent review of the impacts of the development on his/her land. The process shall reflect that set out in the consent provisions relating to the BHPbilliton Dendrobium mine.

13. The proponent shall develop a Noise Management Plan that incorporates an adaptive management approach to the minimisation and mitigation of noise derived from the mining operations.

14. The process for development of the Noise Management Plan (and subsequent modifications) shall provide for community input through discussion with the Independently Chaired Local Complaints Committee/Community Consultative Committee. The committee's comments on the Plan shall accompany the Plan when it is submitted to the DRE for approval.

15. Those 'at risk' of noise-related health impacts shall be offered baseline measurements to be funded by the proponent, education about any protective strategies, regular monitoring, assessment of whether any problem is mining noise related and interventions for those deemed to be so affected.

16. An assessment of buildings of sensitive receptors, and individuals 'at risk', shall be undertaken prior to project commencement to identify further at-receiver noise mitigation measures.

17. The applicant shall meet the reasonable cost of specialist acoustic advice and legal advice obtained by property owners where predicted exceedances of noise criteria entitle those property owners to at-receiver mitigation, negotiation of landholder agreements or property acquisition-on-request.

6.2.7 Monitoring of impacts

- Annual reports on the noise monitoring program, including summarised reports from real-time monitoring, shall be included in regular environmental monitoring reports presented for discussion at meetings of the Independently Chaired Local Complaints Committee/Community Consultative Committee.

- A complaints management system shall be implemented to address matters raised by residents and landowners affected by noise. That system shall record particulars of the complaint including a description of the reported matter, the location of the complainant, the results of the company's investigation of the matter and its final response.

- The record of complaints shall be available on the company's website and be presented for review at meetings of the Independently Chaired Local Complaints Committee/Community Consultative Committee.

- An industry-funded, community -supervised noise monitoring program shall be established for this project. This program shall be similar to that operating in the Hunter in relation to dust, where the monitoring results are published in the local newspapers.

- A program of yearly hearing tests, sleep quality measurement and a health check for ‘at risk’ individuals should be implemented by the company.

6.3 Blasting and vibration

6.3.1 Analysis of the issue

There is potential impacts from blasting concern air-blast/noise, ground vibration, flyrock and blast fume emissions. Ground vibration will also occur as a result of mine-related heavy vehicle movements along public roads.

The EIS proposes that the criteria for limiting the human annoyance at any privately owned receiver (or other sensitive receiver) should be those set out in the1990 ANZEC standard:

- Maximum overpressure due to blasting should not exceed 115dB for more than 5% of blasts in any year, and should not exceed 120dB for any blast.

- Maximum peak particle ground velocity should not exceed 5mm/s for more than 5% of blasts in any year, and should not exceed 10mm/s for any blast.

Modeling presented in the EIS predicts that these criteria would be met at all but a small number of privately-owned receptors. However a large number of those residences are predicted to experience blast-related impacts very close to the nominal “human annoyance” levels. Even a small margin of error in the predicted impacts would mean that the number of private receptors at which the criteria would be exceeded may have been very significantly underestimated.

6.3.2 Concerns/problems/issues

As the predictions for blasting impacts are based on calculations using “generally applicable equations” with no actual measurement data available, a significant margin of error must attach to them.

While the mine plan and blast plan would be expected to provide sufficient flexibility to enable the proposed air-blast and ground criteria to be met at private residences, this does not mean that those residences will be unaffected by noise and vibration effects from blasting.

At the nearby Stratford mine, the monitoring program consistently shows that both air-blast pressures and ground vibration at nearby residences are within the allowable limits, which are the same limits proposed to be applied to the Rocky Hill project. However a review of blasting-related complaints made by residents of Stratford village clearly indicates discomfort with blasting effects. Despite monitoring data indicating ongoing compliance with the blasting criteria at the Stratford mine, nine blast complaints were recorded in 2010, twenty two in 2011, and forty one in the period January - October 2012.

The high average age (65 years) of the Forbesdale residents, who are the group most exposed to blasting effects, means that there are a number of Vietnam veterans, many of whom suffer from Post Traumatic Stress Disorder (PTSD). PTSD is typically reactivated by explosions (and

helicopter noise). This reinforces the necessity for a health audit to be done prior to any mining to plan/compensate for this complication of blasting near a populated area.

Blast Emissions

Blast emissions are listed as posing the highest level of health risk (High) associated with the project. Even after proposed mitigation, blasting emissions will still pose a medium risk though this risk is deemed 'acceptable'.

NSW EPA has not set any air quality goals for NO2. It has adopted the NEPM standards which have one hour and annual average goals. NO2 turns to nitric acid with the moisture within the lungs and can cause severe damage. Given the potential health risk of short-term exposure to high level blast emissions the adoption of the NEPM standard is considered inadequate. This highlights the inadequacy of using averaging in goal setting where damaging peak level lasting only a few minutes can be hidden in a longer average reading. Ground vibration and airblast risks are similarly rated 'High' with no proposed effective mitigating measures.

6.3.3 Proposed mitigation

GRL proposes that blasts would be "conservatively designed" so that the levels of air-blast pressure and ground vibration would meet compliance criteria at all potentially-affected privately owned receptors.

It is proposed that initial blasting would be conducted well away from potentially-affected receptors, and a monitoring program would be conducted to confirm that the generally applicable predictive equations used in the EIS are applicable to the site. The results of that monitoring would then guide development of a specific site law.

A Blast Fume Management Strategy would be incorporated in the Blast Management Plan for the project. The strategy would address factors such as blast design and meteorological conditions.

Structural surveys would be undertaken of residences within a 2km radius of the open-cut pits.

6.3.4 Adequacy of proposed mitigation

Ground vibration and airblast risks are rated 'High' with no proposed effective mitigating measures.

Although Australian Standard (AS2187: Part 2, 2006) is cited in the section of the EIS dealing with blasting and vibration, there is no reference in the EIS to the recommendation contained in the Standard that a lower Peak Vector Sum vibration velocity of 2mm/s be considered as the long term regulatory goal for the control of ground vibration. Twenty years since that recommendation was made, it is inappropriate for ground vibration criteria of 5mm/s PVS to continue to be applied for new developments.

Monitoring records of blasting at the nearby Stratford mine show that a criterion of 2mm/s PVS is achievable.

As this project is essentially a “greenfield development” that would lead to blast-induced vibration impacts at properties not currently affected by blasting, the 2mm/s criterion should be applied to this project. This is particularly important if the intent of the criteria is the minimisation of annoyance and discomfort to persons at noise sensitive sites (including residences) caused by blasting.

Proposed “typical” blasting would use a Maximum Instantaneous Charge (MIC) of 825kg. The blasting impact assessment indicates that if blasts of 825kg MIC are used, air blast criteria would be exceeded at four private properties. The predicted air blast would equal the 115dbL criteria at another eight receptors, and be within 1dBL of the limit at an additional 40 receptors.

These figures are derived from predictive modeling only, and if a margin of error of only 1% were to be attached to them, then some 55 receptors could be expected to experience air blast impacts at or above the criteria limit.

To avoid such exceedance, and the consequent impact on residents of those properties, the conditions of consent should preclude the use of charges exceeding MIC 414kg in those pits.

The modeling presented in the EIS indicates that limiting MICs to that size would reduce the number of receptors at which the air blasts would be reached to three, and the criteria would be exceeded at only one receptor.

Limiting blasting to 414kg MIC would also reduce from (23 to 4) the number of private receptors where the recommended lower limit of 2mm/s ground vibration would be met or exceeded.

The proposal to conduct structural surveys of residences within a 2km radius of the pits needs to be clarified. As the pits would be linear, the distance must be measured from the point at which blasting occurs to the nearest residence.

Even after proposed mitigation blasting emissions will still pose a medium risk.

6.3.5 Grounds for refusal

- the proposed development will exceed acceptable standards for air blast criteria for 4 private properties and up to 55 receptors when applying a 1% margin of error on predictive modeling.

6.3.6 Proposed Conditions of consent

1. Maximum allowable blast shall not exceed MIC 414 Kg in order to lower risk levels from fumes and ground vibration
2. The ground vibration criterion applying at any privately-owned receiver shall be 2mm/s. That is, maximum peak particle ground velocity shall not exceed 2mm/s for more than 5% of blasts in any year, and shall not exceed 10mm/s for any blast.
3. If blast monitoring indicates that ground vibration and / or air blast criteria as set out in the ANZEC standard are not being met at any privately owned receptor, then the

proponent shall acquire that property upon the request of the owner, or enter into a compensation agreement with the owner if that is the owner's preference.

4. Blasts shall be limited to a maximum of 1 blast per day on site (unless an additional blast is required following a misfire), and 3 blasts per week (averaged over any 12 month period) for the life of the project.
5. Blasts shall be confined to the daytime hours when background noise levels are higher, and shall be within a specified range of times to provide a degree of predictability for receptors likely to perceive the blasting.
6. If requested by the owner of a residence within 2km of the blasting locations, the proponent shall arrange and meet the cost of an independent inspection of the material condition of any structure on the property.
7. Blasting operations shall be suspended under meteorological conditions that may lead to dust and NOx gases drifting over surrounding residential clusters.
8. In addition to the network of fixed-location blasting monitors, additional monitors shall be deployed where receptors report experiencing high level impacts from blasting.
9. If a structural inspection conducted by arrangement by the owner of a residence and the company establishes that structural damage is attributable to activities associated with the mining project, the proponent shall meet the reasonable costs of rectifying that damage, and must review its mining operations plan to prevent a recurrence.
10. Blast fumes shall be continuously monitored, with levels set for absolute peaks as well as the conventional 1hour averages.
11. Reports on the blast monitoring program, including recorded data on each blast, shall be included in regular environmental monitoring reports presented for discussion at meetings of the Independently Chaired Local Complaints Committee/Community Consultative Committee.
12. A complaints management system shall be implemented to address matters raised by residents and landowners affected by blasting. That system shall record particulars of the complaint including a description of the reported matter, the location of the complainant, the results of the company's investigation of the matter and its final response.
13. The record of complaints shall be available on the company's website and be presented for review at meetings of the Independently Chaired Local Complaints Committee/Community Consultative Committee.

6.3.7 Monitoring of impacts

A blast monitoring network shall be established around the mine area, including monitoring points of at least two potentially affected residential locations. The fixed noise monitors shall be augmented by monitors that can be positioned at other locations where residents report experiencing significant impacts from the blasting. Those additional monitors may not be required to be permanently deployed.

6.4 Visibility and Light

6.4.1 Analysis of the issue

The Director-General's Requirements issued by DP&I identified "Visibility" as one of the key issues requiring assessment. The site is located within the Gloucester Valley at the northern end of the Gloucester Basin, an area recognised for its high quality scenery.

The valley's visual landscape significance is widely recognised. Gloucester Shire Council recognised the Valley's significance in the commemorative publication *"The Vale of Gloucester"* (1953). The Vale of Gloucester was among the first cultural landscapes to be formally identified in Australia when it was listed by the National Trust of Australia (NSW) in 1975 and nominated for entry on the Register of the National Estate in 1976. This nomination was supported by Gloucester Shire Council but, for unknown reasons, the Australian Heritage Commission failed to assess the nomination and it remained as an *Indicative Listing* until the Register was discontinued in favour of the National Heritage List on 1 January 2004.

The Gloucester Local Environmental Plan addresses natural and scenic conservation by way of the Environmental management zoning which surrounds the Gloucester township and corresponds approximately to the area known as The Vale of Gloucester.

Great Lakes Council has similarly recognised the Valley's significance in a number of planning documents, particularly but not limited to those relevant to Stroud in the Valley's south.

The Stroud-Gloucester Valley's landscape is largely a result of its rural heritage and underpins its tourism industry. An understanding of the Valley's heritage significance, including its scenic qualities, is crucial to understanding its social and economic base and the potential for impacts on scenic quality to undermine other economic activities in the Valley. The Gloucester Valley and Gloucester township serve as a tourism destination centre in their own right and as a base for areas further afield, including the World Heritage Barrington Tops.

Existing coal mining operations in the valley are already threatening its unique visual quality. This Proposal has the potential to continue to erode the significance of this landscape value. The result will be that the Valley's special significance will be permanently lost and its local economy and lifestyle irreparably damaged. The damage that can be inflicted on the local economy may potentially far exceed any perceived benefits from mining expansion.

The Project will include over 800ha of open cut mine, up to 40m high piles of overburden, an extensive conveyor across the floodplain and significant rail loading facilities. This will have a major visual impact on the Gloucester Valley.

The extent and nature of that impact will vary due to the period within the operational life of the mine, the time of day, or night, and the prevailing atmospheric conditions.

The impact on any individual will vary depending on whether they are simply passing through the area, coming to visit the area or living in the area. Will they view the mine for a few seconds or will it form the backdrop of their daily existence?

The Rocky Hill Mine will dramatically change the visual amenity of the Gloucester Valley. The Gloucester Valley should be assessed as an integral, whole landscape; it should not be viewed only as a number of items or areas within the larger landscape. Development that takes place in any part of the landscape ultimately impacts on the whole of the scenic landscape. Without a 'whole of landscape' approach, the component vistas, buildings and historical sites that make up the whole, even if they are protected individually, will become detached items in a disjointed landscape. The significance of the landscape will therefore be lost.

The Avon River Valley and Mograni Range:
taken from 19 Grantham Road

The Avon River Valley and the Mograni Range looking south:
taken from 30 Fairbairns Road.

The Mograni Range looking over the proposed Rocky Hill site:
taken from the Bucketts Way.

Based on the risk analysis undertaken by the Proponent (Section 6.2 and Table 6.3), the potential impacts relating to visibility and their risk rankings after the adoption of standard mitigation measures are as follows.

- Change in content and composition of views from residences and public vantage points (high).
- Visual intrusion or a reduction in scenic quality due to direct/indirect lighting or lighting glow (medium).
- Visibility of industrial traffic and maintenance activities (low).

6.4.2 Concerns/problems/issues

The proponent identifies four principal components that would have a visual impact on the area:

- Four separate and/or contiguous pits and a coal handling and preparation plant (CHPP) within the mine area;
- An overland conveyor for transporting product coal to the Rail Load-out Facility;
- A Rail Load-out Facility (incorporating a rail loop and two coal storage bins);
- Two Power Line Corridors incorporating a relocated 132kV power line and a new 11kV power line external to the mine area;

In the Visibility Assessment of the proposal, the Proponent asserts (4.5.4.2):

"…the most important component of the strategy needs to be the objective to minimise the effect of the final landform on the scenic quality of the site. The secondary aim, while still important, would be to control the visibility of the mining and related activities throughout the life of the Proposal."

They then state (4.5.6): "*The final landform will be indistinguishable from the existing landform for those who are familiar with it. The proposed rehabilitation to woodland may be perceived by the contemporary population as an improvement in scenic quality*."

The statement above glosses over the visual impact of the mine over its (minimum) 16 to 21 years of construction, operation and rehabilitation. The implication is that the visual impact of a developing operational mine is trivial and that the post-mining landscape will be "*new and improved*". The Proponent also asserts at (4.5.5.4) that "*Viewer sensitivity from within private*

residences varies due to a wide range of factors. Lamb (2013a) considers that moderate-high viewer sensitive locations are present within the private residences within the Forbesdale Estate. However, overall, greater weight is placed upon public domain viewing places in the overall assessment."

The visual impact will accrue most significantly to permanent residents whose inability to mitigate impacts by moving and whose investment in property makes them most financially vulnerable to visible impacts. These impacts are projected to continue for at least a human generation.

The visual impact of the proposed activity will be progressive throughout the life of the mine. Ongoing activity will progressively make larger and longer waste emplacements (to be used as visual barriers). There is unlikely to be a period during the mine's operation where the activity will not be visually conspicuous. Recent experience with rehabilitated waste emplacements and visibility barriers at both the Duralie and Stratford Coal mines have served to highlight the visual intrusion of mining activities.

Extensive comment is made in the EIS (4.5.4.3 Daytime Mitigation Measures) in the construction of the Western/Northern, the Central and the Eastern visibility barriers and their ability to shield operations at the Rocky Hill Mine site. These measures are guided by the visual absorption capacity of the area when viewed from different viewpoints.

The technical definitions used appear to disregard the size of the object being viewed. Clearly the ability for the scenery to absorb an unnatural aberration is related not only to the distance from the object, their relative elevations, and intervening features, but also to the object's size.

The Category 1 locations represent a viewing distance for only a very small percentage of the residents and visiting populations.

The Category 2 locations, apart from those rural residential properties along The Bucketts Way and the rural properties along the southern side of Jacks Road, lie to the northern side of the intervening ridge line that runs from The Bucketts Way to the Avon River flood plain. The ridge blocks any direct view of the mine site. However the residents of the Avon View and Thunderbolts estates will have a clear view of the Rocky Hill Mine as they enter and exit the area via Jacks Road.

Category 4 locations are located along Fairbairns Road at an elevation generally below that of the site. The properties along the section of Fairbairns covered in this category are all owned by Gloucester Resources Limited, AGL or Yancoal, with the exception of two or three and as such have less relevance.

Category 3 and parts of category 2 therefore remain the only categories that have any great relevance from the standpoint of loss of visual amenity.

The Proponent (4.5.5.2) records...."*A moderate to high level of visual effects would be evident at the Category 2 and 3 viewing locations (see Photomontages 3 to 7), particularly during the site establishment and construction stage and intermittently throughout the life of the Proposal. Lamb (2013a) records there are approximately 36 and 24 residences respectively with Category 2 and 3 viewing locations, although some views may only be partial. The visual effects when viewed from the Category 2 and 3 viewing locations relate mainly to the construction of the visual barriers which, after they are constructed, would limit the visibility of on-site activities except when earthmoving equipment is operating at or near*

the surface of the overburden emplacements and are not effectively obscured by the barrier or the mounds on the upper surface."
The Photomontages, while appearing to be very constructive to the overall plan of the mine, are not representative of the true effects on the landscape. Below are photographs of the mine area showing its relationship to Forbesdale Estate and the Avon Valley.

Area for the proposed Rocky Hill Mine - Fairbairns Road on the left - Forbesdale Estate houses in background

The dairy, once known as Maslen's, looking towards the Forbesdale Estate. The area directly in front of the photo is the proposed Stage 2 of GRL's coal mining plans for the valley

Maslen's Dairy on the boundary of the proposed Rocky Hill mine proposal. Proposed stage 2 of GRL's exploration area. Forbesdale Estate in the background

Forbesdale Estate looking down on Maslen's Dairy.

Note: While the EIS states that "there are 36 and 24 residents" in the category 2 and 3, it does not take into account the development plans of the area. The residential estates where constructed to house families who wanted a rural residential lifestyle as part of the town of Gloucester. Since the announcement of the Proponents intention to seek approval to mine, development in these rural residential estates has virtually ceased.

6.4.3 Proposed mitigation

The primary mitigation strategy is screening with large earth emplacements, trees or fabricated visibility screens.

6.4.4 Adequacy of proposed mitigation

The visual amenity of an area is not simply a scene or one view. It is the perception of a whole. Scenery is not commented on frequently, but it is noticed all of the time. It is the background to the experience of people in their daily lives.

However, even minor scenic aberrations do attract comment and can significantly negatively impact visual amenity.

Visual barriers can be considered as scenically aberrant just like the features they are trying to screen. Given the spatial and temporal scale, the method of construction and the location of the proposed visibility barriers, they are unlikely to significantly ameliorate the visual impact of the mine.

It is also important to note that efforts at revegetating waste emplacements have mixed success. Poorly vegetated waste emplacements at Stratford present a stark visual contrast to the surrounding countryside, even though they are at the base of the Mograni and were designed to blend in with the landscape.

Finally the creation of “tree tunnels” is likely to simply substitute one visibility impact for another. “Tree tunnels” are the mass planting of native trees and shrubs along roadways, including major access routes, and to shield views from individual properties. These features are currently as alien to the Gloucester Valley as are the visual impact of mining. The tree tunnel effect now mars much of the Hunter Valley’s scenery. It appears set to have a similar effect on Gloucester Valley’s scenic landscape qualities by replacing the views across the valley floor to significant geological features, with visually impenetrable tunnels of native trees and shrubs. The impact and unsuitability of this approach can already be judged by the section of the Bucketts Way immediately north of Craven where young plantings on the eastern side of the road already obscure the view across the valley. The cumulative impact of this ‘whole of landscape quick fix’ has not been undertaken and a thorough assessment is being resisted by mining projects.

A significant factor in assessing this aspect is the shape of the local landscape. As the proposed mine is located on the elevated foothills of the Mograni Mountain range, and the adjacent to residential estates are located on the rise on the western side of the Avon River, the two conflicting land uses have direct and immediate proximity to one another. This “saucer” shape of the landscape means that all visual and noise impacts will directly carry to the nearby residential properties with no real means of mitigation through either barriers, intervening geographical features or distance. The relative location at approximately 1.5 kilometres will mean that these impacts are very readily translated to the residents in the estates to the west.

It is critical to preserving the Valley’s scenic heritage qualities that the practice of mass roadside tree planting also be critically reviewed. Views in the Gloucester Valley are presently characterised by expensive and open rural views. This “big” of immediate farmlands moving across the landscape to the foothills and the mountain ranges containing the Gloucester Valley is the essential character of the valley. The proposal to plant long linear vegetation barriers adjacent to public roads in an attempt to screen mining activities will close in those views and significantly alter the quality of the local landscape.

6.4.5 Grounds for refusal

- The proposed development will leave an unacceptable visual impact on the significant landscape. The visibility barriers and proposed dense plantings will obscure existing significant scenic vistas in the Gloucester Valley.

6.4.6 Proposed Conditions of consent

1. The proponent shall be obliged to acquire any property, should the owner apply, of those impacted by loss of scenic amenity.

2. The proponent shall negotiate a ‘compensation agreement’ with residents who are in the ‘Visibility Impact area’ and who do not wish to leave, prior to project commencement.

6.5 Night Lighting - Direct Emission and Glow

6.5.1 Analysis of the issue

Site illumination for mine operations, rail loading and maintenance is intended to illuminate the various work areas through the night time work shifts. Lighting is proposed to be fixed installation, mobile vehicular lighting and personal work lighting, conveyor lighting and coal train lighting. There is no provision stated for security lighting. Security lighting should be expected to be an overlay on whatever work areas and shift durations require lighting.

The work shifts are broadly 6am to 4am. But all hours are subject to sleep disturbance criteria and carry the potential to extend operations at the CHPP to match production.

The overland conveyor and rail loading facility hours of operation are 'dictated' by ARTC. It is possible that these facilities will operate at any time in the night.

There is no direct statement made in this section of the EIS that maintenance will be conducted largely at night on those facilities not used by night production.

There is a general use of terms such as "*minimise, appropriate, preferably, if warranted, regular, as quickly as possible*". All these terms are sufficiently non-specific and subjective to enable whatever lighting design and regime GRL chooses.

Without more specific criteria it is difficult to assess the potential impacts of light pollution associated with the Proposal.

6.5.2 Concerns/problems/issues

Residents of properties overlooking the mine or with views towards the mine will see direct light emitted throughout the night and/or the glow that accompanies night operations at industrial developments. The glow will be amplified by suspended particulate matter generated by mining activities themselves and by low cloud events which are a feature of the enclosed valley.

The frequency of low cloud events and light propagating atmospheric conditions have not been provided and are considered indispensible in making an informed assessment of light pollution impacts.

The Proponent (4.5.5.5) suggests that the residents surrounding the site might actually appreciate light pollution - particularly if their homes have outlooks in that direction.

The Proponent applies more weight to transient viewers than to those who cannot avoid the view. This approach plays down impacts on permanent residents, those who are most likely to keenly perceive and be most disturbed by light pollution.

In practical terms the Proponent's proposal allows for mine activities across the full 24 hours. Additionally, security lighting is highly likely to be an overlay on the lighting considerations described. It is not unreasonable to assert that light pollution will be a constant impact. Given the distances which light is capable of travelling, light pollution will be one of the most extensive impacts. Its effects will combine most perniciously with the impacts of both dust and noise for those who live in close proximity to the mine.

The shape of local topography as discussed in the previous section on visibility also applies in regard to visual impacts related to night lighting. The saucer shape of the local topography

and the direct view from residential estates to the west to the mine site mean that there is no chance of the mine, and the glow of its lighting, not being visible during night-time hours from these dwellings.
The value of the night sky to the quality of life of residents in the Gloucester Valley cannot be understated. Many residents in the southern part of the town and indeed on rural properties do not have streetlights in their residential neighbourhood. The quality of stars in the night sky and an appreciation of phases of the moon, are qualities local residents talk about. Any diminution of the quality of the night sky would be a loss of amenity to local residents.

6.5.3 Proposed mitigation

The proposed mitigation actions are vague and couched in subjective language.
The proponents intention is to aim to comply with the 1997 Standard - Control of Obtrusive Effect of Lighting. It will take measures that might be successful but it appears that the Proponent is simply aiming at achieving minimum constraints on light pollution in the conditions of consent.

There is no mention of practices that may lead to achieving the Government's goal of World's Best Practice.

Terminology in 4.5.4.5 indicates an attitude of going through the motions of quality management monitoring. Where that fails, or is inadequate, it is proposed to rely on a complaints management process. It will then act on the '*practical opportunities*' implementing these opportunities '*as soon as possible*'.

Management Measures rely heavily on communication between the mine personnel, contractors and residents. This reliance is unrealistic. The example of Stratford clearly demonstrates the likely failure of dependence on day to day management measures. Breaches of consent have been raised continually by community members. Formal complaints have been found to be unproductive. Complaints management processes provide no real outcome.

6.5.4 Adequacy of proposed mitigation

More disciplined provisions reflecting the company's pro-community values and the company's desire to minimise light emissions are easily within reach.

There appears to be no real safeguard other than for the community to complain. But complaints that are left to GRL to evaluate and decide and then act ("*as soon as possible*" is a far cry from "*immediately*").

The rail loading times impact on conveyor and coal loader operations which themselves impact on maintenance activities.

There is no suggestion of widespread use of automatic on demand lighting. There is no mention of shrouding ALL light sources. There is no mention of the use of small light arrays close to the work to be done - except personal torches/lights. The use of lighting towers suggests fewer large powerful elevated lights which by definition cause greater glow.

Mobile lights are highly likely to emit direct light from the work areas or send considerably more light into the 'glow'.

Overall it seems that this mine will operate like most others - seeking compliance with the standards; implementing basic quality management regimens from the 1990s; listening to complaints; and responding to those they choose.

There is much more to be defined in the areas of shrouding, set-up of mobile lights, smaller shrouded lighting arrays closer to the work to be done outside the pits and on-demand lighting. Responsiveness to complaints requires far better definition.

6.5.5 Grounds for refusal

The proposed development will have an unacceptable impact in terms of light pollution in the Gloucester Valley, with ambient light from the proposal likely to be intrusive for residents of the Gloucester community who current experience uninterrupted night skies set in a rural landscape.

6.5.6 Proposed Conditions of consent

1. Night-time operations shall be prohibited due to the significant impact of light pollution on the community. Where approval is given for night-time activity, the following conditions apply:-

2. Lighting systems shall be designed to world's best practice for light minimization and to prevent direct light from leaving the mine working areas.

3. Mitigation measures shall be rewritten to include quantitative thresholds above which pre-specified management action is mandated. Mitigation measures shall allow for the prevention of the use of lighting in areas of persistent complaint until an appropriate ameliorative solution can be developed and implemented.

4. Light management shall include a continuous automatic light monitoring stations representative of all reasonable direct viewing positions.

5. The proponent shall instigate an independently chaired local complaints management committee/community consultative committee comprised of community, industry and state and local government representatives to receive and investigate complaints, and determine and monitor corrective action.

6.6 Terrestrial ecology

6.6.1 Analysis of the issue

Although the proposed area of ground disturbance in the proposed project area is largely confined to cleared pasture land, in places the project would have significant consequences for some elements of the local terrestrial ecology.

The report prepared for GRL by Ecotone Ecological Consultants shows that the project would have an adverse impact on remnant areas of a Vulnerable Ecological Community – Lower Hunter Valley Dry Rainforest – and on the habitats and life cycle of several threatened animal species: the *Eastern bent-wing bat*; the *Large footed myotis*; the *Grey-crowned babbler*; the *Squirrel glider*; and the *Brush-tailed phascogale*.

The dry rainforest remnants, essentially confined to narrow areas along small rocky gullies running down from the line of hills & ridges along the eastern edge of the project area, are recognised by Ecotone as providing known or potential habitat for a range of threatened species including the *Wampoo fruit dove*, *Spotted-tail quoll* and various forest micro bats.

Some 4.3ha of the dry rainforest VEC would be completely cleared under the proposed mine plan. The remnants to be cleared would previously have been contiguous with the larger areas of this VEC that remain in the area proposed to be conserved as a biodiversity offset area.

In other parts of the project area, remaining patches of a different vegetation community - Dry sclerophyll open forest & woodland - provide habitat for known populations of the threatened Grey crowned babbler and Squirrel glider, and potential habitat for the Brush-tailed phascogale.

Although reported by local landholders, the surveys conducted for the EIS have not established whether a Brush-tailed phascogale population is present in the project area. As the consultants estimate that the area may support up to six females but only one or two males, this local population would be put at great risk by mine-related activities such as additional clearing or traffic movements that could disrupt breeding, increase mortality or reduce habitat connectivity.

The consultants have however confirmed the presence of four other threatened species in the project area - the Grey-crowned babbler, Squirrel glider, Eastern bent-wing bat and the Large-footed myotis – all of which were recorded within the road-side vegetation along McKinleys Lane.

The report by Ecotone notes that while the Eastern bent-wing bat and the Large-footed myotis are highly mobile and may forage over a large area, the Grey-crowned babbler and the Squirrel glider are relatively sedentary and are likely to have small populations resident along the roadside vegetation which may be affected by the Proposal, despite the northern end of McKinleys lane being excluded from the proposed area of disturbance.

The proposed project would remove up to 15.8ha of potential foraging, sheltering and breeding habitat for the Squirrel glider

Populations of Squirrel gliders can persist in roadside corridors such as McKinleys Lane, mainly because these corridors often have mature trees with hollows that this species requires for both breeding and roosting. Ecotone estimates that the local population is likely to consist of one or two family groups, but notes that the extent of the local population and the numbers of individuals in the Study Area - particularly the area that would be removed as part of the Rocky Hill Coal Project - is unknown.

The proposal that establishment and maintenance of the Biodiversity Offset area would not commence until year 2 of operations is not justifiable. Establishment of the offset area and implementation of appropriate management practices must commence prior to the commencement of ground disturbance because of the potential for that disturbance to impact terrestrial fauna.

It is proposed in the EIS that the Biodiversity Offset Area would be subject to a Voluntary Conservation Agreement under the National Parks and Wildlife Act, however much of the area concerned lies within the area that is subject to Mining Lease Application 446.

That is not acceptable because of the potential conflict between obligations that may be placed on the landowner under the NPW Act and rights that may be granted under the Mining Act in relation to land-use and other activities within the Offset Area.

As the provisions of the Mining Act prevail over land-use restrictions in other regulatory instruments such as VCAs, the protections provided under a VCA would be rendered ineffective for the part of the offset area that lies inside MLA 446.

6.6.2 Concerns/problems/issues

Under the 7-part test for Lower Hunter Dry Rainforest in the Sydney Basin and NSW North Coast Bioregions Rainforest the EIS for the proposal must address the question of whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

The NSW Office of Environment and Heritage has identified the following measures to assist conservation and recovery of this community:

- Exclude fire from remnants where possible

- Exclude grazing by domestic stock in remnants of this community by appropriate fencing

- Prevent further clearing and fragmentation of remnants

- Restore degraded remnants using bush regeneration techniques such as weed control and supplementary planting

- Control invasion and spread of weeds.

The ecology consultants' report maintains that the project "is not inconsistent with any of these activities except for 'prevent further clearing', since some habitat will be directly cleared". This non-sequitur suggests either a lack of understanding or a rejection of the intent of the OEH guidelines.

In fact the permanent clearance of the affected outliers of this VEC is inconsistent with all of these objectives. If the remnants are completely cleared, then of the other measures / objectives are rendered pointless.

GRL maintains that the potential impacts of the project would be addressed through adoption of avoidance, minimisation and mitigation measures. However it is not clear from the EIS & accompanying reports why the clearance of the VEC outliers cannot be avoided.

There is some reference to the southern half of the eastern visibility barrier being "enveloped by the advancing out-of-pit emplacement during Year 5 and 6 of operations" (s.4-122) but the mine plan presented in Fig 2.5 does not show such a southward extension of the interim overburden placement. Figure 4.42 shows a sediment dam (W2) sited where the dry rainforest remnants in the southeast portion of the project area are located, but no information is presented in relation to possible alternative siting or design of this dam that would avoid clearance of the rainforest remnants.

The EPA's requirement that as well as detailing the measures that would be put in place to avoid or minimise ecological impacts the EIS must include details of alternatives considered has not been met in relation to the clearance of the VEC outliers.

Addressing the question of whether or not the project is likely to reduce the long-term viability of a local population of a species, population or ecological community, the Ecotone report notes that the current viability of the local populations of Squirrel gliders and Grey-crowned babblers within the Study Area appear to be very tenuous, due to their apparent isolation from more extensive areas of suitable habitat in the eastern parts of the Study Area and beyond. The report goes on to conclude that these species "*may have their short-term viability reduced by the Proposal but in the long term, with more extensive native vegetation areas and improved connectivity to the Mograni Range, their viability should improve*".

That conclusion masks the risk of loss of the existing local populations of those two threatened species in the project area, as opposed to impacts on the viability of the species generally. Further, GRL has not established whether there is also a population of Brush-tailed phascolgales in the project area. If there is such a population currently surviving there, then there is a significant risk of the local population of that species also being lost due to the direct and indirect impacts of the project.

The Squirrel glider is also expected to be adversely impacted by proposed expansion of the nearby Stratford coal mine. The Stratford expansion project proposes a number of measures to try to mitigate the impacts of that project on the Squirrel glider, however the increased risk to the local population of this species due to cumulative impact of the two projects has not been taken into account in the EIS prepared for the Rocky Hill project.

Management of the Biodiversity Offset Area will be guided by a Biodiversity Management Plan. As the Offset Area contains extensive areas of the dry rainforest VEC which is fire-sensitive, a fire management plan must form a key part of the Plan. Based on extensive Australian research since the 1960s it is generally recognised that fire, and particularly the frequency of fire, is a critical factor in determining rainforest distribution and survival.

Neighbouring landowners report that recent burning within the GRL property that is to form the offset area was not managed in a way that avoided impact on the dry rainforest areas.

That current land-management practice has the potential to reduce the environmental values on which the offset credits for the project were calculated and needs to be addressed by GRL.

6.6.3 Proposed mitigation

The EIS maintains that impacts of the project on threatened species would be minimised through the design of the mine layout, the impacts would be mitigated following the completion of a risk assessment and the residual impacts offset by designation of suitable good quality habitats to the east of the mine (the proposed Biodiversity Offset Area) for conservation and the restoration of adjacent degraded habitats through fencing and replanting.

GRL proposes that the impacts on the dry rainforest VEC – including the complete clearance of 4.3ha – will be compensated by the inclusion of similar areas in the Biodiversity Offset Area.

For the threatened animal species, in addition to the establishment of the Biodiversity Offset Area GRL proposes that woodland and native vegetation corridors be established as part of the rehabilitation of the final landform, and proposes to apply a range of "*avoidance, minimisation and mitigation measures*".

It is proposed that the roadside vegetation that bounds McKinleys Lane where the Grey-crowned babblers and Squirrel gliders were observed, would be retained. The proposal also includes retention of most trees within the Open Forest / Woodland patch adjoining the western side of McKinleys Lane where the site offices and amenities area is proposed.

To help avoid fauna being hit by vehicles travelling to and from the mine area, a sign would be erected where the mine access road crosses McKinleys Lane "*highlighting that the area is likely to be a fauna crossing point and that drivers should proceed with caution*".

As part of the rehabilitation of the project area, native vegetation belts / fauna corridors (from which grazing would be excluded) would be developed through re-established open woodland.

6.6.4 Adequacy of proposed mitigation

Although only a relatively small area of one Vulnerable Ecological Community – the dry rainforest – and small local populations of two (or perhaps three) threatened animal species are expected to be significantly affected by the project, those affects could be reduced by the application of further avoidance, minimisation and mitigation measures that would be reasonably achievable.

The proposed Biodiversity Offset Area includes a substantially larger area of the dry rainforest VEC than the remnants that would be cleared from within the project area. However if the remnants were preserved, site revegetation during the rehabilitation phase would present an opportunity to re-establish connectivity of those remnants with the larger areas of this VEC in the proposed offset area to the east. If avoiding clearance of the areas of the VEC is not feasible, then rehabilitation of the drainage lines where they occur should be directed at the re-establishment of that ecological community rather than conversion to a stock dam surrounded by pasture as currently proposed (Fig 2.24).

Although the roadside vegetation along the northern half of McKinleys Lane is proposed for retention, indirect impacts from adjacent mining, light, noise and blasting may occur. Ecotone has noted that this has the potential to affect the Squirrel glider lifecycle by causing a change in foraging behaviour, a change in roosting behaviour, displacement of individuals, disruption of the social structure of the population and where the new access road crosses McKinleys Lane near its intersection with Waukivory Road, potential mortality of individual gliders.

The proposed installation of a sign at that location advising drivers to proceed with caution is unlikely to be adequate to reduce the likelihood of animals including the Squirrel gliders and Grey-crowned babblers being hit by vehicles in the absence of measures to limit vehicle speeds in the area. This is an issue of critical importance given the estimates presented in the EIS of 190 – 310 vehicle movements per day to and from the mine area along that access road.

The establishment of native vegetation belts / fauna corridors in the re-established open woodland may benefit a range of species that can utilise young re-growth. However as the tree hollows on which other species including the Squirrel glider are dependent take somewhere in the order of 100 – 150 years to develop, this will not ameliorate the loss of suitable habitat for Squirrel gliders for at least that period. Further, as those revegetated areas would be outside the Biodiversity Offset Area, there can be no confidence that they would in fact remain intact over that time scale.

In relation to the Grey-crowned babblers, Ecotone concluded that despite the proposed mitigation measures it remains possible that the Rocky Hill Coal Project could have an adverse impact on the group of Grey-crowned babblers that inhabit McKinleys Lane area (the local population).

While the Bio-Banking Assessment Methodology specifies ecosystem credits can be used to offset for loss of habitat for the Grey-crowned babbler (and for the Squirrel glider), the indirect effects such as noise on the retained habitat along the northern part of McKinleys Lane are as yet unknown and there is no currently available habitat suitable for the Grey-crowned babbler in the proposed Biodiversity Offset Area.

Monitoring by Countrywide Ecological Service at Gunnedah (cited in the Ecotone report), which suggests Grey crowned babblers occupying areas adjacent to mining activities may be resilient to those activities, demonstrates that efforts to preserve the McKinleys lane population are not futile and hence all practical measures should be taken to avoid loss of that local population.

6.6.5 Grounds for refusal

- The proposed development will have an unacceptable impact on the threatened ecological community of Lower Hunter Valley Dry Rainforest and nine threatened fauna specifies identified on the site.

6.6.6 Proposed Conditions of consent

1. The mine plan shall be revised to avoid the clearance of the outlying remnants of the dry rainforest Vulnerable Ecological Community in the southeast part of the project area.

2. Should clearance of the VEC outliers be found to be unavoidable, the rehabilitation plan must be amended to provide for the restitution of that vegetation community as part of the site rehabilitation.
3. To improve the long-term viability of the dry rainforest VEC within the Biodiversity Offset Area, revegetation within the Offset Area shall include restitution of dry rainforest in areas from which it has been cleared in the historical period.
4. Prior to commencement of any clearing of native vegetation inside the project area a more extensive fauna survey shall be undertaken to establish whether a Brush-tailed phascogale population occurs there. If a population is found, additional measures to avoid and mitigate impacts on that species, including reduced clearing of habitat, shall be identified and implemented.
5. To minimise the risk of vehicles' impact on fauna utilising the remnant vegetation along McKinleys Lane a speed limit of 40km/h shall be applied to the mine area access road where it approaches and crosses McKinleys Lane. Compliance with that limit shall be monitored and if it is found that it is not being complied with, traffic-slowing measures such as placement of speed humps must be installed.
6. Where monitoring of the surviving populations of Grey-crowned babblers and Squirrel gliders in the project area indicates adverse impacts on those populations are occurring, additional measures shall be identified for immediate application to reduce those impacts to levels that would not jeopardise those populations.
7. Should there be no large mature trees available for retention on both sides of the new mine access road where it crosses McKinleys Lane near the intersection with Waukivory Road, glider poles shall be erected in suitable locations as directed by a suitably qualified ecologist.
8. The findings of ecological monitoring conducted in connection with the project shall be included in environmental performance reporting presented on a regular basis for discussion by the relevant Independently Chaired Local Complaints Committee/Community Consultative Committee.
9. Management Plans relevant to the management or mitigation of impacts of the project on the terrestrial ecology – including the Biodiversity Management Plan – shall be presented for discussion by the relevant Independently Chaired Local Complaints Committee/Community Consultative Committee prior to submission of a Plan for approval, and the committee's comments on the draft Plan must be provided to the regulator when the Plan is submitted for approval.
10. Establishment of the offset area and implementation of appropriate management practices shall commence prior to the commencement of ground disturbance.
11. The portion of the proposed Biodiversity Offset Area that lies within the area of MLA 446 shall be excised from the MLA, or an alternative offset area identified.

6.7 Rehabilitation – final landform and landuse

6.7.1 Analysis of the issue

The EIS addresses rehabilitation in two stages: short-term stabilisation of temporary earthworks, drainage lines and disturbed areas during the operational phase of the mine; and progressive establishment of the final landform that would remain following completion of mining. The progressive establishment of the final landform would include rehabilitation directed at returning land to grazing or passive nature conservation and re-establishment of native vegetation for habitat and corridor purposes.

The final landform is described as topographically similar to the existing landform and revegetated with a mix of pasture and woodland that reflects that found in surrounding areas. It is proposed that all the mine pits would be back-filled with over-burden / inter-burden so that no final void would remain post-mining.

Mine and processing infrastructure would be dismantled and removed upon completion of mining, with the exception of the rail loop which would be retained for potential use by future users of the site.

6.7.2 Concerns/problems/issues

The proposal to back-fill the mine pits so that no void remains after completion of mining is supported. However the company's objective that rehabilitation be undertaken "in an ecologically sustainable manner" (s.2.15.2) points to a risk that at some point during the life of the operation, the company could seek to vary the conditions of approval relating to back-filling the final void on the basis that changed economic circumstances rendered that action economically unsustainable.

It is also of concern that rather than developing a specific Rehabilitation Plan, the rehabilitation program would be incorporated in the Mining Operations Plan which would be assessed by the Department of Resources and Energy with no opportunity for input by stakeholders such as Council and local landowners. Particularly during late stages of decommissioning when the temporary visibility barriers are being removed, there will be increased dust and noise impacts on neighbouring properties, and the affected residents should have the opportunity to contribute to the development & implementation of adaptive management of measures to minimise the impacts at that time.

It is proposed to establish native vegetation belts through the portion of the project area that would be re-planted to open woodland. It is intended that stock would be excluded from these belts which would serve as fauna habitat and corridors. The narrowness of those belts would present a range of challenges to their successful establishment, including mitigation of edge effects and fire management that would be different from that in the surrounding open woodland.

Further, there would be no long-term security for these vegetation belts, as there would be no requirement for them to be retained by a future landowner if the land is sold on completion of the project.

In the south-east part of the project area, a portion of land comprising around 9-10ha is proposed to be revegetated as pasture with isolated tree lots. This area includes drainage lines that currently support some 4.3ha of dry rainforest (a Vulnerable Ecological Community) which is proposed to be cleared during the project.

It is proposed in the EIS that the areas from which the dry rainforest would be cleared would be converted to pasture. However the opportunity would exist to re-establish the rainforest vegetation community in that area, potentially re-establishing connectivity with the rainforest areas in the offset area. This would require planting of an appropriate species mix and measures to ensure exclusion of fire and grazing.

6.7.3 Proposed mitigation

The mitigation of issues arising from the rehabilitation program are addressed in separate sections of the EIS that deal with matters such as noise and dust emissions.

6.7.4 Proposed Conditions of consent

1. The rehabilitation program shall be the subject of a separate Rehabilitation Plan that incorporates an adaptive management approach to the progressive rehabilitation of the project area.
2. The process for development of the Plan (and subsequent modifications) shall provide for community input through discussion with the Independently Chaired Local Complaints Committee/Community Consultative Committee. The committee's comments on the Plan should accompany the Plan when it is submitted to the DRE for approval.
3. The surety provided by the company in respect of site rehabilitation shall be structured to avoid any potential for a future amendment of the mine plan that would remove the requirement to back-fill all voids removed on the basis of changed economic circumstances.
4. Rehabilitation of the area from which the remnant area of dry rainforest is to be cleared must include re-establishment of that vegetation type in the patches from which it has been cleared rather than conversion of those areas to pasture with isolated tree lots.
5. Reports on the progress of rehabilitation work shall be included in the regular reporting of environmental management provided to the Independently Chaired Local Complaints Committee/Community Consultative Committee.
6. A property vegetation plan (PVP) under the NSW Native Vegetation Act shall be developed with the Catchment Management Authority (Local Land Services) to ensure the long term retention of native vegetation belts and woodland re-established as part of the rehabilitation of the project area.

6.7.5 Monitoring of impacts

The EIS presents a range of broad criteria against which the rehabilitation of individual areas would be monitored throughout the life of the project. A Rehabilitation Plan should be developed to provide for the development of more specific measures that would guide the monitoring program and which would incorporate all the recommendations made by the ecological consultants.

6.8 Water impacts

This section of the submission will look separately at the issues of surface water, groundwater and flooding impacts.

6.8.1 Surface water impacts

6.8.1.1 Analysis of the issue

This mine proposal plans to divert a substantial quantity of surface water from its natural sub-catchment flows for up to 21 years while the landscape of these sub-catchments is totally destroyed by open cut coal mining and then to replace this with an artificial landscape for which there are no quantifiable parameters for surface water quality or quantity. The diversion flow characteristics have been modelled and deemed to be of "*only a minor negative impact*". This supposition is not considered plausible.

The post mining (rehabilitated) surface water concept in Fig 2.24 is not likely to be realised. The actual situation is totally unknown; EIS section 2.15.5 says that "there is likely to be some settlement", "particularly above the main pit". There is no information on how the actual landscape will be achieved, how it will perform, and no risk analysis: it cannot be assessed and should not be approved.

The proponent's objective is "the management of surface water to avoid or minimise the adverse impacts" EIS sections 4.7.3 and 4.7.4. Adverse impacts are unacceptable in the Avon, Gloucester and Manning River valleys, particularly given the importance of these waters to the water supply service for some 75,000 people from Gloucester to Crowdy Head to Pacific Palms, from the Manning water supply system.

6.8.1.2 Concerns/problems/issues

The EIS identifies a number of risks in section 4.7.1 that could result from the mine proposal and ranks these of less significance than is likely to be the actual case. These impacts are as follows:

Discharge of sediment-laden water and pollution of adjacent creek flows is regarded as a medium risk in the EIS (p4-160) but is potentially much greater due to the following reasons:

- The height and slope of the visibility barriers mean that they will be very difficult to vegetatively stabilise in a reasonable period of time and erosion will wash sediment into the Waukivory Creek and Avon River flood plains. There is further discussion of this substantial risk in the section of this submission dealing with flooding (x.2).

- All sediment dams are designed to discharge into one or other of the Creeks and Rivers outside of the mine area as shown in Figures 3.2 to 3.5 of WRM 2013 (p 5-67/9). This means that the statement on EIS page 4-179 that the capacity of sediment dams would be "designed largely to contain the projected sediment-laden water' is unlikely to be the case.

- Although Table 4.49 provides an “adopted size” for sediment dams it is taken from Table 3.2 (p 5-81 of WRM 2013) but there are no calculations provided as to the required capacity. The assumed catchment sizes for the proposed sediment dams on the western wall of the visibility barriers are mere supposition, as there is no information as to how the runoff from the visibility barrier will actually enter the dam. In fact section 4.7.4.3 of the EIS states that “all sediment dams will be sized according to Blue Book requirements, so it would appear that such calculations have not yet been done so any risk assessment is spurious.

- WRM (2013) on page 5-130 states that the spillways of these dams will be above the 1:100 AEP flood level but this is not stated in the EIS. In either case this is an unacceptable design for a sediment dam on a flood plain; data exists in the consultant report for PMF levels and this should be used for such critical infrastructure.

- The management arrangements considered for all sediment dams is that when they become full of water and sediment it will be discharged within 5 days as stated in section 3.3.1 of WRM 2013. There are no clear statement however as to where it will be discharged. It is proposed that these discharges will go to the river system if the water is of a suitable quality (EIS p 4-184) as defined in an as yet approved EPA license. The water qualities proposed by the proponent (EIS Table 4.55) are higher than the NSW Water Quality Guidelines for salinity and suspended solids and should not be accepted. Therefore, there is a very high risk that water cannot be legally discharged but will simply overflow the sediment dams and pollute the Avon River.

- The total volume of all sediment dams (without any sediment in them) is 580ML as presented in Table 4.49 of the EIS. Rainfall and runoff for the mine area is stated on page 4-184 to vary between 238ML/a and 1199ML/a.

- The site water balance presented in Section 4.7.4.6 of the EIS and section 4.3 of WRM 2013 is only for the saline water zone. It does not include the clean water or dirty water zones and hence does not meet to DGRs for a complete water balance.

- As the EIS does not actually provide a water balance for the dirty water area the following approximation is offered. Assume that from Fig 3.13 in WRM 2013 (p 5-78) that in year 7 of the mine the area of dirty and saline water management are similar. Table 4.3 WRM 2013 page 5-93 indicates that in about year 7 the contribution from rainfall and runoff in the saline area would be about 1400ML/a so it can be assumed that a similar amount occurs in the dirty water zone. As presented in Table 4.49 of the EIS (P 4-182) the capacity of the sediment dams in only 580ML in total so these dams would have to be emptied by pumping to the river at least twice in the year. This represents an unacceptable risk of pollution to local water resources.

  Erosion and instability of levees on the flood plains and the channels of Oakey Creek are regarded as low risks in the EIS (P4-161) but data in the reports indicates a higher risk for the following reasons:

- Even in section 4.7.5.5 (i) of the EIS it states that “there may be a need for localised scour protection at the toe of the … visibility barrier” for 1 in 100AEP flood events. Figure 5.25 in WRM (2013) indicates that 1:100 flood velocities could increase by 1m/s to 2m/s against some of the constructed sediment dam walls. Figures 4.10 and 4.11 in WRM (2013) Appendix C indicate that for a 1:1000 year ARI (flood), the water against the levee and dam walls could be 2-3m deep and 2-3m/s velocity; unless

protected these structures will erode. A further high risk design is that these sediment dams are to be constructed where flood water is deepest as seen by comparing the longitudinal distances in Figures 4.27 and 4.28. In other words these so-called sediment dams are really designed to protect the visibility barrier walls at low points of the flood plain; a very high risk for erosion and downstream water pollution which is considered unacceptable.

- Section 4.7.4.3 states that sediment-laden runoff from the western face of the barrier will be collected in "a series of sediment dams strategically placed along the toe of the barrier. It then proposes to release this water into the Avon River under an EPA licence. This is despite stating on page 4-184 of the EIS that "no overflows would occur throughout the life of the project. Such contradictory statements undermine the credibility of the EIS.

- Oakey Creek will carry extra water because of discharge from the diversion bank that the mine will construct to the east of the site EIS Fig 4.40) in order to stop runoff entering the mine site. Some of this water would normally flow into the Avon River directly or via Waukivory Creek (Fig 4.38). The extra flow in Oakey Creek has only been analysed for a 1 in 20 AEP event and this is entirely unacceptable as the actual Diversion Channel will be designed for a 1:100 yr flow (WRM 2013 page 5-69). Section 4.7.4.2 of the EIS says that the diversion channel will be 1-15m wide and "exhibit a gentle gradient" but this is not supported by the cross section in Fig 3.6 of WRM 2013 (p 5-70), and the statement that the channel will be 30m wide. The downstream ends of both channels will flow into steep drainage lines and while it is stated that energy dissipators will be used to reduce erosion, there is no design data for this and no risk assessment. The erosion assessment of the diversion channels and of the extra flow into Oakey Creek is inadequate and unacceptable.

- There is no information presented about the storage or management of the spoil from the construction of the clean water diversion channels. It is stated that the channel will be grass lined but no information on how or over what time period this will occur. Both of these are high risk elements in the design that have not been evaluated in the EIS.

6.8.1.3 The need to retain poor quality water due to an inability to discharge it without treatment is regarded in the EIS as a medium risk but given the very large volume of contaminated water discussed in the proposal EIS 4.7.4.6 (p4-184) for volume and EIS 4.7.2.6 (p4-169) for quality issues, this risk should be rated as very high for the following reasons.

- A site water balance for saline water is not actually presented in an integrated or diagrammatic form, although Figure 4.44 (EIS p4-178) purports to do this. Summary data on page 4-184 indicates that inflows could be up to1,200ML/annum from rainfall and 1,100ML/a from saline groundwater, outflows could be up to 600ML/a for usage on site and 600ML/a for evaporation from storages, resulting in a need to store at least 1,100ML in some years. There is no year by year analysis of cumulative inflows, outflows, storages or risks associated with these operations in the EIS.

- Section 4.7.4.7 of the EIS states that "*under average conditions approximately 39,000 tonnes of salt could be expected to accumulate in the saline water zone storages over the life of the proposal*" is a very high risk strategy, not a "medium risk".

- As discussed above, there is no water balance for the dirty water management in the mine and this is a major deficiency. The fact that sediment dams will have to be pumped out and even cleaned of sediment to maintain storage is a high risk management action that is not addressed in the EIS.

- A statement is made (p4-184) that "*no overflows would occur throughout the life of the Proposa*l" and that there "*would be the lack of need to extract water from Waukivory Creek, the Avon River or on-site sediment dams*" beyond the site establishment and construction period. This highlights 2 deficiencies in the EIS; firstly that an unspecified amount of water has to be stored on site for years and secondly that a large amount of water is being diverted from the downstream water system. Both of these problems are high risk.

- A further point is made in this section that "*water from the on-site sediment dams once of an acceptable quality, would be returned to the existing creek/river system to maintain environmental flows*". This is a high risk strategy for which no data or analysis is provided.

- Table 4.47 (p4-169) and subsequent discussion provides data that indicate existing surface water quality at the proposed mine area and the rail load-out facility are much higher than NSW Water Quality Objectives for characteristics such as electrical conductivity (salinity), sediment (TSS), nitrogen, phosphorous and some heavy metals. This is simply accepted in the proposal and no remediation provided whereas in reality the proponent should prepare and implement a plan to address this situation. The lack of proposed action on this matter is a serious concern in and means that any further contamination is potentially a high risk for environmental pollution at the site.

  Chemical contamination of surface water and the long term impact to salinity levels in regional surface water are regarded as low risks in the EIS. In fact these are considered high risks based on the information presented and concern from some information not presented.

- Contamination by seepage from the visibility barriers is not assessed yet these will be 40m high and constructed with relatively uncompacted subsoil contaminated with salt. The leachate from these structures will flow directly into the Waukivory Creek and Avon River flood plains.

- The proposal in Table 4.55 of the EIS (p 4-189) that water with salinity and suspended solid values above NSW Water Quality Objective levels will be pumped from sediment dams to the Waukivory Creek and Avon River systems will contaminate these systems and is an unacceptable high risk. The suggestion on the bottom of page 4-184 that water from the sediment dams "*would be returned to the existing creek/river systems to maintain environmental flows*" is a major concern. It infers that environmental flows have been reduced by the mine and that water above defined objective standards is acceptable for environmental flows. This is an inappropriate management proposal in order to remove excess dirty water from the site.

- Section 4.7.4.7 states that at the end of the proposal "*under average conditions*" there will be 39,000 tonnes of salt accumulated in storages and that this will simply "*make its way back into the groundwater system and overburden as the pits are*

backfilled". This statement is unsubstantiated and illustrates another very high risk element of the design. The salt 'slug' will have a very high risk of contaminating surface and ground water as it moves out of the mine area when the pits are filled to a height of 45m above the original ground surface. This will be a long term impact of unquantified magnitude.

- The post mine rehabilitation plan does not include provision for testing (and if necessary treating) material for salinity, acid forming potential, or the presence of heavy metal contaminants prior to it being moved and placed in the new landscape. This means that there is a high risk of unsuitable material being exposed during the earthworks and even being placed permanently in unsuitable places near drainage lines. A risk assessment of all material to be repositioned must be undertaken before it is moved during this landscaping phase.

- Another significant concern is that there is no risk assessment in the EIS of the post mining surface water situation. It is considered unacceptable that such a risk assessment has not been undertaken by the proponent. In fact it is not possible to effectively analyse the post mining surface water situation for the following reasons:

- While indicative rehabilitated surface heights are provided in Fig 2.25 of the EIS these cannot be verified as there is no mass balance for spoil excavated and spoil used to fill in the pits. Sect 2.15.5 says that heights might subside ("*some settlement*") but the self-drainage will be unaffected. This statement would not be correct if the large flat rehabilitated surface above the main pit (newly filled with 100m of spoil) was to subside by 1m relative to the land surface to the west where the visibility barrier has been removed and the land has compacted naturally over years. The risk in this scenario is high and would add to the accumulation of water in the void area.

- There is no plan presented as to how overburden (waste) material will be placed during reformation of the surface landscape and hence no risk assessment of the movement of saline and acidic groundwater within the final landscape.

- There is no surface water balance in the EIS for the post mining landscape so issues such as stream volumes and velocities cannot be assessed. This means that soil erosion is unknown and the risk that this poses to downstream pollution is potentially very high until vegetation is established.

- The likely risks that revegetation will fail on the reformed landscape is high given the harsh soil conditions and the variable climate. This issue has not been assessed for risk and can be assumed to be high.

- Fig 2.24 shows that new streams will be established over the filled voids but there is no information on how these will be constructed or what their flow characteristics will be. It is likely that water will simply infiltrate into the void area and add to the annually increasing volume of contaminated ground water. Eventually this 'basin' of polluted water will enter the downstream ground water systems and even flow onto the land surface to the west of the barrier area.

6.8.1.3 Proposed mitigation

There is no mitigation proposed in the EIS for most of the issues discussed above. It is not acceptable to state that these issues will be detailed in the Mining Operations Plan that will

be submitted to DRE after development consent (EIS section 2.15.1 and other sections). The risks need to be assessed as part of determining the development application and there is insufficient data in the EIS to enable this analysis.

Monitoring of water quality is proposed to "*confirm the quality of water collected on site*" or "*released of site*" or to "*establish the extent (if any) to which runoff from the site is having an adverse impact*".

The proposed mitigation measure for excess dirty water is to pump it for release outside the mine area subject to an Environmental Pollution Licence.

One proposed mitigation measure for saline water is to spray it on roads in the mine to suppress dust.

6.8.1.4 Adequacy of proposed mitigation

The EIS states that "*standard mitigation measures*" will be adopted but this is far from a standard development; it is a coal mine with pits 100m deep and barriers 40m high on the edge of a substantial flood plain.

There is no trigger points proposed that would cause action to be taken if the water quality was different to that predicted or if it was having an adverse impact. This is entirely unacceptable and results in a very high risk management situation that should not be approved.

Pumping dirty water for disposal outside the mine area is unacceptable because the suggested limits of salinity and suspended solids are above NSW guidelines.

Spraying saline water on mine roads will initially suppress dust but because the salt has an adverse impact on soil structure the dust problem will in fact increase. The other problem is that this salt will return to the pits and dams in the mine area via rainfall runoff and not reduce the amount of accumulated salt.

6.8.1.5 Grounds for refusal

- This proposal fails to provide a full water balance as required in the DGRs and as such the impact of the mine on surface water quality and quantity cannot be assessed.
- The DGRs require a "*detailed site water balance inclusive of volume and frequency of any water discharges*". The EIS has failed to provide this analysis for the whole of the dirty water management area, the post mine rehabilitated areas or for the period of at least 5 years from the end of mining to final rehabilitation to the time when the site is adequately revegetated.

- The rehabilitation plan is inadequate and cannot be assessed for its impacts on surface water post mining. The proposed filling of mine voids with over 100m of unconsolidated overburden and coal waste is an untried concept and represents a high risk at this site and there are no proposals in the EIS about what will happen if the landscape fails.

6.8.1.6 Proposed Conditions of consent

1. No approval for development on the floodplain shall occur until the Council Flood Study is completed and the data used to reassess the mine impacts.
2. There shall be no development of visibility barriers or sediment dams within the PMF flood level.
3. The conveyer shall be redesigned to and analyzed for impacts associated with a PMF level.
4. A full plan for post mining landform construction shall be developed and analysed for impacts on surface and ground water on-site and downstream prior to site establishment.
5. Water shall be of better quality that that required by the NSW Water Quality Objectives
6. The approximate 39,00 tonnes of salt residual in the mine pits and "environmental dams" at the end of mining shall not move into the ground and surface water systems.

6.8.1.7 Monitoring of impacts

The EIS suggests that surface water monitoring will occur but it provides no trigger or hold points for when the impacts are unacceptable. It does not commit the proponent to any long term monitoring after the site is relinquished.

6.8.2 Groundwater issues

Groundwater is addressed in Section 4.6 of the main EIS document. The details of the Groundwater Assessment for Rocky Hill by Australasian Groundwater and Environment Consultants (AGE) are located in Volume 2, Part 4.

6.8.2.1 Analysis of the issue

The environmental impacts of the Rocky Hill Mine on groundwater and groundwater related issues are of major concern. Groundwater is a key issue in most coal mining and coal seam gas projects and this project is no exception. The Environmental Impact Statement (EIS) states that the impacts of developing this mine on groundwater related issues will effectively be negligible. To illustrate this, the Groundwater section of the Executive Summary states that the groundwater assessment "concluded that:

- no surrounding groundwater users would be impacted…;
- 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."

The Executive Summary also:

- Acknowledges that "the existing habitats and aquatic communities in……..the Avon River system as a whole is significant…"
- makes "commitments to protecting water quality within Waukivory Creek and the Avon River" and "would ensure the existing aquatic ecology would not be adversely impacted"

However, there are major problems with the EIS that strongly question these categorical statements. Many of the assumptions made in the groundwater model that most of these statements are based on, are highly questionable. For instance the analysis is based on average rainfall over a short period. The critical time for groundwater systems is during drought conditions especially in a series of drought years and these have not been assessed in the EIS. At these times the Avon River and Waukivory Creek "ceases to flow". Water table levels in the alluvial aquifers will also fall and will inevitably fall more with the Rocky Hill mine operating than in average years, possibly leading to major impacts on riverine vegetation.

The EIS quickly dismisses any impacts of drawdowns on current groundwater users because it says there are only a small number of bores close to the mine. This is because GRL and AGL have purchased most of the properties in the area that have wells. Although current use of water from private bores and watercourses is relatively small, this could change considerably in future years. The quality of water discharging from the "post closure landform" is not known but is also of significant concern. The basic right of landholders to be able to access good quality water for domestic and stock purposes must be maintained as is the protection of water for public water supply in the lower Manning with 70,000 plus users.

The cumulative impacts of Rocky Hill's operation at the same time as AGL's gas extraction have not been adequately addressed. Nor has the inevitable future proposals to expand mining in other areas close to Gloucester within GRL's exploration leases.

6.8.2.2 Concerns/problems/issues

The EIS identifies a number of risks that could result from the proposed mine (proposal actual situation) in section 4.6.1.and. These risks are as follows:

- Reduction in baseflow in Waukivory Creek and the Avon River;
- Discharge of poor quality groundwater from the post closure landform;
- Impact on groundwater (alluvial) biota;
- Reduced water in groundwater systems
- Noticeable reduction in base flow regimes in Waukivory Creek and the Avon River, with impacts on downstream aquatic ecology and other users.

These issues have been assessed by AGEC as low to medium risk. Another critical issue in relation to groundwater is the:

- Cumulative impacts of Rocky Hill and Gloucester Gas operating at the same time and the cumulative impact of future expansion of the Rocky Hill mine.

Section 4.6.4 identifies other related "potential environmental impacts". The issues associated with the proponent's identified risks above and potential environmental impacts, as well as other issues not specifically listed by the proponent, are addressed below, but not in the same order.

It is inevitable that, if this project goes ahead, Rocky Hill will apply to expand mining in other areas close to Gloucester within GRL's exploration leases. The Environmental Impact Assessment process in NSW does require consideration of cumulative impacts from future expansion at the time of initial consent and proponents like Rocky Hill are very careful not to provide any detail or even make any reference to future stages except for the requirement for ongoing exploration. This is the 'leg in the door' approach which was used by Stratford Coal and appears to be supported by Government. However in reality, this is a very deceitful approach used by the mining industry.

Complex Hydrogeology & Groundwater Modelling

The modelling package used by AGE can couple groundwater flow with surface water flow. This is touted as a major strength of the package by the consultants (see ES page 4-11 and sections 4.6.5, 10.3.1 and 10.3.6). However in section 11.5, it is stated that "the groundwater model should not be used to assess the flow reductions to the surface water system." This is due to the over simplifications assumed in the model design which are necessary because of the highly complex hydrogeology. However, the assessment of the interaction of groundwater abstraction on surface water base flows is one of the fundamentally important concerns in assessing environmental impacts and this has not been done.

Section 10.4.3 on Transient Calibration of the model goes states on to say that "*The hydrographs show what is considered a good match, and whilst the absolute values of the predicted model do not match, they are all less that 3m different to the observed values, and*

more often less that 1m different." When we are looking at impacts on groundwater levels in the alluvium and also in base flows and river pools, this level of accuracy is unacceptable. Modelling of water level accuracy can be greatly improved by having a much larger number of cells in key potential impact areas such as the alluvium and the river/river pools.

The modelling uses average rainfall to calibrate its steady state condition. For transient calibration, it used the period March 2011 to February 2012. This is a very short period for such a calibration. Predictive simulations were then run for Year 2 to year 14 at quarterly intervals even though the mine application is for 21 years. It's not clear what was used for rainfall data. As stated above, the critical time for groundwater systems is during drought conditions especially during a series of drought years. The EIS does not address periods of drought by using the long rainfall records available for Gloucester. This is not acceptable.

The model does not allow for faults. The approach is that if reasonable calibration can be maintained without considering faults, then all is OK. AGE go on further to say in section 10.2 "that there has been no reported incidence of increased groundwater flow or influence on potentiometric levels associated with mapped fault zones. (They are not aware of situations where faults have interfered from modelling (ref)). However, as explained in section 8.11 of this submission on Geological Setting and Coal Resources, this is not your average mine. The mine area includes a major reverse fault that strikes in a north-south direction. There are also other smaller normal and reverse faults and a major basalt intrusion. GRL has admitted it has not completed sufficient exploratory drilling and mapping to define the location of these geological and structural features. How then can these major features be properly accounted for in the groundwater modelling. Again, this is not an acceptable situation.

Impacts on Water Table & Cumulative Impacts

The modelling for this project predicts very small drawdowns except immediately adjacent to the pits. Even with the AGL Gas Project operating, the drawdowns in the alluvial flood plains are shown as (a) minimal, except very close to the CSG wells. This is markedly different to the predictions modelled in the Stratford Extension Project, which indicates much greater drawdowns. Which consultant is right? This further emphasizes the need for a basin wide groundwater and surface water model. No approval for Rocky Hill or any further approvals for the coal/coal seam gas projects should be given until this model is up and running and providing reliable predictions and the analysis of cumulative impacts completed.

Reduction in baseflow in Waukivory Creek and Avon River

It has been said that there are no free lunches when it comes to removing water from natural water systems i.e. all extractions will have some impact downstream. It is very difficult to accept that, given the large quantity of groundwater to be extracted by GRL and the reductions in the catchment areas for Waukivory Creek and the Avon River, that the reduction in baseflow will be negligible as claimed.

With respect to protecting riverine ecosystems, the worst conditions are similar to what is being experience right now (October 2013). The Avon River stopped flowing 3 to 4 weeks ago. The river is now just a series of shallow pools. These pools and dependent vegetation provide critical habitat to many fauna species possibly including the platypus. Any reduction in surface and/or groundwater flow at these times will be critical for riverine ecosystems but this is not acknowledged in the EIS and no real mitigation is proposed, however in the Surface Water section page 4-184 it states that water from sediment dams "would be returned to the creek/river to maintain environmental flows". Poor quality water is not acceptable for such releases and any flow released must mirror typical natural flow regimes. However none of these aspects has been assessed in the EIS.

Table 4.46 presents a "Checklist against Water Sharing Plan for the Lower North Coast Unregulated and Alluvial Water Sources". Item 5 Rule 67 provides for "…restrictions on the management of groundwater connectivity which apply to the Avon River Water Source whereby aquifer access licences are subject to the same 'cease to pump requirements' as river access licence. In effect this means that pumping from alluvial bores must cease:… where there is no visible flow….". The applicants response is "These restrictions are noted." What does this response mean? It would seem GRL have made is no commitment to agree with this rule.

GRL want to convert their surface water licences to groundwater licences to provide water for the operation of the mine. Therefore if there is no flow in the Avon, GRL would not be able to pump any water to operate the mine. It is not clear how this would apply to dewatering pumps as they are also likely to be capturing water discharged from the alluvial aquifer into the pits. There should be no exception to these rules which means that the project is not likely to be viable from a water management perspective. This potential reduction in base flows should be considered a high risk issue.

Impact on groundwater dependent ecosystems

The EIS states a number of times (egg section 11.6) that the riverine vegetation consists mainly of "River Oak, Cabbage Gum and Broad-leaved Apple. River Oaks are understood to be similar to River Red Gums and these species are likely to rely on groundwater from underlying formations." This is a highly significant comment, as although River Oak communities in the region are not threatened, they play very important roles in all riverine systems where they occur. They provide key habitat in rivers where riverine vegetation has already been impacted by clearing. They also greatly assist with bank stability. The deaths of the River Oaks as a result of low groundwater levels and reduced flows recharging the alluviums, could have a devastating impact on stream stability and the riverine ecosystems including aquatic ecosystems. On the other hand, any loss of riverine vegetation in the Oakey Creek system will cause major flood damage when the increased "clean water diversion" flows increase water velocity and volumes as predicted. These impacts on riverine and groundwater dependent ecosystems need to be considered a high risk issue.

Inflow of saline groundwater into pits and subsequent management.

This area is covered in more detail in sections 2.3 and 2.4 on on Surface Water. GRL's proposal is that saline groundwater will mix with poor quality surface water and be stored on-site or be allowed to discharge treated water into the Avon River. There is real concern about GRL's capacity to store this water. There should be no approvals given to release any mine water into the Avon River system. However if any water is allowed to discharge into the Avon River it needs to be treated to meet NSW Water Quality Guidelines for salinity and the usual physio-chemical requirements as well as for metals and organic toxicants.

Projects such as this that are planned to make large financial gains should not have the right to just discharge poor quality water into local rivers, especially when they are in a public water supply catchment area. No costs associated with the disposal of such water should become a burden to taxpayers. This should be considered a high risk issue.

Discharge of poor quality groundwater from the post closure landform

This issue is covered in the previous section on Surface Water such that whatever applies to surface water discharge should also apply to groundwater discharge. The concept that groundwater levels and salinities will stabilise after 15 years is unacceptable because the data for the Stratford pits is that it would take hundreds of years. The Stratford pits do not have the amount of uphill runoff flowing into the pits that will be the case for Rocky Hill and hence Rocky Hill will probably overflow onto the floodplain. The concept proposed in the Rocky Hill EIS that by filling the voids the hole will be able 'absorb' or 'process' the 39,000tonnes of salt is not substantiated in the EIS and has not been demonstrated in other mines where in-pit disposal of pollution is practised.

6.8.2.3 Proposed mitigation

As the proponent believes that the impacts on groundwater and related issues are negligible, there is no proposed mitigation provided for these impacts.

6.8.2.4 Adequacy of proposed mitigation

The EIS states that "standard mitigation measures" will be adopted but this is far from a standard development.

As for Surface Water, there are no specific trigger points indentified in the section on Groundwater that would cause action to be taken if the water quality or water levels reach unacceptable levels. This should have been done as part of the EIS.

6.8.2.5 Grounds for refusal

The proponent has not adequately addressed groundwater and related issues in the EIS. This proposal should be refused for the reasons outlined below based on the concerns/problems/issued raised in section x.2.

- The groundwater model is over simplified largely because of the great complexity of the hydrogeology makes (this) modelling extremely difficult. It is calibrated coarsely using minimal data. It does not provide sufficient precision to analyse the impacts on Waukivory Creek and the Avon River and their associated ecosystems. Specifically

it does not address what happens to water levels during drought sequences which are the critical periods.

- The modelling outputs show very small drawdowns in watertables which is very different to the Stratford Coalmine Extension EIS particularly when the cumulative impacts of having the AGL Gloucester Gas Project operating at the same time was considered.
- There is inadequate consideration of the risk of impacts of water table drawdown on groundwater dependent ecosystems, particularly the River Oaks, which are fundamental in protecting the stability of rivers and riverine ecosystems
- There is inadequate consideration of how the proponents will manage groundwater that is saline and other poor quality water.

6.8.2.6 Proposed Conditions of consent

With respect to groundwater issues, no consent, including conditional consent, should be granted. The proponent should have properly addressed the issues highlighted above in the EIS.

If consent is given, conditions are required to address the following:

- The need for modelling at a higher level of accuracy;
- The need for trigger points for groundwater and surface water such as pumping water from the alluviums, key river pool levels and the health of River Oak communities;
- The need for trigger points for water quality in monitoring wells, Waukivory Creek and the Avon River;
- Clear descriptions of what action Rocky Hill must take if these trigger points are reached; and
- The need for detailed management plans which properly address groundwater and surface water quantity and quality management plans.
- There should be no release of any mine water into the Avon/Manning River System. If however a release is approved, the water must be treated to, at very least, the requirements of the NSW Water Quality Guidelines.

No construction should occur until these issues are addressed in full.

6.8.2.7 Monitoring of impacts

Detailed monitoring of water quantity and quality will be required, especially for those areas where trigger points are set.

The EIS does not commit the proponent to any long term monitoring after the site is relinquished.

6.8.3 Flooding

6.8.3.1 Analysis of the issue

The proposal for this mine development includes building visibility barriers and sediment dams on the floodplain of the Avon River and Waukivory Creek (EIS p4-161). This is entirely unacceptable as the earthen structures will impact on the flood characteristics of these water courses and also contribute polluted sediment to the downstream water due to increased water velocity eroding these structures (Consultant Study WRM 2013 section 4.12.1).

The proposed height of the conveyor across the flood plain is not adequately evaluated for its flood impact or its security.

Section 2.1.3 of the EIS should contain the need for approval under the Water Management Act 2000 to construct structures on the floodplain.

6.8.3.2 Concerns/problems/issues

The only reason for the Visibility Barriers to encroach on the flood plain is so that their basal width does not impact on the maximum width of the mine pit. Therefore, the plan is to place mine overburden and waste material in levee banks on the floodplain.

While section 2.6.2.4 and Fig 2.7 and Fig 2.17 of the EIS describes the possible shape of the visibility barriers there is no detail about how they will be constructed, what amount of compaction there will be or how they will be stabilised. The fact that some sections will have slopes of 1:2 (V:H) means that stability will be very uncertain and erosion during and after construction will be highly probable. There is no calculation in the EIS of the volumes of waste required to construct the barriers or levees nor is there any consideration of their chemical content as a source of pollution. There is no provision for berms down the slope to reduce runoff and sediment even though this would be a normal soil conservation practice and one that is used at the Stratford mine.

There are 5 sediment dams proposed (on the floodplain) at the base of the constructed barriers but no information on how sediment will be collected and directed into the dams. Nor is there any calculation of the volume of sediment or indication of the management regime to empty these dams when full of polluted sediment during the life of the project. This sediment will contain salt and heavy metal pollutants from the waste material used in their construction (section 3.7 of report WRM2013) and it is unacceptable to have these existing on or adjacent to the floodplain.

Figure 4.27 (page 5-130 of the Consultants report WRM2013) indicates that the banks of the proposed sediment dams are at the low points along the visibility barrier and in reality will operate as levee banks to protect the barrier. Flood depths against the dam walls will be up to 2.5m for the 1:100yr flood and in places an extra 0.6m for the 1:1000yr event. Section 4.12.1 of WRM2013 suggests “that the spillway crest is above the level of the 1 in 100 AEP flood, thus reducing the risk of sediment being flushed from the dams during floods”. This concept is not carried through into the EIS design or discussion. There is no mention in the EIS of the risk of these sediment dams spilling into the river and this is a major deficiency in the document.

Figure 2.7 on page 2.23 of the EIS indicates that the visibility barriers will be 40m high and at least 150m long and up to 1:2 slope. The erosion potential is massive, and the revegetation challenge is enormous. Yet the EIS in section 2.15.6.2 states that the upper 20m of some of the barrier will have slopes of 1:2 (V:H) which is very unstable. Section 2.6.2.4 states that inner slopes will be 2:1 (V:H) which is likely to be greater than the angle of repose of the waste material and therefore impossible to achieve. A likely scenario then would be that the mine has to push the barrier further to the west and further onto the floodplain; which would be totally unacceptable. The alternative would be to reduce the size of the pit and this would not happen. All of this means that the visibility barriers will in fact be very unstable waste heaps that will move onto the floodplain and create substantial pollution of the Avon River.

It is difficult to understand how the EIS, in section 2.15.6 can realistically suggest that these slopes will be planted to pasture grasses and legumes with agricultural equipment. This shows a poor appreciation of the design and a lack of understanding of the local climatic conditions.

The Consultant Study (WRM 2013 Appendix C) undertakes an analysis of flooding at return periods of 100, 500 and 1000 years and for the Probable Maximum Flood (PMF) but the EIS discussion in Section 4.7 only refers to 1:100 year events. This is unsatisfactory as it excludes important impacts. The Appendix page 5-228 states that all flood levees will be constructed at a height of the 1:1000 year flood event plus a freeboard of 0.5m; this is not presented in the main EIS which uses a 1:100 return period at a much lower height.

Section 4.7.2.4 of the EIS only describes the impacts of a 1:100 yr flood and acknowledges that any flood in excess of this would enter the mine pits. This is an unacceptable situation as this water would then become contaminated and its disposal has not been addressed in the water management sections of the EIS. The concept of flood water flowing out of the mine area in a breach situation is not considered in the EIS and the fact that the design could allow it to occur because a PMF level was not adopted is not acceptable.

Section 4.7.5.5 indicates that the overland conveyor will be 1m above the 1:100 AEP flood level and 0.5m above the 1:500 AEP level. However, it does not adequately discuss the impacts of this height or the reason for not using PMF levels for such critical infrastructure. Nor does it discuss the impact of the conveyor piers at 30m intervals across at least 1000m of the Avon flood plain (Figs 4.5 and 4.6 on page 5-222/3 of WRM 20113).

6.8.3.3 Proposed mitigation

Most of these issues are not addressed in the EIS. The EIS considers that the visibility barriers and other levees to the south will prevent flooding of the mine area for a 1:100 year event.

The EIS assumes that there will be no problems in stabilising and rehabilitating the visibility barriers at extreme slopes and in highly variable weather patterns.

There is no mitigation proposed for sediment dams when they become full. The only issue considered is being able to pump water out of them into the Avon River when their proposed EPA license allows them to do so.

6.8.3.4 Adequacy of proposed mitigation

Using a 1:100 year flood return period for a mine design of this size which is proposed to operate for 21 years on the edge of the Avon River flood plain is not economically or environmentally sustainable. The specialist Consultants Report contains data for Probable Maximum Flood events and this should be considered in the design and mitigation measures. There is a high risk that the visibility barriers will erode and this will lead to pollution of the Avon River and possible flooding of the mine. Flooding of the mine has not been considered in any detail as the EIS simply states that the proponent considers that it will not stop the mine operation. They do not consider the issues associated with managing the polluted water that could flow back into the river or would need to be disposed of on site.

It is not feasible to establish the suggested pasture mix on the visibility barriers during most months of the year in Gloucester with the variable rainfall and high evaporation rates. The species are not suitable for year wide planting, the technique of using farm machinery on the slopes is not practical, and to suggest that because the proponent has had success planting trees in undisturbed ground (section 2.15.6 of the EIS) means that the rehabilitation will be successful in totally different landscape conditions is not sustainable.

There is no consideration in the EIS for the possibility that the large visibility barriers may not be stable or revegetated when the first major rainfall event occurs. The consultant's report WRM 2103 page 5-209 indicates 1hr rainfalls of 70mm/hr to be likely for the 1:100yr design adopted but there is no analysis of what this would mean for runoff and erosion from the visibility barriers in to the floodplains. Given the inadequate design of these earth structures and the poor revegetation concepts such a rainfall event would totally fill the sediment dams and seriously pollute the Avon River.

6.8.3.5 Grounds for refusal

- The proposal development will have an unacceptable impact on the floodplains of Waukivory Creek and Avon River from the proposed visibility barriers that are to be constructed within the floodplain.
- The proposed development fails to adequately consider the impact of the proposal on flood waters having regard to pollution from dissolved solids, salinity and heavy metals associated with the proposed sediment dams and visibility barriers.
- The flood assessment data used to predict impact of flooding is inadequate and not robust.

6.8.3.6 Proposed Conditions of consent

1. No approval for development on the floodplain shall occur until the Council Flood Study is completed and the data used to reassess the mine impacts.
2. There shall be no development of visibility barriers or sediment dams within the PMF flood level.
1. *The conveyer shall be redesigned to and analysed for impacts associated with a PMF level.*

6.9 Heritage impacts

6.9.1 Indigenous heritage issues

6.9.1.1 Analysis of the issue

There has been significant traditional occupation and usage of the site. The subject location is within an area that is acknowledged as forming part of a well known "traditional/historic" route between Port Stephens and the Manning Valley. This is evidenced by the number of sites located within the study area (10), and the high number of artefacts within some of those sites.

6.9.1.2 Concerns/problems/issues

The Archaeological Surveys & Reports Pty Ltd (February 2013) Indigenous Archaeological Assessment is dismissive of the cultural significance of the locality and sites located within the area however, there is no basis for this dismissal. The statement that there "*are no known cultural associates with the area*" is indicative of the inadequacy of the report to consult with all registered Traditional Owners in the locality.

The Gloucester Mookibakh Traditional Owners Indigenous Corporation (Registered Number 7734) are not nominated in the 'Table 3 List of registered Aboriginal stakeholders' of the Indigenous Archaeological Assessment prepared by Archaeological Surveys & Reports Pty Ltd (February 2013). This is a serious omission as the Gloucester Mookibakh Traditional Owners Indigenous Corporation retain a significant oral history about, and connection with the subject land.

A Restricted Site is identified in Chapter 4.10.3.2 of the EIS however, no further discussion regarding potential impact on this site occurs nor its location or significance. It is acknowledged however, that all actual and potential sites within the mine area will be destroyed or lost.

6.9.1.3 Proposed mitigation

It is proposed to brief people that are operating earthmoving machinery through an induction process in '*artefact identification'* and make those persons aware of their '*legislative obligations*' with regard to reporting of archaeological material.

6.9.1.4 Adequacy of proposed mitigation

The proposed mitigation measures are a nonsense. The expectation that persons operating heavy earthmoving equipment will be able to focus their attention on artefact identification from the remote confines of a cabin whilst undertaking large scale mining operations are ludicrous. It is acknowledged in the Archaeological Surveys & Reports Pty Ltd (February 2013) Indigenous Archaeological Assessment that it can be expected during the life of the coal mine there will be many changes in staff and workers, machinery, technology, and attitudes and as such mitigation measures may lapse.

6.9.1.5 Grounds for refusal

- That the application be refused under the provisions of Section 79C(1)(b) of the Environmental Planning and Assessment Act, 1979 (as amended) due to the inadequate aboriginal heritage assessment, the likely high Aboriginal usage of the area, the large number of identified sites of significance and the consequent impact the development will have on the indigenous cultural environment of the locality.

6.9.1.6 Proposed Conditions of consent

1. An independent archaeologist must be present onsite during operations that disturb any topsoil material to undertaken a periodic inspection of that material as it is disturbed to identify any artefacts before they are destroyed or lost.

6.9.2 The Non-indigenous heritage issues

This section of Council's submission is informed by a critique of the relevant sections of the EIS prepared by Garry Smith, a local heritage consultant. A copy of the critique is attached at Appendix 3.

6.9.2.1 Overview of the issue

The valley's landscape heritage significance

The underlying issue is whether a coal mining project of this size and scale can be successfully accommodated in the highly significant heritage landscape known as *The Vale of Gloucester,* as documented by Eve Keane for Gloucester Shire Council in 1953*.* This submission shows that the project site and surrounding area have a high level of heritage significance at the local, State and potentially National levels. The Rocky Hill project will have severe and unmanageable impacts on this significance.

The landscape was important to the Aboriginal people of the valley, it was praised by Robert Dawson in his initial exploration of 1826, was praised by Rev John Dunmore Lang during his 1850 visit and was painted by Sir Arthur Streeton in 1894 as a place of scenic-natural importance.

Today, the Stroud-Gloucester Valley's heritage landscape significance underpins the Valley's way of life, its agriculture and its tourism industry.

Recognition of the valley's scenic-heritage significance

The *Vale of Gloucester* was among the first cultural landscapes to be formally identified in Australia when it was listed by the National Trust of Australia (NSW) in 1975 and was nominated for entry on the Register of the National Estate in 1976. This nomination was supported by Gloucester Shire Council but, for unknown reasons, the Australian heritage Commission failed to assess the nomination and it remains as an Indicative Listing on the now discontinued Register of the National Estate. The Gloucester Local Environmental Plan 2010 Zone E3, Environmental Management, specifically addresses the significance of this area.

The Stroud-Gloucester Valley and for the purposes of this submission, the northern end of the valley have been acknowledged as having heritage significance for historical, scenic, scientific and social reasons since 1952. The documents that note that significance are;

- the Gloucester Shire Council's commemorative publication *The Vale of Gloucester*, Eve Keane, Gloucester Shire Council, 1953;
- the National Trust of Australia (NSW) listing 1975, revised 1981, revised again 2009;
- the nomination to the Register of the National Estate 1976;
- nominations to the National Heritage List 2010, 2012;
- provision of the Environment Protection (Scenic) Zone in the Gloucester LEP;
- *The Stroud-Gloucester Valley: A Heritage Landscape Under Threat*, BGSP Alliance Inc., 2009.

6.9.2.2 Concerns/problems/issues

The project is of excessive size and impact
The concern is that the project is too big and too prominent for its impact to be satisfactory managed or mitigated in such a sensitive area. The proposed mine might be a comparatively small mine, but it is proposed to be located in a small-scale landscape. The scale difference between the mine and its context is significant. It will occupy a considerable part of the landscape at the northern end of the Stroud-Gloucester Valley. It will involve approximately 800ha of open cut mines, extensive earth piles and barriers of overburden reaching up to 40m in height and associated infrastructure such as the proposed coal loading conveyor, rail loading and associated buildings. It is an extensive development by itself without considering cumulative impact with the AGL coal seam gas project and the Stratford mine extension.

The area's heritage-scenic significance will be substantially changed and degraded and, even if there is eventually some level of recovery, the short to medium term damage to the physical environment, tourism and the local economy will be high. Some impacts will remain as substantial and permanent changes to the landscape.

The project is not short term
The continued reference to the 'short' claimed life span of the project is used throughout the Non-indigenous Heritage and Visual Assessments and the Environmental Impact Statements. That lifespan is acknowledged as being around 21 years but that duration cannot be classified as small and, if the existing mines in the area and elsewhere are to be examples, is l at likely to want to extend beyond that period. The mine, if approved, will seek expansion and subsequent stages. The project should be classified as having a long term impact.

Cumulative impact
The cumulative impact of the Rocky Hill Project, the Stratford Extension Project, the AGL Project and the infrastructure associated with these projects is potentially unmanageable when full consideration is given to all scenic-heritage matters. These projects will in total substantially change the appearance and scenic-heritage qualities of the area.

The Lamb Visibility Assessment fails to assess cumulative impact when the project is considered in conjunction with the AGL coal seam gas project and the Stratford coal mine extension. It adopts the practice of dismissing the cumulative impact of other development for the reason that the impact is claimed to be small. This cannot be substantiated but is contrary to assessment procedure irrespective of that claim. All impacts should be given due consideration, even those of claimed minimal impact, because it is the cumulative impact (total impact) that should be considered

It is essential that a full and rigorous assessment of cumulative impact be undertaken.

The Lamb Non-indigenous Heritage Assessment and Visibility Assessment do not adequately address the issues
The Rocky Hill Environmental Impact Statement for Non-Indigenous Heritage relies on two specialist assessments; the Visibility Assessment in the Specialist Consultant Studies Compendium, Volume 1 Part 3 and the Non-Indigenous Heritage Assessment in the Specialist Consultant Studies Compendium, Volume 4 Part 12. The submitted Environmental Impact Statement arrives at a number of unsupportable conclusions regarding the project's impact and the mitigation of that impact because of the flawed techniques used in the two above Special Consultant Studies.

The Lamb Non-indigenous Heritage Assessment fails to identify and give due consideration to the area's scenic-heritage significance. The Lamb Non-indigenous Heritage Assessment takes the approach of attacking and dismissing existing heritage assessments, does not use the assessment guidelines required by the NSW Heritage Division, Office of Environment and Heritage, and does not use the holistic approach as required by the NSW Heritage Division.

The assessed level of impact and the means of mitigating that impact do not withstand rigorous assessment and site inspection and are considered to be grossly inadequate

6.9.2.3 Proposed mitigation & the adequacy of the proposed mitigation

The area's landscape and land use have a low Visual Absorption capacity
The Lamb Non-indigenous Heritage Assessment and Visibility Assessment acknowledge that the project will have a significant visual impact and that the area's characteristics and land use provide little in the way of Visual Absorption capacity. The Assessments generally attempt to dismiss the high level visual impact of the proposed development by the use of selective viewing points and by failing to acknowledge the impact when viewed from a number of important locations. These steps appear intended to support the argument that the use of earth mounding visibility barriers provides adequate impact mitigation.

Earth barriers the only significant mitigation method
The Lamb Non-indigenous Heritage Assessment and Lamb Visibility Assessment rely on earth visibility barriers as the only significant mitigation technique. The valley's scenic-heritage significance depends on the expansive views across and along the valley but the proposed extensive use of earth mounding will impact significantly on these qualities. In this sense, the solution to the visual problems created by the development creates another problem of equal impact and the failure to assess the impact of the visibility earth mounding remains as a serious deficiency of the Lamb Assessments. Accounts are provided in the Lamb Visibility Assessment as to how these barriers will be vegetated and managed but these are unconvincing in regard to the methods used and their effectiveness.

The photomontages of the mine and visibility barriers
A full critique of the photomontages provided in the Lamb Visibility Assessment, and also referred to in the Lamb Non-indigenous Heritage Assessment, has not been undertaken in this commentary because they require extensive and rigorous review. However, a tour of inspection shows that the photomontages are less than accurate and are flattering to the claimed mitigation methods. The visibility earth barriers have been discretely coloured in to create little visual impact and have been made to appear less obvious than a tour of inspection reveals. They will be difficult to properly vegetate and to retain in a healthy vegetated state despite claims to the contrary. They will be highly visible overall and particularly so from a number of viewing points, including major viewing points some distance away (Gloucester township and many vantage points within the town, the Bucketts way, Mograni Lookout, etc.)

Returning the landscape to its present form
The methods proposed to return the landscape to its natural form, are not convincing in regard to both their methods and the claimed results. Claims by the Lamb Non-Indigenous Heritage Assessment and Lamb Visibility Assessment that changes in the final landscape will not be noticed by any other than the experienced observer but that most people would find the final landscape to be an improvement are contradictory by their very nature. They can only be interpreted as meaning that rehabilitation will not occur.

6.9.2.4 Grounds for refusal

This response to the Lamb Non-indigenous Heritage Assessment considers that the Assessment fails to meet the Director General's Environmental Assessment Requirements, and that these failures go to the function and substance of the Lamb Environmental Assessment. It is considered that the Lamb Environmental Assessment should be rejected and project approval be refused.

Director General's Environmental Assessment Requirements

The Director General's Environmental Assessment Requirements specify that the Environmental Impact Statement must meet form and content requirements of Clauses 6 and 7 of Schedule 2 of the Environmental Planning and Assessment Regulation 2000. These include the requirement that the principles of ecologically sustainable development should be considered. The attached submission (at Appendix 3) notes that the Lamb Non-indigenous Heritage Assessment did not consider the principles of ESD.

Consistency with Gloucester Local Environmental Plane Zone E3

The General Requirements specify that the EIS must include '*consideration of all relevant planning instruments, including identification and justification of any inconsistencies in these instruments'.*

The proposed Rocky Hill development is situated substantially within the Zone E3 Environmental Management of the Gloucester Local Environmental Plan 2010. Approximately eighty percent of the Rocky Hill proposal area is situated within Zone E3 and that eighty percent constitutes approximately ten percent of the Zone E3 area. The Rocky Hill coal project will be a large open cut coal mine that will occupy a significant part of the Zone E3 area and accordingly will have a very substantial visual-heritage impact. That impact will be inconsistent with the provisions of Zone E3 but no attempt was made by the Lamb Non-indigenous Heritage Assessment to explain those inconsistencies or to justify the proposed development in relation to them

Requirements under the *Environmental Planning and Assessment Act 1979*Section 79C Evaluation

It is noted that section 79C of the Act requires that the consent authority must take a number of matters into consideration (the consent authority will rely substantially on the Environmental Impact Statement to be fully informed regarding those matters).

The Lamb Non-indigenous Heritage Assessment is deficient in relation to Section 79C (1) (b) (c) (d) (e)

(b) the likely impacts of that development, including environmental impacts on both the natural and built environments and social and economic impacts in the locality,

(c) the suitability of the site for the development,

(d) any submissions made in accordance with this Act or the regulations,

(e) the public interest

These requirements should be considered across the full range of environmental matters to be assessed and all four above matters can be considered as being relevant to the non-indigenous heritage assessment. However, comment is made here only in regard to (b). The proposed development will have a significant impact on the heritage significance of the area in regard to both the State and National assessment criteria.

The Lamb Heritage Report avoids scrutiny of these matters by failing to assess the area's heritage significance to the proper standard, by using incorrect assessment guidelines, by failing to use the holistic approach, by failing to undertake a full and rigorous visual impact assessment and by failing to assess cumulative impact.

The Lamb Non-indigenous Heritage Assessment cannot be reconciled with existing heritage assessments. It cannot be reconciled with the scale and impact of the proposed development and because of that, it cannot arrive at suitable mitigation methods. Imposing conditions of consent cannot adequately address these matters. Those aspects of the Lamb Visibility Assessment that have been applied to the assessment of non-indigenous heritage do not and cannot redress the deficiencies in the Lamb Non-indigenous Heritage Assessment because they work in combination with it to obscure and dismiss the valley's scenic-heritage significance.

It is considered that the Lamb Non-indigenous Heritage Assessment should be rejected as inadequate. Council intends to prepare a comprehensive assessment that will enable the Valley's scenic-heritage significance to be properly assessed and the heritage value of the area to be more substantially given the recognition it deserves.

6.9.2.5 Monitoring of impacts

Procedures and means to monitor the impact cannot meet the required function that would normally be expected of monitoring conditions and methods. Such conditions and procedures can record and draw attention to the impacts of the project as they occur but cannot reasonably be used to apply mitigating procedures that would lessen or prevent the damage that is likely to occur if the development was to be approved.

6.10 Health Impacts

16.10.1Analysis of the issue

Air quality, noise and social change impact on human health. Health impacts relating to the proposal are some of the primary concerns of the Gloucester Community.

Health impact associated with blasting and noise are dealt with in different sections of this submission. This section will concentrate on air pollution caused by particulate matter, and general and cumulative impacts including stress related impacts.

Health is much more than the absence of disease. The adverse health impacts from air pollution include, in increasing frequency, premature mortality, hospitalisation, emergency department visits, GP visits, restricted activity at home/work/school, medication use, symptoms, and impaired lung and other organ function.

Coal pollutants are known to affect all major body organ systems and contribute to four of the five leading causes of death including heart disease, cancer, stroke and chronic lower respiratory disease[1].

There are clear indications from the international health research that serious health impacts accrue to communities associated with coal mining[2].

Adults in coal mining communities have been found to have:

- Higher rates of death from lung cancer, chronic heart, respiratory and kidney diseases.
- Higher rates of cardiopulmonary disease, chronic obstructive pulmonary disease (COPD) and other lung diseases, hypertension, kidney disease, heart attack and stroke and asthma.

1. Poorer self rated health and reduced quality of life.

Children and infants in coal mining communities have been found to have:

- Increased respiratory symptoms including wheeze, cough and absence from school,
- High blood levels of heavy metals such as lead and cadmium,

Higher incidence of neural tube defects, a high prevalence of any birth defect and a greater chance of being of low birth weight.

There are often delays in advancing health knowledge being reflected in planning practices. For example, the critical importance of PM2.5 particles for health was published 20 years ago. Its measurement became mandatory in the US more than 10 years ago but is still not codified in planning practice in NSW.

Health Impacts accrue from the announcement of the Exploration License.

In the first years the health impacts are predominantly psychological due to stress. As rural communities can attract stressed individuals seeking ‘quiet and asylum’ there may be a disproportionately high number of ‘High Risk’ people. Stress related mental disturbance is already anecdotally apparent in the Gloucester Community. The psychosocial stressors

[1] ‘Coal’s Assault on Human Health’ Nov 2009 Report from US Physicians for Social Responsibility
[2] Ruth Colagiuri et al (2012) ‘Health and Social Harms of Coal Mining in Local Communities’ University of Sydney Report

continue during mining. These ‘psychological casualties’ are usually ignored with attendant and ongoing health costs.

Multiple and Cumulative Damaging Factors

Each body system is likely to be impacted by several mining stressors concurrently.
Sleep is impaired by :-

- sudden noises from mining, coal loader, railway etc causing frequent wakening,
- continuous noise causing sleep quality to be affected by stress hormones
- dust induced nocturnal asthma attacks leading to awakening and sleep loss,
- anxiety and depression from life time plans having to be put on hold, inability to sell one’s house, fears of being poisoned etc. This leads to impaired sleep quality and reduced sleep duration. The net effect is a cumulative one and likely to impair cognitive (memory, learning, decision making etc) abilities, cause emotional and behavioural disruption and increase next day sleepiness.
- Poisoning of the brain from heavy metals in the water and toxic hydrocarbons from CSG and diesel emissions will further exacerbate the sleep quality, cognitive, emotional and behavioural impairment effects.

PM 2.5 levels are likely to be simultaneously increased by diesel emissions from mining vehicles, diesel emissions from generators for CSG well pumps and the Central Processing Unit and by a local farmer ‘burning off’.

6.10.2 Concerns/problems/issues

General health impacts of coal mining are well documented.

The term ‘acceptable risk’ is often used, but has no quantitative definition and lacks objective clarity. It begs the question “Acceptable to whom”?

The proponents often use ‘acceptable risk’ in conjunction with a restrictive view of end points. The EIS asserts (2B-8) that the health end points assessed were (limited to) short and long term mortality and daily hospitalisations. By restricting risk assessment to only the most significant health impacts the proponent ignores health impacts that did not lead to death or hospitalisation. These impacts need to be estimated and costed.

Throughout the EIS maps have been used which list the properties extending to about 3km from the mine. No objective justification has been made for this cut off. This limiting of ‘receptor’ maps to 3km creates an impression that the residents of these approximately 170 properties (approx 500 people) are the only people who will be affected. This is not the case. For example, the predicted annual TSP Concentration contours from the proposal (pages 2A- 100-103) all extend into Gloucester township. If maps were presented for the seasons when there are southerly winds or of shorter duration peak levels then the impacted area would be more extensive and risks to nearby sensitive receptors including hospital and nursing home inpatients would be more fully described.

The section on “Sensitive Receptors” provides 24hour averages for the High School and Captain Cook Park. This is an illogical time resolution. Shorter duration peak concentrations would be pertinent data.

Residences owned by the mining companies were ignored in lists of impacted houses despite their often being the closest to the mine and likely to suffer the most severe impacts. High mining wages and cheap rentals could be considered partial compensation for the

health impacts. This group will also be most susceptible to blast fume mishaps. Local medical staff may require specific education/training for dealing with these outcomes.

Baseline health audit

Mainstream medicine and a Federal Senate Inquiry[3] believe a Health Impact Assessment (HIA) should be part of the Director-General's Requirements. The DGR's fall short of this, notwithstanding that they specify a requirement to address; 'a description of the existing environment, using sufficient baseline data' (underline is the DG's).

There has been no attempt by the proponent to do a baseline community health audit to assess the health status of the geographically 'At Risk' community. The Gloucester Shire is known to have a preponderance of elderly and low income residents. Both are "High Risk" subgroups. It is not uncommon for individuals to move to rural communities because they have a chronic illness boosting representation of another 'High Risk' group (the chronically ill). Recent local health monitoring has lent support to the existence of over-representation of chronic respiratory problems in the Gloucester population[4].

The last 'High Risk' group are the very young who may be numerically under represented but their incompletely developed lungs, their immature immune defence system, and high respiratory rates makes them particularly susceptible to air pollutants. This together with the presence of 3 schools within 5km of the mine suggests baseline examinations, monitoring and community education, particularly for pregnant women, are still very necessary for this group.

The semi-enclosed nature of the Gloucester valley means the valley walls cause air currents to keep particles within the valley. Additionally the valley shape promotes more temperature inversions. Both these exacerbate dust related health impacts.

Production Rate

All the data presented is based on an assumption of mining 2Mta yet the application is to seek a license for 2.5Mta. The proponent states they anticipate they will only occasionally mine at the higher rate. Irrespective, they will have the right to mine at the maximum rate. Impact assessment should be made on the permissible impact. The data should be presented in accordance with the 2.5 Mta application.

Buffer Zone

The Senate Air Quality Inquiry recommended that "... *buffer zones be used to protect populated areas from large point-source emitters*". A 2km buffer zone has been proposed for wind farms to limit exposure to low frequency and other noise. The NSW Government also recently announced a 2km buffer zone surrounding residential areas for all new Coal Seam Gas development. These clear acknowledgments of impacts of large scale energy

[3] Recommendation 8 of the Federal Senate Inquiry into impacts on health of air quality in Australia: "The committee recommends that Health Impact Assessments be required as part of the assessment process for all new developments".

[4] A community group (Health Under Gloucester Skies, HUGS) alarmed by the lack of a baseline health audit organised for the accredited training of volunteer nurses to do spirometry on concerned residents. To date (Sept 2013) 208 persons have had their lung function measured and just over 30% of these have impaired function. This suggests the community may indeed be one who have an increased presence of those at High Risk due to existing chronic disability. Further testing will occur in October 2013.

infrastructure are not mirrored in the treatment of open cut coal mines which generally have far more visible and pernicious health impacts than either wind or gas facilities.

PM 2.5 and Ultrafine (PM 0.1) Particle Minimisation

The EIS appears confused in its treatment of PM2.5 and ultrafine (PM 0.1) particles. It acknowledges their potential negative impacts but ignores diesel emission products.
There is an acknowledgement that these particles are now believed to be critical in health impacts. There is concern that there is no level of safe exposure. Even if the proponent kept below the current advisory levels at all times there would still be adverse health effects (irrespective of the term 'acceptable').

Diesel combustion products are a Group 1 carcinogen. Ultrafine particles are so small they can get inside cells and cause genetic change. The Senate Inquiry recommends further data on ultrafine particles be collected.

More than 16 million litres of diesel fuel will be used per year when the mine is in production – the equivalent of 5 x 10,000litre tanker loads every day of the year. These diesel combustion products will be a principal source of the PM2.5 'incendiary' particles produced by the project. The predicted PM 2.5 level exceeds the advisory level at 2 residences. The Consultants report (page 2C-8) states "….*It is argued that emissions from combustion engines including carbon monoxide, sulphur dioxide and diesel fumes would be relatively low given the number of mining machines and the large area of the site together with the fact these emissions disperse rapidly and widely. Therefore these emissions are not considered in this report*."

The EIS states that PM 2.5 particles are the result of incendiary processes whilst the larger particles are from mechanical processes (overburden and coal). There is no information on the chemical constitution of PM 2.5 particles likely to be created by the proponent and there has been no investigation of PM 2.5 particles composition in the Gloucester Valley. The Upper Hunter has had a PM 2.5 particle characterisation study. The results for this study are unlikely to be directly transferable to Gloucester as the town and its surrounding environment are significantly different to the Hunter Valley.

Agricultural 'Burning off' and wood smoke from domestic heaters may contribute some PM 2.5 load as may the activities of Stratford, Duralie and even Hunter Valley mines (including pollution related to spontaneous combustion events) and power stations.

Spontaneous combustion has been a problem at Stratford Mine. The potential risks associated with spontaneous combustion are not assessed and the mitigation measures based largely around stockpile management and "trigger action response plan".

There is no legislation regulating the level of exhaust emissions from off road vehicles. The Senate Inquiry recommended "*...that the Commonwealth develop a national standard for diesel engines*" and "….*a national emissions standard for small non-road engines equivalent to the US EPA standards.*" The EIS states vehicles will be fitted with standard exhaust systems. More attention needs to be given to this potential impact.

Domestic Rainwater tank contamination

Domestic rainwater tank contamination has been recorded as a result of existing coalmining activity in the Gloucester Valley. A study conducted by the Macquarie University Environmental Science department[5] found that 97% of 101 tanks located within 10km of

[5] headed by Associate Professors Damian Gore and Mark Taylor

existing coal mines had a pH of between 5.0- 6.0. 16% of tanks had elevated lead levels and a different but overlapping 16% had elevated copper levels. The source of the lead and the copper is the house's roofing, old painting and plumbing. The source of the acidity releasing these heavy metals was hypothesised to be a combination of natural and mine dust contaminants. These levels posed health risks.

Hydrocarbons were observed in many samples. No investigation of the hydrocarbons in the tank water has been done.

Anecdotally, residents involved with the study observed their filters block with coal dust so frequently that the expense has led some to abandon replacement of filters. Metal tanks, guttering and roofing have observable corrosion within a year of installation.
NSW Health has publically raised concerns over the contamination of domestic rainwater tanks by coal mining activity.

The EIS does not acknowledge this evidence. It quotes a small study by Gloucester Council employees who corroborated the presence of lead but goes on to dismiss this potential concern on the basis that the houses in question were in poor repair.

Greenhouse Gas Emissions

This proposal will lead to increased carbon pollution which is currently held to be a cause of global warming. The health impacts of global warming have already commenced with more heat related deaths and signs of greater spread of tropical diseases.
While it is acknowledged that the incremental contribution of a single mine is a small part of the global problem, there is no carbon pollution offset strategy to mitigate these effects.

Cumulative Impact

Finally, calculating the impacts of noise and dust individually and ignoring the health impacts of rapid and unplanned social change without consideration of their cumulative or potentially interactive effects ignores an important impact dimension.

6.10.3 Proposed mitigation

Proposed mitigation measures are largely based around managing operations in an attempt to minimise air pollution.

Most of the proposed mitigation is industry standard and does not incorporate new technical approaches.

6.10.4 Adequacy of proposed mitigation

None of the measures identified are innovative and many of them have been shown to be inadequate in other mining areas. Using industry standard practices in the Hunter Valley has led to significant air pollution problems and attendant health impacts.

Some mitigation measures, including revegetation for dust control, have proven to be problematic in other mining operations and are unlikely to provide adequate mitigation even in the medium term.

There has been no attempt by the Proponent to incorporate innovative approaches to minimising air pollution including pollution control devices on its vehicle fleet, use of stockpile covers, covering coal wagons or spraying veneers on dust generating surfaces.

There has been no attempt by the proponent to do a baseline community health audit to assess the health status of the geographically 'At Risk' community. Without this baseline study and ongoing monitoring of the health of the local community it is impossible to assess the ongoing health impacts of the mine or to design measures to ameliorate them.

No compensation system has been proposed for observed health impacts associated with this project.

The use of Management Measures for mitigation of pollution control relies heavily on communication between the mine managers, operational staff, contractors and residents. This reliance is unrealistic and has proven to be unsuccessful in other mines and mining areas.

Potential breaches of consent conditions by mining companies are primarily raised by community members. An approach that is essentially "all care" but deferred and often heavily contested attribution of responsibility leads to no accountability. This approach is not only unfair, but clearly disingenuous.

6.10.5 Grounds for refusal

- The combination of a large number of people living in close proximity to mining with inevitable risk of health damage, and a likelihood of health costs exceeding financial gains to the State, and the non-essential nature of this small mining project with no irreplaceable features all combine to argue for refusal of this application.
- The 'Acceptable Risk' concept in relation to health damage has been inappropriately applied when these risks can be avoided without significant penalty to the State.

6.10.6 Proposed Conditions of consent

1. A comprehensive Health Impact Assessment shall be conducted (including community education about preventive strategies, a health audit of the current health status of those living within 5km of the proposal, ongoing monitoring of this group and a compensation assessment system for any with suspected mine related health damage. This shall provide 'sufficient baseline data' in line with the DG's requirements. This shall occur before any activity associated with the project is conducted.
2. Specific attention shall be given to young people who are 'High Risk' due to incompletely developed lungs, their immature immune defence system, and high respiratory rates. This together with the presence of 3 schools within 5km of the mine suggests baseline examinations, monitoring and community education, particularly for pregnant women, are still very necessary for this group.
3. The proposal shall adopt a minimum buffer distance of several km's (to be negotiated) with offer of purchasing of properties within the buffer zone
4. All wagons in the rail fleet shall be covered when both loaded and unloaded.
5. A stringent diesel emission standard shall be developed for non road vehicles and machines.
6. A monitoring program for diesel emissions exposure of miner site workers shall be developed and implemented.
7. The proponent shall reassess the air quality impacts prior to site establishment so that the range of wind conditions known to occur within the valley are explicitly and transparently addressed. This information shall be made available to the established

Independently Chaired Local Complaints Committee/Community Consultative Committee.

8. The coal stockpile, CHPP, and conveyor shall be covered.
9. Haul roads shall be regularly sealed or veneered.
10. Dwellings located in close proximity to the mine shall be offered air purifiers and an assessment made of their efficacy.
11. In recognition of historically low background particle levels and the different level of danger associated with fine and ultrafine particles, annual average annual PM2.5 levels be set at 6 microgm/cubic metre.
12. The annual PM10 level shall be set at 20 microgm/cubic metre.
13. Hydrocarbons in domestic rainwater tanks shall be investigated and tank water quality shall be monitored and filters supplied where necessary.
14. Risks to drinking water shall be mitigated by an extension of the town water supply as far as Stratford Village at the cost of the proponent.
15. Health risks shall be reassessed based on a production rate of 2.5 Mta.
16. The proponent shall implement an independently chaired local complaints management committee/community consultative committee comprised of community, industry and state and local government representatives to receive and investigate complaints, and determine and monitor corrective action. This committee should have the power to impose stop-work orders in cases where persistent problems remain unresolved.

6.10.7 Monitoring of impacts

It is essential that if consent is to be contemplated, then adequate baseline health monitoring for all those within the projected area of air pollution impact needs to be undertaken.

Monitoring needs to occur at spatial and temporal resolutions that are meaningful for sensitive receptors. For example, air pollution readings averaged over a 24 hour period obscure shorter lived peak levels which are known to precipitate health impacts. Monitors are placed in fixed locations in larger population clusters will overlook impacts on more scattered residences.

The Senate Inquiry supports this approach in recommending "... *that pollution monitoring should accurately capture population exposure for communities and homes proximate to pollution point sources*". It also recommends that the NEPM Review recommendations be adopted which includes removing population sized thresholds.

The project area has also been the focus of attention by AGL exploring for Coal Seam Gas. There has been fracking of at least 12 wells concentrating around their Tiedman Lane property which is very close to the mine site.

Monitoring of methane levels and associated hydrocarbons needs to be initiated.
A project studying surface water methane levels above and below mining has recently been completed by a Macquarie University honours student. The results are expected this month and may develop and understanding of concerns on mine associated methane

6.11 Geological Setting and Coal Resources

6.11.1 Analysis of the issue

The geological model for the mine area is based on limited exploration drilling and a three dimensional seismic survey. A major reverse fault with a throw of between 150 to 200m strikes in a north-south direction through the proposed planned mine area. Included in the planned mine are other smaller normal and reverse faults. In the eastern section of the mine area a basalt intrusion into the coal seams is considered in the EIS to be not significant to the project. No mapping of this intrusion is included in the proposal. The combination of the geological and structural features makes this a complex project requiring a high level of mine planning.

6.11.2 Concerns/problems/issues

The Director General's Requirements states that the EIS must include a detailed description of the development, including: - justification for the proposed mine plan, including efficiency of coal resource recovery, mine safety and environment protection.

The mining proposition is attempting to recover thin coal seams, most of low quality, which steeply dip (45 to 67 degrees to the west) and are situated within a geological complex faulted and folded structure with igneous rock intrusions.

Stratford Coal, (now Yancoal), operating just to the south, surrendered this exploration area because of the steeply dipping coal seams which thin to the north with a loss in quality.

The company states in the EIS that it has to undertake further exploration drilling to enable it define the quality and quantity of coal resources, validate the significant geological structures, (including steep dips, folding and faulting and basalt intrusions), to be able to calculate tonnages and define the shape and location of the open pits.

The exploration activities outlined in the proposal are insufficient to effectively define the resource, evaluate the quality of the saleable product, determine volume and character of the waste rock to enable sustainable mine planning.

6.11.3 Proposed mitigation

The applicant proposes to "undertake further resource drilling programs within the mine area to enable the exact boundaries of the open cut pits to be defined so as to optimise coal recovery without excessive overburden/interburden removal". Section 2.2.4.

6.11.4 Adequacy of proposed mitigation

The applicant admits to further exploration work which indicates the mine proposal is still at the concept stage. At present, this proposal appears not to comply with the Director General's Requirements.

6.11.5 Grounds for refusal

This is a concept plan which fails to meet The Director General's Requirements which states: that the EIS must include a detailed description of the development, including: - justification for the proposed mine plan, including efficiency of coal resource recovery, mine safety and environment protection. It should be refused on this basis alone.

In view of the large number of abandoned coal mines in the state, a mine proposal of potential low tonnage of 25 million tonnes of ROM coal based on modelling conducted in a high risk geological environment coupled with volatile coal pricing is extremely risky and could be disastrous for the community.

The Proponents suggested mining strategy is one of extracting the better coal and designing pits on the run, depending on the day's price of coal which will determine the stripping ratios and the open cut pit design. This strategy supports the view that the resource is inadequately understood and likely only to be profitable to the Proponent (but not necessarily economic in a broader view) under certain circumstances. This profit-first extraction technique will effectively sterilises the remaining deposit. This Proposal should be refused until its economic viability can be demonstrated.

6.12 Open Cut Pit Planning

6.12.1 Analysis of the issue

The Proponent states "*The open cut pit planning process for the Proposal considered economic, geological, geotechnical and environmental factors to establish the most appropriate and viable design for the individual open cut pits*". The EIS lacks any detailed data to verify that statement. The EIS also mentions the need to do more on analysis and pit design planning and that pits will be designed as they are recovering the best quality coal.

However the overriding driver for coal extraction in this project is the spot price for coal on the day. If the price of coal falls then the Proponent intends to focus on extracting the best quality (coking coal) to meet the market and hence leave the lesser quality coal (steaming grades) in the ground. This technique will sterilise a large quantity of coal from future use. This is not efficient recovery of the resource as required by the DGR.

The open cut pit design needs to take into consideration a number of factors for the project to be mined within the DGRs, including:

The structural geology.
Composition of the various overburden rock types, interburden rock types and coal seam geochemical and handling qualities.
Geochemistry analysis of the overburden/interburden, roof and floor rocks and the coal for pyritic sulphides, heavy metals, saline water and how much is concentrated through the CHHP.
Topography of the mine site and water including surface water, ground water and the extent of drawing down the water table to the maximum depth of the proposed pits to approximately 190 metres.

Washability and anticipated yields are asserted to have been assessed on extrapolated data from six to seven cored holes across the whole mine area. In fact, the geochemical and material handling testing was based on two cored samples for the Weismantel and Coverdale Seams and one cored sample for the remaining seams: Bowens Road, Roseville, Glenview, Avon and Triple, plus various Marker Seam. No bulk sampling has been done to date. This analysis allows the company to target best quality seams for early profitability but not to plan for maximum extraction.

The average thickness of the minable coal seams has been calculated by adding up to 6 thin coal plies together plus their associated interburden sedimentary beds. The seams dip at steep angles of between 45 to 67 degrees, which indicates that this is a challenging and difficult project to both mine and handle through the CHHP. This area was considered by Stratford Coal, (now Yancoal), as unwinnable. Gloucester Coal relinquished this area to the north because the seams deteriorated in thickness and quality plus the steepness of dip.

Similarly the overburden and interburden testing was based on a compilation of samples taken from only 6 cored holes that were used for coal quality testing.

The Proponent downplays the problem with saline water which exists in the coal seams which is a major stumbling block for AGL's CSG extraction. The produced water from AGL's CSG holes has to be held in ponds, treated or carted away by trucks for disposal elsewhere.

The Proponent also suggests that there is minimal risk with heavy metal traces escaping due to reactions of ground and surface water and yet the analysis shows that the overburden/interburden is 'sodic' meaning that they are susceptible to structural stability

problems related to potential dispersion and erosion of the bulk material storage and visibility barriers.

The EIS minimises the concern that CHPP Coal Rejects have some pyritic sulphur which forms an acid generator and becomes a carrier of heavy metals and salt. Only 10kms to the south one of Stratford Coal's significant problem is the quantity of pyrite requiring expensive treatment of CHHP wastes and is required to add limestone to control pH and cover with water to minimise the risk of oxygen reacting with the pyrite to form acid leachate. The EIS refers to the problem but downplays the findings.

The lower coal measures have been affected by marine incursions and hence the Weismantel seam and its associated overburden and interburden of sedimentary rocks has a much higher pyrite content than the upper coal measures and these rocks tend to be acidic rather than alkaline, which assist leaching of metals. Any large spoil piles including reject material present the biggest problem because they are in direct contact with air and rain leading to the mobilising of acid leachate and which can result in the contamination of ground and surface water.

The EIS recognises that there are three distinct groundwater systems present within and surrounding mine site, namely the Permian coal seams and their interburden, shallow weathered rock and the shallow alluvium deposits associated with the creeks and flood plain. The Gloucester Basin's aquifers are recharged by direct rainfall in subcropping coal seams or by leakage from the regolith or overlying colluvial deposits. The colluvial deposits, which are more permeable than the underlying coal seams, are recharged by rainfall and by runoff from the steep slopes and have been interpreted as an important recharge source of the underlying coal seam aquifers.

The open cut mine area is vulnerable to upslope runoff surface water and the mitigation plan is to redirect all upslope small gullies and streams around the mine area.

6.12.2 Concerns/problems/issues

A number of factors are of major concern in the Proposal as presented. These include:
Heavy metal leaching
Acid leaching
Saline water from coal seams
Chemical composition of coal seams and interburden and overburden
Stability of overburden and interburden in stock piles.

The proponent has not satisfactorily demonstrated that it can meet the Director General's Requirements that it can extract the maximum coal product profitably and complete the remedial work and rehabilitation to a world's best standard to protect the environment. Instead, the EIS attempts to trivialise the risk associated with genuine problems that clearly exist for current resource extraction operations in the Gloucester Valley.

The potential water table drawdown and stream diversions are significant in themselves. They become more so with the cumulative effects of water extraction by the two other major mining enterprises of Stratford Coal's eastern extension and AGL CSG project in the valley.

Surface and groundwater are covered in detail in section 8.8 of this submission.

Companies should be held to maximising a resource while protecting the community and environment. If the company can't do that profitably then the resource should be left in the ground until circumstances allow the deposit to be mined satisfactorily.

6.12.3 Proposed mitigation

The company plans to mitigate acid leachate by a number of proposals:

Combining the NAF, PAF and sodic overburden materials within the out of pit and in pit overburden emplacements and rehabilitate the emplacements with a cover of at least 2m of non-sodic material.

Randomly placing the PAF coal rejects either at depth with exhausted open cut pits or with permanent out of pit emplacement at least 10m away from the long term batters, and

Adding lime if required to PAF coal reject materials prior to covering with reduced permeability NAF overburden/interburden materials.

6.12.4 Adequacy of proposed mitigation

The proposed mitigation is inadequate considering the risks associated with mitigation failure. These risks include the accession of acid, salt and heavy metals into soils and water, and soil structural problems that will impact on site rehabilitation and may lead to ongoing problems of erosion and water pollution.

The interburden and some of the overburden contains small coal seams rich in pyritic sulphur which will end up in the stock piles. Given the nature of the steep sloping topography it would be a challenging proposal to be able to sort piles of waste from the CHHP and to selectively set the NAF, PAF and sodic materials into separate stock piles for later blending as is the proposed in the EIS.

The average weathered zone in the mine area is 11m and can be up to 37m deep. Covering out of pit PAF waste material to at least 2m, as proposed, is definitely inadequate given the reject waste material will most likely be above the original natural landscape. The natural landscape surface in the mine site area is steep and falls 80 metres over 1000 m through the mine area where it is proposed to place overburden piles up to 40 m above existing ground level.

The problem with the high concentration in the lower coal measures of pyrite (iron sulphides) is that it is concentrated in the CHHP, and the waste needs to be carefully disposed of into permanent storage.

If the acid forming waste does come into contact with air and water, the acid run-off further dissolves heavy metals such as copper, lead, cadmium, arsenic and mercury leaching into the ground or surface water. Poisonous sulphuric acid, iron and aluminium will leach from coal workings into creeks and streams, leaving stretches of waterways acid-ridden and polluted.

6.12.5 Grounds for refusal

Dr Robertson, Managing Director of RGS Environmental, said acid mine drainage was recognised as the most significant environmental issue for mines around the world.
“There is a huge effort and cost involved in trying to solve the problem,” he said, (Newcastle Herald 17th Sept 2013)

If not rehabilitated appropriately, derelict mines can affect human and environmental health, threatening water quality through sediment run-off, metal contamination and acid mine drainage.

An Auditor-General's report issued last year found that as ownership of mine sites reverts to the Crown, clean-ups may be the government's "largest category of contamination liability". "*The Office of Environment and Heritage advised that potential liabilities for clean-up under the Derelict Mines Program would be substantial and that the few million dollars allocated annually to this program are substantially inadequate*."

The Rocky Hill proposed mine is located in the Gloucester valley's aquifer recharge area and redirection of surface water flows added to the water draw down to 190 m in the open cut pits, will prevent aquifers recharging.

- The project should be rejected on the basis that it is high risk which has not been thoroughly evaluated by the company. The relatively small size of the deposit, its geological structural complexity, and environmental conditions make this project a serious risk for the catchment.

- The project doesn't satisfy the Director Generals Requirements of "efficiency of coal resource recovery and environmental protection".

6.13 Agricultural impact

6.13.1 Analysis of the issue

The agricultural impacts addressed in the EIS mainly relate to the footprint of the mine area. They do not adequately address the impacts on water resources. They do not address the impacts that are already occurring as a result of the extraordinary purchasing of land in the whole district by the proponent over the last 5 years.

The impact of the mine on district water resources is dealt with in the section on ground and surface water.

6.13.2 Concerns/problems/issues

The EIS makes a big issue of the fact that they have purchased the land of one major dairy enterprise and leased it back to the operators plus enabled this operator to lease other land purchased by the proponent over recent years. This is a very focused benefit as it does not include any of the land associated with the mine area and is an activity that could have been undertaken without the mine proposal or the EIS. It is nonsense to suggest that this is an economic benefit associated with the mine.

Section 4.17.2.4 infers that dairy operations could occur within the mine site and this is a ridiculous notion once earthworks and other machinery operation commences. It also suggests that the Mine Area and adjacent lands now owned by the applicant were not being used for commercial agriculture prior to being purchased by the applicant over the last few years. These lands were being stocked at or above district average levels prior to their sale to GRL, however the production of the area has declined since being purchased by the mine applicant.

GRL (the proponent) has purchased a total area of at least 3,000ha in about 40 properties in the vicinity of the mine of which only about 856ha will be used directly for mining. The previously existing agriculture on at least 2000ha and at least 30 family farms has been terminated and in many cases not replaced. This has impacted on agricultural employment in the district and on trade for agricultural service industries. Local stock agents have estimated that livestock sales have decrease by 10% as a result of mine owned land carrying less stock per hectare. For the proponent to conclude (section 4.17.6) that their mine has "*only minor short-term impacts*" and "*long-term positive net benefits*" is not correct.

Section 4.17.5.3 states that "*agricultural land values both within and adjacent to the site are unlikely to change*" is also not correct. The proponent (GRL) has purchased a large area of agricultural land at above market value over recent years. This has raised the expectation for future land sales in the district to levels that are unsustainable for agricultural production. At the same time, land in the vicinity of the mine that has not been purchased by GRL is not saleable because prospective buyers are not prepared to accept the potential risks to this land by the mine impact on the environment.

There will be impacts on water resources that will affect surrounding agriculture but these are dismissed in the EIS. The response sections on ground and surface water have dealt with these impacts.

6.13.3 Proposed mitigation

In section 4.17.4.1 of the EIS it states that "*all land in the mine area will be returned to its pre-mining land capability*".

6.13.4 Adequacy of proposed mitigation

The only detail provided is that this land capability will be achieved by simply placing an 80cm soil profile (undefined top soil and sub-soil depths) on top of the mine voids that have been filled with mine waste material. There is also a statement that saline sub-soil will be removed and disposed of, but there is no calculation presented of the volumes involved for any of these procedures and hence there is no confidence that the objective can be achieved. There is no information on the compaction level to be achieved in the filling operation and hence no information on the water holding capabilities of the reformed land for pasture production. Section 4.17.5.1 even goes as far as to say that the productivity of the rehabilitated land will be higher than that of the original area before mining but there is no data provided to support this unbelievable claim.

Figure 4.5.2 on page 4-215 of the EIS presents the mapped Land Capability Classes for the area by NSW Department of Primary Industries. These were done as a desk study and as stated on page 4-213 they are to be revised in late 2013. Fig 4.5.2 also shows the Speldon Dairy farm to the north of the mine site and this is a farm of irrigated dairy pasture that could possibly be regarded as Class 3 in a re-classification. A field assessment would be required to accurately determine the land class. The proponent is very keen to describe the Speldon property as a "success" but there is no possibility that its level of pasture development and productivity will be feasible across the fence after mine rehabilitation.

6.13.5 Grounds for refusal

- the proposed mine will have an unacceptable impact on agricultural activity, both on the land acquired for mining purposes, and in the immediate locality of the proposed mine.

6.14 Traffic and Transportation

6.14.1 Analysis of the issue

Roads are the arteries of rural communities, they are designed to carry a finite weight of traffic over a fixed lifetime based on assumptions and estimates relevant at their time of development. Dramatic increases in the loads carried by these roads leads to accelerated deterioration and eventual failure. This is not just a financial risk but translates into vehicle damage and accident risk as well.

Road assets form the largest proportion of Gloucester Shire Council's asset portfolio (94%) and maintenance and replacement of the road network is the largest expense incurred by Council. Council's Asset Management Plan and Long-term Financial Plan reveal that Council has a backlog of maintenance/renewal expenditure in excess of $5 million per annum.

The construction and ongoing operation of the Rocky Hill Coal Project will place a huge burden on the roads servicing the proposed development. A burden which they were never designed to carry and which council is unable to financially service.

The EIS documents indicate that during the establishment & construction phase there will be an increase of approximately 64,000 vehicles over six months, and during the operational phase up to an additional 86,500 vehicles per annum generated by this development. All of these additional vehicles will be using Gloucester roads. The EIS fails to adequately identify the source of ballast/gravel/construction material, making reference to locally sourced gravel from a quarry that has been refused development consent by Council.

This traffic can be divided into two types:

- Light vehicles i.e. commuter traffic and;
- Heavy vehicles e.g. construction, delivery and service vehicles etc.

Increases in light vehicle traffic affect the capacity of roads (lane width) and intersection geometry. They also heighten the interaction between large slow-moving heavy vehicles and light traffic increasing the risk of road trauma.

Heavy vehicle traffic has a deteriorating effect on the road pavement which is quantified by the number of equivalent standard axels (ESAs) that will traverse the road pavement over the life of the development.

It is the large increase in the ESAs plus the heightened interaction between large slow-moving heavy vehicles and light traffic that is the main discussion of this section's (traffic and transportation) response to the EIS.

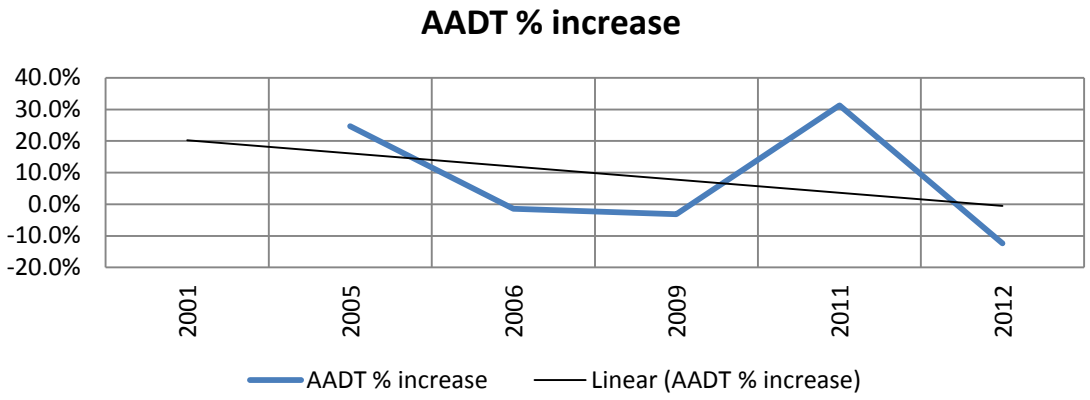
6.14.2 Concerns/problems/issues

Underestimation of Heavy Vehicle Generation and Impacts

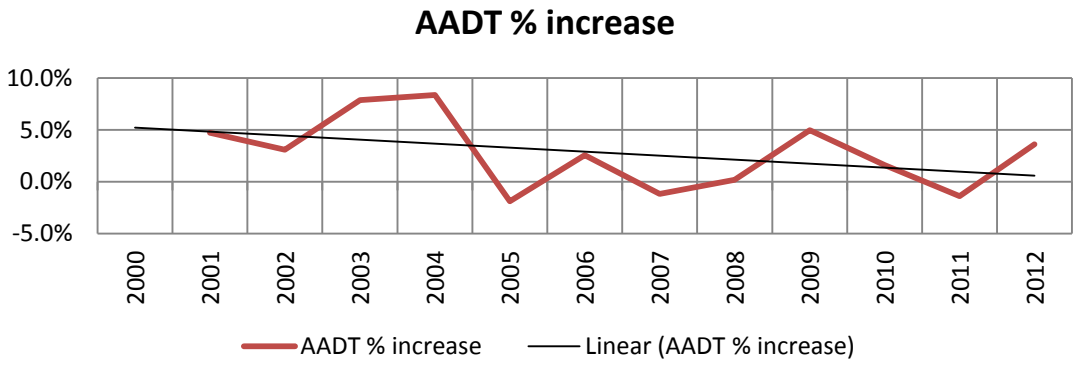
The forecast traffic volumes presented in the EIS provide a skewed assessment of background traffic; utilising as they do, the highest count available to which is added an assumed 3% average growth rate.

While the EIS claims that there are no obvious trends in traffic growth, the attached graphs (figure 8.14.1) indicate that there are trends that can be extracted from the traffic data (in most cases they are falling) and that the use of a generalised 3% growth factor on top of the highest available traffic count is not justified.

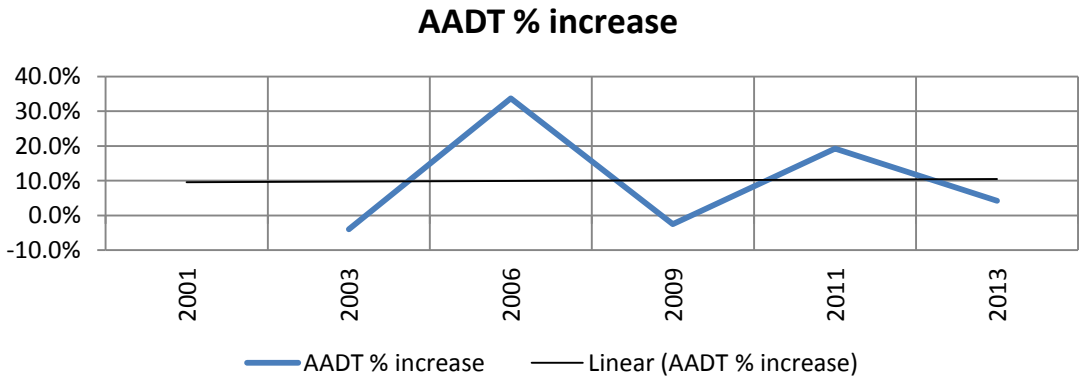
Bucketts Way East - Shire Boundary



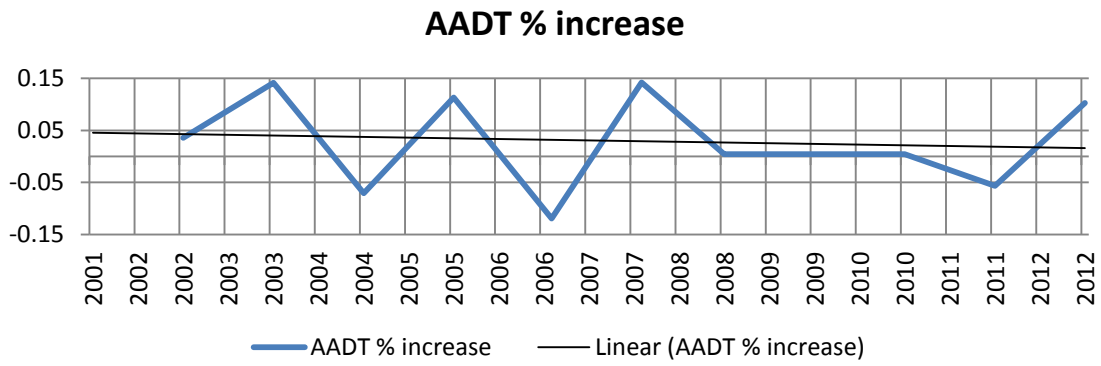
Bucketts Way East - Avon Flat



Bucketts Way South - Shire Boundary



Bucketts Way – Golf Course



Council does not accept the modelled figures contained in the EIS and notes that the figures do not incorporate; actual traffic generation (merely assumed numbers), reasonable calculated background traffic (see above) or model equivalent axle loadings (ESAs), (See Table 8.14.1 ESA values for typical heavy vehicles using The Bucketts Way).

For example: the EIS contains a list of mine equipment that will be used on site and states that there will be 40 low loaders required to deliver mine equipment over two months. Council calculates that 63 low loaders will be required to deliver the list of equipment (see table 8.14.1). This is 57% greater than stated. Additionally as many of these will be overweight loads, they will have the same effect on the road pavements as 169 (legally loaded) tri-axle semi-trailers (a 322% difference).

Where traffic generation numbers are provided, they are presented in such a fashion that they are not easily compared. E.g. numbers are presented in a table (Specialist consultant study pages 9.89-90) where the column “Traffic” contains numbers that could represent per shift, per day, per week and per 2, 4, 5 & 6 months!!! With no explanation given whether they are “trips” i.e. 2 movement (1 in and 1 out), or single movements alone.

Council submits that the proponent makes inappropriate assumptions about the effect of the project on our rural traffic generation.

Heavy Vehicle Generation (ESAs) – Mine Plant Delivery

UNIT	STEER	DRIVE	2 AXLE TRAILER	3 AXLE TRAILER	4 AXLE TRAILER	ESAs	No.Trips	Total Esa
Rotary Drill Terex SKF12 43-50T(45t)	6.5	20			36.5	13.1	1	13.1
Excavator Cat 345 D 45T(45t)	6.5	20			36.5	13.1	1	13.1
Excavator Komatsu Upperstructure(36.4)	6.5	20			27.9	8.8	1	8.8
Excavator Komatsu Counterweights(36.4)	6.5	20			27.9	8.8	1	8.8
Excavator Komatsu Undercarriage(46.35)	6.5	20			37.85	14.1	1	14.1
Excavator Komatsu Loader Attach(27 .7)	6.5	16.5		19.7		5.4	1	5.4
Excavator Liebherr Upperstructure (38.95t)	6.5	20			30.45	9.8	1	9.8
Excavator Liebherr Bed Assembly(42.7)	6.5	16.5			37.7	11.5	1	11.5
Excavator Liebherr Counterweight(25.4t)	6.5	16.5		17.4		4.9	1	4.9
Excavator Liebherr Track Centre frame(26)	6.5	16.5		18		5.0	1	5.0
Excavator Liebherr Track side frameL(26)	6.5	16.5			36.054	10.3	1	10.3
Excavator Liebherr Track side frameR(26)	6.5	16.5			36.054	10.3	1	10.3
Excavator Liebherr Boom&Arm (47.89t)	6.5	20			39.39	15.4	1	15.4
Excavator Liebherr Bucket (31.5t)	6.5	16.5			26.5	5.9	1	5.9
Excavator Hitachi Cab & bed(26.336)	6.5	16.5	16.336			6.2	1	6.2
Excavator Hitachi Main Frame(39.3)	6.5	16.5			40.8	14.2	1	14.2
Excavator Hitachi Engine (24.8)	6.5	16.5	14.8			5.5	1	5.5
Excavator Hitachi Counter Weight(40.2)	6.5	16.5			35.2	9.7	1	9.7
Excavator Hitachi Cntre Frme+Cvr(32.03)	6.5	18		22.53		7.2	1	7.2
Excavator Hitachi Track Frm L(46.9)	6.5	20			38.4	14.6	1	14.6
Excavator Hitachi Track Frm R(46.9)	6.5	20			38.4	14.6	1	14.6
Excavator Hitachi Boom Assmbly(35.8)	6.5	16.5			29.3	6.8	1	6.8
Excavator Hitachi Arm&Buckett(40.5)	6.5	16.5			35.5	9.9	1	9.9
Haul Truck Cat Upper Structure(69.85)	6.5	20			43.35	19.5	8	156.3
Haul Truck Cat Wheels(27.623)	6.5	16.5		19.623		5.4	8	43.1
Haul Truck Cat Body(31.92))	6.5	16.5			26.92	6.0	8	48.3
Scraper Cat upper Structure(39.788)	6.5	16.5			34.788	9.5	3	28.4
Scraper Cat Loader Attach(27.325)	6.5	16.5			19.325	4.6	3	13.9
Grader Cat 14M (21.4t)	6.5	16.5	11.4			4.6	1	4.6
Loader Cat 988 (51t)	6.5	20			42.5	18.5	1	18.5
Dozer D11 Upper(74.455t)	6.5	20			66.955	80.1	2	160.1
Dozer D11 Ripper&Blade (36.33)	6.5	16.5			31.33	7.6	2	15.3
Dozer 844 Upper (63.527t)	6.5	20			55.027	40.1	1	40.1
Dozer844 Buckett (6.273)	6.5	7.73				2.1	1	2.1
Water Cart Cat 777C (48.6)	6.5	20			40.1	16.1	1	16.1
Water Cart Cat 777C (15.8)	6.5	17.3				4.6	1	4.6
							63	776.6
Notes:Tare Mass adopted - Prime mover 8t, Bogie trailer 5t, Tri Trailer 7t, Quad trailer 10t								

Increase of Heavy Vehicles and Subsequent Pavement Damage along The Bucketts Way

The Bucketts Way is the principal road access through the Shire servicing the proposed development. It is classified as a Regional Road, which means the asset is owned by Council but some funding is received from the Roads and Maritime Services (RMS) in regard to its maintenance (via the Block Grant) and capital improvement (occasional special grant funding).

The Bucketts Way leaves the Pacific Highway at “The Twelve Mile” and proceeds through the villages of Limeburners Creek, Booral, Stroud, Stroud Road, Wards River, Craven, Stratford, the town of Gloucester, Krambach, Burrell Creek, Tinonee, and rejoins the Pacific Highway at Purfleet.

The Bucketts Way was originally the Pacific Highway and was constructed to a minimal standard in the 1950s. With the opening of the bridge over the Karuah River at Karuah the highway was deviated away from Gloucester.

The road pavement was rehabilitated in the late 70s early 80s. The pavement design was a minimum of 300 mm of “ridge gravel” with the top 125 mm lime stabilised. This equates to a 20 year pavement design for a traffic load of 1000 vehicles per day (VPD) with a 5% heavy vehicle loading (50 HVPD) with minimal allowance for traffic growth.

In 1999 the three caretaker Councils, Gloucester, Great Lakes and Greater Taree engaged Roadnet Pty Ltd to undertake a route development study of The Bucketts Way. The results of the study indicated major deficiencies in condition, underfunding for maintenance and capability to carry increases in traffic load. Safety Issues and the importance of the road to the local and broader communities were also identified. The three Councils formed a Route Management Advisory Group and over the period to 2011 were able to obtain funding from various State and Federal sources for pavement rehabilitation or works totalling $44M of the original $66M identified in the Roadnet study.

(The funding announced by Rob Oakeshott, Federal member for Lyne, in 2011 (page 4-235) was in fact $17.5 Million, shared equally between GSC and GTCC. Tendered prices for this work average approximately $1M /km; this will achieve somewhat less than 8 km of pavement rehabilitation work within Gloucester Shire Unfortunately the final program will therefore not include rehabilitation of 3.21km south of Wellard's Lane or 2.98km between Faulkland Road and Broad Gully Bridge as also stated 4.1.1 of the EIS)

Allowing for CPI adjustments a programme of works amounting to $33M still remains to be completed to achieve the 1999 requirements.

The 1980 pavement design was adequate for existing and foreseen traffic at the time and would have continued, perhaps with a reduced level of service, well beyond its design life. The commencement of the Stratford Mining Complex in 1995 saw a significant increase in heavy vehicle traffic. A level which has been maintained since that time.

The current condition of the road is variable, and whilst some sections are in reasonably good condition, there are many kilometres of this road that are below acceptable standard for the existing volume and nature of traffic currently using the road.

Council has noted that much of the pavement is in very poor condition and needs reconstruction, and a significant safety concern is that there are no overtaking lanes for the entire length of the road from the Pacific Highway at “the Twelve Mile” through to its reconnection with the Pacific Highway at Taree. Where developments such as this generate large volumes of heavy vehicular traffic, there is a significant additional burden on both the standard and safety of the road.

The increasing mining activity in our local area has been placing significant increase in demand for heavy vehicles on this road. It should also be appreciated that the very substantial impact on the condition of the road is due to heavy vehicle traffic and not motorcars as illustrated in the following table:

ESA values for typical heavy vehicles using The Bucketts Way

		1 ESA = 80kn or 8.2 tonnes
Class 4	2 axle truck	1.829 ESA’s
Class 5	3 axle truck	2.744 ESA’s
Class 8	4 axle semi	3.841 ESA’s
Class 9	5 axle semi	4.756 ESA’s
Class 10	6 axle semi	5.183 ESA’s
Class 11	19m B Double	6.768 ESA’s
Bogie Tipper plus	3 axle dog trailer	5.79 ESA’s
Bogie Tipper plus	4 axle dog trailer	6.768 ESA’s
By Comparison a Passenger vehicle under 2 tonne		**0.0004ESA’s or 1/2250th**

The Rocky Hill Mine will be responsible for a significant increase in the traffic flow on The Bucketts Way and other access roads leading to the proposed mine site and other construction precincts. The extent of that impact varies during the proposed life of the mine primarily between the construction phase and the operational phase.

During the construction phase large numbers of heavy vehicles transporting construction materials, infrastructure components and machinery are concentrated in a 6 month period. These add up to 6,260 heavy vehicle movements (HVM) or an additional 13,270 ESAs in a six month time frame. During the Production phase this stabilises at approx 5,000 HVM or an additional 10,600 ESAs per annum. This accumulates to an additional 161,670 ESAs that The Bucketts Way is expected to absorb over the life of the project.

Suffice to say that any increase is beyond the capacity of the road to absorb and only hastens the deterioration of the already poor pavement.

Traffic Assumptions- Establishment/Construction Phase

Traffic Assumptions - Mine ArealConveyor East			Volume	ESAs / Vehicle	Total ESA's
Vehicle Type		Traffic			
Light Vehicles					
	Employees (mine)/day Two shifts (7am -3pm, 2pm - 10pm)	100	31200		
	Employees (CHPP) over 6 months	900			
	Employees (conveyor) over 5 months	225			
	Other	*33450*			
Heavy Vehicles (These contain odd numbers and so are assumed to be one-way only)					
equipment/plant/materials/delivery/collection					
	Low loader (mine equipment deliveries over 2 months)	40	63	Var	776.6
	Semi-trailer (mine)	90		4.6	414
	Semi-trailer (CHPP) over 6 months	30		4.6	138
	Semi-trailer (conveyor) over 6 months	30		4.6	138
	Concrete trucks over 6 months	110	550	2.4	264
	Cranes (CHPP) over 6 months	10		5.6	56
	Cranes (Conveyor) over 6 months	5		5.6	28
	Concrete trucks (CHPP) over 6 months	80	400	2.4	192
	Concrete trucks (Conveyor) over 6 months	72	360	2.4	172.8
	Semi-trailer (workshop/pads) over 6 months	30		4.6	138
Supplies delivery		*994*			
	Fuel/week (19m B-Double fuel tanker = 58,500lts) @ 0.89kg/lt	3	8,775,000	6.7	1045.2
	Explosives/year	220		2.4	528
	Other (CHPP) over 6 months	60		2.8	168
	Other (Conveyor) over 6 months	45		2.8	126
		656			
Traffic Assumptions -Conveyor Central (Entry off Fairbairns Road)					
Vehicle Type		Traffic			
Light Vehicles					
	Employees (light vehicles) over 5 months	225			
Heavy Vehicles (These contain odd numbers and so are assumed to be one-way only)					
	Semi-trailer (conveyor) over 6 months	25		4.6	115
	Concrete trucks (Conveyor) over 6 months	72	360	2.4	172.8
		644			
Traffic Assumptions - Rail Load-outlConveyor West (Entry off The Bucketts Way)					
Vehicle Type		Traffic			
Light Vehicles					
	Employees (conveyor) over 5 months	450			
	Employees per day (rail earthworks) over 5 months	12			
	Employees per day (rail install) over 6 months (after earthworks	18			
	Employees (TLO) over 6 months (after earthworks)	1600			
	Other				
		4160			
Heavy Vehicles (These contain odd numbers and so are assumed to be one-way only)					
Equipment/plant/materials/delivery/collection					
	Low loader	12		?? say	150
	Concrete trucks (conveyor) over 6 months	125	625	2.4	300
	Concrete trucks (TLO) over 6 months (after earthworks)	30		2.4	72
	Semi-trailer (conveyor) over 6 months	50		4.6	230
	Semi-trailer (TLO) over 6 months (after earthworks)	60		4.6	276
	Semi-trailer (sleepers) over four months (from Brisbane) (after earthworks)	70		4.6	322
	Semi-trailer (rail) in 4 months (after earthworks)	15		4.6	69
	Truck and dog (structural fill) from South near Dungog deliver over 4 months May be able to source on site	642		4.7	3017.4
	Truck and dog (track capping) from South near Dungog deliver over 4 months	289		4.7	1358.3
	Truck and dog (ballast) from South near Dungog deliver over four months	586	11720	4.7	2754.2
Supplies delivery		*3758*			
	Other/week	2		2.4	249.6
		3966			**13,270.9**

Safety of Fairbairn's Road

The EIS proposes to gain access to the middle section of the overland conveyor belt by utilising Fairbairn's Road. Fairbairns Road is largely a residential service road firstly servicing the 25 large lot residential properties accessing the first kilometre of the road then the remaining larger rural properties which are principally run as hobby farms. The Road is lightly built, as befits its largely residential and hobby farm needs. The recent seal extensions that have taken place on this road were performed to a low standard primarily as a dust suppressant/weatherproofing measure.

The bridge over the Avon River has a 10 t load limit befitting its ageing nature. There is a temporary bridge constructed adjacent to the original which was constructed to enable a property owner to take his log trucks home for servicing; with all materials being supplied by this owner.

The temporary bridge does not have an unlimited load capacity as suggested in the EIS, but is subject to engineering certification for loads exceeding 22.5 tonnes. In addition the bridge materials supplied were low-durability timber, giving the bridge limited life.

It thus does not provide unlimited heavy vehicle access to the remainder of the road.

Safety of the Fairbairn's Road/The Bucketts Way Intersection Particularly During Construction Phase

The intersection of Fairbairns Road with The Bucketts Way is located on a crest with sub-standard sight distance to the north.

As noted by the EIS the intersection is of a basic layout with no auxiliary turning lanes or shoulder widening. This is also the access for a dairy located to the west of The Bucketts Way. This dairy has the third largest output of all dairies within Gloucester Shire making this location a busy site already.

The EIS notes that this location has a history of road accidents, so to intensify the use (even short term) without a major intersection upgrade presents a very high risk.

Safety of the Fairbairns Road Rail Crossing

Fairburn's Road crosses the main northern rail line approximately 1 km east of the intersection with The Bucketts Way. The alignment on both approaches is very poor with extremely limited sight distance. Not only is the sight distance to the crossing limited; vision of the flashing lights is also limited with no auxiliary advance warning available.

In addition the railway alignment at this location is very poor with no sight distance for the train driver of the approaching level crossing.

The EIS notes that this crossing is ranked 186 on the ALCAM database, however the report goes on to say that the database information is out of date! In its discussion regarding level crossings in Section 2.3.3 of the EIS (page 9 – 39), the following comment is made: “the risk rating is calculated using a variety of inputs including traffic volumes and identified safety issues. There is a strong correlation between the traffic volumes and the risk rating. Higher

traffic level crossings generally appear to be higher in risk given the increase in traffic frequency.

Surprisingly the EIS makes no mention of discussions with the ARTC regarding the effect of the proposed increased traffic levels (both long & short term) on this level crossing.

To intensify the use of this level crossing (even short term) without an upgrade to either the alignment or the crossing infrastructure, is creating an extreme risk.

Increase in Heavy Vehicles and Subsequent Pavement Damage on Jacks Road

Jacks Road is currently a lightly used Council road nearing the end of its design life. The Road use is primarily residential in nature, servicing as it does in excess of 100 large lot residential properties. Historical and existing traffic usage is shown in the table below

	Jacks Road	Light Vehicles			Heavy Vehicles									Totals						
	Class	1	2	3	4	5	6	7	8	9	10	11	12	Week	/Day	/Lane	Light	Heavy Vehicles		ESAs/Day
	Jun-02	9	1379	45	61	25	0	5	0	11	14	3	0	1552	310	155	287	24	7.7%	49
	Mar-03	27	2056	101	97	77	1	2	2	15	23	19	0	2420	346	173	312	34	9.8%	145
	May-05	8	2094	94	89	36	10	4	4	3	41	27	0	2410	344	172	314	31	8.9%	105
	Jul-06	35	2186	91	155	37	6	15	6	16	27	18	0	2592	370	185	330	40	10.8%	162
	May-08	36	2904	146	195	125	9	2	9	4	48	8	0	3486	498	249	441	57	11.5%	156
	May-09	47	3133	127	202	70	9	4	6	6	38	13	0	3655	522	261	472	50	9.5%	188
Bridge Closed	Jun-12	15	2584	133	196	26	0	4	4	10	31	22	1	3026	432	216	390	42	9.7%	118

The EIS predicts traffic usage to the mining area during the site establishment/construction phase to be in the order of 51,000 vehicles (6 months). Existing traffic usage (based on 2009 figures) for the same period would be approximately 95,000. Meaning the traffic usage of Jacks Road will increase by more than 50%.

Through the operational phase of the mine the EIS predicts traffic usage to be in the order of 81,500 vehicles against existing usage of 190,500; again about a 50% increase.

This is a dramatic increase in traffic, both light and heavy, passing a residential area and on a road that is nearing the end of its design life.

This Road is popular with cyclists and prior to the closure of the Jacks Road Bridge, this together with Waukivory Road was regularly used as a training loop commencing and ending in Gloucester.

Safety of the Jacks Road/The Bucketts Way Intersection

The EIS describes this intersection as a “basic rural intersection layout” and comments that it is appropriate for the amount of traffic currently generated on this road. The level of intensification proposed by this development would render this intersection woefully inadequate, particularly as sight distance at this location is at the lower end of what is considered adequate.

Safety of the Jacks Road Rail Crossing

This level crossing was upgraded to Lights & Boom gates within the last 10 years; however the road alignment of the western approach is substandard, limiting advanced warning of the crossing. With the increased volume of traffic proposed the risks at this crossing will increase.

Again, surprisingly the EIS makes no mention of discussions with the ARTC regarding the effect of the proposed increased traffic levels (both long & short term) on this level crossing.

Increase in Heavy Vehicles and Subsequent Pavement Damage on Waukivory Road (North of Jacks Road)

The EIS states that Waukivory Road "*prior to the closure of jacks Road bridge across the Avon River primarily services existing properties along its length*". As such the Road was constructed to a low standard as befitting a low traffic road and has a pavement reaching the end of its design life.

This road is popular with cyclists and prior to the closure of the Jacks Road Bridge, this together with Jacks Road was regularly used as a training loop commencing and ending in Gloucester.

The EIS predicts a 29% increase in traffic on this section of road, with Waukivory Road North of Jacks Road increasing by 109% during the operational phase. The EIS fails to take into account (only mentioning in passing) that almost all of the establishment/construction phase traffic will need to utilise this road if mine establishment /construction works commence prior to the completion of the new Jacks Road Bridge.

Should this be the case this road will rapidly deteriorate into an almost untrafficable state posing serious danger to all road users. Even if the bridge is finished prior to the establishment phase even then the level of traffic proposed on this road will still cause much damage to the road surface, once again increasing the level of danger to road users.

Safety of the Waukivory Road/The Bucketts Way Intersection

The intersection of Waukivory Road with The Bucketts Way is described in the EIS as having "good geometry and good sight distance" however there are no line markings and no protected turning areas.

With the level of traffic increase proposed by this development; upgrading to a formal intersection treatment will be imperative.

Accessing the Mine Site through Gloucester Streets Prior to Completion of a New Jacks Road Bridge and Subsequent Pavement Damage.

The EIS refers to "*a heavy vehicle bypass through Gloucester*" as if by some magical means these vehicles were diverted around the residential areas of Gloucester. In fact the route referred to as "*the heavy vehicle bypass*" passes right through the centre of Gloucester's residential area including a school zone!

The EIS mentions in passing that much of the establishment/construction phase traffic will need to utilise this route prior to the completion of the new Jacks Road Bridge. This will require heavy vehicles and construction traffic to “grind up the hill” from church Street to Ravenshaw Street and then pass through the school zone with school children going to and from school. From a safety point of view this conflict of traffic must be considered an extreme risk.

In addition these roads are also reaching the end of their design life with pavement failure becoming an increasing feature. A sudden influx of heavy traffic will lead to rapid deterioration of the pavement which this Council simply cannot afford to rectify.

Safety of Access to the Rail Load-out Facility

The EIS proposes that a rail load out facility be constructed at the site of the former Boral timber processing plant directly off The Bucketts Way.

This site has not been used for many years and the access no longer meets current safety standards. The EIS proposes that a huge increase in traffic, particularly heavy vehicles, will be accessing the site during the construction phase (upwards of 8000 vehicles) this will create a particularly dangerous situation on a 90 km/h stretch of road with no formal intersection or passing lanes available. Without a major intersection upgrade this presents a very high risk

6.14.3 Proposed mitigation

General Mitigation measures:

The EIS proposes the preparation and implementation of a Construction Transport Management Plan for the site establishment and construction phase which addresses the following.

- The use of the Gloucester heavy vehicle bypass, The Bucketts Way and Waukivory Road for construction traffic until the new bridge across the Avon River on Jacks Road is constructed.

- Use of the two adjacent bridges on Fairbairns Road, particularly the unlimited load bridge on the sidetrack, safe approach speeds and driver awareness to minimise potential adverse traffic interactions.

- The need for interim speed limits and other interim controls.

- Management of speed and other related driving characteristics of all personnel including sub-contractors.

- Driver awareness and interim traffic management arrangements, particularly '1 when approaching the rail crossings on Jacks Road and Fairbairns Road.

- Consideration of pedestrians and cyclists.

- Avoiding/minimising site establishment construction phase, particularly large or oversize loads, traffic during busy periods such as the Christmas or Easter holidays.

Construction of all road and intersection upgrades in accordance with Austroads Standards with suitable dimensional capacity to accommodate the dimensions of the anticipated oversized loads.

Management of any impacts arising from road and bridge construction works for vehicles accessing the Mine Area and private residences.

Preparation and implementation of a Code of Conduct for contractors and employees travelling to and from the Site. The code would identify the designated access routes to the component areas of the Site, and cover the Applicant's expectations with respect to drivers' behaviour, the avoidance (wherever practical) of the school bus operating periods, or specific driving protocols when avoidance is not practical. The code would also include disciplinary responses in the event of noncompliance with the code.

Regular discussions with the school bus company(s) to ensure that information regarding school bus routes, times and pick-up/drop-off locations remains up to date.

Education of the workforce through inductions, toolbox talks etc.

Payment of a road maintenance contribution to Gloucester Shire Council commensurate with traffic volumes generated on Jacks Road and Waukivory Road. Any maintenance contribution would take into consideration the road upgrades that are proposed by the Applicant.

In addition to the general management and mitigation measures, a range of specific road and intersection upgrade works are proposed.

Increase of Heavy Vehicles and Subsequent Pavement Damage along The Bucketts Way

The EIS does not acknowledge that the proposed development will cause extensive damage to The Bucketts Way pavement "*it is not anticipated that the proposal would have a significant impact on The Bucketts Way given the relative low volume of traffic generated in comparison with existing volumes and projected growth*". It does go on to say however that "*The Bucketts Way is in significant need of repair to reach a suitable level of service to accommodate the existing and forecast traffic volumes*".

Clearly then the project will have a severe impact on the pavement of The Bucketts Way which this EIS presents no means of correcting.

Safety of Fairbairn's Road

The EIS presents no mitigation measures to address the safety issues.

Safety of the Fairbairn's Road Intersection Particularly During Construction Phase

The EIS presents no mitigation measures to address the safety issues.

Safety of the Fairbairns or Road Rail Crossing

The consultant to the EIS (Constructive Solutions) considers that improvements to the bare bones Road rail crossing would be desirable independent of the proposed development. The EIS however dismisses any need to provide mitigation to the safety issues of concern.

Increase in Heavy Vehicles and Subsequent Pavement Damage on Jacks Road

Mitigation measures proposed are:

- upgrade to 8 m seal (2 x 3.25m travel Lanes plus 0.75 m sealed shoulders) on an 8.0m formation.
- Install line markings, including edge lines to define travelling lanes.
- Remove and replace the existing bridge over the Avon River with a two Lane Bridge suitable for oversize/overweight vehicles, and improve road alignment by straightening the approaches to the bridge.
- Install “transverse bar” line marking and/or “Give Way” signs on Jacks Road for vehicles exiting the Thunderbolts and Avon River Estates and rural properties via Angophora Road, Combo Road and Maslens Lane.

Safety of the Jacks Road/The Bucketts Way Intersection

Upgrade the existing intersection to include:

- a de-acceleration Lane in the form of a channelized right Lane to accommodate light vehicles and heavy vehicles approaching from South
- a de-acceleration Lane for vehicles turning left into jacks Road to prevent unnecessary impedance to through traffic; and
- installation of “Transverse bar” line marking and “Give Way” signs for vehicles leaving jacks Road
- given the limited sight distance at the intersection the applicant would also encourage Council to extend 60 km/h speed restriction to the south of the intersection.

Safety of the Jacks Road Rail Crossing

The EIS presents no mitigation measures to address the safety issues.

Increase in Heavy Vehicles and Subsequent Pavement Damage on Waukivory Road (North of Jacks Road)

The EIS presents no mitigation measures to address the safety issues.

Safety of the Waukivory Road/The Bucketts Way Intersection

The EIS presents no mitigation measures to address the safety issues.

Accessing the Mine Site through Gloucester Streets Prior to Completion of a New Jacks Road Bridge and Subsequent Pavement Damage

The EIS presents no mitigation measures to address the safety issues.

Safety of Access to the Rail Load-out Facility

- remove the northern leg of the existing “Y” intersection
- Installation of “Transverse bar” line marking and “Give Way” signs for vehicles leaving the facility.

General Mitigation Measures

The proposed Traffic Management Plan (TMP) put forward as general mitigation measures in section 4.9.3 of the EIS are just nice, warm and comforting words. These statements are primarily just restating the State road rules which, as is well known, require the police to ensure their compliance - hardly a measure of adequacy.

All these roads are public roads outside of the proponent’s control. If anything the TMP simply draws attention to the high risk areas without providing any real mitigation of those risks.

Increase of Heavy Vehicles and Subsequent Pavement Damage along The Buckets Way

No mitigation measures are offered for this risk/impact.

No contribution to the mines proportion of the damage inflicted on the pavement is offered.

Safety of Fairbairn's Road

No mitigation measures are offered for this risk/impact. Not even a contribution to the mines proportion of the damage inflicted on the pavement.

Safety of the Fairbairn's Road/The Bucketts Way Intersection Particularly During Construction Phase

No mitigation measures are offered for this risk.

Safety of the Fairbairns Road Rail Crossing

No mitigation measures are offered for this risk.

Increase in Heavy Vehicles and Subsequent Pavement Damage on Jacks Road

The mitigation measured proposed appear adequate for light vehicle traffic however no mention is made of upgrading the pavement to take the huge increase in heavy vehicle traffic (ESAs) that will be generated by this proposal.

The maintenance contribution offered is not quantified and therefore its adequacy cannot be established.

Safety of the Jacks Road/The Bucketts Way Intersection

While an intersection upgrade is proposed, it does not address all the traffic movements approved at this location. Only construction of a Roundabout will adequately address the risks created by the large increase in traffic created by this proposed development.

Safety of the Jacks Road Rail Crossing

No additional mitigation measures are offered for this risk.

Increase in Heavy Vehicles and Subsequent Pavement Damage on Waukivory Road (North of Jacks Road)

No mitigation measures are offered for this risk.

Safety of the Waukivory Road/The Bucketts Way Intersection

No additional mitigation measures are offered for this risk.

Accessing the Mine Site through Gloucester Streets Prior to Completion of a New Jacks Road Bridge and Subsequent Pavement Damage.

The "motherhood statements" contained in the proposed general measures do not address the risks of this route nor is there any compensation offered for the damage that the proposed development will cause to the road pavements.

Safety of Access to the Rail Load-out Facility

The limited measures proposed for this location do not address the high risks created during the construction phase.

6.14.4 Grounds for refusal

- Council would be unable to adequately maintain the road network impacted upon by this project at a safe and appropriate standard and has no reasonable prospect of ever being able to do so. In that regard it is noted that:

  The existing design standard of much of The Buckets Way - particularly the complete lack of overtaking lanes and passing opportunities - is not appropriate for the proposed intensified traffic;

  The lack of rigour in the proponent's traffic modelling in the EIS, intensification of mining related traffic generally on The Bucketts Way and a range of other matters, in combination, ensure that Council will not have the capacity to safely maintain the consequential road network associated with the proposed development. Any approval is certain therefore to compromise the safety of mine workers and other road users.

- The EIS does not adequately address the Director-General's Requirements and additional matters as contained in Appendix C pages 9 – 81 through 85.
  - accurate predictions of the road and rail traffic generated by the proposal (DP&I).

- As revealed in 8.14.2.1; where the EIS has provided information that can be checked; heavy vehicle generation is shown to be in error by an amount greater than 50%. This brings into question all other “predictions of traffic generation” provided.
- a detailed assessment of the potential impacts of the development on the capacity, safety and efficiency of the: local and regional road network, with particular regard to a cumulative traffic impact assessment; condition assessment of the existing network (DP&I);
- The EIS has failed to provide pavement condition assessments, relying only on visual assessment. These provide no indication as to the ability of the pavement to support the traffic generation provided.
- A detailed description of the measures that would be implemented to maintain and/or improve the capacity, efficiency and safety of the road and rail networks in the surrounding area over the life of the Proposal (DP&I);
- The EIS fails to adequately address the majority of the safety issues raised by the increased traffic generation of the proposal.
- The volume and frequency of traffic over the railway level crossing on Jack's Road also needs to be examined to establish the need for a replacement crossing with a traffic bridge over the railway line (Gloucester Shire Council (02104112)).
- The EIS provides no indication that the proponent has consulted with the Australian Rail Track Corporation (ARTC) in regard to the increased risk generated by the proposed development at both the Jacks Road and Fairbairn's Road level crossings.
- NSW Transport Roads & Maritime Services (03/04/12) - The anticipated additional vehicular traffic generated from the proposed development and the trip distribution on the road network during both the construction and operational phases. It is requested that the predicted traffic flows are shown diagrammatically to a level of detail sufficient for easy interpretation.
- The EIS fails to provide the detail of traffic generation required by NSW RMS in that there is no diagrammatical representation of predicted traffic flows contained in the document.
- NSW Transport Roads & Maritime Services (03/04/12) – The study shall also give consideration to the cumulative traffic impacts of other proposed and approved developments in the area.

- Where the EIS does give consideration to the cumulative traffic impacts of other proposed and approve developments in the area it is does so only as a means of diminishing impacts of the proposed development, rather than revealing the escalation in risk to which this proposal will contribute.

6.14.5 Proposed Conditions of consent

Should the proposal not be refused, any approval granted should contain the following conditions of consent:

1. The Proponent must, prior to commencement, undertake meaningful consultations with the Australian Rail Track Corporation (ARTC) regarding the standard of rail crossings at Fairbairns Road and Jacks Road. The consultation must include reference to proposed construction traffic (both heavy & light) as well as ongoing production traffic. Such traffic figures must be based on actual traffic counts from active mines and current modelling.
2. The Proponent must, at its election, either:
    a. Upgrade the rail crossings to the standard identified in the consultations undertaken in compliance with clause 1 to the ARTC and Council's satisfaction; or
    b. pay Council an amount equal to the amount required to perform the work that otherwise would have been required in respect of clause 2(a).
3. The Proponent must, prior to construction, pay Council an amount reasonably necessary to permit Council to obtain a report setting out the road and pavement condition (for the purpose of ascertaining future dilapidation) of Fairbairns Road.
4. The Proponent must, upon completion of construction, pay Council an amount reasonably necessary to permit Council to obtain a report setting out any identified damage caused to Fairbairns Road (including any diminution of road life or loss of service) occasioned by the Proponent's construction work.
5. The Proponent must, at its election, either:
    a. restore any damage identified in the report obtained in compliance with clause 4 to Council's satisfaction and compensate Council in respect of any identified loss of life or loss of service of that road; or
    b. pay Council an amount equal to the amount required to perform the work and make the compensation that otherwise would have been required in respect of clause 5(a).
6. The Proponent must (for the section of Waukivory Road between Mckinleys Lane & The Bucketts Way and for Jacks Road between Waukivory Road & The Bucketts Way) pay Council's reasonable costs of obtaining an appropriately qualified person to conduct a route and upgrade assessment. Such route and upgrade assessment must be assessed in accordance with Austroads "A Guide to Geometric Design of Rural Roads" 2009 and be based on actual traffic counts from active mines and current modelling so as to address the following:
    a. lane widths and shoulder widths;
    b. clear zone encroachments and risks identified in road safety audits;
    c. intersection design; The Bucketts Way, Combo Road, Maslens Road, Angophora Road, Waukivory Road and Mckinleys Lane, including any realignment of the side roads as necessary for safe intersection design;
    d. bus stops and property accesses affected by the proposal;
    e. bridge width and approach alignment; and
    f. overtaking lanes, climbing lanes and/or slow vehicle turnouts.
7. The Proponent must (for the section of Waukivory Road between Mckinleys Lane & The Bucketts Way and for Jacks Road Between Waukivory Road & The Bucketts

Way) pay Council's reasonable costs of obtaining an appropriately qualified person to conduct an assessment on the pavement design to ensure that the full 30 year design life is achieved under the increased traffic projections. Such projections must be based on actual traffic counts from active mines and current modelling and having regard (amongst other things) to background traffic growth.

8. The Proponent must (for the section of The Bucketts Way between the Great Lakes Shire Boundary and Jacks Road) pay Council's reasonable costs of obtaining an appropriately qualified person to conduct an assessment on the pavement condition and to quantify the impact and pavement degradation likely to occur under the increased traffic projections. Such projections must be based on actual traffic counts from active mines and current modelling and having regard (amongst other things) to background traffic growth.
9. The Proponent must (for the intersection of Fairbairns Road & The Bucketts Way and for the access road to proposed coal load-out facility & The Bucketts Way) pay Council's reasonable costs of obtaining an appropriately qualified person to conduct an upgrade assessment. Such upgrade assessment must be assessed in accordance with Austroads "A Guide to Geometric Design of Rural Roads" 2009 and be based on actual traffic counts from similar construction activities associated with active mines and current modelling so as to address the following:
    a. lane widths and shoulder widths;
    b. clear zone encroachments and risks identified in road safety audits;
    c. intersection design.
10. The Proponent must, at its election, either:
    a. undertake any further works recommended to be undertaken following assessment of the matters set out in clauses 6 to 9; or
    b. pay Council an amount equal to the amount required to perform the work that otherwise would have been required in respect of clause 10(a).
11. The Proponent must, prior to construction, apply to Council for a s138 Permit to (without limitation) occupy the road for construction purposes, set up of work sites and install temporary warning signs.
12. The Proponent must not commence any work on the mine site that would, but for this Approval, be impermissible before the work set out in clause 10 is completed whether or not that work is performed by the Proponent, the Council or any other person.
13. The Proponent must not commence any work on the mine site prior to the completion of the upgrade of Waukivory Road between Mckinleys Lane & The Bucketts Way and for Jacks Road between Waukivory Road & The Bucketts Way.
14. The Proponent must ensure that heavy vehicle traffic related to Gloucester Resources Limited's Rocky Hill Coal Project does not use the "Gloucester Heavy Vehicle Eastern Bypass"
15. The Proponent must in respect of the section of Waukivory Road between Mckinleys Lane & The Bucketts Way and for Jacks Road between Waukivory Road & The Bucketts Way enter into a maintenance agreement with Council for the maintenance of the roads for the life of the mine (Works Endorsement deed). The Works Endorsement Deed must be based on prevailing roads legislation and the Aus-Spec (Nat-Spec) Maintenance Specification.
16. The Proponent must pay to Council an annual contribution in respect of ongoing cumulative mine related road depreciation and maintenance for The Bucketts Way.

Such contribution shall be based on the proportion of ESAs attributable to the proposed development for the life of the development. This proportion shall be calculated from the traffic counts and weigh-in-motion measurement results from the monitoring stations below required.
The formula for the calculation shall be:

[WoL cost/PL x Distance from Shire Boundary to Monitoring site] X ESAs @ Monitoring site
[Total ESAs]

WoL = Whole of life cost = $1,138,238/km (2013 +Construction Price Index)
PL = Pavement Life = 30 years
ESA = Equivalent Standard Axle (1 ESA=80 kilo newtons) {Note overloading will be subject to the 4th power rule}

6.14.6 Monitoring of impacts

- To adequately monitor the traffic/pavement impacts of the proposed development the following installations will be required and installed a minimum of 3 months prior to any work commencing for the development:
- The installation of permanent classifying traffic counters at the following locations:
    - The Bucketts Way, immediately south of the entrance road to the rail load-out facility,
    - The entrance road to the rail load-out facility, immediately east of The Bucketts Way,
    - Fairbairn's Road, east of the North Coast rail line and prior to the Avon River,
    - All three approaches to the Jacks Road/ The Bucketts Way intersection,
    - All three approaches to the Waukivory Road/Jacks Road intersection,
    - Waukivory Road, east of McKinley's Lane.
- High speed “Weigh-in- motion” equipment (e.g. Culway) installed in conjunction with the above traffic counters at the following locations:
    - The entrance road to the rail load-out facility, immediately east of The Bucketts Way,
    - Fairbairn's Road, east of the North Coast rail line and prior to the Avon River,
    - The Bucketts Way south of the intersection with Jacks Road,
    - McKinley's Lane immediately south of the intersection with Waukivory Road.

- In addition the following information should be provided on a monthly basis:
    - Printouts of records from the coal handling & processing plant - providing accurate figures of run-of-mine coal processed for the previous month,
    - Copies of the mine sign-in sign-out book - providing accurate figures of all employees, visitor, contractor and delivery attendance for the previous month.

Monitoring of impacts

To adequately monitor the traffic/pavement impacts of the proposed development the following installations will be required 3 months prior to any work commencing for the development:

6.15 Local infrastructure and services

6.15.1 Analysis of the issue

The study completed by R.W. Corkery and Co. Pty Ltd outlines the issues relevant to the local infrastructure within the town of Gloucester with regard to the proposed implementation of the Rocky Hill Coal mine. As recorded in their report, the implementation of the proposed mine will significantly impact the local infrastructure within Gloucester. The pace and nature of the development and the associated increase in the number of people working and /or living within Gloucester will greatly affect infrastructure demand. At the height of the implementation of the project, there will be an estimated 150 jobs created from the project. As a consequence the number of people (families) moving to the area will further increase the population of Gloucester. The main services impacted will be community facilities such as schools, hospital services, housing and Council run services such as the library and waste. Further, and most importantly, emergency services such as police, ambulance, the Rural Fire Service, and the State Emergency Service will be affected.

R.W. Corkery & Co. Pty Ltd have indicated within their report that there are social risks associated with increased population and of increased employment opportunities, which include the following:

- Wage inequity leading to lack of social cohesion
- Stress on capacity of some social infrastructure to meet demands of the new population
- Upward pressure on the rental market and housing prices to the detriment of low income earners
- Worker fatigue and traffic impacts if new employees drive in and drive out as opposed to residing locally
  (pg 4-347).

These issues are especially pertinent to Gloucester, a small rural town that relies heavily on its community members, for volunteer and community work.

6.15.2 Concerns/problems/issues

The Rocky Hill Coal Mine is a relatively small mine in NSW. However, the size of the mine, and the possible increase in population in a short time period will be a large change relatively, to the town of Gloucester. An increase of 150 people to the existing population of 5000 will mean a 3% increase in the size of Gloucester's population– a doubling of Gloucester Councils predicted annual population growth. A fast increase in the population will put stress on the local infrastructure within Gloucester, with few mitigation methods on the part of the proponent. In fact within the document, the proponent states that for some services, it will be a matter for the State Government to provide extra services.

As an example, information from the NSW ambulance service, has estimated that on average across NSW, 150 people would generate about 15 emergency incidents a year. As the ambulance service has stated that it is at its maximum capacity within Gloucester at present, without extra resources, an extra 15 emergency cases would over burden the ambulance and hospital system within Gloucester.

Similarly, the police area command is located in Gloucester, with the police station not staffed on a 24 hour basis. Further population growth will see further resources needed.

The Rural Fire Service and State Emergency Service are volunteer run services, also being run at capacity. Further incidents are likely to increase with the increase in population. Without support, these services are likely to be over burdened.

6.15.3 Proposed mitigation

The proposed mitigation methods is primarily the Community Grants Program that the company provides annually, and an assumption that the State Government will assess and implement strategies that will provide minimum impact on the community.

6.15.4 Adequacy of proposed mitigation

Table 1 attempts to rate, from the Community's perspective the risk of adverse outcomes for the three participants in a mining development (low-green, moderate-orange, high-red).

Table 1: Risk matrix for current participants in mining developments

	Social	
	Short term	Long term
Proponent	Generally ignored but may be mitigated by Conditions of License	No liability recognised
State Government	Generally ignored as they pose no real cost at the state level	Liabilities poorly considered as they only become fully apparent to future governments
Local Community	Ignored costs are unmanaged by either the State or the Proponent and Communities left to manage as best they can	Serious long-term social dislocation with no explicit support for managing its effects

The proposed mitigation methods do not adequately address the costs, both socially and in infrastructure terms. The main mitigation methods are to rely on the State Government to fund services that the community could otherwise deal with. In increasing the population in a short time frame, these services will no longer be able to dealt with in a constructive and organised manner, and will be detrimental to the community as a whole.

6.15.5 Grounds for refusal

The proponent noted that changes need to occur to the infrastructure, however has proposed few mitigation measures.

Relying on government organisations to change infrastructure, is not an adequate mitigation measure for the disruption caused by over burdening local infrastructure

Existing emergency infrastructure cannot handle an increase in population over a short time frame.
Many of the existing emergency services are manned by volunteers. These are at capacity at the moment. Further population increase will over burden this service.

6.16 Tourism

6.16.1 Analysis of the issue

There is a fundamental concern that the mine will put at risk the entire economic contributions of a long-term sustainable tourism sector operating within the Valley.

About Gloucester and its Brand

In marketing terms, Gloucester has an unbeatable brand position of being the closest town to the Barrington Tops (our tourism slogan is 'Basecamp for Barrington Tops'). This unique selling proposition is immensely strengthened by the World Heritage listing of this National Park. In addition to this world-recognised accolade, the Vale of Gloucester was listed by the National Trust in 1975, as a declared 'significant heritage landscape.' The Vale of Gloucester stretches from Stroud in the south, to Barrington in the north of Gloucester. The Gloucester Tourism logo is a platypus, which represents healthy rivers and river catchments.

Tourism in Gloucester is inextricably linked to the scenic beauty of peaceful rural valleys and forested mountain tops, and to World Heritage nature for adventure and wellbeing. Gloucester's scenic beauty is not an unsubstantiated claim, rather it's an essential part of Gloucester's Brand.

Tourism's economic contribution

Tourism is one of the critical economic drivers for the Gloucester region, specifically listed in Council's Community Strategic Plan as a key opportunity for the next 10 years in achieving long-term financial sustainability for our region.[6] Proof is in the data from Tourism Research Australia published by Destination NSW that shows our Visitor Economy is worth $30 million each year for the Gloucester local government area[7]. That equates to a $360 million contribution over the same 21 year life of the proposed Rocky Hill open-cut coal mine. And all of it is earned, retained and churned back into the local economy by small scale tourism operators who create jobs for 241 people in the local industry.[8]

The risks to Gloucester's Visitor Economy arise from the following issues:

Water security issues
Tourism Advancing Gloucester believes that pristine rivers and aquifers are an essential component of Gloucester's Brand. The activity of the Rocky Hill open-cut coal mine threatens this key component, and so threatens our tourism businesses. Environmental impacts from the mine will have a devastating impact on tourism in the locality.

Air quality issues
Tourism Advancing Gloucester believes that poor air quality issues arising from the Rocky Hill open-cut coal mine threaten this key component of Gloucester's Brand, and so threatens tourism businesses. The unique geography of the Gloucester valley is such that dispersal of air pollutants is hampered and as such, our residents and tourism operators have nowhere to hide when it comes to air quality impacts.

[6] Gloucester Shire Council Community Strategic Plan 2012-2022: Direction Three: Creating a strong economy, pp 39-41
[7] Destination NSW: Travel to Gloucester Local Government Area, 4 year average annual to Sep 2011
http://www.destinationnsw.com.au/__data/assets/pdf_file/0013/74101/Gloucester-LGA-profile.pdf
[8] Results of survey into Employment in the Gloucester Tourism Industry, by Gloucester Visitor Information Centre, Oct 2012

Dusty air filled with particulates will impact on our visitor's peaceful enjoyment of the region, with immediate knock-on effects against visitor satisfaction, against word-of-mouth recommendations, against visitor numbers and against the economic contribution of tourism to Gloucester. Visitors from bustling cities and towns come to our region for the fresh air, clean rivers and emerald green scenery they believe can be found year-round in Gloucester.

Noise impact issues

Heavy mining activity of the Rocky Hill open-cut coal mine is proposed to operate six days a week, 7am to 10pm, with 10pm-4am additionally mentioned in the EIS as being desirable. The proposed earthen mounds will not mitigate all noise impacts. On quiet rural land, any noise travels easily and Gloucester's narrow and steep-sided valley pushes the sounds of heavy machinery to the far corners of the valley.

Tourism Advancing Gloucester believes that the noise impact from the Rocky Hill open-cut coal mine will be detrimental to Gloucester's Brand. The proposed 21 years of noise will impact on our visitor's peaceful enjoyment of the region, with immediate knock-on effect against visitor satisfaction, against word-of-mouth recommendations, and will negatively affect Gloucester tourism.

The soothing peace and quiet of our region is what draws visitors and is an essential component of our Brand. The constant rumbling of heavy mining machinery is not conducive to a relaxed holiday. It is considered there should be a buffer zone for noise of 10km.

Visual impact issues

Tourism Advancing Gloucester considers the visual impact from the Rocky Hill open-cut coal mine will not be mitigated by the proposed earthen mounds and so the mining activities will be detrimental to Gloucester's Brand. The tree screens already being planted by Rocky Hill along the Bucketts Way will create an additional visual impact.

Conclusion

Much has been made of Rocky Hill's economic claims of their open-cut mining operations that will be so close to Gloucester residences. Tourism Advancing Gloucester believes that the true indicator of economic value to our region is from sustainable, long-term contributions to the Gloucester economy. Mining is not a long-term sustainable land use. What will happen to Gloucester in 21 years time when the Rocky Hill open-cut coal mine has finished its extractions and all that remains is a one-industry town justifiably worried about its future?

The current plans by the Rocky Hill open-cut coal mine will destroy productive farmlands, ruin pristine rivers, and provide 21 years of noise, dust and visual impacts. It will negatively impact Gloucester's scenic beauty and change forever the scenic rural perception of the region. It will break the Gloucester Brand and tourism industry.

6.17 Economic issues

6.17.1 Analysis of the issue

Council has been significantly concerned with the potential economic impact of the proposed development on the fragile local economy. Accordingly, economic consultants, economists at large, were engaged to update the local economic profile and to produce a critique of the socio economic assessment included in the EIS. A copy of their report is included as appendix 1.

The following summary from their report is included in this section of council submission:

The Rocky Hill Coal Project is a proposed open cut mine in the Gloucester Local Government Area (LGA), around 260km north of Sydney. The project has attracted controversy in the Gloucester area due primarily to its proximity to the Gloucester township and residential areas. Gloucester Shire Council have commissioned Economists at Large to review the socio economic assessment of the project, prepared by consultants Key Insights. The socio economic assessment is in two main parts, social and economic.

The social section identifies the strong community opposition to the project and its many potential impacts on the community. Key points include:

- *Around 80% of survey respondents oppose the Rocky Hill project*
- *Over 75% of respondents are concerned about impacts on:*
    - *Visual amenity*
    - *Water*
    - *Dust*
    - *Noise*
    - *Agriculture*
    - *Town character*

- *Between 42-50% of respondents felt the project would assist existing businesses or attract more businesses to Gloucester.*

Our criticisms of the social part of the socio economic assessment relate to:

- *Optimistic estimate of local employment – goals of 75% resident employment are unlikely to be achievable based on data from other projects.*
- *Cumulative impact assessment which ignores data relating to other projects.*

The economic section of the Key Insights assessment is flawed and does not present a strong economic case for the project. The key flaws in the economic section are:

- *No cost benefit analysis*
- *No demonstration of the financial viability of the project*
- *Inappropriate use of multiplier analysis*
- *Flawed and non-transparent calculation of royalties and tax revenues*
- *Plagiarism and poor referencing*

No cost benefit analysis

Without cost benefit analysis (CBA) there is no quantitative assessment of if the project is in the interests of the NSW community. CBA is the economic tool that asks if the costs to community welfare are compensated for by the benefits of the project. CBA is required for project assessment under the Director General's Requirements for the project as well as Treasury and Department of Planning guidelines. CBA has been a part of all coal project assessments in NSW for many years. The omission of CBA from this assessment is not explained and is a major shortcoming.

Financial viability

CBA can also assist in assessing the financial strength of the project. If a project is not financially viable, benefits through employment and royalties will be deferred or reduced. In the current economic conditions many new coal projects are facing financing difficulties. Our analysis based on best available data suggests the project is not financially viable, with a net present value negative $10.8 million. This means that over the lifetime of operations for the mine, as currently planned, the project will cost more to run than it will earn in revenue. Despite requests to the proponent, data usually available to investors was not provided.

It is often assumed that a proponent would not pursue a project of questionable financial viability. However, in this case there is incentive for the proponent to pursue environmental approvals, both for the option of development in the future if coal prices rise sufficiently, or to increase the value of the project for sale, possibly to the operators of the neighbouring Stratford mine.

Inappropriate use of multiplier analysis

Instead of CBA or financial analysis, the economic section focuses on the results of a multiplier model (also known as an input-output model) of the projects economic impacts. The assumptions in this model ensure that the positive economic impacts will be exaggerated while the costs are ignored. Key assumptions in this model include:

- *No resource constraints – the model assumes that there is an infinite amount of skilled labour and other inputs that can be used by the project. In reality skilled workers and other inputs are scarce in Gloucester.*
- *Fixed prices – the model assumes that even though the project is and located in a small economy, wages, rents and costs will be unaffected. In fact Gloucester has seen significant changes in prices for land and labour.*

Because of these flaws bodies such as the ABS and NSW treasury warn against using this form of analysis for project assessment. This methodology was also criticised in the recent Warkworth coal project case.

Aside from the flaws inherent in multiplier models, the authors have based their analysis on data from the 1990s which predates the mining boom and major changes in technology such as email and the internet. This heavily compromises the usefulness of any results of this analysis.

The socio economic assessment estimates the increase in jobs for Gloucester residents at between 13 and 61. We suggest the likely net increase in employment is between 15 and 30, an increase of around 1.5% of the Gloucester labour force. At a state level the report estimates up to 469 jobs will be generated, we suggest the likely figure is around 123, an insignificant increase at the state level.

Flawed and non-transparent calculation of royalties and tax revenues

Income and payroll tax estimates provided are linked to the multiplier analysis above and therefore heavily overstate these values. The report makes an estimate of royalties at $186m. There is no working shown, but this seems to be based on:

- *Optimistic price assumptions*
- *Ignoring royalty deductions*
- *Undiscounted future values*

We estimate the present value of royalties at $59.5m, just 32% of the amount estimated by the report.

Plagiarism and poor referencing

Parts of the report are not the work of the authors but are plagiarised from other reports. In particular, some sections are taken from Minerals Council of NSW's public relations documents. There is no attribution of these plagiarised sections to Minerals Council. Other sections are compromised by using poorly referenced coal company data rather than data from government agencies. There is no reference section or bibliography.

Conclusion

The socio economic assessment identifies the strong community opposition to the project based on potential impacts to Gloucester's amenity, social fabric and other industries. It does not, however, present a convincing case that these impacts will be offset by economic benefits. Although it is not clear from Key Insight's report, the project seems to be financially unviable under current conditions, with a negative present value of $10.8 million. Approving the project under these conditions would not result in any employment or revenue benefits

and would indefinitely extend problems relating to the uncertainty of the project on residents, particularly those to the south of Gloucester township.

If coal prices changed and the project was able to proceed financially, the main benefits of the project for the NSW community appear to be a net increase of up to 30 jobs for Gloucester residents and royalty revenue to the state government of $59.5m in present value terms. Against this, decision makers need to balance the opposition of 80% of the Gloucester community, based on costs to residents in reduced property values and reduced amenity as well as the damage to other important industries such as tourism and agriculture. While quantifying these values is beyond the scope of this report we suggest that the costs do not outweigh the benefits and therefore recommend council oppose the project.

6.18 Bush Fire Hazard

6.18.1 Analysis of the issue

The DGRs require that the EIS must address: “Hazards including bushfires and floods”. The Proponent lists the potential impacts relating to bush fire as:

> *Fire initiated off site threatening site operation – medium risk.*
>
> *Fire initiated on site threatening site operations or spreading off site – low risk.*
>
> *Risk rankings are allocated on the basis of assets and the degree to which the land is prone to fire.*

With the exception of the former Boral timber site there are no assets currently located on the proposed mine site. Assets are those identified in the Gloucester Bush Fire Risk Management Plan (2008). Identified assets do not include private residences some of which are closer to the proposed mine than assets identified in the GBFRMP. Infrastructure assets including roads and bridges, fences and the North Coast Railway have not been considered.

There is no treatment of the individual potential sources of ignition on the site. Specifically there is no mention of the Conveyor and Coal Loading facilities.

The specific risks associated with large stockpiles of high quality fuel are not addressed. Nor are the risks associated with spontaneous combustion.

There is no information addressing the risk from spontaneous combustion in the spoil heaps or the coal storage piles. Neither is there any treatment of the risk from gas fires in the seams themselves.

The hazard assessment in the EIS focuses the risk of bushfire external to the site impacting on the site. There is very little discussion of the impact that any fire initiated on the site would have on land, vegetation and assets surrounding the proposed site.

The DGRs additionally contain a requirement to address “*potential impacts on local and regional communities including increased demand for local and regional infrastructure and services (such as housing, childcare, health, education and emergency services); and impacts on social amenity, particularly those impacts associated with residents of Gloucester, large lot residential estates on Gloucester’s outskirts and nearby landowners and residents.*”

The Proponent states (Section 4.14.7) that activities undertaken within the site would increase the number and type of potential ignition sources in the local area. They further propose to make water and fire fighting equipment available to the RFS, to develop a Bush Fire Management Plan in consultation with the Gloucester RFS and to liaise with “officers of the RFS and adjacent landowners regarding fire hazard minimisation within the site”.

No detailed consideration has been given to self-heating and spontaneous combustion which must be must be considered as a hazard. It is well known that self-heating and spontaneous combustion:

- Occurs in spoil heaps as well as coal heaps.

- Occurs in conveyor belts and loading facilities under suitable conditions.
- Occurs in mine sites in the Gloucester and Hunter Valley's and frequently occurs in Greta coal measures which are not dissimilar to Gloucester coal measures.
- Is difficult and consequently very expensive to extinguish.
- Releases a range of toxic pollutants into the atmosphere.

These pollutants include:

- SO2 (arising from sulphur associated with coal, either as mineral matter or bound to the organic fraction).
- Nox.
- CO due to incomplete combustion.
- Fine particles;
- other hazardous air pollutants (e.g. Poly nuclear aromatic hydrocarbons, PAH)

6.18.2 Concerns/problems/issues

The identification of assets is simplistic and does not identify nearby residences and a range of infrastructure assets.

Vegetation management at the interface between the mine and pre-existing vegetation is not addressed. The complexities of managing fires that involve both vegetation and coal or gas have not been considered.

Significant areas of new vegetation are planned as part of this proposal. No consideration has been given to selection of species and vegetation structures that could convey a degree of fire resistance for areas to be used as visibility barriers and screens. In fact, the types of communities that will be developed (high density plantations of fire promoting native species) will likely increase fire risk and severity.

The proposal does not explicitly consider its impacts on the demand for and provision of local emergency services. There is no fulltime professional fire fighting capacity in Gloucester. All fire fighting resources are volunteer, and, with the exception of about 12 NSW Fire and Rescue ‘Retained Fire Fighters’, all are RFS volunteers. Apart from the availability concerns and the strains that may be placed on the local Brigades’ ability to respond to core responsibilities, issues around specialised training and response times are simply ignored. The risks posed by a large industrial complex adjacent to town should be more fully examined.

The development of a Bush Fire Management Plan is supported. However, the proposal gives no indication of what level of input the “adjacent landowners” would have in this process. Nor does it indicate what part the volunteers, who are the ones potentially at risk, would play in its development. Further there is no recognition of the reality that, given the limited resources of the locality, the plan would be developed in the knowledge that a major fire event at the mine site could severely impact on the community’s ability to respond to other events – especially during the peak fire season.

There is a lack of detailed analysis on the ignition risks arising from specific elements of the project, including:

- spontaneous combustion in piles and coal seams and
- the coal conveyor system and
- the coal loader
- mine machinery
- regular mine operations including maintenance activities that may provide ignition sources.

There is a lack of detailed information about the resources and skills required to combat any fire resulting from one of these ignition events, particularly fire in the coal seams, stockpiles or handling facilities.

There is no analysis the water requirements in the event of a spontaneous combustion event in one of the spoil or coal piles. There is no indication of how this requirement might be met. There is no information about which of the various waste water stores might be suitable for use in fire fighting and fire fighting equipment.

6.18.3 Proposed mitigation

Mitigation measures have been listed in Section 4.14.6. As the Proponent states these are generic.

6.18.4 Adequacy of proposed mitigation

The generic mitigation measures are generally adequate for low intensity vegetation fires.

However, the dismissal of a whole range of private and public assets is a serious oversight.

The mitigation measures do not consider the specific risks posed by a coal mine including:

- Coal based fires and attendant pollution.
- Ignition risks associated with coal mining infrastructure and operations.
- Fire in vegetation communities (essentially densely spaced plantations) planted by the Proponent.

They do not realistically assess the availability of fire fighting resources including equipment capable of dealing with coal based fires, expertise and personnel.

The mitigation measures do not seriously consider the close proximity to the proposed mine to the town. A comprehensive fire risk analysis must be undertaken that includes worse case scenarios for both vegetation and coal fires.

6.18.5 Grounds for refusal

- There is a lack of specific information regarding the real risk of coal or gas fires, the risks posed by coal fires to the nearby town of Gloucester, the ignition risks posed by mine infrastructure and operations, the design and management fire prone vegetation, and resourcing adequate fire fighting response capacity.

6.18.6 Proposed Conditions of consent

1. Preparation of a Bush Fire Management Plan to be approved by the Rural Fire Service that includes specific consideration of the full range of public and private assets that are influenced by the scale of this proposal.

2. The generic safeguards and controls listed by the Proponent (4.14.6) should be included as conditions of consent.

3. Sufficient staff should be trained to RFS standards for first response to vegetation fires on the Proponent's land. A fully trained first response crew including a Crew Leader with a suitable fire fighting appliance should be available on site at all times during the Bushfire Danger Period and when fire danger rating is very-high or higher.

4. Planted vegetation management plans must be developed. They must include specification of species composition and structures that not only meet strategic management goals (dust suppression, noise suppression, visual amenity, ecological conservation) but also aim to minimise the risk of fire ignition and propagation.

5. Coal and Gas Fire Management Plan must be prepared and implement in consultation with the appropriate experts. The plan should fully articulate and mitigate the risks posed by coal fires to the nearby town of Gloucester and the ignition risks posed by mine infrastructure and operations. The implementation of this plan must provide for adequate resourcing of fire fighting response capacity.

7. Conclusion

The executive summary of the EIS states that the Proponent's objectives are to;

- *Maximise coal recovery* – but it fails to substantiate this because the geological information is flawed, as it is based on limited sampling and the mine plan proposes to change the mining activity to extract better priced coal at will, which could sterilise the remaining deposits.
- *Undertake all operations in an environmentally responsible manner* – this will not occur because the proposal has major flaws and omissions with regard to planning for, assessment of, mitigation of water, air, noise transport and rehabilitation issues;
- *Create a final land form that is safe, stable, visually and topographically sympathetic to the existing landform* – but this is not possible because there is no information to substantiate the final landform, or to assess the environmental impacts of this outcome;
- *Provide a stimulus to the Gloucester and district economies* – but this is unlikely to happen to the extent suggested according to Council's economic consultant.
- *Achieve the above objectives in a cost effective manner to ensure the Rocky Hill Project is viable* – two separate economic assessments (Economists at Large; GRIP) have both concluded that the project, as presented, is not viable.

This mining proposal, its plan and impact mitigation measures are unlikely to allow the proposal to meet these objectives. The proposal has limited details to enable some impact assessment to be undertaken. Many of the key issues that require impact analysis are not provided or are only partially analysed. There are many statements about how good this proposal will be for Gloucester when in reality it has the potential to cause many problems for the reasons detailed in this submission. The statements made about the consequences for Gloucester if mining does not proceed are not supported by the Council and community assessment.

Noise is one of the greatest aspects of regular complaint at the nearby Stratford mine. The Rocky Hill proposal is to operate 24 hours a day and this will have an unacceptable noise impact on at least 242 properties and the EIS regards this as "*medium risk*". Table 6.3 suggest that the design has reduced the impact to ALARP (*as low as reasonably practical*). This demonstrates that the proponent is not serious about people's amenity (as impacted through sleep and health consequences).

The EIS has failed to address the DGR's established for assessing noise impacts at night, the need to correctly identify the number of receptor levels (households/people affected), and to investigate alternative mitigation measures. This undermines the objective of being "*environmentally responsible"*

Modelling in the EIS indicates that air – blast impacts will exceed acceptable standards for at least four properties and this could be as many as 51 properties if a 1% error factor is considered in the calculations. This is not "environmentally responsible "or socially responsible mine planning.

The proponent suggests that the proposed "Visibility Barriers" will solve the problems of visible impacts in the Valley. The creation of 40 m high mounds of waste overburden

material that will be difficult to revegetate, will be a blight on the landscape from every direction and not prevent the mine operations from being visible.

One vulnerable ecological community, and two (perhaps three) threatened animal species will be significantly affected by the proposed mine, and mitigation measures in the EIS are considered completely inadequate. There has been no attempt to avoid these impacts and this again undermines the proponents stated objective of environmental responsibility; this is not a serious attempt to avoid a negative impact.

The proposal to backfill the mine void and creates an aesthetic landscape is a concept that could be supported if enough information was provided to assess the likely success and the potential impacts. Unfortunately there is no information on which to assess if the volumes are reasonable, no data on the fill procedures to assess the likely extent of pollution when the void volume fills, with run-off and contaminated groundwater; no procedures provided in order to evaluate the chance of the constructed streams actually flowing; and no assessment of soil erosion during the whole rehabilitation process. There is no assessment of the risks to revegetation of the structures as a result of weather patterns or extreme seasonal conditions. The final landscape concept is an uncertain outcome with unknown consequences.

Building overburden waste disposal mounds on the floodplain and describing them as “Visibility Barriers” is misleading and environmentally irresponsible. There is inadequate assessment in the EIS of the flood damage that these structures could suffer and no assessment of the operational requirements for the sediment dams constructed on the floodplain at the base of the barriers. It is acknowledged in the EIS that these barriers are flood levies and they should be assessed as such. The lack of any assessment of flooding that could occur in the mine and consequently pollute the Avon River is grounds for refusing the development application. The fact that only the 1:100 AEP flood is assessed is a serious concern and the assessment should have considered the design implications of floods above the one in 100 AEP (i.e. the Probable Maximum Flood).

It is acknowledged in the EIS that an indigenous restricted site exists in the mine area but the only mitigation is a suggestion to train mine equipment operators to look out for and report archaeological material. The extent of consultation with traditional owners was inadequate.

The cumulative impact of this mine in conjunction with other existing and proposed mining activity on non-indigenous heritage has not been adequately assessed because the study assumes that all individual impacts are small. The heritage assessment did not consider the principles of ESD as required by the DGRs, and no attempt was made to assess the impacts against the inconsistencies with the Gloucester LEP for development in the Environmental Management E3 zone.

Health risks are acknowledged in the EIS but not adequately assessed for maximum rates of production and not based on a self audit of residence that are likely to be affected by air quality. Proposed health mitigations are based largely on attempts to minimise air pollution without any innovative approaches to this problem, and without considering real cumulative impacts despite the current understanding of these issues in the Hunter Valley.

Health, noise, dust and transport impacts are based on data for a mine operating on average production of 2Mt/a yet the application seeks approval for a maximum rate of 2.5 Mt/a. It is difficult to understand why the impacts of increasing from 2Mt to 2.5 Mt are not presented or assessed in the EIS.

Geology in the proposed mine area is very complex and has been rejected by several other mining companies over the past 40 years. The current proponent proposes to "*undertake further resource training programs within the mine area to enable exact boundaries of the open cut pits to be defined so as to optimise coal recovery*". This indicates that the mine planning is still at the concept stage and explains why the detail is lacking. This lack of detail means that the DGRs requiring justification of the mine plan and mine efficiency are not addressed. Because of this and the limited overburden testing undertaken, the potential for acid mine drainage has not been assessed and hence environmental protection from overburden and coal rejects is unable to be finalised.

The coal mine is a small operation in a complex geological area. The limited degree of coal seam geochemical and product yield sampling, infers that the objective is to target best quality seems for early profitability, but not to plan for maximum extraction. Nor does this approach provide confidence in the planning for mitigating impacts of acid mine drainage. Again a concept plan without detail that does not fully address the DGRs and does not allow for full impact analysis. The limited financial and economic analysis further indicates the conceptual nature of the proposal in a time of poor profitability for small high cost coal mines.

Surface and groundwater studies provided in the annexures by consultants are complex, but not all of the information is used in the EIS and not all of the DGRs are addressed for these issues. There is no complete site water balance present for the mine proposal and in fact the surface water section is totally missing in the EIS and in the consultant studies. This means that the impacts of sediment dams cannot, and have not been assessed even though the EIS states that they will have to be pumped out regularly. The impact of this pumping on either off-site or on-site water quantity and/or quality is unknown. Sediment dams are proposed at the foot of the western Visibility Barrier and on the floodplain, without any assessment of their potential impacts on water quality. This is an example of a design concept with no detail to enable proper assessment. Another design assumption is that the stream reconstructed on the final landscape will carry water but there is no justification as to why they will, and if so, what the hydraulic characteristics will be.

The suggestion that water from the sediment dams "*would be returned to the existing creek/river systems to maintain environmental flows*" is a significant concern. It infers that environmental flows have been reduced by the mine (a situation denied in other sections of the EIS) and that water in excess of defined water quality objective standards is acceptable for environmental flows.

It is proposed that at the end of the mine "under average conditions" there will be 39,000 t of salt accumulated in storages and that this will simply "*make its way back into the groundwater system and overburden as the pits are backfilled*". The statement is unsubstantiated and illustrates another very high risk element of the design. The salt "slug" will have a very high risk of contaminating surface and groundwater as it moves out of the mine area when the pits are filled to a height of 45 m above the original ground surface. This will be a long-term impact of unquantifiable magnitude.

In fact there are no linkages model between surface and groundwater because the groundwater model is too simplified in order to cope with the complex hydrogeology of the site. The model is calibrated against a very small data set and certainly not for any drought period when groundwater impacts are most critical. This adverse implication of the mine concept and the lack of analysis for real situations is also a significant concern. These limitations in the analysis mean that the EIS does not comply with the DGRs for water resources.

Agricultural impacts addressed in the EIS relate only to the footprint of the mine site and do not address impacts from the large-scale purchasing of farms outside the mine area over the last five years. While the stated objective is to leave the final landform at the same land capability as before mining there is no detail as to the depth and quality of the soil profile, because quantities are not known and there is no information on soil water profiles because the compaction densities are not described. The proposed final landscape is a “quick fix” concept with no detail.

The Rocky Hill mine proposal will be responsible for a significant increase in traffic flow on the Bucketts Way and other roads in the Shire, and the EIS has not adequately identified either vehicle numbers or load weights and safety issues at road intersections. The proposed mitigation measures simply draw attention to the high risk situation without providing any real mitigation.

The economic data in the EIS provides estimates of local employment that are unlikely to be achieved based on data from other projects. Data from other Gloucester mining projects is ignored in the cumulative impact assessment of socio economic impacts. There is a poor economic case presented in the EIS for the project to develop. Major concerns include a lack of cost benefit analysis, no demonstration of the financial viability of the project, inappropriate use of multiplier (input/output) analysis and incorrect and nontransparent calculation of royalties and taxes. This means that for the financial situation presented, the project has uncertain employment outcomes, and would indefinitely extend the problems of uncertainty for the affected population and their economic circumstances. Even if financially viable project is unlikely to only provide limited benefits to the community which would be outweighed by the economic costs of social and environmental disruption. There is no analysis in the EIS of cumulative economic impacts with other mining projects or large employee industries.

The social analysis in the EIS acknowledges the large opposition to the proposal for another mine so close to town and discusses impacts on housing, employment, health and social fabric. However it suggests that a target of 75% of workers to reside in the Shire is achievable, but provides no data for this conclusion. This is despite the fact that data for other mines shows that this is not the case. In both other mines over 50% of workers drive in and out, but the social implications of this are not discussed in any detail.

The EIS leaves many questions in regard to potential environmental impacts. Whilst there may be some economic benefits, the potential of the proposal to significantly impact other industries, residential amenity and the public perception of the town, remain of great concern to Council and the community. It is requested that the application be refused for the following consolidated list of reasons.

8. Consolidated grounds for refusal

Rocky Hill Coal Project SSD-5156

Reasons for Refusal

Insufficient information has been submitted to enable a comprehensive assessment under Section 79C of the Environmental Planning and Assessment Act, 1979.

Particulars:

1. The EIS has failed to provide adequate information in regard to additional and further mitigation measures for noise impacts in relation to hours of operation, as required by the DGR's

2. There is inadequate information presented to consider the impacts on the agricultural condition of the land as it existed prior to acquisition by the proponent.

3. The EIS fails to address the Director General's Requirements having regard to:

    a. Acoustic assessment of noise impacts and identification of the location and number of receivers that will be exposed to mine noise for the first time.
    b. Provision of a full water balance as required in the DGRs. As such the impact of the mine on surface water quality and quantity cannot be assessed. This is a serious error in the EIS.
    c. A "detailed site water balance inclusive of volume and frequency of any water discharges". The EIS has not done this for the whole of the dirty water management area, the post mine rehabilitated areas or for the period of at least 5 years from the end of mining to final rehabilitation to the time when the site is adequately revegetated.
    d. The groundwater model is over simplified largely because of the great complexity of the hydrogeology makes (this) modelling extremely difficult. It is calibrated coarsely using minimal data. It does not provide sufficient precision to analyse the impacts on Waukivory Creek and the Avon River and their associated ecosystems. Specifically it does not address what happens to water levels during drought sequences which are the critical periods.
    e. The modelling outputs show very small drawdowns in watertables which is very different to the Stratford Coalmine Extension EIS particularly when the cumulative impacts of having the AGL Gloucester Gas Project operating at the same time was considered.
    f. Environmental assessment of Non-Indigenous Heritage Impact, including assessment of visual-scenic-landscape qualities of the area and two items with potential local heritage significance within the site area.
    g. The proposal's mining strategy is one of extracting the better coal and designing pits 'on the run', depending on the day's coal price, which will determine the stripping ratios and the open cut pit designs. This 'profit-first extraction technique' will effectively sterilise the remaining deposit and does

not demonstrate “efficiency of coal resource recovery, mine safety and environmental protection”.

h. Accurate predictions of the road and rail traffic generated by the proposal (data checked revealed to be in error by an amount greater than 50%)
i. A detailed assessment of the potential impacts of the development on the capacity, safety and efficiency of the local and regional road network, with particular regard to a cumulative traffic impact assessment, condition assessment of the existing network (no pavement assessment provided, visual assessment only).
j. A detailed description of the measures that would be implemented to maintain and/or improve the capacity, efficiency and safety of the road and rail networks in the surrounding area over the life of the proposal.
k. The volume and frequency of traffic over the railway level crossing on Jack’s Road to be examined to establish the need for a replacement crossing with a traffic bridge over the railway line.
l. The anticipated additional vehicular network during both the construction and operation phases. Requested predicted traffic flows to be shown diagrammatically to a level of detail sufficient for easy interpretation were not provided
m. Assessment of cumulative traffic impacts of other proposed and approved developments in the area
n. An Aboriginal cultural heritage assessment (including both cultural and archaeological significance) which shall demonstrate effective consultation with Aboriginal communities in determining and assessing impacts, and developing and selecting mitigation options and measures (the proposal fails to consult with registered Gloucester Mookibakh Traditional Owners Indigenous Corporation Number 7734.

Gloucester Local Environmental Plan 2010

The proposed development is inconsistent with the applicable aims and objectives of Gloucester Local Environmental Plan 2010. The proposal is unsatisfactory with regard to S79c(1)(a)(i) Environmental Planning and Assessment Act 1979.

Particulars:

4. The proposed development is inconsistent with the applicable aims and objectives of clause 1.2 of the Gloucester Local Environmental Plan 2010 having regard to the management of the resources of Gloucester, the protection of rural lands, natural resources and assets of heritage significance, the management of development to benefit the community, embracing and promotion of the principles of ecologically sustainable development, conservation of biological diversity and sustainable water management, and recognition of cumulative impacts of climate change, and the provision of a secure future for agriculture.

5. The proposed development is inconsistent with the applicable aims and objectives of the E3 Environmental Management Zone of the Gloucester Local Environmental Plan 2010, within which 77% of the proposal is located having regard to the protection, management and restoration of areas with special ecological, scientific, cultural or aesthetic values and the conservation of biological diversity and native vegetation corridors and the scenic qualities, in a rural setting.

6. The proposed mine compromises Council's ongoing intent to protect the scenic qualities of the town of Gloucester from inappropriate development, as specified in the Gloucester Local Environmental Plan 2010.

7. The proposed mine will have an unacceptable impact on future planned development in the residential estates in the southern part of the town of Gloucester.

8. The proposed mine will have an unacceptable impact on the future planned residential expansion east of the township and railway line beyond 2030 as identified in its housing development strategy – 2006.

9. The proximity of the proposed development to the urban settlement of Gloucester will have an unacceptable impact on the health and community of local residents.

Environmental Impact

The development has an adverse impact on the environment, and is unsatisfactory when considered against the provisions of Section 79c(1)(b) Environmental Planning and Assessment Act 1979.

Particulars:

10. The development poses an unacceptable acoustic impact on the amenity of 224 residential, rural residential and rural properties in close proximity to the development due to the extensive hours of operation proposed for mining and associated activities.

11. The proposed development fails to propose equitable mitigation, compensation or property acquisition to all private receptors that will be affected by unacceptable noise levels.

12. The significant number of private receptors that would experience intrusive noise without mitigation outweighs the relatively small predicted net benefits of the project to the local community or the State.

13. The proposal fails to propose equitable mitigation, compensation or property acquisition to all private receptors that will be affected by unacceptable noise levels.
14. The proposed development will have a negative impact on the targeted residential growth in the locality.
15. The development is out of character with the immediate locality and will detract from the rural/residential amenity.

16. The proposed development will exceed acceptable standards of airblast criteria for 4 private properties and up to 55 receptors when applying a 1% margin of error on predictive modeling.
17. The proposed development will have an unacceptable visual impact on the significant landscape. The visibility barriers and proposed dense plantings will obscure existing significant scenic vistas in the Gloucester Valley.
18. The proposed development will have an unacceptable impact in terms of light pollution in the Gloucester Valley, with ambient light from the proposal likely to be intrusive for residents of the Gloucester community who currently experience uninterrupted night skies set in a rural landscape.
19. The proposed development will have an unacceptable impact on threatened ecological community of Lower Hunter Valley Dry Rainforest and nine threatened fauna species identified on the site.
20. The proposal development will have an unacceptable impact on the floodplains of Waukivory Creek and Avon River from the proposed visibility barriers that are to be constructed within the floodplain.
21. The proposed development fails to adequately consider the impact of the proposal on flood waters having regard to pollution from dissolved solids, salinity and heavy metals associated with the proposed sediment dams and visibility barriers.
22. The flood assessment data used to predict impact of flooding is inadequate and not robust.

23. The proposed rehabilitation plan is inadequate and cannot be assessed for its impacts on surface water post mining. The proposed filling of mine voids with over 100m of unconsolidated overburden and coal waste is an un-tried concept and of high risk at this site because there is no data provided as to the likely impacts. There are no statements in the EIS about what will happen if the landscape fails.

24. There is inadequate consideration of the risk of impacts of water table drawdown on groundwater dependent ecosystems, particularly the River Oaks, which are fundamental in protecting the stability of rivers and riverine ecosystems

25. There is inadequate consideration of how the proponents will manage groundwater that is saline and other poor quality water.

26. The proposed development is likely to have a significant impact on the indigenous cultural environment of the locality.

27. The proposed development will have a significant impact on the heritage significance of the area having regard to both the State and National assessment criteria. The State criteria (a) historical significance, (c) aesthetic significance and (d) social significance are strongly affected and the other criteria (b), (e), (f), and (g) are affected to varying degrees. The National criteria under the Environmental Protection and Biodiversity Conservation Act 1999, s324D(3), as prescribed by the regulations are similarly affected, as the “place has an outstanding heritage value to the nation because of the place’s importance in the course, or pattern of Australia’s natural or cultural history”; and the “place has outstanding heritage value to the nation because of the place’s importance in demonstrating the principal characteristics of a class of Australia’s natural or cultural environment”; and the

"place has outstanding heritage value to the nation because of the place's importance in exhibiting particular aesthetic characteristics valued by a community or cultural group".

28. The development poses an unacceptable social and economic impact to properties in the locality.

29. The proposed development is uneconomically viable in its current form and requires additional stages to become viable.

30. Council would be unable to adequately maintain the road network impacted upon by this project at a safe and appropriate standard and has no reasonable prospect of ever being able to do so. In that regard it is noted that the existing design standard of The Bucketts Way, particularly the complete lack of overtaking lanes and passing opportunities, is not appropriate to the proposed intensified traffic. Furthermore, the intensification of mining related traffic generally on The Bucketts Way and a range of other matters, in combination, ensure that Council will not have the capacity to safely maintain the consequential road network associated with the proposed development.

31. The proposed development will result in a negative social impact on the local community through an adverse change in the composition of the community and disruption to social cohesion due to acquisition of noise and air quality affected properties.

32. The proposal will exacerbate the loss of sense of place and materially and adversely change the sense of community for Gloucester and the surrounding countryside.

33. The proposed development will alter the fabric of the community through rapid change in the composition of the community.

34. The proposed mine will have an unacceptable impact on agricultural activity, both on the land acquired for mining purposes, and in the immediate locality of the proposed mine.

35. Relying on government organisations to change infrastructure, is not an adequate mitigation measure for the disruption caused by over burdening local infrastructure

36. Existing emergency infrastructure cannot handle an increase in population over a short time frame.

37. Many of the existing emergency services are manned by volunteers. These are at capacity at the moment. Further population increase will over burden this service.

Site Suitability

The site is unsuitable for the proposed development and is not consistent with the provisions of Section 79c(1)(c) Environmental Planning and Assessment Act 1979.

Particulars:

38. The relatively small size of the deposit and its geological structural complexity and environmental conditions are such that there is significant risk associated with the proposal.

39. The proposal is located in the Gloucester valley's aquifer recharge area and redirection of the surface water flows, added to the water draw down to 190m in the open cut pits, will prevent aquifers recharging.

Community Consultation

The issues of concern raised in public submissions relating to the proposal remain unresolved. The proposal is not consistent with the provisions of Section 79c(1)(d)Environmental Planning and Assessment Act 1979.

Particulars:

40. Air quality

41. Groundwater and surface water impacts

42. Ecological impacts

43. Noise issues

44. Health impacts

45. Traffic impacts

46. Visual amenity impacts

47. Economic impacts

48. Cumulative impacts, particularly interaction with approved Coal Seam Gas extraction in the locality.

Public Interest

The proposal is not consistent with the provisions of Section 79C(1)(e)Environmental Planning and Assessment Act 1979 having regard to the public interest.

Particulars:

49. The proposed development is not in the public interest. The proposal provides for potential low tonnage of 25 million tonnes of ROM coal based on modelling conducted in a high risk geological mine coupled with volatile coal pricing.

50. The development is contrary to the public interests and expectations, of an orderly and predictable built environment.
51. The significant social impact on the community is contrary to the public interest and the principle of intergenerational equity. The proposed development will exacerbate existing experiences of Solastalgia or "loss of place" currently experienced by members of the community through the cumulative impacts of approved Stratford Coal Mine activities (and their proposed extensions) and AGL Coal Seam Gas extraction.
52. The combination of a large number of people living in close proximity to mining with inevitable risk of health damage, and a likelihood of health costs exceeding financial gains to the State.
53. The 'Acceptable Risk' concept in relation to health damage has been inappropriately applied when these risks can be avoided without significant penalty to the State.

Part 2 – ISSUES FOR CONSIDERATION IF A DETERMINATION TO APPROVE IS PROPOSED

1 Life of the project

Coal production is dependent on economic conditions. The viability of any production period depends on the balance between income and expenditure. The current price downturn is making mines of the scale proposed sub-economic. The neighboring Stratford and Duralie mines have both recently announced that they are shedding contractors and employees and it appears likely that production at Stratford may go into indefinite hiatus in the near future. Similar trends of mines opening and closing depending on international coal demand and subsequent price changes have been observed in other areas in the state like Gunnedah.

The proposed mine is not large scale and is therefore likely to be relatively economically inefficient. It will contribute only marginally to coal production in Australia.

The proponent also has two adjacent exploration license areas. They have undertaken extensive exploration in the Gloucester Valley in recent years and have identified significant coal reserves and are waiting on approval to explore in Stage 2, which abuts Stage 1, north of the proposed Rocky Hill mine and is even closer to Gloucester's residential areas. In addition, the proponent has purchased numerous properties in the valley, extending well beyond the area immediately surrounding the location of the proposed mine.

The Stratford and Craven communities were asked to accept a "boutique" coal mine in 1995. That mine was to have a limited impact and a short life after which it would be closed and the site rehabilitated. The land was to be returned to farming and it was proposed that the mine void would be used for aquatic recreation.

This did not happen.

Instead, the satellite Duralie coal mine was approved and developed, with its ROM coal railed to Stratford for processing. A subsequent expansion of the Duralie mine was also approved. The new Bowens Road North and Roseville West open cuts at Stratford were approved and developed. Mining and attendant coal handling and processing has extended way beyond the timeframe that the community was originally asked to support; and a proposal for a further extension of some 13 years is currently being assessed by the Department.

These factors and the community's experience with Stratford and Duralie make any assertion regarding the life of the mine somewhat ambiguous and disingenuous.

Yet there is no consideration in the EIS of the prospect of future extensions /expansion.
Local residents are being asked to accept the development of a new mining complex on what must be considered only partial information.

Greater transparency is required concerning the potential for this project to be extended or other associated projects initiated nearby, following this project's conclusion. Only with full information can residents and other stakeholders make informed judgments about the likely impacts that the development will have on them.

Without full information residents are not in a position to plan to deal with what is likely to be the full impact on their lives. At Stratford, many made the decision to stay rather than move, based on the original apparently finite approval. Others made that decision at the time of the Bowens Road North approval. Had they been informed at the outset that mining could be

expected to continue indefinitely many may have made different decisions. Instead, they have effectively “lost” a decade or more of their lives and are now trapped and forced to endure the intrusive impacts of the continuing mining operations. There is no market for properties adjacent to mining operations.

There has been considerable stress and uncertainty caused by this piecemeal expansion of the Stratford and Duralie mines. The Gloucester community was assured that the Department did not look favorably on this practice and that information concerning potential for mine expansion would be considered in future mine project approvals.

Council accepts that only the specific project can be the subject of this development application. However, it must be realistically set within a context that explains the proponent’s future plans and the cumulative impacts of adjacent mining activity. Council strongly hold the view that residents should not have to live with continuing uncertainty and that the EIS should go into some detail about issues such as the identified coal reserves and likely future mining projects

.

It is also important to note that this issue impacts on many aspects of the environmental assessment, including the mining operations plan, rehabilitation, noise and blasting impacts and biodiversity offsets.

2 Post consent assessment, monitoring and consultations

As a consequence of past experience with extractive resource approvals within the Gloucester Shire and nearby local government areas, the following section proposes a series of conditions to be included in any consent issued for the proposal and includes conditions for post consent monitoring that are considered important in light of the communities experiences and frustration with inaction from the Community Consultative Committee process to date.

Reason: To ensure that the development is in accordance with the determination.

Reason: To ensure compliance with the development consent.

Reason: In order for the development of land to proceed in a coordinated and orderly manner and to avoid potential conflicts with this consent

HOURS OF OPERATION

1. The proponent is required to fund the preparation of an annual, comprehensive review of the Noise Management Plan by an independent Acoustic Consultant, for review by the Independently Chaired Local Complaints Committee/Community Consultative Committee.

NOISE

2. Annual reports on the noise monitoring program, including summarised reports from real-time monitoring, shall be included in regular environmental monitoring reports presented for discussion at meetings of the Independently Chaired Local Complaints Committee/Community Consultative Committee.
3. A complaints management system shall be implemented to address matters raised by residents and landowners affected by noise. That system shall record particulars of the complaint including a description of the reported matter, the location of the complainant, the results of the company's investigation of the matter and its final response.
4. The record of complaints shall be available on the company's website and be presented for review at meetings of the Independently Chaired Local Complaints Committee /Community Consultative Committee.
5. An industry-funded, community -supervised noise monitoring program should be established for this project. This program would be similar to that operating in the

Hunter in relation to dust, where the monitoring results are published in the local newspapers.

6. A program of yearly hearing tests, sleep quality measurement and a health check for 'at risk' individuals should be implemented by the company.

BLASTING & VIBRATION

7. A blast monitoring network shall be established around the mine area, including monitoring points of at least two potentially affected residential locations. The fixed noise monitors should be augmented by monitors that can be positioned at other locations where residents report experiencing significant impacts from the blasting. Those additional monitors may not be required to be permanently deployed.

REHABILITATION – FINAL LANDFORM AND LANDUSE

8. The EIS presents a range of broad criteria against which the rehabilitation of individual areas would be monitored throughout the life of the project. A Rehabilitation Plan should be developed to provide for the development of more specific measures that would guide the monitoring program and which would incorporate all the recommendations made by the ecological consultants.

TRAFFIC & TRANSPORT

9. To adequately monitor the traffic/pavement impacts of the proposed development the following installations will be required 3 months prior to any work commencing for the development:
10. The installation of permanent classifying traffic counters at the following locations:
    a. The Bucketts Way, immediately south of the entrance road to the rail load-out facility,
    b. The entrance road to the rail load-out facility, immediately east of The Bucketts Way,
    c. Fairbairn's Road, east of the North Coast rail line and prior to the Avon River,
    d. All three approaches to the Jacks Road/ The Bucketts Way intersection,
    e. All three approaches to the Waukivory Road/Jacks Road intersection,
    f. Waukivory Road, east of McKinley's Lane.
11. High speed "Weigh-in- motion" equipment (e.g. Culway) installed in conjunction with the above traffic counters at the following locations:
    a. The entrance road to the rail load-out facility, immediately east of The Bucketts Way

b. Fairbairn's Road, east of the North Coast rail line and prior to the Avon River,
c. McKinley's Lane immediately south of the intersection with Waukivory Road.

12. In addition the following information should be provided on a monthly basis:
13. Printouts of records from the coal handling & processing plant - providing accurate figures of run-of-mine coal processed for the previous month,
14. Copies of the mine sign-in sign-out book - providing accurate figures of all employees, visitor, contractor and delivery attendance for the previous month.

HEALTH IMPACTS

15. It is essential that if consent is to be contemplated, then adequate baseline health monitoring for all those within the projected area of air pollution impact needs to be undertaken.
16. Monitoring needs to occur at spatial and temporal resolutions that are meaningful for sensitive receptors. For example, air pollution readings averaged over a 24 hour period obscure shorter lived peak levels which are known to precipitate health impacts. Monitors are placed in fixed locations in larger population clusters will overlook impacts on more scattered residences.
17. The Senate Inquiry supports this approach in recommending "... that pollution monitoring should accurately capture population exposure for communities and homes proximate to pollution point sources". It also recommends that the NEPM Review recommendations be adopted which includes removing population sized thresholds.
18. The project area has also been the focus of attention by AGL exploring for Coal Seam Gas. There has been fracking of at least 12 wells concentrating around their Tiedman Lane property which is very close to the mine site.
19. Monitoring of methane levels and associated hydrocarbons needs to be initiated.
20. A project studying surface water methane levels above and below mining has recently been completed by a Macquarie University honours student. The results are expected this month and may develop and understanding of concerns on mine associated methane

3. Proposed conditions of consent should refusal not be proposed

HOURS OF OPERATION

Reason: Health and amenity.

Reason: To maintain the amenity and quiet enjoyment of adjoining residential premises.

Reason: To avoid impact on public amenity, health and safety, and public interest.

1. A permanent curfew on all night time operations, including maintenance and coal loading.
2. Mining operations, including start-up activities, shall be confined to the hours 7.00am - 6.00pm.
3. Mitigation measures shall be available on request to all residents within the 'Noise Exceedance Zone" including enhanced glazing, insulation, air conditioning and subsidised power (to offset air conditioning costs) at full cost to the development.
4. Where mitigation proves to be inadequate the Proponent is obliged to acquire impacted properties at the owner's request and regardless of the level of exceedance of the PSNL.
5. The proponent will negotiate a 'compensation agreement' with residents in the 'Noise Exceedence Zone' prior to project commencement.
6. The proponent shall fund the establishment of an independently chaired local complaints management committee/community consultative committee comprised of community, industry and state and local government representatives to receive and investigate complaints, and determine and monitor corrective action.
7. Mitigation measures shall be applicable to all prospective residents within the 'Noise Exceedance Zone. Prospective residents means all new houses, constructed within the zone and after the project approval date, for the life of the mine.

NOISE

Reason: Health and amenity.

Reason: To maintain the amenity and quiet enjoyment of adjoining residential premises.

Reason: To avoid impact on public amenity, health and safety, and public interest and avoid disturbance.

9. All noise sources associated with the project shall be assessed to identify noise characteristics of tonality, impulsiveness, intermittency, irregularity or dominant low-frequency content, prior to being utilised in operational activity with both A- and C-weightings being used to determine the low-frequency components.
10. Where analysis of noise sources identifies any of the characteristics listed above, the correction factors listed in the INP shall be added to the predicted noise levels at the receiver before comparison with the criteria.
11. The method to used to assess the extent of low frequency noise shall be that set out in the INP, i.e. a 5dB correction is to be applied in the event of a >15dB difference between C and A weighted noise levels.
12. C-weighted measurements shall be included in all noise monitoring. Where those measurements indicate a significant low-frequency component in noise at a receiver, the correction factors listed in the INP shall be added to the measured noise levels at the receiver before comparison with the criteria.
13. Noise reduction measures in relation to selection and operation of both fixed and mobile plant shall include measures to minimise, at source, the low frequency component of noise created by that plant.
14. A 10% exceedance allowance should not form the basis of relevant conditions of consent. The proponent shall offer at-receiver mitigations at all private residences where the PSNL is exceeded. These mitigations include acoustic insulation, air-conditioning and/or negotiation of a Landowner Agreement.
15. At-receiver noise mitigation such as enhanced glazing, insulation and air conditioning, and / or negotiation of Landowner Agreements in respect of properties where the modeling predicts exceedance of PSNLs shall be completed prior to project commencement.

16. Where the PSNL is exceeded by 5dBA or more at a private receiver, the proponent shall acquire the affected property if so requested by the landowner. The acquisition procedures shall be the same as those set out in condition 11.2 of the Bowens Road North development consent (DA-39-02) relating to the Stratford Mine.

17. In the categorisation of properties according to degree of exceedance of the PSNL, the category ranges shall be amended to describe exceedances up to 2dBA above PSNL, and exceedances 2dBA and above. Similarly, the threshold for inclusion in the Noise Affectation zone shall be expressed as 5dBA and above, rather than >5dBA as proposed in the EIS.

18. Where the predicted noise levels at a receiver exceed the PSNL, the intrusive noise criteria shall be set at the PSNL – not at the predicted level.

19. The location and operation of real time noise monitoring shall ensure that it is possible to discern mine-related noise from other sources, and data from that monitoring shall be included in ongoing assessments of compliance with noise criteria.

20. The real-time noise monitoring shall include response-triggers for immediate operational action to address the cause / source of excessive noise.

21. If a landowner considers the development to be exceeding the impact assessment criteria then he/she shall be entitled to ask the Director-General for an independent review of the impacts of the development on his/her land. The process shall reflect that set out in the consent provisions relating to the BHPbilliton Dendrobium mine.

22. The proponent shall develop a Noise Management Plan that incorporates an adaptive management approach to the minimisation and mitigation of noise derived from the mining operations.

23. The process for development of the Noise Management Plan (and subsequent modifications) shall provide for community input through discussion with the Independently Chaired Local Complaints Committee/Community Consultative Committee. The committee's comments on the Plan shall accompany the Plan when it is submitted to the DRE for approval.

24. Those 'at risk' of noise-related health impacts shall be offered baseline measurements to be funded by the proponent, education about any protective strategies, regular monitoring, assessment of whether any problem is mining noise related and interventions for those deemed to be so affected.

25. An assessment of buildings of sensitive receptors, and individuals ‘at risk’, shall be undertaken prior to project commencement to identify further at-receiver noise mitigation measures.

26. The applicant shall meet the reasonable cost of specialist acoustic advice and legal advice obtained by property owners where predicted exceedances of noise criteria entitle those property owners to at-receiver mitigation, negotiation of landholder agreements or property acquisition-on-request.

Blasting & Vibration

Reason: Health and amenity.

Reason: To maintain the amenity and quiet enjoyment of adjoining residential premises.

Reason: To avoid impact on disturbance, public amenity, health and safety, and public interest.

Reason: To record the structure condition of likely affected properties before works commencement.

27. Maximum allowable blast shall not exceed MIC 414 Kg in order to lower risk levels from fumes and ground vibration

28. The ground vibration criterion applying at any privately-owned receiver shall be 2mm/s. That is, maximum peak particle ground velocity shall not exceed 2mm/s for more than 5% of blasts in any year, and shall not exceed 10mm/s for any blast.

29. If blast monitoring indicates that ground vibration and / or air blast criteria as set out in the ANZEC standard are not being met at any privately owned receptor, the proponent shall acquire that property upon the request of the owner, or enter into a compensation agreement with the owner if that is the owner’s preference.

30. Blasts shall be limited to a maximum of 1 blast per day on site (unless an additional blast is required following a misfire), and 3 blasts per week (averaged over any 12 month period) for the life of the project.

31. Blasting shall be confined to the daytime hours when background noise levels are higher, and shall be within a specified range of times to provide a degree of predictability for receptors likely to perceive the blasting.

32. If requested by the owner of a residence within 2km of the blasting locations, the proponent shall arrange and meet the cost of an independent inspection of the material condition of any structure on the property.

33. Blasting operations shall be suspended under meteorological conditions that may lead to dust and NOx gases drifting over surrounding residential clusters.

34. In addition to the network of fixed-location blasting monitors, additional monitors shall be deployed where receptors report experiencing high level impacts from blasting.

35. If a structural inspection conducted by arrangement by the owner of a residence and the company establishes that structural damage is attributable to activities associated with the mining project, the proponent shall meet the reasonable costs of rectifying that damage, and shall review its mining operations plan to prevent a recurrence.

36. Blast fumes shall be continuously monitored, with levels set for absolute peaks as well as the conventional 1hour averages.

37. Reports on the blast monitoring program, including recorded data on each blast, shall be included in regular environmental monitoring reports presented for discussion at meetings of the Independently Chaired Local Complaints Committee/Community Consultative Committee.

38. A complaints management system shall be implemented to address matters raised by residents and landowners affected by blasting. That system shall record particulars of the complaint including a description of the reported matter, the location of the complainant, the results of the company's investigation of the matter and its final response.

39. The record of complaints shall be available on the company's website and be presented for review at meetings of the Independently Chaired Local Complaints Committee/Community Consultative Committee.

VISIBILITY & LIGHT

Reason: Health and amenity.

Reason: To maintain the amenity and quiet enjoyment of adjoining residential premises.

Reason: To avoid impact on disturbance, public amenity, health and safety, and public interest.

Reason: To minimise impact on surrounding properties, improved visual appearance and amenity for locality.

40. The proponent shall be obliged to acquire any property, should the owner apply, of those impacted by loss of scenic amenity.
41. The proponent shall negotiate a 'compensation agreement' with residents who are in the 'Visibility Impact area' and who do not wish to leave, prior to project commencement.

NIGHT LIGHTING – DIRECT EMISSION AND GLOW

Reason: Health and amenity.

Reason: To maintain the amenity and quiet enjoyment of adjoining residential premises.

Reason: To avoid impact on disturbance, public amenity, health and safety, and public interest.

Reason: To minimise impact on surrounding properties, improved visual appearance and amenity for locality.

Reason: To protect the environment and amenity of surrounding properties.

42. Night time operations shall be prohibited due to the significant impact of light pollution on the community.
43. Where approval is given for night-time activity the following conditions apply:
44. Lighting systems shall be designed to world's best practice for light minimization and to prevent direct light will leaving the mine working areas.
45. Mitigation measures shall include quantitative thresholds above which pre-specified management action is mandated. Mitigation measures shall allow for the prevention of the use of lighting in areas of persistent complaint until an appropriate ameliorative solution is developed and implemented.
46. Light management shall include continuous automatic light monitoring stations representative of all reasonable direct viewing positions.

47. The proponent shall instigate an independently chaired local complaints management committee/community consultative committee comprised of community, industry and state and local government representatives to receive and investigate complaints, and determine and monitor corrective action.

TERRESTRIAL ECOLOGY

Reason: To protect the environment.

Reason: To preserve the natural environment.

48. The mine plan shall be revised to avoid the clearance of the outlying remnants of the dry rainforest Vulnerable Ecological Community in the southeast part of the project area.

49. Should clearance of the VEC outliers be found to be unavoidable, the rehabilitation plan shall be amended to provide for the restitution of that vegetation community as part of the site rehabilitation.

50. To improve the long-term viability of the dry rainforest VEC within the Biodiversity Offset Area, revegetation within the Offset Area should include restitution of dry rainforest in areas from which it has been cleared in the historical period.

51. Prior to commencement of any clearing of native vegetation inside the project area a more extensive fauna survey shall be undertaken to establish whether a Brush-tailed phascogale population occurs there. If a population is found, additional measures to avoid and mitigate impacts on that species, including reduced clearing of habitat, shall be identified and implemented.

52. To minimise the risk of vehicles impact on fauna utilising the remnant vegetation along McKinleys Lane, a speed limit of 40km/h shall be applied to the mine area access road where it approaches and crosses McKinleys Lane. Compliance with that limit shall be monitored and if it is found that it is not being complied with, traffic-slowing measures such as placement of speed humps shall be installed.

53. Where monitoring of the surviving populations of Grey-crowned babblers and Squirrel gliders in the project area indicates adverse impacts on those populations are occurring, additional measures shall be identified for immediate application to reduce those impacts to levels that would not jeopardise those populations.

54. Should there be no large mature trees available for retention on both sides of the new mine access road where it crosses McKinleys Lane near the intersection with Waukivory Road, suitable glider poles shall be erected in appropriate locations as directed by a suitable qualified ecologist.

55. The findings of ecological monitoring conducted in connection with the project shall be included in environmental performance reporting presented on a regular basis for discussion by the relevant Community Consultative Committee.

56. Management Plans relevant to the management or mitigation of impacts of the project on the terrestrial ecology – including the Biodiversity Management Plan – shall be presented for discussion by the relevant Community Consultative Committee prior to submission of a Plan for approval, and the CCC's comments on the draft Plan shall be provided to the regulator when the Plan is submitted for approval.

57. Establishment of the offset area and implementation of appropriate management practices shall commence prior to the commencement of ground disturbance.

58. The portion of the proposed Biodiversity Offset Area that lies within the area of MLA 446 shall be excised from the MLA, or an alternative offset area identified.

REHABILITATION – FINAL LANDFORM AND LANDUSE

Reason: To ensure rehabilitation of the site.

59. The rehabilitation program shall be the subject of a separate Rehabilitation Plan that would incorporate an adaptive management approach to the progressive rehabilitation of the project area.

60. The process for development of the Plan (and subsequent modifications) shall provide for community input through discussion with the Independently Chaired Local Complaints Committee/Community Consultative Committee. The committee's comments on the Plan shall accompany the Plan when it is submitted to the DRE for approval.

61. The surety provided by the company in respect of site rehabilitation shall be structured to avoid any potential for a future amendment of the mine plan that would remove the requirement to back-fill all voids removed on the basis of changed economic circumstances.

62. Rehabilitation of the area from which the remnant area of dry rainforest is to be cleared shall include re-establishment of that vegetation type in the patches from which it has been cleared rather than conversion of those areas to pasture with isolated tree lots.

63. Reports on the progress of rehabilitation work shall be included in the regular reporting of environmental management provided to the Independently Chaired Local Complaints Committee/Community Consultative Committee.

64. A property vegetation plan (PVP) under the NSW Native Vegetation Act shall be developed with the Catchment Management Authority (Local Land Services) to ensure the long term retention of native vegetation belts and woodland re-established as part of the rehabilitation of the project area.

FLOODING & WATER

Reason: To prevent the placement of any structures which may impede the 100 year ARI flood.

Reason: To ensure protection of life and property.

65. No approval for development on the floodplain shall occur until the Council Flood Study is completed and the data used to reassess the mine impacts.
66. There shall be no development of visibility barriers or sediment dams within the PMF flood level.
67. The conveyer shall be redesigned to and analysed for impacts associated with a PMF level.
68. A full plan for post mining landform construction shall be developed and analysed for impacts on surface and ground water on-site and downstream prior to site establishment.
69. Water shall be of better quality that that required by the NSW Water Quality Objectives
70. The approximate 39,00 tonnes of salt residual in the mine pits and “environmental dams” at the end of mining shall not move into the ground and surface water systems.

TRAFFIC & TRANSPORT

Reason: To ensure public safety and protect public infrastructure and utilities.

Reason: To ensure safe traffic movement.

71. The Proponent shall, prior to commencement, undertake meaningful consultations with the Australian Rail Track Corporation (ARTC) regarding the standard of rail

crossings at Fairbairns Road and Jacks Road. The consultation shall include reference to proposed construction traffic (both heavy & light) as well as ongoing production traffic. Such traffic figures shall be based on actual traffic counts from active mines and current modeling.

72. The Proponent shall, at its election, either:

    (a) Upgrade the rail crossings to the standard identified in the consultations undertaken in compliance with clause 1 to the ARTC and Council's satisfaction; or

    (b) pay Council an amount equal to the amount required to perform the work that otherwise would have been required in respect of clause 68(a).

73. The Proponent shall, prior to construction, pay Council an amount reasonably necessary to permit Council to obtain a report setting out the road and pavement condition (for the purpose of ascertaining future dilapidation) of Fairbairns Road.

74. The Proponent shall, upon completion of construction, pay Council an amount reasonably necessary to permit Council to obtain a report setting out any identified damage caused to Fairbairns Road (including any diminution of road life or loss of service) occasioned by the Proponent's construction work.

75. The Proponent shall, at its election, either:

    (a) restore any damage identified in the report obtained in compliance with clause 4 to Council's satisfaction and compensate Council in respect of any identified loss of life or loss of service of that road; or

    (b) pay Council an amount equal to the amount required to perform the work and make the compensation that otherwise would have been required in respect of clause 71(a).

76. The Proponent shall (for the section of Waukivory Road between Mckinleys Lane & The Bucketts Way and for Jacks Road between Waukivory Road & The Bucketts Way) pay Council's reasonable costs of obtaining an appropriately qualified person to conduct a route and upgrade assessment. Such route and upgrade assessment shall be assessed in accordance with Austroads "A Guide to Geometric Design of Rural Roads" 2009 and be based on actual traffic counts from active mines and current modeling so as to address the following:

    (a) lane widths and shoulder widths;

    (b) clear zone encroachments and risks identified in road safety audits;

(c) intersection design; The Bucketts Way, Combo Road, Maslens Road, Angophora Road, Waukivory Road and Mckinleys Lane, including any realignment of the side roads as necessary for safe intersection design;

(d) bus stops and property accesses affected by the proposal;

(e) bridge width and approach alignment; and

(f) overtaking lanes, climbing lanes and/or slow vehicle turnouts.

77. The Proponent shall (for the section of Waukivory Road between Mckinleys Lane & The Bucketts Way and for Jacks Road Between Waukivory Road & The Bucketts Way) pay Council's reasonable costs of obtaining an appropriately qualified person to conduct an assessment on the pavement design to ensure that the full 30 year design life is achieved under the increased traffic projections. Such projections shall be based on actual traffic counts from active mines and current modeling and having regard (amongst other things) to background traffic growth.

78. The Proponent shall (for the section of The Bucketts Way between the Great Lakes Shire Boundary and Jacks Road) pay Council's reasonable costs of obtaining an appropriately qualified person to conduct an assessment on the pavement condition and to quantify the impact and pavement degradation likely to occur under the increased traffic projections. Such projections shall be based on actual traffic counts from active mines and current modeling and having regard (amongst other things) to background traffic growth.

79. The Proponent shall (for the intersection of Fairbairns Road & The Bucketts Way and for the intersection for the access road to proposed coal load-out facility & The Bucketts Way pay Council's reasonable costs of obtaining an appropriately qualified person to conduct an upgrade assessment. Such upgrade assessment shall be assessed in accordance with Austroads "A Guide to Geometric Design of Rural Roads" 2009 and be based on actual traffic counts from similar construction activities associated with active mines and current modeling so as to address the following:

(a) lane widths and shoulder widths;

(b) clear zone encroachments and risks identified in road safety audits;

(c) intersection design.

80. The Proponent shall, at its election, either:

(a) undertake any further works recommended to be undertaken following assessment of the matters set out in clauses 6 to 9; or

(b) pay Council an amount equal to the amount required to perform the work that otherwise would have been required in respect of clause 10(a).

81. The Proponent shall, prior to construction, apply to Council for a s138 Permit to (without limitation) occupy the road for construction purposes, set up of work sites and install temporary warning signs.

82. The Proponent shall not commence any work on the mine site that would, but for this Approval, be impermissible before the work set out in clause 10 is completed whether or not that work is performed by the Proponent, the Council or any other person.

83. The Proponent shall not commence any work on the mine site prior to the completion of the upgrade of Waukivory Road between Mckinleys Lane & The Bucketts Way and for Jacks Road between Waukivory Road & The Bucketts Way.

84. The Proponent shall ensure that heavy vehicle traffic related to Gloucester Resources Limited's Rocky Hill Coal Project does not use the "Gloucester Heavy Vehicle Eastern Bypass"

85. The Proponent shall in respect of the section of Waukivory Road between Mckinleys Lane & The Bucketts Way and for Jacks Road between Waukivory Road & The Bucketts Way enter into a maintenance agreement with Council for the maintenance of the roads for the life of the mine (Works Endorsement deed). The Works Endorsement Deed shall be based on prevailing roads legislation and the Aus-Spec (Nat-Spec) Maintenance Specification.

86. The Proponent shall pay to Council an amount in lieu of s94 contributions in respect of ongoing cumulative mine related road depreciation and maintenance.

INDIGENOUS HERITAGE

Reason: Heritage conservation

87. An independent archaeologist shall be present onsite during operations that disturb any topsoil material, to undertake a periodic inspection of that material as it is disturbed to identify any artefacts before they are destroyed or lost.

HEALTH IMPACTS

Reason: Health and amenity.

Reason: To maintain the amenity and quiet enjoyment of adjoining residential premises.

Reason: disturbance, public amenity, health and safety, and public interest.

88. A comprehensive Health Impact Assessment shall be conducted (including community education about preventive strategies, a health audit of the current health status of those living within 5km of the proposal, ongoing monitoring of this group and a compensation assessment system for any with suspected mine related health damage. This shall provide 'sufficient baseline data' in line with the DG's requirements. This shall occur before any activity associated with the project is conducted.
89. Specific attention shall be given to young people who are 'High Risk' due to incompletely developed lungs, their immature immune defence system, and high respiratory rates. This together with the presence of 3 schools within 5km of the mine suggests baseline examinations, monitoring and community education, particularly for pregnant women, are still very necessary for this group.
90. The proposal shall adopt a minimum buffer distance of several km's (to be negotiated) with offer of purchasing of properties within the buffer zone
91. All wagons in the rail fleet shall be covered when both loaded and unloaded.
92. A stringent diesel emission standard shall be developed for non road vehicles and machines.
93. A monitoring program for diesel emissions exposure of miner site workers shall be developed and implemented.
94. The proponent shall reassess the air quality impacts prior to site establishment so that the range of wind conditions known to occur within the valley are explicitly and transparently addressed. This information shall be made available to the established Independently Chaired Local Complaints Committee/Community Consultative Committee.
95. The coal stockpile, CHPP, and conveyor shall be covered.
96. Haul roads shall be regularly sealed or veneered.
97. Dwellings located in close proximity to the mine shall be offered air purifiers and an assessment made of their efficacy.

98. In recognition of historically low background particle levels and the different level of danger associated with fine and ultrafine particles, annual average annual PM2.5 levels be set at 6 microgm/cubic metre.

99. The annual PM10 level shall be set at 20 microgm/cubic metre.

100. Hydrocarbons in domestic rainwater tanks shall be investigated and tank water quality shall be monitored and filters supplied where necessary.

101. Risks to drinking water shall be mitigated by an extension of the town water supply as far as Stratford Village at the cost of the proponent.

102. Health risks shall be reassessed based on a production rate of 2.5 Mta.

103. The proponent shall implement an independently chaired local complaints management committee comprised of community, industry and state and local government representatives to receive and investigate complaints, and determine and monitor corrective action. This committee should have the power to impose stop-work orders in cases where persistent problems remain unresolved.

VOLUNTARY PLANNING AGREEMENT

The proponent shall be required to enter into genuine negotiations with Council for the establishment of a voluntary Planning Agreement that will provide a material public benefit that reflects the values of Council's adopted Framework for Protecting and Enhancing Our Community – Future Development Principles.

Appendix 1

Submission on Socio Economic Appendix of Environmental Impact Statement of Rocky Hill Coal Project

Prepared for	Gloucester Shire Council
Client contact	Graham Gardner/Danny Green
Ecolarge contact	Rod Campbell
Date	25 Oct, 2013
Status	FINAL

Summary

The Rocky Hill Coal Project is a proposed open cut mine in the Gloucester Local Government Area (LGA), around 260km north of Sydney. The project has attracted controversy in the Gloucester area due primarily to its proximity to the Gloucester township and residential areas. Gloucester Shire Council have commissioned Economists at Large to review the socio economic assessment of the project, prepared by consultants Key Insights. The socio economic assessment is in two main parts, social and economic.

The social section identifies the strong community opposition to the project and its many potential impacts on the community. Key points include:

- Around 80% of survey respondents oppose the Rocky Hill project
- Over 75% of respondents are concerned about impacts on:
    - Visual amenity
    - Water
    - Dust
    - Noise
    - Agriculture
    - Town character
- Between 42-50% of respondents felt the project would assist existing businesses or attract more businesses to Gloucester.

Our criticisms of the social part of the socio economic assessment relate to:

- Optimistic estimate of local employment – goals of 75% resident employment are unlikely to be achievable based on data from other projects.
- Cumulative impact assessment which ignores data relating to other projects.

The economic section of the Key Insights assessment is flawed and does not present a strong economic case for the project. The key flaws in the economic section are:

- No cost benefit analysis
- No demonstration of the financial viability of the project
- Inappropriate use of multiplier analysis
- Flawed and non-transparent calculation of royalties and tax revenues
- Plagiarism and poor referencing

No cost benefit analysis

Without cost benefit analysis (CBA) there is no quantitative assessment of if the project is in the interests of the NSW community. CBA is the economic tool that asks if the costs to community welfare are compensated for by the benefits of the project. CBA is required for project assessment under the Director General's Requirements for the project as well as Treasury and Department of Planning guidelines. CBA has been a part of all coal project assessments in NSW for many years. The omission of CBA from this assessment is not explained and is a major shortcoming.

Financial viability

CBA can also assist in assessing the financial strength of the project. If a project is not financially viable, benefits through employment and royalties will be deferred or reduced. In the current economic conditions many new coal projects are facing financing difficulties. Our analysis based on best available data suggests the project is not financially viable, with a **net present value negative $10.8 million**. This means that over the lifetime of operations for the mine, as currently planned, the project will cost more to run than it will earn in revenue. Despite requests to the proponent, data usually available to investors was not provided. The proponents reviewed our financial modelling and we specifically asked if there were any assumptions that seemed unreasonable. They offered no comment.

It is often assumed that a proponent would not pursue a project of questionable financial viability. However, in this case there is incentive for the proponent to pursue environmental approvals, both for the option of development in the future if coal prices rise sufficiently, or to increase the value of the project for sale, possibly to the operators of the neighbouring Stratford mine.

A key implication of the financial difficulties the project faces is that even if approved, it is unlikely to proceed as planned. Delay would seem inevitable. While any benefits from the project would be delayed, the impacts on the residential property market south of Gloucester town would remain. Further costs to the wider tourism industry and "tree change" population would also be incurred. The ongoing stress and mental wellbeing of residents in the southern estates should also be considered.

Inappropriate use of multiplier analysis

Instead of CBA or financial analysis, the economic section focuses on the results of a multiplier model (also known as an input-output model) of the projects economic impacts. The assumptions in this model ensure that the positive economic impacts will be exaggerated while the costs are ignored. Key assumptions in this model include:

- No resource constraints – the model assumes that there is an infinite amount of skilled labour and other inputs that can be used by the project. In reality skilled workers and other inputs are scarce in Gloucester.
- Fixed prices – the model assumes that even though the project is and located in a small economy, wages, rents and costs will be unaffected. In fact Gloucester has seen significant changes in prices for land and labour.

Because of these flaws bodies such as the ABS and NSW treasury warn against using this form of analysis for project assessment. This methodology was also criticised in the recent Warkworth coal project case.

Aside from the flaws inherent in multiplier models, the authors have based their analysis on data from the 1990s which predates the mining boom and major changes in technology such as email and the internet. This heavily compromises the usefulness of any results of this analysis.

The socio economic assessment estimates the increase in jobs for Gloucester residents at between 13 and 61. We suggest the likely net increase in employment is between 15 and 30, an increase of around 1.5% of the Gloucester labour force.

Flawed and non-transparent calculation of royalties and tax revenues

Income and payroll tax estimates provided are linked to the multiplier analysis above and therefore heavily overstate these values. The report makes an estimate of royalties at $186m. There is no working shown, but this seems to be based on:

- Optimistic price assumptions
- Ignoring royalty deductions
- Undiscounted future values

We estimate the present value of royalties at $59.5m, just 32% of the amount estimated by the report.

Plagiarism and poor referencing

Parts of the report are not the work of the authors but are plagiarised from other reports. In particular, some sections are taken from Minerals Council of NSW's public relations documents. There is no attribution of these plagiarised sections to Minerals Council. Other sections are compromised by using poorly referenced coal company data rather than data from government agencies. There is no reference section or bibliography.

Conclusion

The socio economic assessment identifies the strong community opposition to the project based on potential impacts to Gloucester's amenity, social fabric and other industries. It does not, however, present a convincing case that these impacts will be offset by economic benefits. Although it is not clear from Key Insight's report, the project seems to be financially unviable under current conditions, with a negative present value of $10.8 million. Approving the project under these conditions would not result in any employment or revenue benefits and would indefinitely extend problems relating to the uncertainty of the project on residents, particularly those to the south of Gloucester township.

If coal prices changed and the project was able to proceed financially, the main benefits of the project for the NSW community appear to be a net increase of up to 30 jobs for Gloucester residents and royalty revenue to the state government of $59.5m in present value terms. Against this, decision makers need to balance the opposition of 80% of the Gloucester community, based on costs to residents in reduced property values and reduced amenity as well as the damage to other important industries such as tourism and agriculture. While quantifying these values is beyond the

scope of this report we suggest that the costs do not outweigh the benefits and therefore recommend council oppose the project.

CONTENTS

Introduction

The Rocky Hill Coal Project is a proposed open cut mine in the Gloucester Local Government Area (LGA), around 260km north of Sydney. The project has attracted controversy in the Gloucester area due primarily to its proximity to the Gloucester township and residential areas. The proposal is located only 5 kilometres from the town centre and around 1 kilometre from residences. While most residents are concerned about amenity issues that would result from the proposal, some support the project for its potential employment.

An environmental impact statement (EIS) has been prepared for the project, which includes a socio economic assessment by Key Insights Pty Ltd (EIS Specialist Consultant Studies Compendium Volume 4, Part 14). The EIS is currently on display and open for public submissions as part of the NSW state government's assessment process.

Gloucester Shire Council have commissioned Economists at Large to review the socio economic assessment by Key Insights. The review is intended to contribute to Council's submission on the Rocky Hill EIS. Economists at Large have written two other reports for Council, a socio economic profile of the LGA (Economists at Large, 2013a) and an assessment of the cumulative effects of resource projects on the LGA (Economists at Large, 2013b). Both of these reports are referred to in this review.

The Key Insights report consists of two broad sections – social (chapters 2-5) and economic (chapter 6). Other chapters are largely introduction and conclusions. The social section is based on:

- A "community profile" based on census and other data
- A description of community facilities and infrastructure based on local interviews and data
- A survey of residents' attitudes towards the project
- Interviews with a wide range of stakeholders

The economic section is based on:

- Multiplier analysis
- Calculations of taxes and royalties
- Other secondary data

This approach is a departure from that taken by most socio economic assessments of major projects in NSW, particularly major coal projects. Some of these changes are a welcome addition to the assessment process, while others are a major step backwards. In general, the social section of the report has been conducted well and we applaud the publication of survey and interview results. The economic section, by contrast, is of low quality. It contains numerous flaws, departures from standard economic practice and sections plagiarised from coal industry publications.

Social section

The social section of the Key Insights report, mainly chapters 2-5 are largely based on data from the Australian Bureau of Statistics (ABS), local interviews and other well known sources. Many of the key findings echo those of (Economists at Large 2013a), which also makes extensive use of ABS census data and interviews with similar stakeholders. Key points include:

- Gloucester's population is steady, with average age higher than NSW as a whole and low unemployment.
- Employment is focussed on agriculture, health care, retail, construction and tourism.
- High rates of home ownership.
- Descriptions of childcare, healthcare, education and other facilities.

Chapter 4 outlines the survey conducted on community perceptions of the Rocky Hill project. The survey was delivered by mail to 88% of the shire's 2300 households, with replies received from 493 households – over 20%. Key results include:

- Around 80% of respondents oppose the Rocky Hill project (p59, 57)
- Over 75% of respondents are concerned about impacts on (p57):
    - Visual amenity
    - Water
    - Dust
    - Noise
    - Agriculture
    - Town character
- 42-50% of respondents felt the project would assist existing businesses or attract more businesses to Gloucester.

These results closely reflect the results of a council survey conducted in 2011, which also showed strong opposition to the project[9].

Interview summaries in Chapter 4 reflect the survey result's picture of widespread opposition to and concern about the project.

Chapter 5 is based largely on these interviews and discusses impacts on:

- Health
- Mental health
- OH&S
- Social infrastructure and facilities
- Social fabric
- Employment
- Housing
- Cumulative impacts

[9] http://www.gloucester.nsw.gov.au/Planning---Development/Mining-Applications/Mining-Survey-Results

The authors deserve credit for presenting many results that are critical of the project and not shying away from the community opposition and strong concerns about the project, eg:

- Health issues associated with air, water, noise and light impacts
- "Heightened levels of stress associated with the Rocky Hill Coal Project" (p77)
- Residents desire to remain "a town with mines rather than a mining town" (p84)

Our only significant criticisms of the Key Insights report social sections

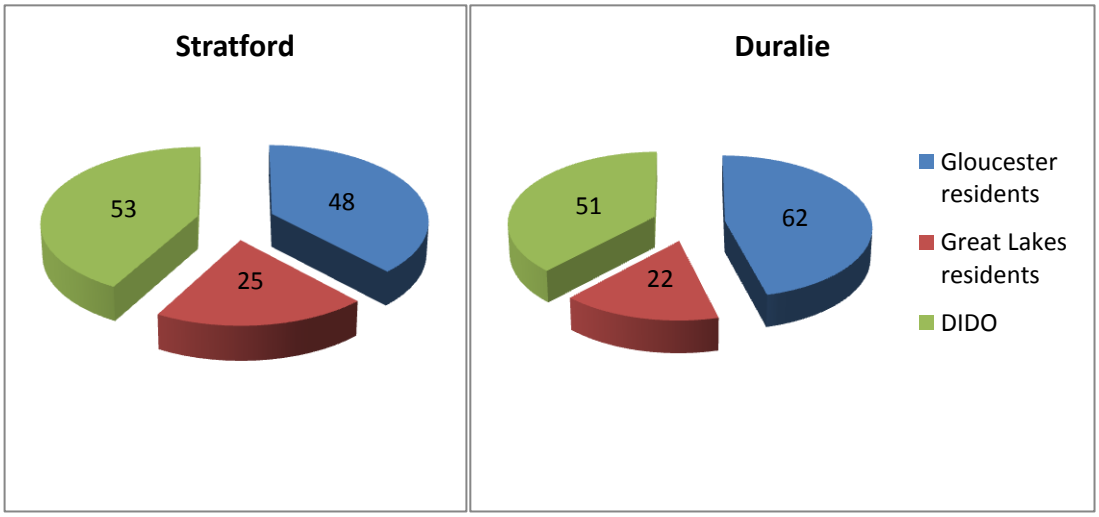
Employment of local workers

On p87, Key Insights state:

> *This SEIA recommends a target of 75% of workers to reside in the Shire or nearby areas. It is anticipated that this target is achievable.*

Key Insights view that this target is achievable is not based on any data, analysis or references. In Economists at Large (2013b) the current and forecast levels of local employment at the Stratford and Duralie mines are discussed at length, based on reports commissioned by those mines, (Gillespie Economics, 2012) and (Gillespie Economics, 2009):

Figure 1: Local employment at existing coal projects



(see Economists at Large 2013a, p59)

Given that these projects employ less than 50% Gloucester residents, it seems unlikely that the Rocky Hill project could achieve this goal.

Section 5.8 Cumulative impacts and 6.10 Cumulative economic impacts

Similarly, these sections make no attempt to assess the data available for the cumulative economic and social impacts of the projects proposed for the Gloucester area. Economists at Large (2013b) is devoted to this topic. The report examines the available data on resident and non-resident employment in these projects and develops three scenarios for the possible influx of workers (p6):

Figure 2: Cumulative employment impacts - high scenario

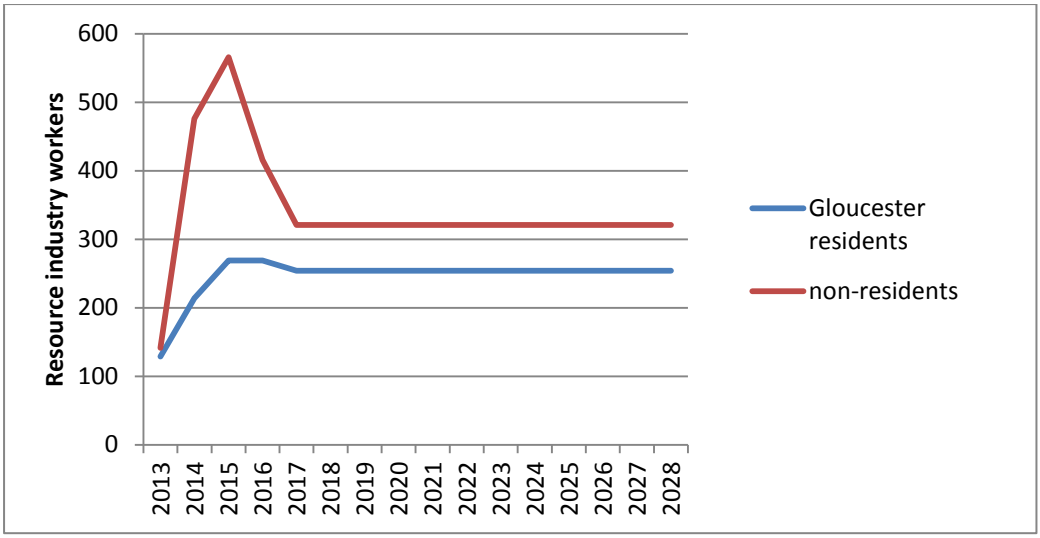


Figure 3: Cumulative employment impacts - mid scenario

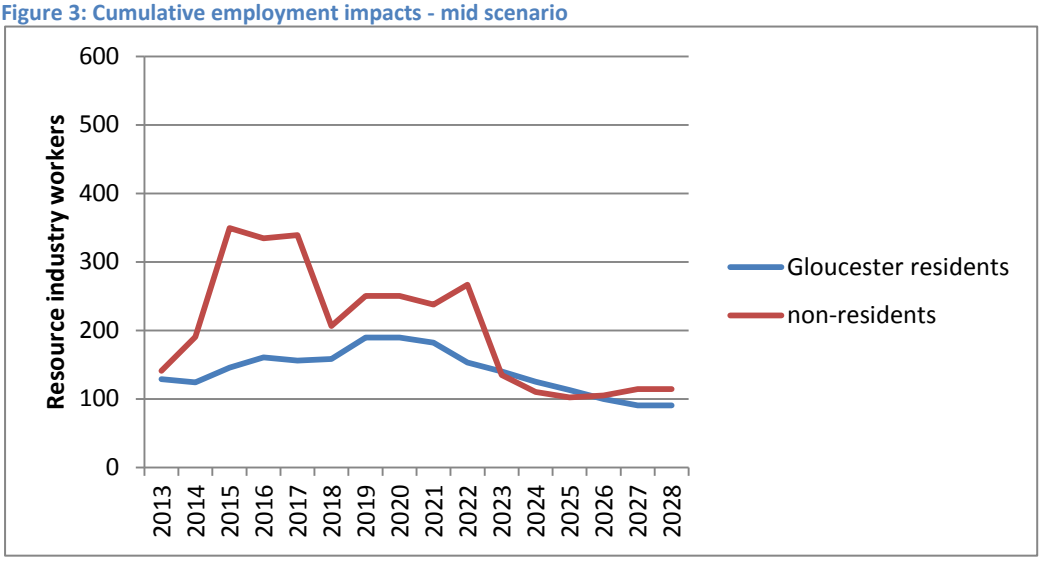
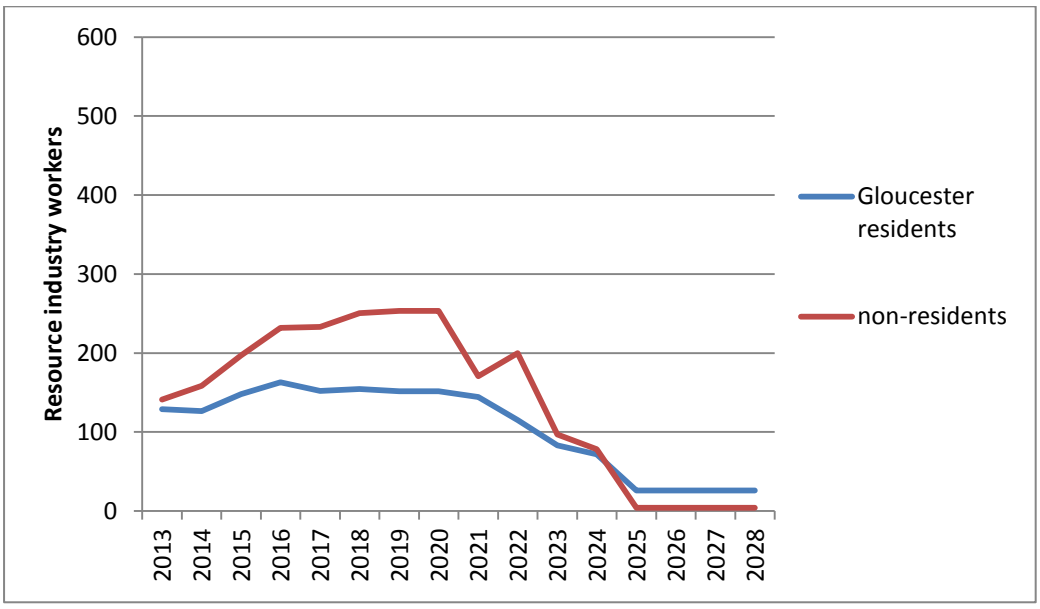


Figure 4: Cumulative employment impacts - low scenario



Economists at Large (2013b) finds there is the potential for up to nearly 600 non-resident workers to be commuting into Gloucester by 2015, while the most likely scenarios see a modest increase in resident employment, followed by a downturn. The report concludes:

> *the cumulative effects of resource projects proposed for the Gloucester LGA have the potential to seriously affect the amenity of the LGA, other industries important to the Gloucester economy and the overall welfare of Gloucester residents. The pace and nature of these developments should be made clear to planners who should work with agencies and proponents to ensure the economic and social welfare of Gloucester is protected.(p7)*

Economic section

The economic section of the Key Insights report is flawed and does not present a strong economic case for the project. The key flaws in the economic section are:

- No cost benefit analysis
- No demonstration of the financial viability of the project
- Inappropriate use of multiplier analysis
- Flawed and non-transparent calculation of royalties and tax revenues
- Plagiarism and poor referencing

In fact, the economic case for the project is weak. It is unlikely to be financially viable under current economic conditions. We estimate the net present value of the project at negative $10.8 million, meaning it would lose money if it commenced today. This means claimed employment and financial benefits are unlikely to occur in the near to medium term, while many costs, particularly those to residents living in estates south of Gloucester town would continue.

Key Insights' methodology overstates employment and revenues. If the project were to go ahead in improved market conditions, we estimate the present value of royalties at $59.5 million, compared to Key Insight's undiscounted estimate of $186 million.

No cost benefit analysis

The socio economic assessment of the Rocky Hill Project by Key Insights does not include the most important economic tool for project assessment, cost benefit analysis (CBA). CBA is important as it is the one form of analysis that asks the question "does this project make us better off". The assessment contains no systematic analysis of whether the benefits of the project – mainly royalties and employment will outweigh the costs of building the project and costs that weigh on the local community, other industries and the environment.

Although they never provide analysis of costs and benefits, Key Insights claim:

> *This report concludes that, with the implementation of the recommendations, there would be a net socio-economic benefit associated with the Proposal.(p18)*

> *On balance, there would be a net social and economic benefit associated with the Rocky Hill Coal Project. (p169)*

Without CBA this claim is not based on any structured assessment and is entirely speculative and qualitative.

By omitting CBA, Key Insights' analysis does not fulfil the Director General's Environmental Assessment Requirements (DGRs) for this project. In particular, the DGRs require the socio economic assessment to provide:

> *a detailed assessment of the costs and benefits of the development as a whole, and whether it would result in a net benefit for the NSW community. (p4)*

This is a clear instruction for CBA as has been common practice in all coal projects in NSW for many years, see for example (ECS, 2013; Gillespie Economics, 2008, 2013). Key Insights claim (on page 27) to have consulted the Department of Planning's *Draft Economic Evaluation in Environmental Impact Assessment* (Gillespie & James, 2002), but this document also makes clear:

> *The accepted technique for assessing changes in the economic well-being of a community is benefit-cost analysis (BCA). This is the main tool of economic efficiency analysis, especially where unpriced effects must be taken into account. In a benefit-cost analysis, maximum economic efficiency is achieved when the present value of net benefits (total benefits less total costs) is maximised. This evaluation criterion is described as net present value (NPV).*
>
> ***Note**: **To conduct a proper economic evaluation of the options associated with a proposed development that is likely to have significant environmental impacts it is essential to undertake a benefit-cost analysis**.(p8, emphasis in original)*

Key Insight's lack of cost benefit analysis is particularly concerning following the publication in November 2012 of the NSW Department of Planning and NSW Treasury's *Guidelines for the use of Cost Benefit Analysis in mining and coal seam gas proposals*. The guidelines reinforce the need for cost benefit analysis identified in the DGRs:

> *The cost benefit analysis is a tool to help inform decision making. The overall net public benefit is a matter for the consent authority which, based on the Minister for Planning and Infrastructure's delegations, is typically the Planning Assessment Commission (PAC) for State significant mining and coal seam gas proposals.*
>
> *The PAC will consider whether the proposal will provide a net public benefit, informed by a CBA undertaken by suitably qualified economic professionals. The CBA will need to be consistent with these Guidelines and other supporting material published by the Government. (p2)* (NSW Treasury, 2012)

The guidelines were published following extensive debate over the quality and technical aspects of CBAs of coal projects in NSW. See for example:

- Re Stratford Extension proposal
  - (Gillespie Economics, 2012),
  - (Economists at Large, 2013c)
  - (Gloucester Advocate, 2013)
- Re Maules Creek coal proposal
  - (Gillespie Economics, 2011)
  - (Hansen Bailey, 2011)
  - (Bennett, 2011)
  - (Campbell, et al 2011)
- Re Bulga Extension proposal –
  - (ECS, 2013)
  - (Economists at Large, 2013d)

CBA has been central to the recent legal proceedings around the Warkworth extension case and the Ashton SEOC case in the NSW Land and Environment Court. In his judgement on the Warkworth case Preston CJ noted:

> *The [CBA], and the Choice Modelling on which the [CBA] depends, are also deficient. They do not consider all of the relevant matters that need to be considered by an approval authority in determining a project application, the relevant matters at the level of particularity required, or in accordance with the factual findings and inferences I have made in relation to the relevant matters.(p155)*

The appeal against the Ashton SEOC project is still before the court. The court heard evidence from three economists over two days, including the lead author of this report, Roderick Campbell. The evidence presented included extensive discussion of CBA of that project.

Most recently, the NSW Minister for Planning and Infrastructure has proposed legislation that prioritises the economic importance of resource projects. Specifically:

> *In determining an application for consent for development for the purposes of mining, the consent authority must consider the significance of the resource that is the subject of the application, having regard to:*
>
> *(a) the economic benefits, both to the State and the region in which the development is proposed to be carried out, of developing the resource* (NSW Minister for Planning and Infrastructure, 2013) *p4*

Without CBA, it is impossible for decision makers to assess economic net benefits to the state and to the region as this new legislation would require.

Key Insights' failure to provide CBA represents a major step backwards for economic assessment of coal projects in NSW. The failure to provide this analysis is difficult to understand given the urgings of the DGRs, Treasury and Planning guidelines, the decision of the Land and Environment Court and recent changes to legislation.

Financial and economic viability of the Rocky Hill project

As the Key Insights study lacks any cost benefit analysis, decision makers are given little insight into the financial case for the mine. This seems particularly inappropriate at a time when many Australian coal projects are being scaled back or shelved:

> *Conditions within the coal industry in Australia and other regions of the world remain challenging with many coal mining companies taking steps to improve the profitability of their businesses and reviewing their ongoing position in the industry. Several companies have taken a decision to sell assets and many of the projects proposed in earlier and better times are being reviewed. Some of these projects have been shelved.* (Yancoal, 2013a)*p2*

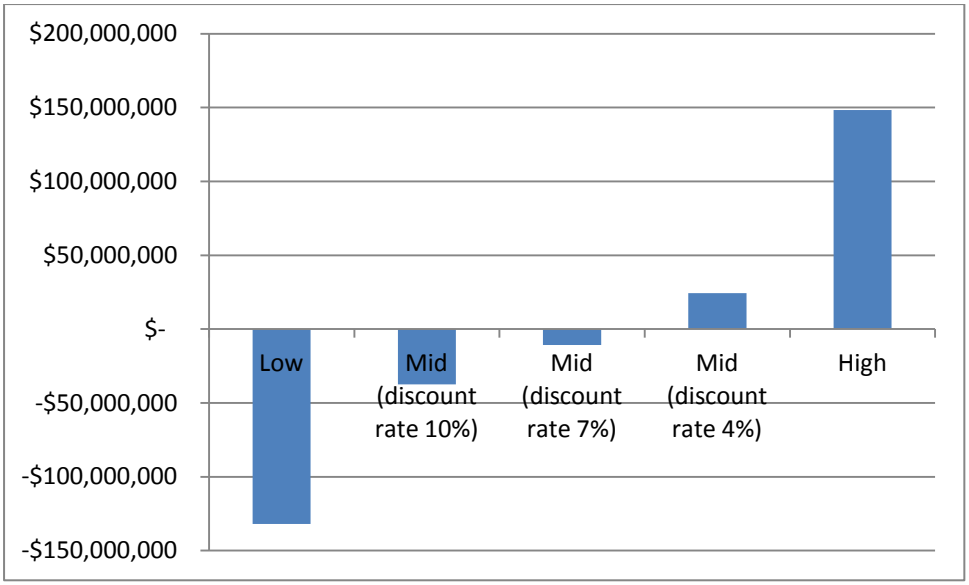
> *AT least 60 jobs will go from the Duralie and Stratford coalmines at Gloucester as owner Yancoal cuts production in response to falling coal prices.*
> *Stratford and Duralie general manager Doug Gordon said Stratford – which operates five days a week – would shut its Roseville Pit operation.*(Kirkwood, 2013)

> *"Current price levels are unsustainable in the medium term, with close to 30 per cent of seaborne thermal production being cash-cost negative,'' the company said.*
> *The pessimism will result in the Wandoan project, a greenfield thermal coal development in Queensland, being frozen or divested, after it was listed on Wednesday as one of seven Australian coal prospects that were now ''on hold''.* (Ker, 2013)

The Key Insights assessment, indeed the entire EIS, includes no direct discussion of coal prices, exchange rates, coal specifications or likely cost structure. Given that the Rocky Hill project, like the Wandoan project, is a greenfield project, its finances should be questioned particularly closely. As part of this research we have repeatedly requested financial data from GRL, who have not provided the basic information that would usually be supplied to investors such as forecast quality, prices and basic cost structure.

Despite the lack of formal analysis and data, some estimates can be made based on information in the EIS, market data and information from the neighbouring Stratford and Duralie mines. We have developed discounted cash flow models of various scenarios for the Rocky Hill project based on these data sources. Our results suggest the project is financially unviable under present conditions and dependent on improvements in coal prices or cost structure to become viable.

Figure 5: Net present value of project under various scenarios



(Note: Low and High scenarios both use a 7% discount rate)

The modelling assumptions and sources for the mid estimate are presented below. See appendix for detailed discussion and discounted cash flow model.

Table 1: Modelling assumptions used for mid estimate of Rocky Hill Coal Project financial viability

Item	Unit	Value	Source
Project life	Years	14	EIS section 2.1.4
ROM coal production	Million tonnes	22.9	EIS section 2.6.4
Average yield	%	65%	Yancoal quarterly reports
Product coal	Million tonnes	14.9	Ecolarge Calculation
Metallurgical coal	%	36%	Yancoal quarterly reports
Thermal coal	%	64%	Yancoal quarterly reports
Metallurgical coal production	Million tonnes	5.4	Calculation
Thermal coal production	Million tonnes	9.6	Calculation
Metallurgical coal price	2012 USD/t	$139	(CBA, 2013)
Thermal coal price	2012 USD/t	$92	(CBA, 2013)
Exchange rate	USD:AUD	0.88	(CBA, 2013)
Cash costs per tonne	2012 $AUD/t	$105	(Yancoal, 2013b)
Capital costs	2012 AUD, millions	$190	(Key Insights, 2013)p92
			(NSW Treasury, 2012)
Net present value			
(Discount rate 4%)	2012 AUD, millions	24.3	Ecolarge Calculation
(Discount rate 7%)	2012 AUD, millions	-$10.8	Ecolarge Calculation
(Discount rate 10%)	2012 AUD, millions	-37.3	Ecolarge Calculation

While the project is unlikely to be financially viable under current conditions, there are several reasons why the proponents continue to push for project approval:

- Having invested heavily in local property, paying premium prices for land (see Economists at Large 2013 p24) abandoning the project would incur heavy losses.
- Approval would provide option value – ie the right, but not the obligation, to develop the project in the future, at which point prices may be higher or costs lower, improving the profitability of the mine.
- With approvals the project would be a more attractive asset to other buyers, most obviously the operator of neighbouring Stratford Coal Mine, Yancoal.

Implications of project financial viability

The implication of this analysis is that if the project were to be approved it would be unlikely to attract finance. Without finance the project would be unable to commence production in the medium term. The nature and scale of the project may also need to change. This would result in the delay and reduction of any financial benefits of the project to the state through royalties, or jobs to workers. While benefits would be delayed and reduced, many of the costs of the project would remain:

- Uncertainty around the project would continue to affect residents south of Gloucester, where properties have reduced greatly in value and in effect become unsaleable. This affects not only the financial wellbeing of these residents, but also causes great stress and emotional damage. See (Economists at Large, 2013a) p24-26 for discussion of impacts on property markets and Key Insights p77, who observe that "evidence of distress amongst some members of the local community is indisputable."
- Social discontent associated with the project. Key Insights' community survey found that over 80% of the Gloucester community is opposed to the project (p59).
- Opposition to the project is vocal and visible. The negative publicity surrounding the project would likely continue, negatively affecting the tourism industry and social amenity. See (Economists at Large 2013a p51):

  > *The obvious opposition to the projects – placards and signs along various roads are prominent – and accompanying media coverage are problems for the industry. Respondents felt that the problem was not just opposition, but the reality of what was being proposed as this would impact on the demographics and quality of life in the LGA….One respondent said that tour companies and other private tourists have contacted them to ask "is Gloucester still worth visiting?"*

- The project has a negative impact on the local beef industry, as explained in (Economists at Large 2013a p39):

  > *Representatives of resource companies stress that they attempt to agist as much as possible and "have not turned anyone away". Other observers suggest that land owned by resource companies is running at perhaps 10-25% of its usual stocking rates.*

In summary, it seems unlikely any benefits of the project will be realised in the medium term, while ongoing costs to the community remain. Furthermore, the claimed benefits of the project by Key Insights and the proponent seem heavily overstated, as discussed in the following section.

Economic Impact Assessment

Sections 6.1 to 6.7 of the Key Insights report are an economic impact assessment. This assessment is an attempt to estimate the economic impacts of the project on the local and wider economy. It is important to understand the difference between economic impact assessment and cost benefit analysis. Impact assessments estimate changes in levels of output, whereas CBA estimates changes in net economic benefits, known as "economic welfare". Impact assessments ask the question of "how busy does the project make us" while CBA asks "does the project make us better off". For this reason NSW Treasury warns:

> *[Economic] impact assessment is not a substitute for a thorough economic analysis of a policy. The appropriate method for analysing policy alternatives is benefit cost analysis (BCA). BCA considers the best use of resources and as such treats labour inputs as a cost. [A multiplier]- based economic impact analysis is best seen as a complement to a BCA and does not provide evaluative guidance. A [multiplier] model will estimate flow on impacts irrespective of the qualities of the [project] triggering those impacts.*(NSW Treasury, 2009)*p4*

In other words, a "multiplier" model, such as the one presented by Key Insights, will produce large estimates of increases indicators such as output and employment regardless of whether the project increases the welfare of the community or is financially viable for the proponent.

The ABS (2011) details the shortcomings of this "biased estimator of the benefits or costs of a project":

> ***Lack of supply–side constraints:*** *The most significant limitation of economic impact analysis using multipliers is the implicit assumption that the economy has no supply–side constraints. That is, it is assumed that extra output can be produced in one area without taking resources away from other activities, thus overstating economic impacts. The actual impact is likely to be dependent on the extent to which the economy is operating at or near capacity.*
>
> ***Fixed prices:*** *Constraints on the availability of inputs, such as skilled labour, require prices to act as a rationing device. In assessments using multipliers, where factors of production are assumed to be limitless, this rationing response is assumed not to occur. Prices are assumed to be unaffected by policy and any crowding out effects are not captured.* (ABS, 2011)

For an example of the ABS's first point, the Key Insights analysis assumes there is no "constraint" to the amount of construction labour available in Gloucester. They assume that there is a large pool of skilled construction and mining workers ready to work on the project who will not be taken away from some other project either in Gloucester or in NSW more broadly. As Economists at Large (2013) point out, this is not the case – unemployment is low in Gloucester and construction workers are in high demand in the LGA and in neighbouring LGAs. Thus, construction jobs "created" by the project also result in construction jobs being "destroyed" elsewhere in the economy. Key Insight's estimates account only for the "creation" and not the "destruction".

The ABS's point about fixed prices refers to the assumption by Key Insights that the new demand for inputs such as construction workers can be satisfied without increasing the price of their wages. This is clearly unrealistic, as mining wages have increased considerably during the mining boom as is regularly emphasised by the mining industry.

Acknowledging that input-out data was mostly used to support "bids for industry assistance", (ABS, 2011), the ABS stopped publishing data that supported this sort of analysis following their 1998-99 publication. This is the reason why Key Insights' analysis is based on ABS multipliers from 1996-97 (see page 94[10], 99 & 129).

The age of these multipliers should be of serious concern to readers of the Key Insights report. Multipliers are meant to describe the relationships between industries, inputs and outputs. These relationships change with fluctuations in the economy, the fortunes of different sectors and with changes in technology. Multipliers from the mid 1990s predate not only the mining boom but also major changes in technology – for example, in 1996-97 email and the internet were not widely used. Key Insights implicitly assume here that these relationships between parts of the economy have not changed since 1996 and will not change during the 14 years of the project. These assumptions seriously compromise the usefulness of Key Insights' estimates.

Furthermore, it appears that Key Insights have based their assessment on national level input output tables.

> *The transaction tables used in this analysis are based on those developed at the national level by the Australian Bureau of Statistics. This means that some value judgements and relativities have been made to determine relevant estimates for State [sic] and local levels.(p93)*

There is no discussion of what these value judgements and "relativities" are or how they were arrived at. The ABS notes that this approach is unsuitable for a small region such as Gloucester:

> ***Not applicable for small regions**: Multipliers that have been calculated from the national I–O table are not appropriate for use in economic impact analysis of projects in small regions. For small regions multipliers tend to be smaller than national multipliers since their inter–industry linkages are normally relatively shallow. Inter–industry linkages tend to be shallow in small regions since they usually don't have the capacity to produce the wide range of goods used for inputs and consumption, instead importing a large proportion of these goods from other regions.* (ABS, 2011)

Other practitioners of this form of analysis are more transparent in the measures they take to adjust their analysis for the time and place they are focussed on. See for example (Gillespie Economics, 2010) who base their assessment on 2005-06 multipliers developed independently for the Narrabri and Gunnedah region and provide a referenced appendix outlining their methodology.

In addition to the criticism of this approach by NSW Treasury and the ABS, similar criticisms were made in the recent Land and Environment Court judgement relating to the Warkworth coal project:

[10] Page 94 claims there has been an update of labour multipliers published in 2008, however Key Insights provide no reference for this change. Aside from this, it seems all other multipliers are based on 1996-97.

I am not persuaded that it is appropriate to accept the conclusions drawn in the I0 analysis as to the quantum of economic benefit derived in the form of economic output and jobs created in the Hunter region….I accept the evidence of [the opponents of the Warkworth project] that it cannot be assumed that the absolute amount of employment in coal mining and transport, and the relative level of employment between coal mining and transport, will remain stable at 2001 levels until 2030, given the investment in new coal infrastructure that has been built since 2001 and is planned to be built before 2030, and changes in technology which change the average capital/labour ratio. (Preston, 2013)*p158-159*

In the current Land and Environment Court case concerning the Ashton Coal project, the coal company's own economist, Dr Jerome Fahrer of ACIL Allen consulting, has criticised the approach taken by Key Insights and earlier consultants to the Ashton mine, the Hunter Valley Research Foundation. Dr Fahrer said:

[In] the Warkworth case [multiplier] modelling was criticised by the chief judge and ... for good reason. [This] modelling is fine for some purposes but it's not the best technique … for this kind of purpose [evaluating a coal mine]. the reason is that [multiplier] modelling takes no account of the fact that there are limited productive resources [in the economy] principally people to be employed. So it always makes the amount of output, income, jobs, bigger than would likely be the case, unless you're in the Great Depression, or a very deep recession. (see court transcripts, p546)

With these criticisms in mind, it is important to assess the key result of the Key Insights' economic section, Table 30 (p108):

Figure 6: Estimated Number of Jobs Generated by the Proposal During Operations

	Low impact scenario		Mid impact scenario		High impact scenario	
	Direct	Multiplied	Direct	Multiplied	Direct	Multiplied
Local area	13	33	31	79	61	156
NSW	123	445	123	445	123	445
Australia	123	469	123	469	123	469

The different scenarios reflect different levels of local employment, 10%, 25% and 50% respectively. Note that these contradict the goal stated in the social section of 75% local employment, and conform to expectations in figure 1 of this report, showing Stratford and Duralie mines employ less than 50% Gloucester residents. In light of those results, we consider the low scenario to be unlikely.

Direct jobs results here do not account for jobs that would be lost in other industries, due either to crowding out in the labour market, reduced quantity of agricultural land, or a decline in tourism and treechange residents. Modelling of a similar sized project, the Ashton Coal project expansion[11], by consultants ACIL Allen, commissioned by the owners of that mine, suggests that project would lead to a reduction of employment in other industries of around half the direct jobs created at the local level. Extrapolating those results to this project would suggest local job increases of between 7 and 30.

Due to the flaws of the multiplier modelling – lack of resource constraints, fixed prices, application to a small region, out-of-date multipliers – the multiplied results are heavily misleading. Modelling of the Ashton coal project suggests that at a state and national level net employment of that project is only 2 to 12 jobs greater than the direct employment of that project.

To summarise, we suggest that the net employment effect of the project for Gloucester residents would be an increase of 15 to 30 jobs. At the 2011 census, Gloucester's labour force was 2067 people. The expected increase represents an increase of only 1.5% of the labour force. At a state level, the expected increase of 123 jobs represents an insignificant change on the state's 3.1 million strong labour force.

[11] This modelling is currently before the Land and Environment Court and is not directly available at time of writing. The lead author of this submission, Roderick Campbell, has had access to this document due to his involvement in that case. References to the modelling results are in the court transcripts and are public information.

Royalties and taxes

The key economic benefits of the project for state and federal governments are royalty and tax payments. Key Insights estimates of these values is found in section 6.8, p108. Key Insights estimates of both royalty and tax revenues are flawed and heavily overstate these values.

Royalties

Key Insights claim the project will:

> *pay in the order of $186 million in state royalties over its operational life. (p109)*

It is unfortunate that they show no working for this calculation, as it seems to heavily overstate the likely royalty value. We estimate the present value of royalties from the project at $59.5m. This calculation is based on (full calculations in appendix):

- the production schedule in EIS section 2.6.4,
- metallurgical and thermal coal production from Stratford and Duralie reported in Yancoal quarterly reports
- current price forecasts for semi-hard coking coal (2012 AUD$139) and thermal coal (2012 AUD$92) from the Commonwealth Bank (CBA 2013)
- A royalty rate of 8.2% (NSW DII, 2008).

This generates a gross royalty value of $151.7 million. If Key Insights used a higher estimate of coal price, yield or other assumption, this may explain the difference. However, Key Insights do not consider the deductions from royalties which coal producers are allowed to make:

- Beneficiation – deduction for a full cycle of washing is $3.50/t
- Levies:
    - Australian Coal Association Research Program (ACARP) ($0.05/t)
    - Mine Subsidence Levy (unlikely to apply to an open cut mine)
    - Mines Rescue Levy
    - Commonwealth Levy for Long Service Leave
- Insurance
- Other deductions relating to bad debts. (NSW DII, 2008)

We estimate the Rocky Hill project would claim at least $3.55 in deductions per tonne from a full wash cycle in the proposed CHPP and from the ACARP levy. This would reduce royalties to $98.6m. It is standard practice in economic assessment to present streams of costs and benefits over time as a "present value". As benefits in the distant future are not as valuable as benefits in the current period, these need to be discounted. Using the standard (NSW Treasury, 2007 p18) discount rate of 7%, the present value of these royalties is $59.5m.

Tax revenue

Key Insights' estimates of tax revenue generated by the project consist of income tax, GST, company tax, carbon tax and payroll taxes. See tables 31 and 32, p109.

Income and payroll tax

Income tax and payroll estimates are based on the impact of the project on jobs. As discussed above, the increase in the number of jobs at a state and national level, the level at which these taxes are collected, is expected to be around 123.

Assuming an average salary of $100,000 per year and a payroll tax rate of 5.45%, this represents a present value of $5.9 million over the life of the project (7% discount rate), significantly less than the assessment's undiscounted estimate of $17.6 million (p109).

Under the same assumptions, payable income tax would reach $39.8m, as opposed to Key Insight's undiscounted estimate of $168.2m. This tax accrues to the federal government, around 27% of this will accrue to NSW (Bennett & Gillespie, 2012), around $10.7m.

GST

Key Insights appear to assume that domestic expenses comprise nearly 100% of total expenses and include GST. They estimate the GST sum from this. There is no way to assess the validity of these figures as they are unsourced and do not contain sufficient information on the methodology and assumptions used. Their estimate of $90.1 million during operations appears not to include deductions and is not discounted. Discounted across the period of the project, this sum represents $56.8 million.

Company tax

Estimates of company profits are considered commercial in confidence and are not provided. This has not been the case for economic assessments of all other coal mine assessments in NSW in recent years, where a "net production benefits" figure has been estimated and can be considered an approximation of pre-tax earnings. Coal price assumptions are usually stated. See for example (Gillespie Economics, 2010, 2011, 2013).

It is therefore unclear what assumptions have been used, including the company tax rate Key Insights have applied. This is important because various researchers have found that mining companies operating in Australia pay effective rates of company tax well below the theoretical rate, due to many deductions and exemptions. See (Markle & Shackelford, 2009; Richardson & Denniss, 2011), who find that rates faced are 17% and 13.9% rather than the theoretical 30%. Key Insights estimate of $304.0 million (p109) is likely to be based on the theoretical rate and undiscounted. Assuming Richardson and Denniss's 13.9% effective tax rate and discounted at 7% this revenue would have a present value of $87.9m. Importantly, there is no way of knowing in what year profits would occur, by averaging Key Insights estimate over the project life, our estimate will overstate tax revenues as early losses are likely to be deducted.

Carbon Tax

There is no working to support the carbon tax estimate of $29.0 million. There have been considerable changes to the outlook for carbon tax revenues in recent events. This tax is intended to internalise environmental damage into economic decision-making. While Key Insights estimate the revenue gained from the carbon tax, they do not emphasise the damage the project inflicts on the atmosphere, which is likely to outweigh this revenue.

other sections

Plagiarism and poor referencing

See sections:

- 6.12.1 Importance of coal in the NSW and Australian Economies [sic]
- 6.12.2 Importance to the Hunter Region

Large parts of these sections are not original work by Key Insights, but are plagiarised from other sources. One of these sources is the NSW Minerals Council, an industry association for the mining industry. It is inappropriate for a document that is part of a public assessment process to be reproducing the work of an industry association, particularly as it was used without attribution.

Plagiarised and inadequately referenced sections include, but may not be limited to:

- The first four paragraphs of section 6.12.1 are plagiarised from (NSW Minerals Council, 2012), see p4.
- In section 6.12.2 the first paragraph is plagiarised from (RDA Hunter, 2013), see first para p20. This paragraph, describing coal mining as the "bedrock" of the Hunter's economy, first appears in section 2, p37, also without attribution.
- The second last paragraph on page 143, beginning "The Hunter's power generation industry" is plagiarised from (RDA Hunter, 2013), see first para p22.
- Most dot points on page 143 are taken verbatim from (NSW Minerals Council, 2011) with minimal attribution.
- Other figures are reproduced directly from coal company reports and presentations, attributed to the companies, but with no link to the original source of the data, see figures 19 and 20.
- One source, (Knights & Hood, 2009) was referenced, as a University of Queensland publication, but was funded by Peabody Energy, a coal company.

Readers should note that the Key Insights report has no bibliography or reference section, making reference checking particularly difficult.

In these sections Key Insights have done little more than reproduce material from a minerals industry association and coal companies, so it is not surprising that a very positive picture is painted of the industry. An alternate view of some of the same data – for example table 50 – is that 95% of Hunter Valley workers and 99% of NSW workers do not work in the coal industry, making it hardly the "bedrock" of the Hunter economy. None of the negative economic effects of the coal industry and the mining boom are discussed – e.g. pressures on labour markets, exchange rates, environmental issues, impacts on tourism, manufacturing, agriculture, etc. See (Richardson & Denniss, 2011).

Aside from being plagiarised and biased, these sections do not contribute to decision making in the Gloucester Valley and about the Rocky Hill project in particular. While the coal mining industry has grown in recent years and exerts considerable influence in NSW and the Hunter Valley, as these

sections discuss, this has no bearing on the costs and benefits of the Rocky Hill project and decisions on to whether to approve or reject the project.

Similarly, Section 6.9 relies on poorly referenced data from a property developer presentation on real estate across the wider Hunter, as well as comment from Queensland and Western Australia, but provides little information on likely impacts in Gloucester which are relevant to the Rocky Hill project. In contrast, see Economists at Large (2013) p22 to 26 for analysis of Gloucester real estate based on local interviews and data.

Section 6.11 Scenario analysis

The purpose of this section is unclear. The Key Insights report states:

> *This section of the report seeks to investigate the validity of [the view that the approval of Rocky Hill and growth in other sectors are mutually exclusive], and consider the relevant data to determine the likely scenarios in terms of [sic] these sectors should the Rocky Hill Coal Project proceed, or otherwise.*

The view that approval of Rocky Hill and "ongoing success" of other sectors are *mutually exclusive* is not, in our observation, widely held. The view that Rocky Hill could *negatively affect* amenity in the town and the performance of other industries is widely held and is largely undisputed. This section does not, as claimed "determine the likely scenarios in terms of these sectors should the Rocky Hill Project proceed, or otherwise". Instead, this section:

- Presents a comparison of NSW and Gloucester population data, concluding that there are various demographic problems that need "strategies, projects and investment to change the current trajectory if Gloucester is to have a more positive economic future". NSW population data is heavily skewed by urban Sydney. A more relevant comparison would be with other neighbouring LGAs, as is presented in Economists at Large (2013a) and a consideration of whether a steady population, low unemployment and a demographic that is older than the NSW average are actually problems. There is also no mention of the existing Gloucester Community Strategic Plan, (GSC, 2012) and how the Rocky Hill Coal Mine addresses some of the issues identified in the plan.
- The agriculture scenario applies national data with the Gloucester region, which seems inappropriate. As mentioned in the Economic Impact Assessment section, Key Insights assume that all jobs in the Rocky Hill project will come from an unlimited labour force and that sectors have no impact on each other. See Economists at Large 2013a for more detailed analysis of agriculture in Gloucester and potential impacts of resource projects.
- The tourism scenario claims that "at the time of the 2006 census, 136 [Gloucester residents] were employed directly in tourism." As the census does not count employment in tourism, this claim needs careful examination. It seems to come from table 44, which is from another study. Estimating tourism employment from census data is difficult because of the different categories involved and methods vary. There is no discussion of this by Key Insights. See Economists at Large (2013a) for estimates of more recent employment in tourism, ranging from 111 to 240 depending on definitions and categories.
- Presents scenarios based on 2006 data, claiming 2011 census data is not available. This data has been available for around 12 months.

Conclusion

The Key Insights socio economic assessment of the Rocky Hill coal project makes a strong assessment of the social aspects of the project. The social section of the report is based on a survey of Gloucester residents and interviews with various stakeholders. This section identifies the strong opposition to the project based on its potential impacts on residents, town amenity, the local environment and other important sectors of the Gloucester economy. Key results include:

- Around 80% of survey respondents oppose the Rocky Hill project
- Over 75% of respondents are concerned about impacts on:
    - Visual amenity
    - Water
    - Dust
    - Noise
    - Agriculture
    - Town character

- Between 42-50% of respondents felt the project would assist existing businesses or attract more businesses to Gloucester.

Our criticisms of the social section relate to the optimistic assessment of likely local employment and the failure to incorporate available data in cumulative impact assessment.

In contrast to the generally well-produced social section, the economic section is severely flawed. It offers no credible analysis to suggest that the financial or employment benefits of the project will outweigh the many possible negative impacts and the strong community opposition to it.

The omission of cost benefit analysis (CBA) from the economics section is the first and most significant shortcoming. In NSW debate has raged between economists over aspects of coal project CBA for several years, resulting in the publication of guidelines by Treasury and Planning in 2012 (NSW Treasury, 2012). While the debate has focussed on technical issues and outcomes, neither side has questioned the need for CBA or its usefulness. Key Insights seem to be either unaware of this debate or unconcerned by it.

The lack of CBA is concerning in the current economic climate, where many coal projects are struggling for financial viability. Basic cash flow modelling suggests the net present value of this project is negative $10.8 million. As a consequence the project may struggle to attract financing, even if approved. This would compound the problems to nearby residents indefinitely, an outcome that should be avoided. If approved, to begin production the proponents would require prices to increase or costs reduced substantially. Alternatively, and perhaps more likely, the proponent will attempt to sell the project to neighbouring Yancoal who may be able to make the project more viable due to their existing infrastructure.

Instead of CBA or financial analysis, the economic section focuses on the results of a multiplier model of the projects economic impacts. The assumptions in this model ensure that the positive economic impacts will be exaggerated while the costs are ignored. Key assumptions in this model include:

- No resource constraints – that there is an infinite amount of skilled labour ready to be deployed onto the project.
- Fixed prices – that the project will not have any impact on local wages, rents and costs.

Because of these flaws, economists and key government departments such as the Australian Bureau of Statistics and NSW Treasury have long been critical of this type of multiplier analysis.

In addition to the flaws inherent in multiplier models, the authors have based their analysis on data from the 1990s which predates the mining boom and major changes in technology such as email and the internet. This data is also at a national level, with no apparent adjustment to local conditions in Gloucester. This heavily compromises the usefulness of any results of this analysis.

The socio economic assessment estimates the increase in jobs for Gloucester residents at between 13 and 61. We suggest the likely net increase in employment is between 15 and 30, an increase of up to 1.5% of the Gloucester labour force. At a state level the report estimates up to 469 jobs will be generated, we suggest the likely figure is around 123, an insignificant increase at the state level.

Analysis of government revenues is equally poor. This is important as these are the main benefit of the project to the state. For a project to be approved, economic analysis should show that these revenues strongly outweigh the many costs it imposes on the community. The analysis by Key Insights is non-transparent and potentially heavily optimistic. Tax revenue estimates are linked to the multiplier analysis and therefore heavily overstate these values. The authors make an estimate of royalties at $186m but no working is provided. Our estimate, with full modelling in appendix, is a present value of $59.5m, just 32% of the amount claimed by the report.

Parts of the Key Insights report is not their own work, but appears to be plagiarised from other sources, including a minerals industry group. Referencing is also poor, including other material from coal companies. This detracts from the independence of the report.

The socio economic assessment identifies the strong community opposition to the project based on potential impacts to Gloucester's amenity, social fabric and other industries. It does not, however, present a convincing case that these impacts will be offset by economic benefits. Although it is not clear from Key Insight's report, the project seems to be financially unviable under current conditions, with a negative present value of $10.8 million. Approving the project under these conditions would not result in any employment or revenue benefits and would indefinitely extend problems relating to the uncertainty of the project on residents, particularly those to the south of Gloucester township.

If coal prices changed and the project was able to proceed financially, the main benefits of the project for the NSW community appear to be a net increase of up to 30 jobs for Gloucester residents and royalty revenue to the state government of $59.5m in present value terms. Against this, decision makers need to balance the opposition of 80% of the Gloucester community, based on costs to residents in reduced property values and reduced amenity as well as the damage to other important industries such as tourism and agriculture. While quantifying these values is beyond the scope of this report we suggest that the benefits do not outweigh the costs and therefore recommend that council and state decision makers oppose the project.

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Appendix 2 – Acoustic Review of the Rocky Hill Coal Project

WOOD & GRIEVE ENGINEERS

Rocky Hill Mine Noise impact assessment review

Acoustic Review of Rocky Hill Coal Project

Tania Parkinson, Gloucester Shire Council

17 October 2013

Revision No.1

Prepared by Daniel Castro Project Number: 25841-SYD-N
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Revision

REVISION	DATE	COMMENT	APPROVED BY
1	17/10/2012	Initial draft	ORFG

Contents

1. INTRODUCTION

The purpose of this report is to provide a high level review of the Noise Impact Assessment and mitigation measures of the Rocky Hill Coal Project forming a part of the Environmental Impact Statement (EIS) of the proposed mining development.

Gloucester Resources Limited (GRL) proposes to develop and operate an open cut mine located between 3.5Km and 7Km southwest of Gloucester. The Proposal comprises four principal components, namely:

1. Four separate and/or contiguous open cut pits and a coal handling and preparation plant (CHPP) within the Mine Area;
2. An overland conveyor for transporting product coal to the Rail Load-out Facility. The overland conveyor is located within a 50m wide Overland Conveyor Corridor;
3. A Rail Load-out Facility (RLF) incorporating a rail loop and two coal storage bins; and
4. Two Power Line Corridors incorporating a re-located 132kV power line and a new 11kV power line external to the Mine Area.

Wood and Grieve Engineers were commissioned by Gloucester Shire Council to conduct a review of the Wilkinson Murray (WM) Noise and Blasting Assessment dated from 5th March 2013.

This assessment discusses the likely noise impact on the potentially nearest most-affected receivers of the proposed development based on the data presented in the EIS documents, including noise and vibration management measures and impact on the surrounding residential receivers.

This assessment has been prepared considering the following documents:

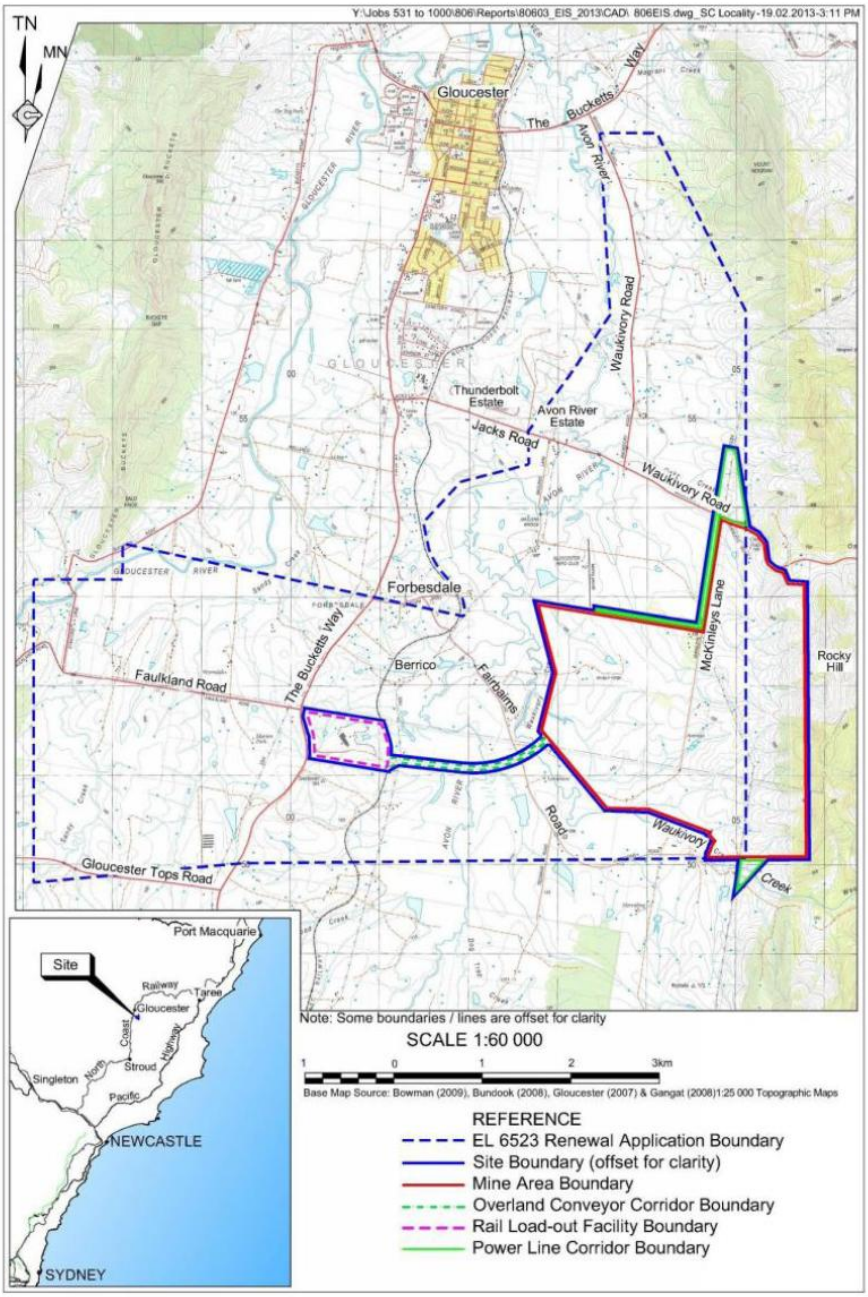
- Director General's Environmental Assessment Requirements Application Number SSD 5156
- Rocky Hill Project Documentation supporting an Application for the Director-Genera's Requirements (Section 5.2 February 2012)
- Specialist consultant studies compendium Volume 1 - Part 1, April 2013
- EIS Section 5 Draft Statement of Commitments
- Interim Construction Noise Guideline (DECC, 2009)
- Assessing Vibration: a technical guideline (DEC, 2006)
- Australian and New Zealand Environment Council – Technical basis for guidelines to minimize annoyance due to blasting overpressure and ground vibration (ANZEC, 1990)
- NSW Industrial Noise Policy (EPA, 2000)
- NSW Road Noise Policy
- Interim Guideline for Assessment of Noise from Rail Infrastructure Projects (DECC, 2007)

2. PROJECT OVERVIEW

2.1 Site Description

The Rocky Hill Coal Project is a proposed open cut mining operation located approximately 3.5Km - 7Km south-east of Gloucester urban area in New South Wales (NSW). The site location is shown in Figure 1.

Figure 1: Site and surroundings overview



Source: Specialist Consultant studies *Part 1: Noise, Vibration and Blasting Assessment*

2.2 Hours of Operations

2.2.1 Site establishment and construction

Table 2 displays the proposed hours for the site establishment and construction. In the event that traffic noise is associated with construction during nighttime (movements to/from site) this should be taken into consideration.

Table 1: Proposed hours of site establishment and construction activities

Construction Activity	Normal hours[1,3]	Days
Preparatory activities	6am – 7am	Monday – Friday
Mine area earthworks and infrastructure	7am – 10pm[2]	Monday – Saturday
CHPP and workshop	7am-10pm 7am-1pm	Monday – Friday Saturday
Overland conveyor	7am-6pm 7am-1pm	Monday – Friday Saturday
Rail Load-out facility	7am-6pm 7am-1pm	Monday – Friday Saturday
Off-site construction activities	7am – 6pm (daylight hours)	Monday – Friday
[1] Contingency hours for all on-site activities should be 10pm [2] Operational hours for earthworks in acoustically exposed areas would be limited to 7am-6pm Monday to Friday, and 8am to 1pm Saturday [3] Only activities that comply with operational noise criteria RBL+5dB(A) would be undertaken outside the standard hours of construction activities		

2.2.2 Operational activities

Table 2 displays the proposed hours of operation for the mining activities. It is noted that the night time activities Monday – Saturday rom 10pm – 4am are subject to some conditional conditions. We understand that clarification should be sought in regards the definition of the number and location of the real-time monitoring locations so as to ensure that the night time activities are complying with the sleep disturbance criteria.

Table 2: Proposed hours of operational activities

Activity	Days*	Hours	Comments
Pre-start activities	Monday - Saturday	6am – 7am	
Mining	Monday - Saturday	7am – 10pm	Subject to confirmation by modelling and real-time monitoring that night-time and sleep disturbance criteria are satisfied at privately-owned receptors, mining would continue from 10:00pm on each of Monday to Saturday and extend to 4:00am on the following day. There would be no mining activity between 4:00am and 7:00am on any day.
	Monday - Saturday	10pm – 4am	
CHPP	Monday - Saturday	7am – 10pm	Hours and days worked to match production
Coal Product Despatch	Monday - Saturday	Any time	As required to satisfy ARTC product despatch schedule
Maintenance	Monday - Saturday	7am – 10pm 8am – 10pm All other hours	If activities are not audible at privately owned receptors
*Public Holidays excluded	Monday - Saturday		

According to action 4.11 of the Draft Statement of Commitments, two (2) permanent real-time noise monitoring locations are to be installed at the Forbesdale and Avon River Estate. This seems adequate but we question if an additional permanent noise / meteorological station would be required to account for the noise at the receivers south of Faulkland Rd (e.g. 184B, 191A, 56A, 18, etc.).

3. EXISTING ENVIRONMENT

3.1 Noise Environment of the Area

3.1.1 Ambient and Background Noise Levels

The ambient noise environment is another critical aspect of a noise impact assessment, as ambient and background noise levels are generally used as the basis of the establishment of the numerous criteria which characterized the operation of a particular site such as the Rocky Hill Project. A combination of attended and unattended noise surveys were conducted by WM over the following periods:

- July 2010
- March 2011
- July 2011, and
- July 2012

The various surveys shows that the background noise levels or RBL (Rating Background noise Levels as defined in the INP) are below the minimum noise required by the INP, the WM report states the following:

> *"The background noise levels at all locations [other than those affected by traffic e.g. The Bucketts Way] were equal or below 30dBA which constitutes the minimum RBL adopted by the INP".*

We understand that basing the assessment on the background noise levels measured prior to the mine operating is a fair outcome and a reasonable basis for establishing the various noise criteria presented in the WM report. Indeed any RBL lower than 30dB(A) are required to be set to a minimum of 30dB(A) as recommended by the INP.

Nevertheless we would like to outline that the INP was created in order to provide some level of noise protection to residents leaving nearby industrial sites whether existing or new. Significant noise impact can occur when these industrial sites are located in areas where the density of population could be considered medium. In these areas background noise levels lower than 30dB(A) can occur at night. It is understood that a minimum RBL of 30dB(A) is adopted in order to avoid to put unnecessary financial pressure on new industrial developments while providing a good level of amenity to the community leaving nearby.

According to the WM background noise survey, RBL's in the Gloucester area (rural area) for some receivers are 3-8dBA's lower than 30dB(A) depending on the period of time and location of receivers considered. This triggers the following question: "Is the minimum INP RBL of 30dB(A) adequate to describe the background noise levels of the rural area surrounding the Gloucester mining operation?"

The answer to that question will obviously have an impact on the project specific noise level and on the sleep disturbance criteria associated with the proposed operation of the project, which may in essence become lower than the suggested values presented in this document.

The noise monitoring locations used for the EIS are shown in the Figure 1 below.

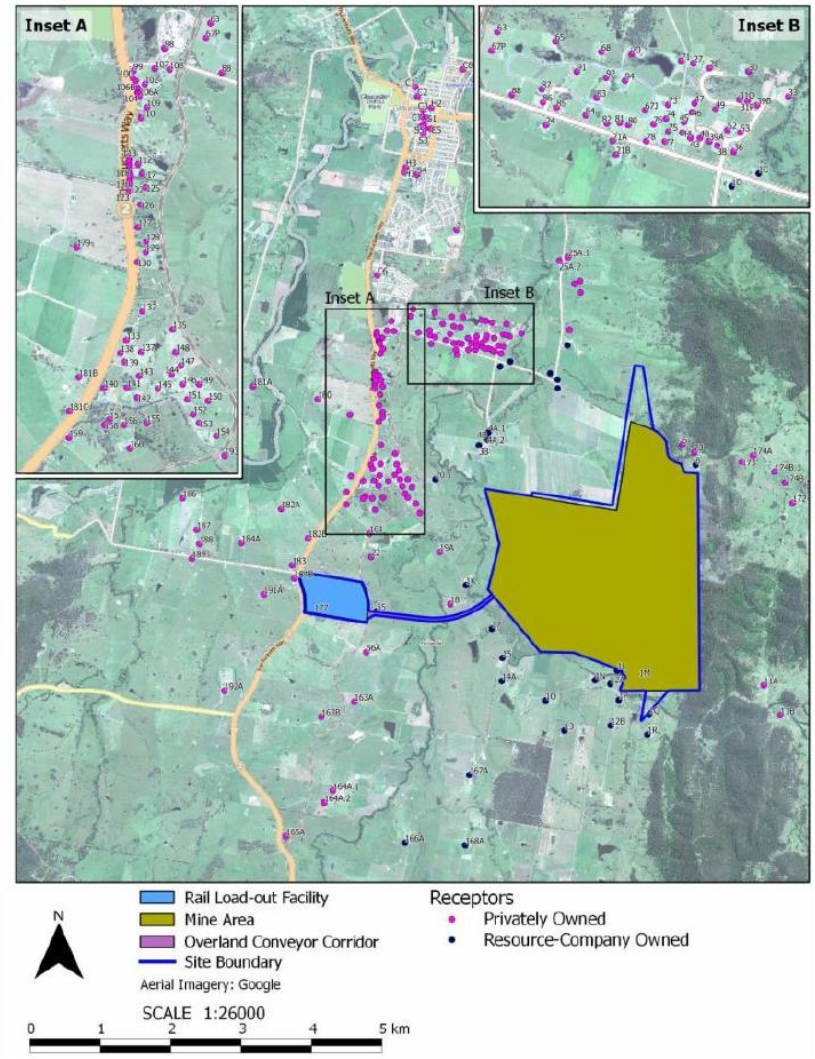
3.1.2 Rail Noise Levels

Existing train movements have been estimated based on the Stratford Extension Project Environmental assessment appendix C (SLR, 24 October 2012), this assessment, based on predictions, shows that existing noise levels are already exceeding the rail noise levels as defined in the EPA (Table 7.8 from WM report).

3.1.3 Traffic Noise Level

Section 7.1.4 of the WM report displays an existing average weekday traffic volumes. However, no clear indication of existing specific traffic noise levels has been found in the documentation.

Figure 2: Noise sensitive receivers



Source: Specialist Consultant studies *Part 1: Noise, Vibration and Blasting Assessment*

3.2 Meteorological Conditions of the Area

The typical meteorological conditions of an area need to be taken into consideration when conducting noise modeling in order to predict accurately the resultant noise levels from a site operation at the boundary of sensitive receivers. There is an acknowledgement that noise levels can be enhanced with wind and temperature inversion phenomenon.

Indeed section 5.3 of the INP (EPA, 2000) provides the following regarding wind effect and temperature inversion:

> *Wind effects need to be assessed where wind is a feature of the area. Wind is considered to be a feature where source to receiver wind speeds (at 10m height) of 3m/s or below occur for 30% of the time or more in any assessment period in any season.*
>
> *Where inversions condition are predicted for at least 30% (or approximately two nights per week) of total night-time winter, then inversion effects are considered to be significant and should be taken into account in the noise assessment.*

The conclusion of the analysis presented into the WM report is that their alternative method "provides a more rigorous approach of predicting noise levels [...] based on meteorological data obtained for the locality".

In essence wind conditions and temperature inversions have been taken into account using an alternative method (instead of the Pasquil-Gifford) in the noise modeling to assess the noise impact of the mine operations on the nearby residents. This methodology suggests that the impact on the noise at the receivers in regards to the temperature inversion is a function of the inversion strength in the early evening. This conclusion seems to imply that meteorological conditions should be recorded at all receivers to account for the impact of the temperature inversion at each potentially affected location. Confirmation is required to clarify how the temperature inversions are going to be measured at the required receiver locations. This is relevant as the meteorological conditions will trigger the operational activities during nighttime.

4. SUMMARY OF FINDINGS OF THE REVIEW

This section of the report is presenting WGE comments and findings following the review of the relevant documentation.

4.1 Modeling Assumptions

4.1.1 Noise data locations

The selection of receptors that was used to be representative of the potentially affected receivers seems to be adequate for the type and size of project. We understand that some measurement locations (e.g. Location 10 and Location 11) have been used to establish the exiting noise environment at broader groups of residents. However, having more noise monitoring locations, clarification should be provided on why data from monitoring locations 4, 5, 6, 8, 9 (Figure 4.9 Section 4 EIS) have not been used at any group of receivers.

4.1.2 Meteorological data collection

The alternative method proposed by WM seems to be more stringent than the INP one, which is beneficial to the residents. However, the main conclusion derived from the meteorological conditions alternative methodology is that for some locations affected by temperature inversions, the decision regarding if nighttime measurements are allowed or not should be based on the atmospheric conditions in the evening. This implies that meteorological conditions should be continuously monitored and transmitted to the operations center to proceed with the adequate decision.

4.1.3 Software used

We would like to comment on the fact that the noise model used to assess the noise impact at the boundary of the nominated receivers is called ENM. This software is not commonly used today (besides in some mine developments), instead, SoundPlan or CadnaA seem to be more used. It has been demonstrated even by WM that there are some discrepancies between the predicted noise levels obtained with ENM, SoundPlan and real measurements. These discrepancies are specifically relevant depending on the used noise spectra and the meteorological conditions of the scenarios.

It is quite challenging to comment on the ENM model results (noise contours) as we have had no access to the project model; however we understand Council's concern in regards to the Avon River Estate results from Figure 6.16 on the WM report. We believe that the proposed solution of installing a permanent real-time noise monitor located in that area should provide a way of mitigating any of the potential adverse effects of the mining activities (including construction) throughout the entire project development, and adapt mitigation measures in order to achieve the established criteria.

4.1.4 Change in operation throughout the proposed years of operation

The changes on noise due to operational activities over the different yearly scenarios are based on the change of location where activities occur and the type of plant/noise source generating the noise. This information is provided by the mining operator and seems reasonable in comparison with other projects of similar nature.

4.2 Construction Noise

4.2.1 Criteria

The criteria used by WM for assessing the potential noise impact of construction activities was based on the Interim Construction Noise Guideline (DECC, 2009). The use of the guideline is considered to be appropriate. The WM reports that most of the construction activities will be undistinguishable from the operational activities with two exceptions:

1. The construction of the northern visibility barrier
2. The construction of the Rail Load-out

The construction noise is assessed mainly for the two aforementioned situations. The rest of construction noise is associated in a similar manner to the 0.5 years operational scenario. We note however that although the noise activities are similar for the 0.5 year scenario the construction stage, the noise criterion for both situations (operational vs construction) is significantly different.
No clear indication on what residents may be affected by the proposed northern visibility barrier is defined and should be provided.

4.2.2 Comments on Construction Noise Impact Assessment

The WM reports that up to 8 privately own residents (183, 184B, 18, 19A, 22A [we understand this should be 22], 56A, 161, 163A) will be affected by the construction of the Rail Load-out Facility and the overland conveyor.
The construction mitigation measures (Section 8.3 of the WM report) addresses most of the issues, however:

- The noise contour (Figure 6.4) shows a result where no noise seems to be generated in the Rail-load-out area during construction.
- More information about the receivers affected by the northern visibility barrier, and expected attenuation should be provided.
- Given some exceedances are predicted a proactive measure and planning of permanent noise monitoring locations could be sought.
- Reference to nighttime works should not be used as construction hours should not extend past 6pm (item o) in Section 8.3 of the WM report).

4.3 Operational Noise

4.3.1 Criteria

The EPA has regulatory responsibility for the control of noise from "scheduled premises" under the *Protection Environment Act, 1997*. In implementing the INP, the assessment procedure for industrial noise sources has two components:

- Controlling intrusive noise impacts in the short term for surrounding residence
- Maintaining noise level amenity for particular land uses for surrounding residences and other land uses.

In assessing the noise impact of industrial sources, both components must be taken into account for residential receivers, but, in most cases, only one will become the limiting criterion and form the project-specific noise levels for the industrial source.

The project-specific noise level for the purpose of the assessment is presented in Table 3.

Table 3: Proposed specific noise levels (from WM report)

Receptor Numbers (see Figure 2)	Criteria Type	Criterion		
		Day	Evening	Night-time
21A, 21B, 24, 63, 65, 67J, 67P. 68, 70, 73. 74, 75, 76, 77, 78. 80. 81, 82, 83, 84. 85, 86, 87. 88, 90, 91, 92 94 * 64. 66, 67A, 67B, 67C. 67D, 67E. 67F. 67G, 67H 67I, 67K, 67L, 67M, 67N 67O, 67Q, 69, 71, 72, 79, 89, S93, 95, 96	INP Intrusive – LAeq,15min	36	35	35
	INP Amenity – LAeq,period	50 recommended acceptable 55 recommended maximum	45 recommended acceptable 50 recommended maximum	40 recommended acceptable 45 recommended maximum
98. 99, 100. 102, 103. 104, 105, 106A. 106B 107, 108, 109, 110,*97	INP Intrusive – LAeq,15min	43	35	35
	INP Amenity – LAeq,period	50 recommended acceptable 55 recommended maximum	45 recommended acceptable 50 recommended maximum	40 recommended acceptable 45 recommended maximum
112, 113, 114, 115, 117, 118, 119, 120, 122, 123, 125, 126, 127, 128. 129, 130. 132, 133, 138. 139, 140, 159, 181B, 181C, 182B, 183, 184B, 19B, 19C, 111. 116, 121, 124, 131, 162	INP Intrusive – LAeq,15min	40	35	35
	INP Amenity – LAeq,period	50 recommended acceptable 55 recommended maximum	45 recommended acceptable 50 recommended maximum	40 recommended acceptable 45 recommended maximum
All others	INP Intrusive – LAeq,15min	35	35	35
	INP Amenity – LAeq,period	50 recommended acceptable 55 recommended maximum	45 recommended acceptable 50 recommended maximum	40 recommended acceptable 45 recommended maximum
All privately owned land	Industry Standard – LAeq,15min	40 on more than 25% of the land	40 on more than 25% of the land	40 on more than 25% of the land
Note 1: Daytime 0700 hrs to 1800 hrs Monday to Saturday; or 0700 to 1800 on Sunday or public holydays, Evening 1800 hrs to 2200 hrs, Night the remaining periods..				

According to the INP as quoted above, the intrusiveness criteria are the limiting factor. Indeed if the intrusiveness criteria are met, the amenity criteria will automatically be met (whether corrected or not to account for existing industrial sources at the time of the measurement).
Therefore it is our opinion that the project specific-noise level for the RHCP should be the intrusiveness criteria for the residential receivers as shown in Table 3.

4.3.2 Comments on assessment methodology

The methodology adopted within the WM noise impact assessment for the privately owned dwellings and vacant land consisted in splitting the receivers exceeding the noise criteria into three groups depending on the expected exceedances. The three receiver groups for which the noise criteria are exceeded are defined as follows:

Table 4: Project noise impact

Assessment Criteria	Noise Criteria	"Noise Management Zone"		"Noise Affectation Zone"
		Marginal	Moderate	
Intrusiveness $L_{Aeq,15\ minute}$	Refer **Table 2**	1 to 2 dBA above project-specific criteria	3 to 5 dBA above project-specific criteria	> 5 dBA above Project-specific criteria
Amenity $L_{Aeq,Period}$	Refer **Table 2**			

We understand the goal pursued with the definition of these groups is to try to separate receivers groups for which exceedances of the assessment criteria may not be noticeable to the community, corresponding to the Noise Management Zone (Marginal/Moderate), and receivers group that for which exceedances of the assessment criteria will be noticeable to the community corresponding to the Noise Affectation Zone. Nevertheless, although we agree that the 1-2 dB(A) in term of overall sound pressure level will not necessarily significantly a be noticeable by most people, exceedances of 5 dB(A) may be noticeable if we consider the low frequency character of the noise (see section 4.5.1 for more details).

We would like to make the following comments on this approach:

- The established criteria is in both cases predicted to be exceeded under the typical wind and temperature inversions conditions as described by the INP and defined in the WM report. There is a proposal for each group of receivers to deal with the noise exceedances through noise monitoring, noise management, etc.
- A difference of 3dB(A) correspond to doubling the power of a noise source. Indeed two noise sources generating a sound pressure level of 40dB(A) at 1m from a receiver will have a combined resultant sound pressure level of 43dB(A) therefore we believe that a 3dB(A) above the assessment criteria will be noticeable by the community and that it is a relevant exceedance. This is important when taking into consideration the absolute value, e.g. an increase of 3 – 5dB(A) from a sound pressure level of 90dB(A) (93-95dB(A)) will be significantly perceived differently from a 3-5dB(A) increase from sound pressure level of 35dB(A).

4.3.3 Comments on proposed mitigation measures

For receivers within the Noise management noise zone (7, 19A, 154, 163A, 163B, 183, 184B and 193) the WM reports suggests, among other actions, that:

- Noise monitoring is required at agreed locations. Clarification should be sought on what criteria are used to select the monitoring locations.
- Implementation of feasible and reasonable acoustical mitigation measures could be applied. Clarification should be sought on the details of the mitigation measures.
- Use of predictive meteorological forecasting and real-time monitoring is required. Clarification should be sought on what criteria are used to select the monitoring locations.

For the receivers in the Noise Affectation Zone (6, 18, 23 and 56A) the WM reports suggests, among other actions, that:

- Management measures involving negotiation (including negotiation and acquisition) are suggested as the only measure to deal with the situation.
- Additionally, generic management measures are proposed which seem adequate considering the predicted circumstances.

4.3.4 Noise monitoring requirements and Noise Management Plan

Two permanent noise monitoring locations at Avon River and Thunderbolt Estates have been proposed. Additional monitoring is proposed for one extra location; this should be specified during the preparation of the Noise Management Plan. From this section of the WM report it seems that the Noise Management Plan will be the document where all these information will be summarised. A further review of this document would be advisable.

4.4 Cumulative Noise Assessment

The proximity of other mining related developments in the area calls for a cumulative noise assessment to evaluate the potential of the new proposal in conjunction with the existing mining activities. The WM report shows compliance is achieved at all receivers when the simultaneous operations of the Stratford Coal Mine, Duralie Coal Mine and the Rocky Hill Coal Project are operational. WGE conducted an independent review of the Stratford Coal Mine and the cumulative results of the RHCP seem to be consistent with the Stratford ones.

4.5 Low Frequency Noise Approach

Three different approaches to deal with the Low Frequency Noise problem were presented in the WM report. This is an example of the complexity of the matter and the controversy/discrepancies within the industry of how to deal with this subject. The criteria were:

1. The INP, which recommends that an assessment is conducted in terms of the difference between the C and the A-weighted levels from the noise source and, if a difference of 15dB or more exists, then a correction of 5dB should be applied.
2. DEFRA, which requires third octave band measurement of the Leq, L10 and L90 is taken in 1/3rd octave bands between 10Hz and 160Hz. If the Leq taken over a relevant period of time exceeds a reference spectrum, it may indicate that a source of low frequency noise could case disturbance. A 5dB relaxation could be applied to the reference spectrum in the event that a) the noise occurs only during daytime and/or the noise has a steady characteristic.
3. A simple outdoor correction. Based on information provided by Broner (2011) which nominates criteria based in L_{eq}dB(C).

4.5.1 Comments on the low frequency noise approach

We understand that using option 3 (the simple outdoor correction) as a screening method to establish at this stage the likelihood of low frequency noise problems is adequate.
However, and to be consistent with the WM statement "the DEFRA approach [...] represents the latest research into the assessment of low frequency noise" it is our opinion that the DEFRA methodology should be conducted at a number of receptors to collect information. The main implication of this option is that the environmental noise loggers will be able to record third octave band values. There are several environmental noise units (commercial products) in the market that have this feature readily available.

4.6 Blasting Assessment

4.6.1 Criteria

The WM report adopts the ANZEC Technical Basis for Guidelines to Minimize Annoyance due to Blasting Overpressure and Ground Vibration dated from September 1990. We agree that this is the most relevant guideline to assess Blasting phenomenon and also agree with the consistency of the criteria presented in the ANZEC document and in AS2187: Part 2-2006.

The blasting criteria can be expressed as follow:

- The recommended maximum level for airblast is 115 dB Linear.
- The level of 115 dB Linear may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level should not exceed 120 dB Linear at any time.
- The recommended maximum for ground vibration is 5 mm/s, Peak Vector Sum (PVS) vibration velocity.
- The PVS level of 5 mm/s may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level should not exceed 10 mm/s at any time.

In addition, the WM report makes mention to the AS 2187.6:-2006; although this standard provides a less stringent criteria for building damage and therefore it is suggested be used only to assess the mine-owned receptors.

4.6.2 Comments

The empirical model based on blasting measurements around the site is relevant as long as it is used with caution. Although we understand and agree that, as screening tool, the best way of establishing a potential adverse impact of overpressure and ground vibration, is through a mathematical equation modeling, it is also fair to say that this model is highly affected by the nature of the ground separating the source from the receiver, the relative heights of the source and receiver, etc.

We also note that although the ANZEC guideline suggest a maximum ground vibration of 5mm/s (PVS) it is recommended that 2 mm/s PVS is considered as a long-term regulatory goal for control of ground vibration. It is noted that a maximum MIC 414Kg is recommended to ensure that compliance is achieved next to receptor 18.

It is required that a Blast Management Plan is conducted and continuously developed. This document should define the blast measurement program of the initial blast, the procedures for the blasting and the proposed monitoring program.

4.7 Traffic Noise

4.7.1 Criteria

The road traffic noise criteria presented in the WM report following the NSW Road Noise Policy (2011) is the relevant criteria to apply to external road to the site which will see an increase of traffic as a result of the proposed new development. The WM report defines The Bucketts Way as "arterial road" and Jacks Road and Waukivory Rd as "sub-arterial roads". This classification seems adequate.

4.7.2 Comments on traffic noise

The main comment regarding the traffic noise is that more information regarding existing traffic noise measurements is required, i.e. location, times, etc. The assessment and conclusions seems correct and reasonable but more information about the existing traffic noise levels should be provided.

4.8 Rail Noise

4.8.1 Criteria

Two different criteria for Rail Noise are discussed in the WM report: the Australian Rail Track Corporation (ARTC), and the EPA one

The ARTC noise assessment goals for the project are nominated as follows:

> *It is an objective of this License to progressively reduce noise levels to the goals of 65 dB(A) Leq, (day time from 7am – 10pm), 60 dB(A) Leq, (night time from 10pm – 7am) and 85dB(A) (24 hr) max pass-by noise, at one metre from the façade of affected residential properties through the implementation of the Pollution Reduction Programs.*

The EPA's rail noise requirements differ from the ARTC ones. A set of trigger levels are defined as per Table 5, with the main difference being the averaging period time (day and night vs 24 hours).

Table 5: EPA's rail noise assessment trigger levels

Descriptor	Rail Traffic Noise Goal
$L_{Aeq,\ 24\ hour}$	60 dBA
Maximum Pass-by L_{Amax} (95^{th} percentile)	85 dBA

Note: 95^{th} percentile equates to the 5% exceedance value.

Discussions between WM and the EPA led to a specific project level of $L_{Aeq,24hr}$ 60dB(A), noting that additional train movements can only exceed 2dB(A) if they are appropriately justified.

4.8.2 Comments on rail noise

The WM assessment shows that the existing rail noise levels already exceeds the EPA criteria. At the same time, the impact of the new rail movements is expected to have little impact on the cumulative rail noise levels. Thus, the proposed management/engineering measures proposed by the WM seem to be the most sensible approach.

4.9 Sleep disturbance criteria

4.9.1 Criterion for the prevention of sleep disturbance within residences

The WM report provides criteria drawn from:

1. The EPA's INP Application Notes dated 9 June 2011 (refer Appendix F) recognizes that the current LA1(1minute) sleep disturbance criterion of 15 dB(A) above the prevailing LA90(15minute) level is not ideal. The assessment of potential sleep disturbance is complex and not fully understood; however the EPA believes that there is insufficient information to determine a suitable alternative criterion.
2. The World Health Organization (WHO) has published Guidelines for Community Noise. The WHO documents on the Guidelines For Community Noise is the outcome of the WHO-expert task force meeting held in London in April 1999. The WHO guidelines defines sleep disturbance as follow:

   "Sleep disturbance is a major effect of environmental noise. It may cause primary effects during sleep, and secondary effects that can be assessed the day after night-time noise exposure. Uninterrupted sleep is a prerequisite for good physiological and mental functioning, and the primary effects of sleep disturbance are: difficulty in falling asleep; awakenings and alterations of sleep stages or depth; increased blood pressure, heart rate and finger pulse amplitude; vasoconstriction; changes in respiration; cardiac arrhythmia; and increased body movements. The difference between the sound levels of a noise event and background sound levels, rather than the absolute noise level, may determine the reaction probability. The probability of being awakened increases with the number of noise events per night. The secondary, or after-effects, the following morning or day(s) are: reduced perceived sleep quality; increased fatigue; depressed mood or well-being; and decreased performance.

   For a good night's sleep, the equivalent sound level should not exceed 30 dB(A) for continuous background noise, and individual noise events exceeding 45 dB(A) should be avoided. In setting limits for single night-time noise exposures, the intermittent character of the noise has to be taken into account.

   This can be achieved, for example, by measuring the number of noise events, as well as the difference between the maximum sound level and the background sound level. Special attention should also be given to: noise sources in an environment with low background sound levels; combinations of noise and vibrations; and to noise sources with low-frequency components."

4.9.2 Comments on sleep disturbance

The definition of sleep disturbance and associated criteria presented in the WHO guidelines are consistent with the proposed EPA criteria.

Therefore it is our opinion that the EPA criteria in the absence of other criteria should be used as the sleep disturbance criteria for the proposed extension of the mining operation.

Notwithstanding our agreement with the applied criteria, it is worth mentioning that a predicted noise level of 45dB(A) represents an exceedance of the "real" background noise level of ~20dB(A) which in terms of loudness will be equivalent to a noise that is four time as loud. This is due to the minimum 30dB(A) requirements as defined in the INP. Although it is difficult to predict whether these noise levels will be a systematic source of potential awakening it is as difficult to predict that a noise event that is more than 20dB(A) above the background won't cause any sleep disturbance. Therefore special attention, and priority, should be given to those noise complaints that happen during nighttime periods.

4.10 EIS Recommendations vs WM Report Clarifications

Section 4.2.4.1 of the EIS states that the hours of operation during construction from Monday to Friday should be limited to 7am – 6pm and 8am – 1pm for Saturdays; clarification should be given on what is the location and number of the "*earthworks in acoustically exposed areas*" as defined in note 2 in Table 2 of the WM report and why the proposed times are extended in regards to those defined in the EPA's Interim Construction Noise Guidelines (DECC 2009).

It is noted that the recommendations on Section 4.2.5.1 of the EIS has been reworded (minor changes) in respect to Section 10.2 of the WM report. The following recommendations are found in the WM report but not in the corresponding EIS Section (10.2):

- Selection of noise attenuated mobile equipment and/or implementation of additional hard controls
- Reduced or restricted operations during evening and night-time periods (during operational activities).
- Mitigating conveyor noise at the source through selection of quiet systems and partially enclosing the overland conveyor in exposed locations.

Action 4.12 of the Draft Statement of Commitments calls for the installation of a predictive meteorological system to predict the adverse meteorological conditions. Given that a lot of activities depend on information provided by the weather stations, it could be a positive outcome to nominate the locations for the installation of such equipment.

Also, we could not find the mitigation measures as described in Section 10.2 of the WM report in the Draft Statement of Commitments. We understand that the measures described in Section 10.2 (the noise barriers) should be part of the EIS commitment for the project.

5. CONCLUSIONS

This report presents a review of the RHCP Project Environmental Impact Statement focusing on the Specialist Consultant Studies report Part 1: Noise, Vibration and Blasting Assessment carried out by Wilkinson Murray dated April 2013.

This document focused on reviewing the various assessment criteria likely to generate noise impact including construction and operation of the proposed mining project.

The document has identified a certain number of items and presented a certain number of comments based on these items presented in the WM report.

It has been noticed that there are significant number of references to the Noise and Vibration Management Plan across the reviewed documentation. It is recommended that this document is presented to the community, and peer reviewed, as soon it becomes available.

All the specific conclusions and proposed discussions are presented within each section of this report. As a broad summary, it is noted that the noise impact at most of the surrounding receptors (149) are expected to comply with the relevant criteria although the noise may be audible from time to time. Also, it has been reported that the Gloucester Township should not be affected by noise exceedances. However, there are 12 different private residential receivers that may be affected with different degree of noise exceedances throughout the project:

- 5 receivers would experience operational noise levels of 1dB(A) and 2dB(A) above the relevant criteria
- 3 receivers would experience levels between 3dB(A) and 5dB(A), and
- 4 receivers would experience operational noise levels in excess of 5dB(A)

Different solutions and measures have been presented to manage the aforementioned exceedances. From our experience in similar projects, it is our opinion that an independent compliance testing including noise and blasting monitoring could be implemented as part of the condition of consent or EPA License which will be granted for the proposed mining operation. This will provide a greater level of comfort to the community that the established noise and blasting criteria as presented in this document are achieved.

Appendix 1: Glossary of Acoustic Terms

Noise

Acceptable Noise Level:	The acceptable L_{Aeq} noise level from industrial sources, recommended by the EPA (Table 2.1, INP). Note that this noise level refers to all industrial sources at the receiver location, and not only noise due to a specific project under consideration.
Adverse Weather:	Weather conditions that affect noise (wind and temperature inversions) that occur at a particular site for a significant period of time. The previous conditions are for wind occurring more than 30% of the time in any assessment period in any season and/or for temperature inversions occurring more than 30% of the nights in winter).
Acoustic Barrier:	Solid walls or partitions, solid fences, earth mounds, earth berms, buildings, etc. used to reduce noise.
Ambient Noise:	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.
Assessment Period:	The period in a day over which assessments are made.
Assessment Location	The position at which noise measurements are undertaken or estimated.
Background Noise:	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation, when extraneous noise is removed. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the L_{90} noise level.
Decibel [dB]:	The units of sound pressure level.
dB(A):	A-weighted decibels. Noise measured using the A filter.
Extraneous Noise:	Noise resulting from activities that are not typical of the area. Atypical activities include construction, and traffic generated by holidays period and by special events such as concert or sporting events. Normal daily traffic is not considered to be extraneous.
Free Field:	An environment in which there are no acoustic reflective surfaces. Free field noise measurements are carried out outdoors at least 3.5m from any acoustic reflecting structures other than the ground
Frequency:	Frequency is synonymous to pitch. Frequency or pitch can be measured on a scale in units of Hertz (Hz).
Impulsive Noise:	Noise having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
Intermittent Noise:	Level that drops to the background noise level several times during the period of observation.
L_{Amax}	The maximum A-weighted sound pressure level measured over a period.

L_{Amin}	The minimum A-weighted sound pressure level measured over a period.
L_{A1}	The A-weighted sound pressure level that is exceeded for 1% of the time for which the sound is measured.
L_{A10}	The A-weighted sound pressure level that is exceeded for 10% of the time for which the sound is measured.
L_{A90}	The A-weighted level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L_{90} noise level expressed in units of dB(A).
L_{Aeq}	The A-weighted "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
L_{AeqT}	The constant A-weighted sound which has the same energy as the fluctuating sound of the traffic, averaged over time T.
Reflection:	Sound wave changed in direction of propagation due to a solid object met on its path.
R-w:	The Sound Insulation Rating R-w is a measure of the noise reduction performance of the partition.
SEL:	Sound Exposure Level is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain L_{eq} sound levels over any period of time and can be used for predicting noise at various locations.
Sound Absorption:	The ability of a material to absorb sound energy through its conversion into thermal energy.
Sound Level Meter:	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound Pressure Level:	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone.
Sound Power Level:	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power.
Tonal noise:	Containing a prominent frequency and characterised by a definite pitch.

RESPONSE TO THE NON-INDIGENOUS HERITAGE ASSESSMENT INCLUDING RELEVANT PARTS OF THE VISIBILITY ASSESSMENT OF THE ROCKY HILL EIS

Prepared by Garry Smith for Gloucester Shire Council,
October 2013

Contents

1. INTRODUCTION

The Rocky Hill Environmental Impact Statement for Non-Indigenous Heritage does not give due regard to the Gloucester Valley's scenic-heritage qualities and the impact the proposed development will have on these qualities. The valley's special heritage qualities have been widely acknowledged at both a popular level and by acknowledged experts such as the National Trust of Australia, professional historians and practising heritage consultants. The scenic-heritage qualities are a major influence on the valley's sense of identity, its way of life and its economy.

The Rocky Hill Environmental Impact Statement for Non-Indigenous Heritage relies on two specialist assessments; the Visibility Assessment in the Specialist Consultant Studies Compendium, Volume 1 Part 3 and the Non-Indigenous Heritage Assessment in the Specialist Consultant Studies Compendium, Volume 4 Part 12. The Environmental Impact Statement arrives at a number of unsupportable conclusions regarding the project's impact and the mitigation of that impact because of the flawed techniques used in the two above Special Consultant Studies. This response considers that the above two Special Consultant Studies are too severely flawed to be reconciled and should be dismissed.

Please note that this commentary has been organised approximately according to the matters being raised and does not necessarily follow the sequence of the Lamb Non-indigenous Heritage Assessment and the Lamb Visibility Assessment.

2. THE LAMB NON-INDIGENOUS HERITAGE ASSESSMENT FAILS TO GIVE DUE REGARD TO EXISTING ASSESSMENTS

The Lamb Non-indigenous Heritage Assessment cannot be reconciled with the existing two professional assessments that address the significance of the Gloucester Valley and takes the approach of attacking them and dismissing them. It is important to note that the Lamb Non-indigenous Heritage Assessment relies substantially on these two assessments for its background research but in disagreeing with them does not offer any significant research or evidence of its own.

2.1 The National Trust Listing of The Stroud-Gloucester Valley

Summary of National Trust of Australia (NSW) listings of the Vale of Gloucester

The National Trust listings for the Stroud-Gloucester, although not statutory, provide a highly authoritative account of the valley's heritage significance. The Trust's listings draw on the skills of highly qualified and experienced practitioners in a number of areas and are highly authoritative because of this. A chronological account of the Trust listings to date for the *Vale of Gloucester* follows.

- The National Trust of Australia (NSW) classified the Vale as a heritage landscape in 1975.

- The National Trust referred the nomination to the Australian Heritage Commission in 1976 but the Commission did not assess the nomination and it sat in the Register of the National Estate unassessed as an 'indicative listing' only. The RNE has now been abolished in favour of the new register, the National Heritage List.

- The National Trust revised the listing for the Vale of Gloucester in 1981.

- The National Trust again revised the listing in 2011, changing the listing title to the *Stroud Gloucester Valley, incorporating the Vale of Gloucester*.

Executive Summary point 9 a) page 12-9

This claim that the National Trust's Statement of Heritage Significance does not use the 'seven-criterion' analysis required under the NSW Heritage System is incorrect. The Trust does not enumerate and address the significance in that nominated order but a reading of the Trust Register Listing Report demonstrates clearly that these criteria form the basis of the Trust's assessment.

The Lamb Non-indigenous Heritage Assessment adopts a stance throughout whereby the National Trust of Australia and the Barrington-Gloucester-Stroud Preservation Alliance must support every claim with detailed evidence but the Lamb Assessment need only assert that something is so without argument or evidence. The Lamb Assessment should be read in entirety to understand how it attempts to discredit and dismiss the National Trust and BGSP Alliance assessments.

2.2 The BGSP Alliance assessment *The Stroud-Gloucester Valley; A heritage landscape under threat*

General comment

This assessment was prepared for the Barrington Gloucester Stroud Preservation Alliance Inc by a professional consultant with more than thirty year experience in undertaking cultural and natural heritage assessments in the region. This forty-two page document was undertaken as an independent professional study to assist in the valley's planning process and as a precursor to the more extensive comparative study that is required. However, the Lamb Non-indigenous Heritage Assessment attempts to dismiss the BGSP Alliance assessment and it is required that this aspect of Lamb Assessment and its reasons be critically examined.

Two matters are raised for initial consideration. First, the Lamb Non-indigenous Heritage Assessment fails to understand the purpose of the BGSP Alliance assessment, which was intended as a preliminary assessment to take the subject to further detailed, comparative assessment. It is a plain-English document intended for general reading. As such, it is free of the lengthy discourses, jargon, technical terms, pseudo acronyms and abbreviations that hinder the understanding of some more lengthy heritage assessments. Second, it is clear that the Lamb Non-indigenous Heritage Assessment commences from a position of bias and sets out to discredit the BGSP Alliance document in order to assist approval of the proposed coal

development. It cannot be reconciled with *The Stroud Gloucester Valley…* and must therefore discredit that assessment.

The Lamb Assessment's criticism of the BGSP Alliance assessment

The following matters are raised as being illustrative of that process and of its failure to understand the relevant heritage landscape issues but are not exhaustive in regard to it.

Executive Summary, point 8 a) page 12-9

This commences by noting that the Gloucester Basin is physically and visually separated from the Booral-Stroud area, which contains a substantial number of heritage listed items. This is incorrect, the Stroud-Gloucester Valley is geologically the one formation and provides a coherent, connecting landscape when travelling along its entire length. The two drainage patterns, one to the north and one to the south, are not discernable to the casual eye and are the result of physical stream-capture in the one, overall geological formation.

Executive Summary point 8 b) page 12-9

This point concerning conformation of settlement patterns to the landscape is obscure and meaningless in the circumstances.

Executive summary point 8 c) page 12-9

The areas cited are reasonably within the Gloucester Basin by geological and geographical considerations and the purpose of the statement is difficult to understand.

Executive Summary point 10 a) page 12-9

The claims that the BGSP Alliance assessment does not use defining criteria that conform to the current guidelines of the NSW Heritage Manual is incorrect. The assessment follows the criteria stipulated by the NSW Heritage Division, Office of Environment and Heritage, and the requirements under section 4A of the *Heritage Act 1977*. The claims that the levels of social significance claimed by the BGSP Alliance are not justified are merely part of the Lamb Report's continued attempts to discredit the BGSP Alliance assessment for the purpose of aiding the project's approval.

Executive Summary point 11, 11 a) page 12-9

The claim by the Lamb Non-indigenous Heritage Assessment that the Site is not considered to be a heritage item because the impacts of the proposal would be on values that are not confined to individual sites requires explanation. It is inconsistent with established practice, does not follow heritage assessment guidelines and is contrary to section 4A of the *Heritage Act* 1977.

The area identified by BGSP Alliance correspond to the Stroud-Gloucester Syncline with the extensions into the Gloucester River valley and the Mograni Creek valley being the only debatable matter in that they lie outside the strict limits of the Gloucester Syncline. However, they become part of it by erosion processes. As noted above, the southern geological definition of the Syncline commences at Booral. This is addressed further below.

3. Potential Heritage Landscape, 3.1 Physical and Visual Setting page 12-28

The account given in this section is in much of its content geologically incorrect. Claims that the physical and visual characteristics of the Syncline do not include the Stroud area are puzzling because the introduction to the Syncline in both geological and landscape qualities commencing at Booral. The beginning of the valley in a visual sense can be fully appreciated from the Bucketts Way approximately three kilometres south from Stroud and can be seen to great effect from Silo Hill, Stroud. The southern geological definition of the Syncline commences at Booral,[12] any attempt to claim otherwise has no geological basis and must be dismissed. As noted above, the area identified by BGSP Alliance corresponds to the Stroud-Gloucester Syncline with the extensions into the Gloucester River valley and the Mograni Creek valley being part of it by erosion processes.

This comment goes to the Lamb Assessment's refusal to use the holistic approach as required by the NSW Heritage Division, Office of Environment and Heritage, and is only another attempt to dismiss the Alliance assessment.

3.3 The Landscape Interpreted from a Cultural Perspective, page 12-29

The first paragraph of this section illustrates the bias and inaccuracies of the Lamb Non-indigenous Heritage Assessment when it claims that the BGSP Alliance assessment was 'primarily conceived by the perceived threat to the valley by coal and coal seam gas'. This is incorrect, it was conceived as the logical conclusion to the long overdue need to finalise the 1976 nomination for entry on the Register of The National Estate. The threat of mining was a later consideration that influenced the title of the work but not the decision to undertake the work.

The Lamb Non-indigenous Heritage Assessment claims that the BGSP Alliance document 'adopts a position that is different in some respects from conventional conservation practice' but fails to identify those respects. This is incorrect. The Alliance document follows conventional practice in all regards and follows the landscape assessment guidelines recommended by the NSW Heritage Division, Office of Environment and Heritage.

The Lamb Non-indigenous Heritage Assessment claims that the BGSP Alliance call for a more inclusive understanding of the scenic, historic, cultural and geological values of the landscape means *'in essence that the assessment of the impacts of development on individual buildings, sites and historic places does not give sufficient weight to the landscape as a total item of cultural value*'. This statement is obscure in its meaning and incorrect by any reasonable interpretation. The Alliance assessment notes the very high significance of the landscape and notes that further comparative assessment is required to fully quantify that significance, which as a preliminary assessment is of State significance and potentially of National significance. The Lamb Non-indigenous Heritage Assessment fails to develop its argument in any way because it fails to address the issues in anymore than a token manner.

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[12] Geology Map, *Dungog*; Geological Series Sheet 9233 (Edition 1) 1993, Department of Mineral Resources, New South Wales Government.

The remainder of the first paragraph makes obscure commentary about 'a holistic approach'. The meaning of this is unclear but seems to stem from the Lamb Non-indigenous Heritage Assessment's failure to apply landscape assessment guidelines but to use guidelines for individual items such as building and other structures. A holistic approach is a quintessential element of landscape assessment and is required under the NSW Heritage Division, Office of Environment and Heritage guidelines.

The last paragraph on page 12-29 commences a discussion of what constitutes a place's history. The point of this is unclear. This philosophical discussion draws on a number of writers who specialise in this type of writing but draws no identifiable conclusions that are relevant to the project application. It concludes with an obscure paragraph that leaves the reader uncertain as to the purpose of the entire section.

3.4 What is a heritage overview? page 12-31

There is some limited merit in this lengthy discourse but it fails to draw any firm conclusions that can provide guidance in the matters to hand. It again criticises the BGSP Alliance and its main function appears to be an attempt to claim the higher intellectual ground.

The discourse asserts in paragraph 3 that there is no material evidence remaining of the land's use by the AA Co. This is incorrect. Sites that that can be identified from AA Co writings are still recognisable today and informed guidance will bring this very much alive. Such sites include the site of the AA Co dam near the former AA Co headquarters at Gloucester and the site and building itself.

The paragraph notes that the landscape has continued to change and that no evidence from the AA Co has survived. Later development has not destroyed all evidence of the AA Co's occupation of the valley but the point must be made that the later use also contributes to the valley's high landscape significance. It is this rich tapestry of land use that creates the total, overall significance.

The discourse continues with meaningless statements that are intended to override existing assessments and opinion. The comment that 'It may appear to be the same grazed, rural landscape in hindsight, but this is largely an illusion' is an unsupported statement of little meaning.

Page 12-32

The discourse continues on the first paragraph on page 12-32 in an unclear manner that draws no coherent conclusions and continues to make false claims. The claim that the AA Co selected the estate for it production potential is true. However, it is a matter of record that the valley's landscape was appreciated from the initial exploration and continued to influence land use and settlement from that time. The landscape was important to the Aboriginal people of the valley, it was praised by Robert Dawson in his initial exploration, was praised by Rev John Dunmore Lang during his 1850 visit and was painted by Sir Arthur Streeton in 1894 as a place of scenic-natural importance.

The valley's landscape has been an integral part of its character and sense of place since its first settlement, and before then in regard to Aboriginal significance. The matter of how a place's scenic qualities can influence its sense of place and social-economic growth is a matter that has been little addressed as a research topic. In this regard there are clear

indication that the valley's scenic qualities have been an outstanding influence on the valley's sense of place and social-economic growth. This can be readily ascertained by an understanding of the area's history, its past and present social values past and the way the area promotes its tourism industry.

Paragraphs 4 and 5 on page 12-32 espouse argument about views of, from and between heritage items. If the two concluding sentences commencing 'If there is an authentic…' and 'In the same vein, the presence of …' are argued as the final summarising statement of the argument presented, the conclusion must be that the views within and from the surrounding area do have heritage significance and the proposed development will impact adversely.

The reference to selective 'view cones' in the last sentence on page 12-32 is a concept that has limited application in assessing landscapes of this type and is not relevant in this instance because the proposed development is a part of the heritage 'item'. Once again, the use of the correct guidelines would have prevented such comment.

4.1.2 Alternative BGSPA Statement of Heritage Significance, commencing p.12-36

Paragraph 1 continues with the Lamb Assessment's criticism. The commentary in much of this section is an inaccurate critique of the BGSP Alliance assessment and there is little point in providing a lengthy account of all of the issues. However, two matters in the last paragraph illustrate the Lamb Heritage Report's failed understanding of the valley's scenic-heritage significance. These are the criticism of the statements concerning the Bucketts as a backdrop to Gloucester and the popularity of the Mograni Lookout.

4.1.2 page 12-37, 4th paragraph

The Lamb Non-indigenous Heritage Assessment suggest that Katoomba, Nelson Bay etc would dispute that claim about the significance of the Bucketts as a backdrop to Gloucester but the Lamb Assessment fails to understand the point being made in the BGSP Alliance assessment. The towns cited in the Lamb Non-indigenous Heritage Assessment are in high scenic tourist areas, that is agreed, but the attractions named by the Lamb Assessment are promoted tourist features in their various areas. They may be partly visible from their respective town areas or have no context to them at all so that the observer must to travel to view them. They do not visually dominate every part of their relevant towns as the Bucketts dominate Gloucester.

The Gloucester Bucketts, page 12-37, 4th paragraph

The Bucketts are highly visible from every part of Gloucester and because of their scale, changing colours and visual impact provide a setting that is rarely, if ever, matched elsewhere. This visual setting has a profound effect on both Gloucester residents as to how they see their home town and on the visitor. Comment is made elsewhere in this commentary about their description by Robert Dawson upon the area's initial European exploration and their painting by Sir Arthur Streeton.

The Mograni Lookout, page 12-37, 4th paragraph

The comments about the popularity of the Mograni Lookout has similarly been misinterpreted. The Mograni Lookout is not a publicised tourist attraction, it is a roadside parking area in a rural area. Its visitation rate as a drive-by location as opposed to a promoted tourist attraction is extremely high. As well as its heavy usage, it is visited by photographic groups and is used for other purposes such as a setting for wedding photographs. The Lamb

Non-indigenous Heritage Assessment would not have been in a position to assess this usage and the Lamb Assessment detracts from its own credibility by this sort of criticism.

3. THE LAMB NON - INDIGENOUS HERITAGE ASSESSMENT FAILS TO FOLLOW THE REQUIRED LANDSCAPE ASSESSMENT PROCEDURE

The Lamb Non-indigenous Heritage Assessment fails to follow landscape assessment guidelines. This manifests itself in two critical ways: first the Assessment fails to use the required holistic approach to landscape assessment, and second, the Assessment uses guidelines intended for buildings and structures

3.1 The required 'holistic approach' was not used

3.3 The Landscape interpreted from a cultural perspective, page 12-29

It is important to consider at all times that the holistic approach is a quintessential element of landscape assessment and is required under the appropriate guidelines. The Lamb Non-indigenous Heritage Assessment fails to use the holistic approach and therefore fails to grasp the basic elements of landscape assessment, yet is critical of the BGSP Alliance's 'holistic' approach to landscape assessment and undertakes a criticism of the BGSP Alliance assessment for this reason.

The NSW Heritage Division, Office of Environment and Heritage, does not have landscape guidelines and has adopted the Victorian guidelines, Heritage Victoria, *Landscape Assessment Guidelines for Cultural Heritage Significance*, July 2002, updated January 2009. Those guidelines at 5 'ABC' Assessment Checklist specify that '*In the same way that ecological models recognise the inter-connectedness of living systems, cultural landscape heritage assessment should recognise the holistic nature of landscapes as part of a larger environmental system'.*

3.2 The Lamb Heritage Assessment uses incorrect assessment guidelines

4. Assessing Potential Heritage Impacts on the Landscape

4.1 Methodology (page 12-33)

Although the BGSP Alliance assessment did not list the landscape guidelines and argue compliance with them, it did follow those guidelines. As noted, the Lamb Non-indigenous Heritage Assessment failed to follow the required guidelines.

Guidelines used by the Lamb Non-indigenous Heritage Assessment

The eight dot-point recommendations used by the Lamb Non-indigenous Heritage Assessment were prepared for buildings, structures and sites. The NSW Heritage Division, Office of Environment and Heritage, does not have landscape guidelines and has adopted the Victorian guidelines, Heritage Victoria, *Landscape Assessment Guidelines for Cultural Heritage Significance*, July 2002, updated January 2009 . The attempts by the Lamb Non-indigenous Heritage Assessment to adapt building and site guidelines to assessing landscape

produces unnatural results and the Lamb assessment is deeply flawed because of that procedure.

The guidelines used in the Lamb Non-indigenous Heritage Assessment and noted in that assessment are reprinted below. A brief reading of these reveals their unsuitability to landscape assessment for the reason that the landscape is the 'item' not just something that is in the vicinity of the 'item'.

- How is the impact of the new development on the heritage significance of the item or area to be minimised?
- Why is the new development required to be adjacent to a heritage item?
- How does the curtilage allowed around the heritage item contribute to the retention of its heritage significance?
- How does the new development affect views to, and from, the heritage item?
- What has been done to minimise negative effects?
- Is the development sited on any known, or potentially significant archaeological deposits? If so, have alternative sites been considered? Why were they rejected?
- Is the new development sympathetic to the heritage item? In what way (e.g. form, siting, proportions, design)?
- Will the additions visually dominate the heritage item? How has this been minimised?
- Will the public, and users of the item, still be able to view and appreciate its significance?

The required NSW heritage landscape guidelines

As noted above, the Lamb Non-indigenous Heritage Assessment's failure to use the required guidelines is a serious omission that leaves the Lamb Assessment deeply flawed. The Lamb Assessment fails to identify the heritage significance of the highly significant northern end of the Gloucester Valley and fails to understand the qualities that define that significance. It follows that it fails to identify and understand what the development's impact on that significance will be.

The Victorian guidelines address landscape assessment under the following headings and readers are referred to those guidelines for an understanding of this most critical matter. These guidelines encompass greater advisory detail than is indicated by the broad headings listed below and, contrary to the Lamb Non-indigenous Heritage Assessment, require that the holistic approach be adopted.

1. Purpose and Scope of Guidelines

2. Commonly-used terms

3. Describing Landscapes by Type

4. Cultural Significance
   - Values of Cultural Significance
   - Assessment criteria

5. 'ABC' Assessment Checklist
   - A Area, and environmental or site context

B Boundaries

C Cultural patterns relating to historical development

D Distribution of elements

E Specific elements

F Further factors associated with standard heritage assessment guidelines

3.3 Other assessment matters regarding the Lamb Non-indigenous Heritage Assessment

The Lamb Non-indigenous Heritage Assessment continues throughout the assessment process to diminish or dismiss the substantial potential impact of the proposed development. The examples identified below are illustrative of that procedure but are not exhaustive of them.

4.1.3 RLA assessment of Heritage Significance page 12-40
Criterion (f) Rarity

The Lamb Non-indigenous Heritage Assessment attempts to dismiss the valley's significance under criterion (f) by claiming that the National Trust of Australia did not deal with this criterion and that the BGSP Alliance did not deal with it on the basis that it requires comparative analysis. From this, the Lamb Assessment claims that it does not have any significance under criterion (f) but offers no consideration to justify the dismissal. The BGSP Alliance assessment correctly notes that significance under criterion (f) rarity requires comparative assessment as its basis. That submission notes that there is a preliminary level of evidence sufficient to trigger further assessment but acknowledges that such assessment will be extensive. The current level of research indicates that criterion (f) may be satisfied for geological, historic, scenic and social significance.

4.3 Questions to be answered in a SoHI, page 12-47

This section fails in its purpose because it uses guidelines intended for 'items' - buildings, structures and sites, instead of landscape guidelines. It attempts to adapt these guidelines to landscape but does so with little success or understanding of the subject matter. The failure of taking a holistic approach to the landscape remains a continuing and fundamental deficiency.

4.3.1 How is the impact of the new development on the heritage significance of the item or area to be minimised, commencing page 12-47

This section is flawed because the Lamb Assessment fails in four critical areas. First, as noted above it uses guidelines intended for buildings and sites, not landscape. Second, it fails to accept aesthetic significance as a heritage assessment criterion, and from that fails to accept scenic views as a component of heritage significance. Third, it fails to give due consideration to the northern end of the valley, Robert Dawson's *The Vale of Gloucester*, as the critical and highly significant defining northern section of the Stroud-Gloucester Valley. Fourth, it cites the visual assessment in Appendix 2 Section 2.4 as addressing the relevant scenic issues but fails to integrate scenic-visual significance into the heritage assessment. Appendix 2 instead attempts to dismiss the very obvious visual impact of the proposed development by the use of selective viewing points and by failing to acknowledge the scenic impact from a number of major locations.

Second paragraph of 4.3.1 page 12-48

The second paragraph of 4.3.1 page 12-48 epitomises the dismissive approach of the Lamb Non-indigenous Heritage Assessment when it claims;

> *The landscape is agreed to be of aesthetic significance, but the views affected are not agreed to be heritage views. This is not of great importance. since* [because?] *the need to return the site to the highest possible quality and with a landform and use compatible with the existing use and adjacent development pattern is required in either case.*

The views are heritage views, this is the critical error - the subject site is a part of the identified heritage landscape. The last sentence of paragraph 2 further emphasises the deficiency in the Lamb report's approach when it says that the matter is not of 'great importance'. The reader must interpret this as meaning that a major and highly visible scarring of the landscape of a heritage area is of no greater importance than the same impact on a non-heritage area, but that it does not matter because inadequately quantified remedial action is going to be undertaken somewhere in the future to an undefined 'highest' possible quality.

4.3.2 Why is the new development required to be adjacent…? page 12-48

The proposed development is within the heritage landscape area, not adjacent to it. This guideline is intended for buildings and structures.

4.3.3 How does the new development…? page 12-48

No comment is relevant other than that it highlights that the guidelines being used are intended for 'items' - buildings, structures and sites, not for landscape.

4.3.4 How does the new development affect views to and from …. page 12-48

Again, this is intended for buildings, structures and sites, not landscape. The proposed development is <u>in</u> the heritage landscape. The heritage assessment again fails to integrate the visual assessment into the heritage assessment but refers the reader to Appendix 2 for further consideration and integration of material that should have been provided by the heritage assessment.

4.3.5 Is the development sited on any known, or potentially significant archaeological deposits …? have alternative sites been considered? page 12-48

The wording of this guideline again shows it is intended to address buildings, structures and sites.

4. OTHER INCORRECT AND MISLEADING STATEMENTS IN THE LAMB NON-INDIGENOUS HERITAGE ASSESSMENT

As noted, the main approaches of the Lamb Non-indigenous Heritage Assessment to justifying the unjustifiable is to dismiss existing the professional assessment of the Stroud-Gloucester Valley and to use inappropriate assessment methods in its own assessment.

A full critique of the unreasonable and biased assessments found in the Lamb Non-indigenous Heritage Assessment would result in a response of grossly excessive length. Accordingly, this document is restricted to a brief review of relevant examples that will illustrate the problem. The issues addressed below are the significance of the Gloucester

Bucketts, the views from the Mograni Lookout, the generally inadequate visual assessment and the failure to acknowledge heritage items within the subject area.

4.1 The Gloucester Bucketts and the Gloucester Valley landscape

The Gloucester Bucketts, although not statutorily listed, are widely acknowledged to have high levels of significance at local, State and National levels for indigenous, geological, historical, scenic and social reasons. The Gloucester Bucketts and the surrounding highly significant landscape, Robert Dawson's *Vale of Gloucester*, were not properly interpreted and evaluated in the Lamb Non-indigenous Heritage Assessment and the following comments are illustrative of that situation.

4.1.1 Why the item, place or area is of heritage significance, page 12-34, 12-35

The use of Robert Dawson's 1826 account of the Bucketts as a scientific description to support the Lamb Assessment's claims must draw comment even if it initially appears to be of little consequence. Dawson's description was made at the time of the full flowering of *Romanticism* or *The Romantic Period,* the age of Wordsworth, Coleridge and Sir Walter Scott. The description has only limited use as a factual description of the Buckets as they appeared at that time although Dawson's comments can to an extent be reconciled with the present landscape by making allowance for the language of that time.

To use it as an introduction to a commentary on landscape change and evolution within the Gloucester Valley is inappropriate, particularly considering the commentary's failure to understand the factors that have shaped the Gloucester Valley's landscape. Leading from that, the Lamb Non-indigenous Heritage Assessment then compares the Gloucester Valley landscape to the Western Cumberland Plain landscape without acknowledging the different historical and environmental factors that affected each

The claim that the Bucketts are not a heritage site

4.2.2 Identifying the impacts…page 12-45

The claim at the first line on page 12-45 that the 'Bucketts are not a heritage item' is an astonishing statement in the circumstances. As noted previously, the Gloucester Bucketts are widely acknowledged to have high levels of significance at local, State and National levels for indigenous, geological, historical, scenic and social reasons. Is the duty of the Lamb Non-indigenous Heritage Assessment under the Director-General's Environmental Assessment Requirements to assess the significance of the area and of items in the area and within the visual ambit of the area, whether they are statutorily listed or not.

An important and admired quality of the Bucketts that which could not be appreciated by a brief inspection is the way in which their appearance and colour changes according to weather, time of day and time of year – red, blue, green, yellow and sombre grey are all colours of the Bucketts changing appearance. Local residents frequently express their admiration of these qualities.

4.2 Failure to acknowledge heritage items within the mine site

Executive Summary point 6 d) page 12-8

The claim that there are no statutory items, contributory items or sites on or in the vicinity of the Site or its visual catchment is incorrect. Two non-listed dwellings of heritage significance, 237 Fairbairns Road and 305 Fairbairns Road, are on the subject site. Number 237 clearly has local significance and number 305 appears also to have local significance but

the view was obscured by an avenue of old trees and the property was not entered. This submission does not provide an assessment of them, that is the duty of the Lamb Non-indigenous Heritage Assessment. These buildings are to be demolished.

5. VISUAL ASSESSMENT

5.1 Overview of the area's scenic significance

As noted in this response, the scenic-visual qualities throughout the Stroud - Gloucester Valley are important qualities that contribute significantly to the valley's self image, its way of life, its economy and its heritage significance. While the valley's visual qualities have has been acknowledged by the Lamb Non-indigenous Heritage Assessment and Visibility Assessment, that acknowledgement has been limited and dismissive in regard to the significance of those qualities and the project's potential impacts on them.

In particular, the Lamb Non-indigenous Heritage Assessment has refused to acknowledge the valley's visual qualities as being an important contributor to the valley's heritage significance. Although the valley's significance extends throughout its length, the highly significant Booral-Stroud area defines the southern limit of the valley and the highly significant northern end, Robert Dawson's *Vale of Gloucester,* defines the northern extent of the valley. The siting of the proposed development in the highly significant northern reaches of the valley and its potential impact have been obscured by the Lamb Non-indigenous Heritage Assessment's dismissive approach.

5.2 The Lamb Non-indigenous Heritage Assessment and Visibility Assessment combine to dismiss visual significance

The Lamb Non-indigenous Heritage Assessment and Visibility Assessment work in combination to diminish and dismiss the scenic-visual impact of the development. For example, the lamb Non-indigenous Heritage Assessment - Executive Summary, point 20 k) page 12-12 acknowledges that there will be an impact on the aesthetic values of the landscape but dismisses that by asserting that it will not be in 'same view compositions' as the Gloucester Bucketts or Gloucester. If this means the observer cannot stand at the one point and view both without moving the eyes it lacks any credibility as a supposedly persuasive statement about the valley's heritage significance.

5.3 Visibility assessment - the size, scale and impact of the proposed development

The proposed mine is large by any criteria and will occupy a substantial part of the landscape at the northern end of the valley. It will involve approximately 800ha of open cut mines, extensive piles and barriers of overburden reaching up to 40m in height and associated infrastructure such as coal loading conveyor, rail loading and associated buildings. It is an extensive development by itself without considering cumulative impact with the AGL coal seam gas project and the nearby Stratford extension.

5.4 Visibility assessment - impact of the visibility screens

A critical matter not addressed by the Lamb Visibility Assessment is the impact of the screening methods themselves. The valley's scenic-heritage significance depend on the expansive open view across and along the valley. The proposed extensive use of earth mounding will impact significantly on these qualities. In this sense, the solution to the visual problems created by the development creates another problem of equal impact.

A critique of the photomontages provided in the Lamb Visibility Assessment, and referred to in the Lamb Non-indigenous Heritage Assessment, has not been undertaken in this commentary because they require extensive and rigorous review. However, a tour of inspection shows that the photomontages are somewhat less than accurate and are flattering in regard to their appearance and the claimed mitigation methods. The visibility earth barriers have been discretely coloured in to create little visual effect and have been made to appear less obvious than a tour of inspection demonstrates. They will be difficult to properly vegetate and to retain in a healthy vegetated state despite claims to the contrary. They will be highly visible from a substantial number of viewing points.

The conclusion is that the visibility barriers themselves will have a severe impact.

5.5 Visibility Assessment - specific issues

The following matters are raised as being illustrative of the deficiencies and unsubstantiated comments in the visual assessments, they are certainly not exhaustive of the concerns noted. The Lamb Visibility Assessment fails to assess cumulative impact when the project is considered in conjunction with the AGL coal seam gas project and the Stratford coal mine extension. This is assessed more fully below under 6. CUMULATIVE IMPACT - *Visibility Environmental Impact Statement*, R.W. Corkery & Co. Pty. Limited

Effect on landscape character page 3-12, 6th dot point

The Lamb Visibility Assessment states the following:

> The final landform will be distinguishable from the existing landform for those that are familiar with it. The proposed rehabilitation to woodland, may be perceived by the contemporary population as an improvement in scenic quality of that component.

The above statement is very difficult to accept. The visual qualities will be affected for approximately twenty years but probably longer. This should be classed as long term impact, not to be dismissed as merely transient. However, irrespective of that the changes will be far more noticeable than the statement indicates and the claim that it will present an improvement in scenic qualities can only be described as absurd. This statement indicates a lack of understanding in regard to assessing scenic-heritage significance.

3.3 Visual Absorption Capacity page 3.54 onto 3.56, 3.57

The Lamb Visibility Assessment notes at the above section that the site and its land use provide little in the way of Visual Absorption capacity and there is general agreement with that. The Assessment then continues to assess the level of visual effects on the four categories of viewing regions described according to their distance from the proposed site and their elevation in relation to it.

Some points of disagreement can be drawn with this description although some aspects of it are reasonable. The problem is that issues such as topography, intervening vegetation and the placement of visual barriers (as the panacea for all ills) are then cited as bringing these acknowledged impacts to an acceptable level.

The Lamb Visibility Assessment can in regard to the mitigating factors relied upon be assessed and audited with a little effort and some basic surveying skills. This reveals that the

landscape conclusions drawn by the Lamb Visibility Assessment cannot be supported. The conclusion is and always must be that the proposed development is of such scale and siting that it will be highly and intrusively visible.

6. VISUAL CUMULATIVE IMPACT

6.1 General comment

The Lamb Non-indigenous Heritage Assessment fails to assess cumulative impact. The practice of dismissing the cumulative impact of other development for the reason that the impact is claimed to be small is contrary to assessment procedure. All impacts should be given due consideration, even those of apparently minimal impact, for two fundamental reasons. First, cumulative impact assessment should consider the cumulative impact of ALL developments because it is the total impact that is being assessed. Individual developments may each have a low level of impact but a high level of combined impact. Second, a particular development may have a low level of impact on its own but may combine with other development in a multiplying or reactionary manner to produce a greatly increased impact. Failure to address these two requirements constitutes failure to assess cumulative impact.

The Lamb Non-indigenous Heritage Assessment completely ignores cumulative impact. The reasons for this are not stated in the Assessment but would go to the Lamb Heritage Report's failure to properly assess the landscape significance of the site and its setting. This is a serious omission that limits the application of the Lamb Non-indigenous Heritage Assessment because the Rocky Hill project, the existing and planned Stratford mine extensions and the AGL Coal Sean Gas project will have a substantial combined impact.

The Lamb Visibility Assessment goes to some length to justify the visual impact, which it notes has the potential to create an excessive cumulative impact. However, it then attempts to justify that by another lengthy criticism of the BGSP Alliance assessment, the unconvincing assertions that the various developments are not situated within the same view and the sweeping claims that rows of eucalypt trees and extensive earth mounding are the panacea for all visual ills. At no point are these assertions convincing and at no point is the cumulative impact properly assessed. At no point is assessment of the visual impact caused by the earth mounds incorporated into the overall assessment.

6.2 *Visibility Environmental Impact Statement*, R.W. Corkery & Co. Pty. Limited

4.5.5.6 Cumulative Impacts page 4-136

The Lamb Visibility Assessment leads the *Visibility Environmental Impact Statement* by R.W. Corkery & Co. Pty. Limited to a number of unsubstantiated conclusions at 4.5.5.6 Cumulative Impacts page 4-136. First, it notes that '*the proposed activities to be undertaken by AGL would be of a scale that would not contribute to any noticeable visual impacts. Similarly, the proposed re-located 132kV power line and new 11kV power line and the associated substation would be of a scale that is unlikely to contribute to any noticeable cumulative impacts'*. An inspection of the area shows that this claim cannot be substantiated.

Second, it notes that the Stratford Coal mine lies within some common view catchments to the proposal area but excuses this by the claim that for most of the viewing locations that are to the north-west and west of the mine area the two mines would not be in the same view. The logic of this is unclear and it can only amount to another method to dismiss cumulative impact.

Third, the last paragraph in that section, page 4-136, concludes by claiming *'Lamb (2013a) concludes that, on balance, it is considered that while minor cumulative impacts would occur, given the short life span of the Proposal, the cumulative impacts would not be significantly increased as a result of the combines presence of the Stratford Coal Nine and the Applicant's proposal'.* This conclusion is not supportable by inspection of the site and area and cannot be justified. It is narrow and selective, it diminishes the cumulative impact of the existing and planned mining projects, fails to acknowledge the combined visual impact and the extent that both will be visible, and completely omits the AGL project from the assessment.

The AGL project will have a significant visual impact when all aspects of that project are considered, yet this has been ignored. The AGL project will include gas wells, connecting roads and necessary infrastructure. Coal seam gas projects have a high visual impact and failure to consider the AGL project is a serious omission.

The continued reference to the 'short' claimed short life span of the project is regularly used throughout the Non-indigenous Heritage and Visual Assessments and the Environmental Impact Statements. That lifespan is acknowledged as being around 21 years but that duration can hardly be classified as small and, if the existing mines in the area and elsewhere are to be examples, will almost certainly considerably exceed that period. The mine, if approved, will seek expansion and subsequent stages. The project should be classified as having a long term impact.

7. GROUNDS FOR REFUSAL

This response to the Lamb Non-indigenous Heritage Assessment considers that the Assessment fails to meet accepted environmental assessment requirements and fails to meet the Director General's Environmental Assessment Requirements and that these failures go to the function and substance of the Lamb Environmental Assessment. This response considers that the Lamb Environmental Assessment should be rejected and project approval be refused.

7.1 The Director General's Environmental Assessment Requirements

General Requirements

A full assessment of how completely the Lamb Heritage Assessment fails to address the Director General's Environmental Assessment Requirements would require a document of excessive length in these circumstances. However, the following commentary is provided as an overview.

Principles of ecologically sustainable development

The General Requirements specify that the Environmental Impact Statement must meet form and content requirements in Clauses 6 and 7 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*, which require among other matters:

> Clause 7 (1) (f) the reasons justifying the carrying out of the development, activity or infrastructure in the manner proposed, having regard to biophysical, economic and social considerations, including the principles of ecologically sustainable development set out in subclause (4).

Subclause (4) of Clause 7 describes the principles as (a) the precautionary principle, (b) the principle of inter generational equity, (c) the conservation of biologically diversity and ecological integrity, and (d) improved valuation, pricing and incentive mechanisms.

Application of the principles of ecologically sustainable development

Applying these principles is a complex matter and their application to the heritage environment is particularly so. However, at least (b) *the principle of inter generational* equity must be relevant to the long term and potentially permanent changes that will impact upon the northern end of the valley, the area known as *The Vale of Gloucester.* The Lamb Non-indigenous Heritage Assessment's continual attempts to dismiss the landscape heritage significance of *The Vale of Gloucester* and the visual impact that the proposed development will have on *The Vale of Gloucester* are relevant because the development's impact will be considerable. As a result of this, the *Vale of Gloucester* will be passed onto to future generations in a permanent or long term damaged state.

The Environmental Impact Statement should consider all relevant planning instruments

The General Requirements specify that the EIS must include '*consideration of all relevant planning instruments, including identification and justification of any inconsistencies in these instruments'.*

The proposed Rocky Hill development is situated substantially within the Zone E3 Environmental Management of the Gloucester Local Environmental Plan 2010. The 2010 Zone E3 boundaries correspond very closely with the boundaries of the former Zone 7(d) Environmental Protection (Scenic) Zone in the Gloucester Local Environmental Plan 2000, the main difference being a small extension in area to the south-west of the zone. However, no part of the Rocky Hill project site is within that extended area and that extension is not relevant to these comments.

The objectives of Zone E3 are:

- to protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values.
- to provide for a limited range of development that does not have an adverse effect on those values.
- to conserve biological diversity and native vegetation corridors, and their scenic qualities, in a rural setting.

It is most important to note that Zone E3, as did the former Zone 7(d), corresponds closely to Robert Dawson's initial *Vale of Gloucester* and to the ongoing use of the term. The importance of this area in underpinning the scenic-heritage significance of the northern half of the Stroud-Gloucester valley cannot be understated.

Approximately eighty percent of the Rocky Hill proposal area is situated within Zone 3 and that eighty percent constitutes approximately ten percent of the Zone E3 area. The Rocky Hill coal project is a large open cut coal mine that will occupy a significant part of the Zone E3 area and accordingly will have a very substantial visual-heritage impact. That impact will be inconsistent with the provisions of Zone E3, but no attempt was made by the Lamb Non-indigenous Heritage

Assessment to explain those inconsistencies or to justify the proposed development in relation to them.

The failure of the Lamb Non-indigenous Heritage Assessment to consider the Gloucester Local Environmental Plan 2010 and give due regard to its provisions is a serious omission that goes to the integrity of the Assessment.

Non-indigenous heritage requirements

The requirements specific to Non-indigenous heritage are:

- a Historic heritage assessment (including archaeology) which must:
- include a statement of heritage impact (including significance assessment) for any State significant or locally significant historic heritage items;
  and,
- outline any proposed mitigation and management measures (including an evaluation of the effectiveness and reliability of the measures);

The Lamb Non-indigenous Heritage Assessment fails to meet the first requirement, which specifies that the Assessment should consider all items of local or State heritage significance. This includes items that are not statutorily listed. The Lamb Non-indigenous Heritage Assessment failed to identify the two dwellings 237 Fairbairns Road and 305 Fairbairns Road and dismissed the landscape of *The Vale of Gloucester* and the Gloucester Bucketts as having no heritage significance. There is substantial opinion that these have heritage significance at the local, State and National levels and failure to identify and give due consideration to these is a serious omission in the Assessment.

It follows from the above omission that the Lamb Non-indigenous Heritage Assessment also fails to meet the last requirement of the above Environmental Assessment Requirements to outline relevant mitigation and management measures and evaluate the effectiveness and reliability thereof.

7.2 *Environmental Planning and Assessment Act 1979*

Section 79C Evaluation

This response does not attempt a full analysis of the grounds for refusal under section 79C of the Act, to do so would require a detailed and lengthy submission. This response notes that section 79C requires that the consent authority must take a number of matters into consideration. The consent authority will rely substantially on the Environmental Impact Statement to be fully informed regarding those matters.

This response does not undertake a full review of those provisions but notes the deficiency in the Lamb Non-indigenous Heritage Assessment in relation to Section 79C (1) (b) (c) (d) (e)

(b) the likely impacts of that development, including environmental impacts on both the natural and built environments and social and economic impacts in the locality,

(c) the suitability of the site for the development,

(d) any submissions made in accordance with this Act or the regulations,

(e) the public interest

These requirements should be considered across the full range of environmental matters to be assessed and all four above matters can be considered as being relevant to the non-indigenous heritage assessment. However, comment is made here only in regard to (b). The proposed development will have a significant impact on the heritage significance of the area in regard to local, State and National assessment criteria. The State criteria (a) historical significance, (c) aesthetic significance and (d) social significance are strongly affected and the other criteria (b), (e), (f), and (g) are affected to varying degrees. The National criteria under the *Environmental Protection and Biodiversity Conservation Act* 1999 (Cth) s 324D(3), as prescribed by the regulations, are similarly affected and the following three criteria are noted but a fuller consideration is necessary to expand on that.

- **the place has outstanding heritage value to the nation because of the place's importance in the course, or pattern, of Australia's natural or cultural history;**

- **the place has outstanding heritage value to the nation because of the place's importance in demonstrating the principal characteristics of a class of Australia's natural or cultural environments;**

- **the place has outstanding heritage value to the nation because of the place's importance in exhibiting particular aesthetic characteristics valued by a community or cultural group.**

The Lamb Non-indigenous Heritage Assessment avoids scrutiny of these issues by failing to assess the area's heritage significance to the proper standard, by using incorrect assessment guidelines, by failing to use the holistic approach, by failing to undertake a full and rigorous visual impact assessment and by failing to assess cumulative impact.

8. CONCLUSION

The proposed Rocky Hill coal project will have a substantial and detrimental impact on the visual-scenic-landscape qualities of project site area and the surrounding area. The Lamb Non-indigenous Heritage Assessment failed to understand the heritage significance of the site and the surrounding area because it did not give due consideration to the existing heritage assessments of the area and failed to follow landscape assessment guidelines, applying instead guidelines intended for the assessment of buildings and structures.

This irregularity in assessment procedure was compounded by the Lamb Non-indigenous Heritage Assessment failure to follow the 'holistic approach' to landscape assessment as required by the NSW Heritage Division, Office of Environment and Heritage. The Lamb Non-indigenous Heritage Assessment also failed to assess the heritage significance of two items with potential local heritage significance within the site area.

The Lamb Visibility Assessment provides some acknowledgement of the area's scenic significance but fails to integrate that into the area's heritage significance and fails to properly assess the project's potential impact on that significance. The Assessment arrives at a number of unsupportable conclusions based on distance, viewing angles, existing landforms and the use of earth barriers to claim that the visual impact would not be intrusive, yet an inspection of the site and a rigorous review of the data and mitigation techniques shows clearly that the project will have a substantial impact that will change the visual character of the area.

The conclusion is that the project will have a severe impact on the heritage and scenic significance of the site and the area and, that the impact cannot be absorbed or mitigated to a satisfactory level. The effects of that will be far reaching and will impact across all of the area's social, environmental and economic qualities. For these reasons, the project should be refused.

Appendix 4 - Cumulative Economic Impact

Cumulative impact of resource developments on the socio economics of Gloucester LGA

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October 2013

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Cover photo: aquaculture operation south of Gloucester. Photo by Rod Campbell.

Citation:

Economists at Large, 2013, *Cumulative impact of resource developments on the socio economics of Gloucester LGA,* a report for Gloucester Shire Council, prepared by Economists at Large, Melbourne, Australia.

Authors:

Rod Campbell

Nick Gedye

Summary

Gloucester Local Government Area (LGA) is located some 260km north of Sydney, NSW. With a population of around 4,900 Gloucester is a traditionally agricultural area which has experienced significant migration from "tree changers" in recent decades. The area also has existing and proposed coal and coal seam gas developments:

- Stratford coal project (existing and proposing to expand)
- Duralie coal project (existing and proposing to expand)
- Rocky Hill coal project (currently a proposal)
- Gloucester Gas project (currently test drilling and proposing to expand to commercial production)

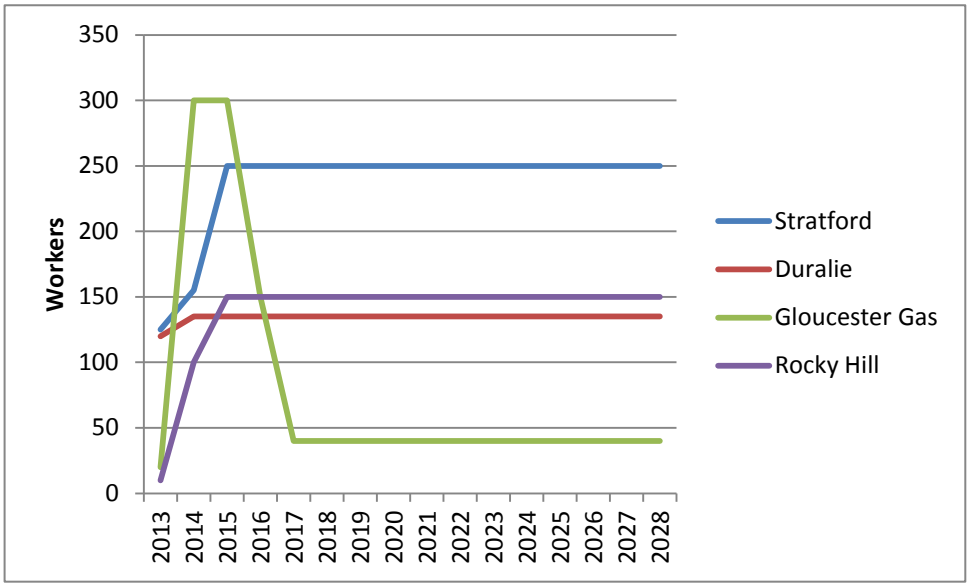
This report assesses the socio economic impacts of the four coal and coal seam gas projects on the Gloucester.

The main socio economic benefit of these projects for Gloucester is employment. The Stratford and Duralie projects currently employ approximately:

	Gloucester residents	Great Lakes LGA residents	Non-residents	Total
Stratford project	48	25	53	126
Duralie project	62	22	51	135
Total	110	47	104	261

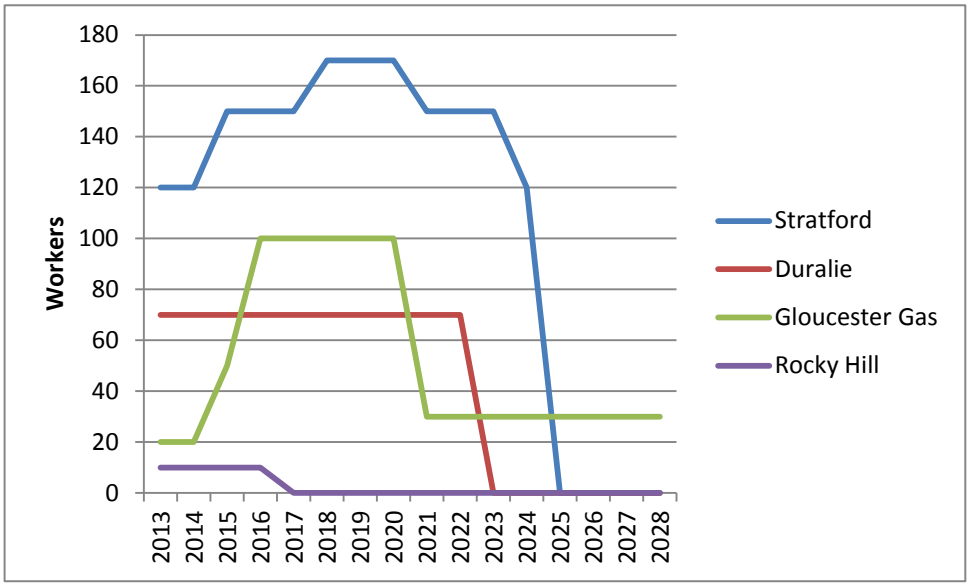
Estimating the employment levels in the four projects over future years is difficult given uncertainty around their approvals, timing and employment levels. We have developed three scenarios, high, low and mid, to explore potential impacts. The high scenario is based on employment levels published by the four projects, largely in their respective environmental impact statements. It assumes that all projects will start next year, 2014.

Resource project employment – high scenario

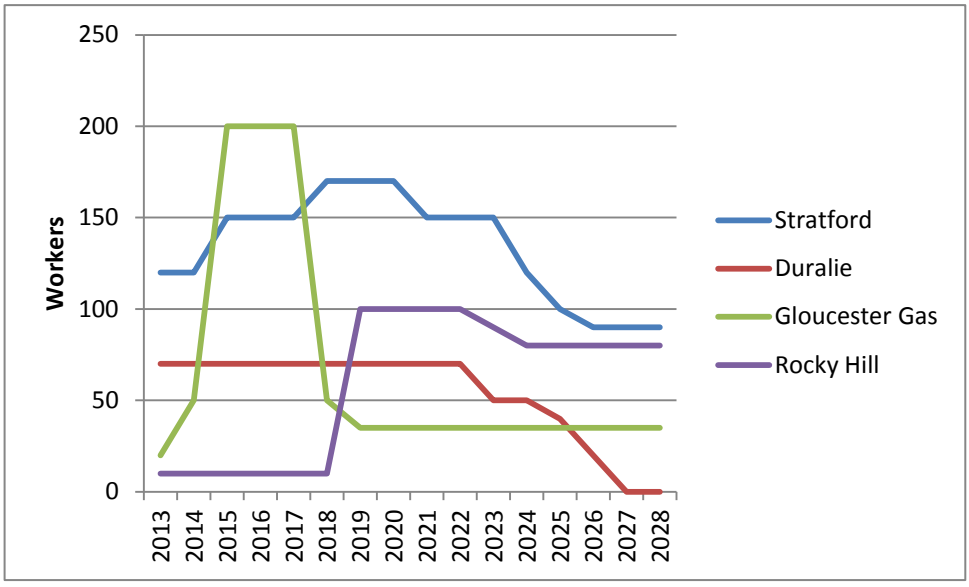


We consider the high scenario to be unlikely, given the current planning assessments and the difficulties some proponents will face in raising finance for their projects. We have developed low and mid scenarios for employment, based on published information and our own impressions which we consider more likely:

Resource project employment – low scenario



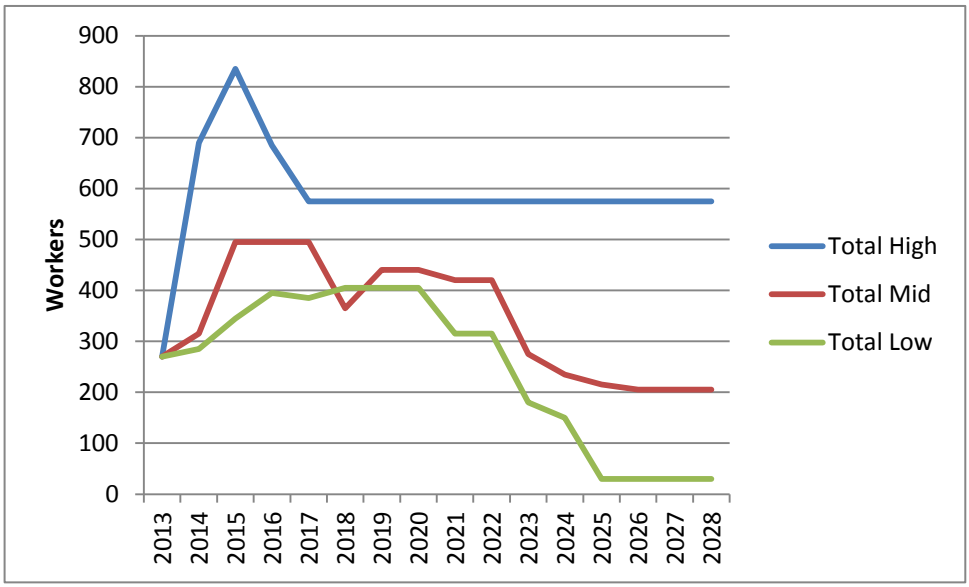
Resource project employment – mid scenario



Comparing these three scenarios demonstrates the difficulties facing planners in Gloucester, as they prepare for levels of employment on resource projects that could vary between a construction peak

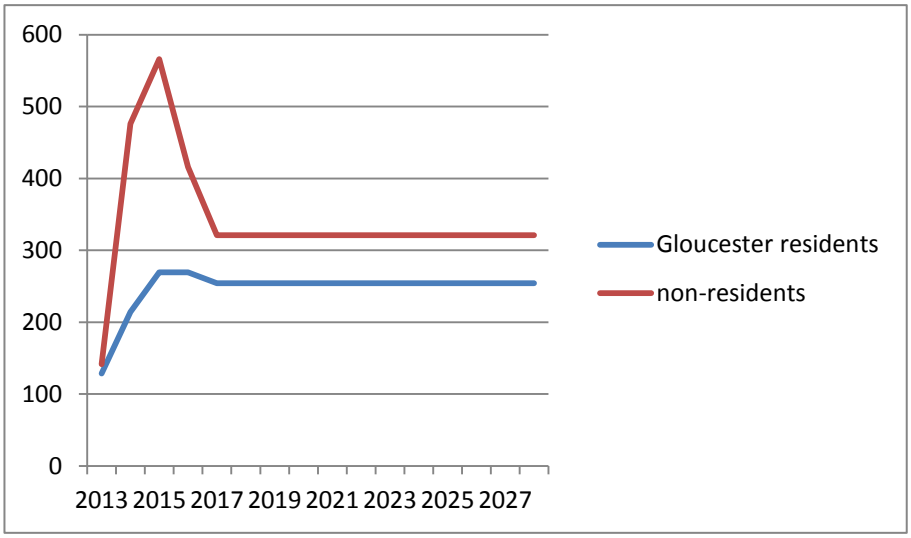
of 800 and post construction lows of near zero, depending on project timing and longer term viability:

Cumulative total employment on resource projects – three scenarios



The challenge confronting planners is compounded by uncertainty relating to what portion of workers will reside locally in Gloucester and what portion will be non-residents commuting in from other LGAs. Based on current rates of resident employment, we estimate the following portions for each scenario:

High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500
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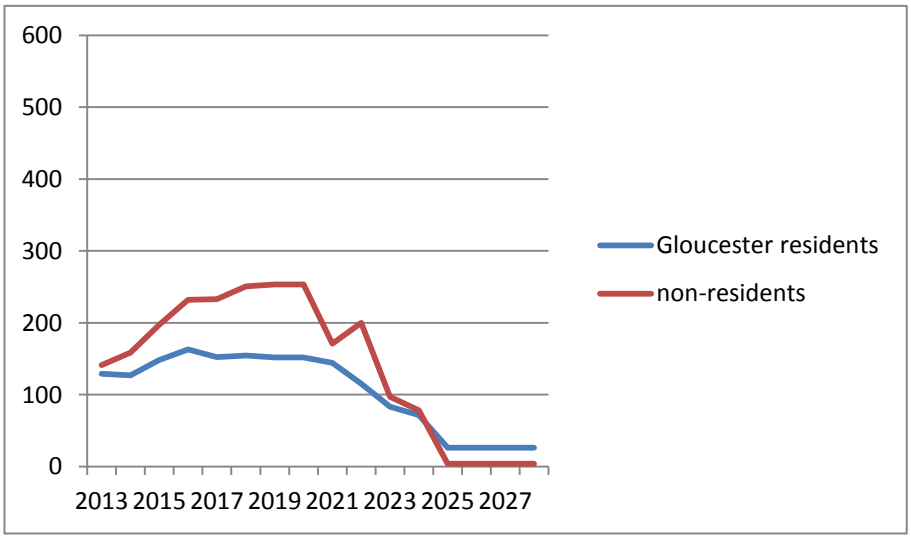
2013 2015 2017 2019 2021 2023 2025 2027
Gloucester residents
non-residents

Low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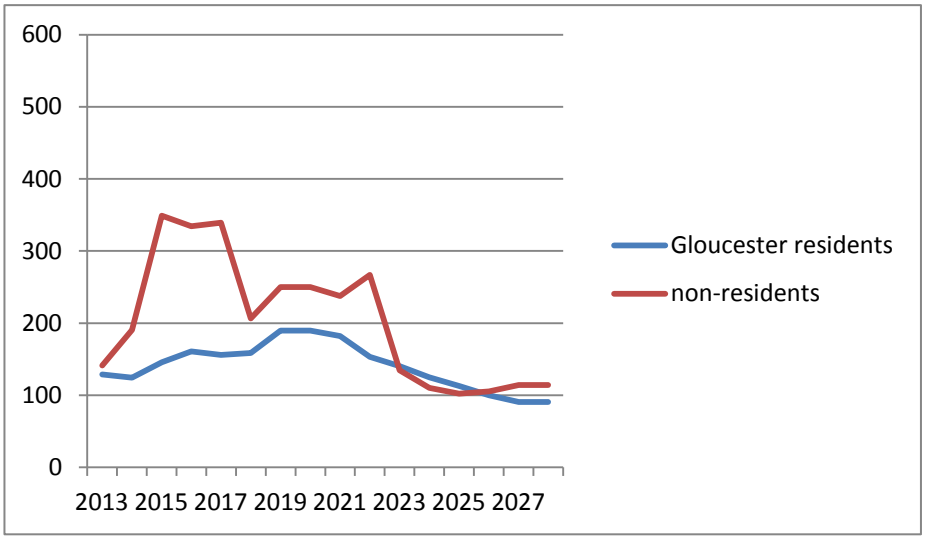
2013 2015 2017 2019 2021 2023 2025 2027
Gloucester residents
non-residents

Mid



Under all scenarios there are significant increases in non-resident workforce. Under the high scenario this could peak at 566 non-resident workers, four times current levels. The more likely scenarios also see sustained increases of levels of non-resident workers more than double current levels.

Employment levels for Gloucester residents are also difficult to predict. The sustained increase to 250 jobs in the high scenario seems unlikely as resources will be exploited over time and production may become less labour intensive. The other scenarios see more modest increases in the medium term and longer term decline.

Wider impacts

The influx of non-resident workers would likely have strong impacts on the amenity and social fabric of the Gloucester LGA, with increased numbers of temporary workers and increased traffic movements. These changes could offset many of the more positive aspects of the projects.

Population

Gloucester's population has been fairly stable for the last twenty years. While some stakeholders believe resource projects will lead to increases in resident population, under the more likely scenarios this seems uncertain as changes in town amenity could displace some residents and deter others from moving to the LGA for lifestyle reasons.

Employment

The impact of resource projects on employment of Gloucester residents is also ambiguous. While some residents would find new employment in resource projects and some employees would move to the LGA, this is unlikely to have great impact on either unemployment numbers or total employment. Gloucester's unemployment is already low and those who are unemployed tend to be long-term welfare recipients unlikely to have skills to work on resource projects. Workforce participation is also low due to the demographics of the LGA.

Furthermore, major projects can reduce employment in other industries due to transferring workers, driving up local wages and potentially changing the amenity of the area. These impacts are most likely to affect tourism, agriculture and light manufacturing. Recent research commissioned by coal project proponents in the Hunter Valley confirms these effects. "Indirect" employment is unlikely to be significant.

Impacts on other industries and socio economic characteristics are difficult to estimate due to the uncertainty of the timing and extent of the project proposals.

In conclusion, the cumulative effects of resource projects proposed for the Gloucester LGA have the potential to seriously affect the amenity of the LGA, other industries important to the Gloucester economy and the overall welfare of Gloucester residents. The pace and nature of these developments should be made clear to planners who should work with agencies and proponents to ensure the economic and social welfare of Gloucester is protected.

CONTENTS

Introduction

Gloucester is a town and local government area (LGA) located in northern New South Wales, 260km north of Sydney. The LGA has a population of around 4,900, making it one of the smaller LGAs by population in NSW. The area's economy has traditionally been focused on beef and dairy cattle, while in recent decades significant numbers of people have moved into the LGA for retirement, a "tree change" or other lifestyle reasons. A significant tourism industry has also developed since the early 1990s, with visitors attracted to the pretty rural scenery and nearby world-heritage listed national parks. Services and retail serving residents and visitors are also now major employers in Gloucester.

While Gloucester has a long history of mining and mineral extraction, the current generation of resource projects began in 1995 when the Stratford coal mine commenced operations near the village of Stratford, south of Gloucester town. Further south, the Duralie mine began in 2003. Although it is located just outside the Gloucester LGA, its operations are integrated with Stratford. Both these projects are applying to extend operations and two other resources projects are proposed, the Gloucester Gas Project and the Rocky Hill Coal Project.

Resource projects have caused controversy in Gloucester. While some stakeholders have welcome the opportunities the projects provide such as employment and land sales, others have been negatively affected by land value changes and impacts on other industries such as agriculture and tourism.

This report focuses on the potential local impacts of resource projects in Gloucester. Section one provides an overview of the four current and proposed projects. Section two explores the estimated employment rates of these projects. In section three we consider the cumulative impacts of these projects, through three scenarios of their timing and impact. Section four considers the likely levels of local and non-local employment in the cumulative scenarios. Sections five and six explore the likely impacts of these scenarios on the socio economic characteristics of Gloucester and other industries. A separate report provides an extensive socio economic profile of the LGA, Economists at Large (2013a).

1. Overview of resource projects

Stratford Coal

The Stratford Coal project began in 1995 and extracts up to 1.2 million tonnes per annum (Mtpa) of Run of Mine (RoM) coal per year, to produce around 0.7 Mtpa of thermal and metallurgical coal. The mine is owned by Yancoal Australia, a subsidiary of Chinese company, Yanzhou Coal.

The Stratford Coal mine originally had approval to operate until 2013 (Gillespie Economics 2012). An extension is proposed that would allow for the continuation of the existing mine into agricultural land and native forest, close to the village of Stratford, 13km south of Gloucester town. The proposal is for a 11-year extension of existing operations and expansion to extract up to 2.6 million tonnes RoM coal per year to produce around 1.2 million tonnes of product coal[13] (Gillespie Economics 2012). Yancoal Australia is seeking planning approval and has prepared an Environmental Impact Statement, which is currently being reviewed by the NSW Department of Planning.

Duralie Coal

Yancoal Australia is also the owner of the Duralie coal mine and extension project, located 30km south of Gloucester town just outside the Gloucester Local Government Area (LGA), in the Great Lakes LGA. The Duralie mine began in 2003 and produces 1.8 Mtpa of RoM coal. After processing Yancoal estimates the ROM coal from Duralie should produce around 1 Mtpa of product coal.

Duralie's coal is transported by uncovered train wagon to the Stratford coal complex for processing. Because of the integration of these two mines, most Yancoal reports refer to them together, or as "Gloucester Basin" projects.

The Duralie extension project was approved with various conditions in 2012. It will extend the existing open cut operations into areas of native vegetation and cropping land to produce 3 million tonnes per annum (Mtpa) of (ROM) coal. Yancoal estimate the two mines will produce 2.0-2.3 Mtpa of metallurgical and thermal coal (Yancoal 2013).

Gloucester Gas Project

AGL is proposing to develop coal seam gas resources within the Gloucester and Great Lakes LGAs, south of Gloucester town. The proposal includes the construction of 110 gas wells, a central processing facility, electricity generation facility and gas transmission pipelines. The Central Processing Facility would have an annual capacity of 30 petajoules (NSW consumes about 1,700 petajoules of energy per year (AGL 2013; AECOM 2009).

The project received approval from the NSW Planning and Assessment Commission in 2011 and from the federal government in 2013. The project is still going through exploration phases and has not yet begun full scale construction or production.

[13] Product coal refers to the marketable coal after initial processing.

Rocky Hill

The Rocky Hill coal project is a proposed new open cut coal mine around 5 kilometres south east of Gloucester town. The proponents, Gloucester Resources Limited, are proposing to mine 2.5 Mtpa of ROM coal to produce 1.75 Mtpa of product coal for up to 21 years. Coal would be washed on site. No information is available as to the coal specifications, although the company claims to be producing "primarily" semi-hard coking coal.

2. Employment impacts

The main benefit of resource projects for Gloucester residents are direct employment. Other benefits of these projects largely leave the local area, specifically:

- Revenues from sale of coal and gas accrue largely to overseas shareholders.
- Royalty and tax revenues accrue to state and federal governments, some of which returns to the local area.
- Contributions to council revenue, environmental and social trust funds, community programs, etc could be significant, but few details are available.
- Spending on capital and operating expenses largely accrue outside the LGA, although this may be significant for some local businesses.

The employment created by these projects is generally well paid and respondents to interviews emphasised that many locals had worked on resource projects and saved money, after which investing in farms and other local businesses (Economists at Large 2013a).

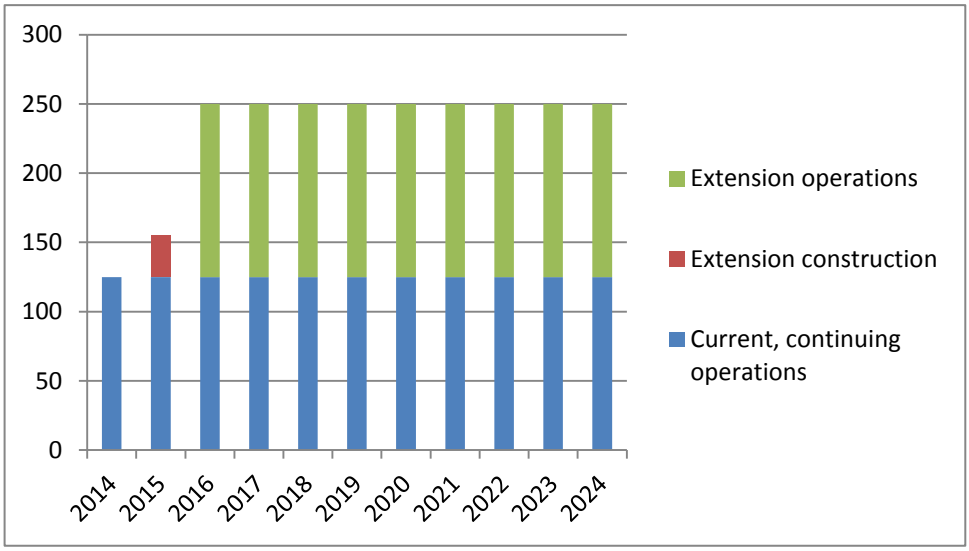
Despite the importance of employment as a local impact, there is uncertainty around the level, timing and nature of employment in each project.

Employment in Stratford project

The Stratford coal project claims to currently employ around 120 people[14]. The economic assessment of the Stratford extension project report that in addition to the existing staff, 30 people would work on the construction phase of the extension for one year (Gillespie Economics 2012). After construction an additional 94 to 128 people would work on the project, resulting in total employment of around 250 (Gillespie Economics 2012). These estimates were confirmed as the best available estimates by an officer of Stratford Coal contacted for this research.

Figure 7: Stratford extension employment estimates

[14] http://www.stratfordcoal.com.au/about_us.php



Source: (Gillespie Economics 2012)

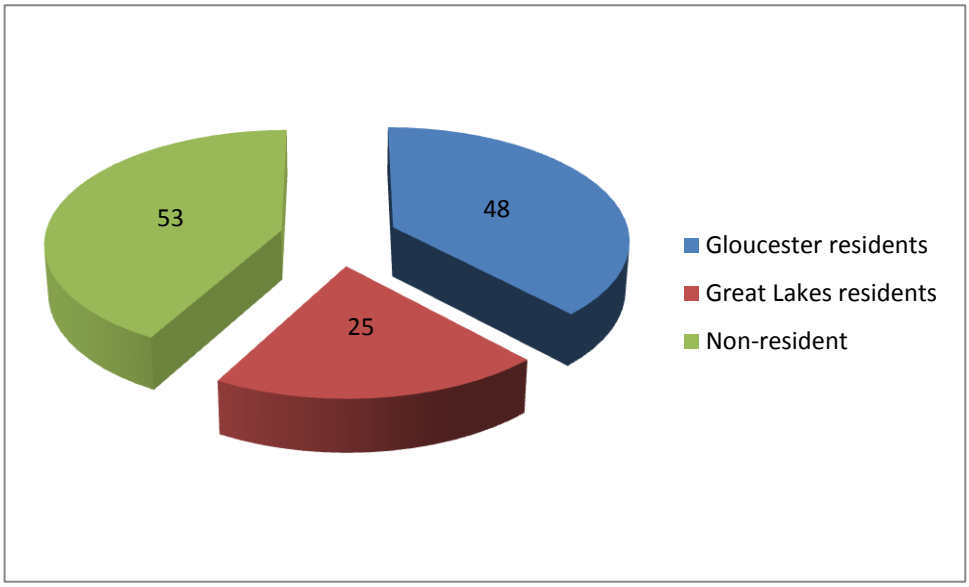
Few details are provided to confirm these estimates. It seems uncertain in an industry as capital intensive as coal mining why a doubling of RoM coal production would require a doubling of the workforce. It seems more intuitive that some economies of scale would be achieved that would not require such labour inputs. The Duralie expansion project is for a similar sized expansion, yet will require only an increase of 15 workers. (Gillespie Economics 2009, see also discussion below)

The economic assessment of the Stratford proposal (Gillespie Economics 2012) was criticised by (Economists at Large 2013b) in a review commissioned by the Barrington Gloucester Stroud Preservation Alliance. One of our main criticisms was that the assessment overstated the financial case for the project, particularly by using estimates of coal prices well above current prices and other analysts long term forecasts. Our forecasts have been borne out, as the projects have recently reduced employment in response to financial difficulties as reported in (Kirkwood 2013). As the financial benefits of the mine have become less certain, this has reduced the level of employment on the project. Current market conditions and long term assessments of coal markets are seeing employment in coal projects reduced. See (Russell 2013) and (Freed 2013) for discussion and overview.

More than affecting the level of employment on the Stratford project – and other projects – consideration of the financial aspects of these mines can affect the timing of employment. Operations and expansions can be delayed or production being reduced at times depending on market conditions.

No estimate is provided for how many of the Stratford extension employees will reside locally. (Gillespie Economics 2012) estimated that employee residence would remain similar to current rates on the project, with 38% of employees residing in Gloucester, 20% residing in neighbouring Great Lakes LGA and the remaining 42% drive-in-drive-out from other locations.

Figure 8: Current Stratford employee estimates



Source: Gillespie Economics 2012

This seems unlikely for two reasons. Firstly, as discussed in our Gloucester LGA Economic Profile (Economists at Large 2013a), Gloucester has low unemployment, low labour force participation rates and some preference for part time and seasonal work. Sourcing workers from the existing Gloucester labour market will be difficult.

Secondly, with uncertainty surrounding the economics of projects and their demand for employment, we would expect fewer workers to relocate to the LGAs where they work and an increasing move towards non-resident workers.

Employment in Duralie project

Uncertainty surrounds employment impacts of the Duralie project. The economic assessment of the extension project made estimates of the current and future employment levels:

> *Currently, the total direct workforce at the DCM is approximately 120 people, with approximately 74 residing within the Gloucester and Great Lakes SLAs. The operational workforce associated with the Project is estimated at 135, hence, the additional direct workforce from the Project is estimated at 15.*(Gillespie Economics 2009)*p34*

This estimate seems broadly in line with census data that suggests 129 Gloucester residents work in mining, considering another 50 work at Stratford or more distant projects. However, the website of the mine operators, Leighton, suggests that far fewer people work on the project:

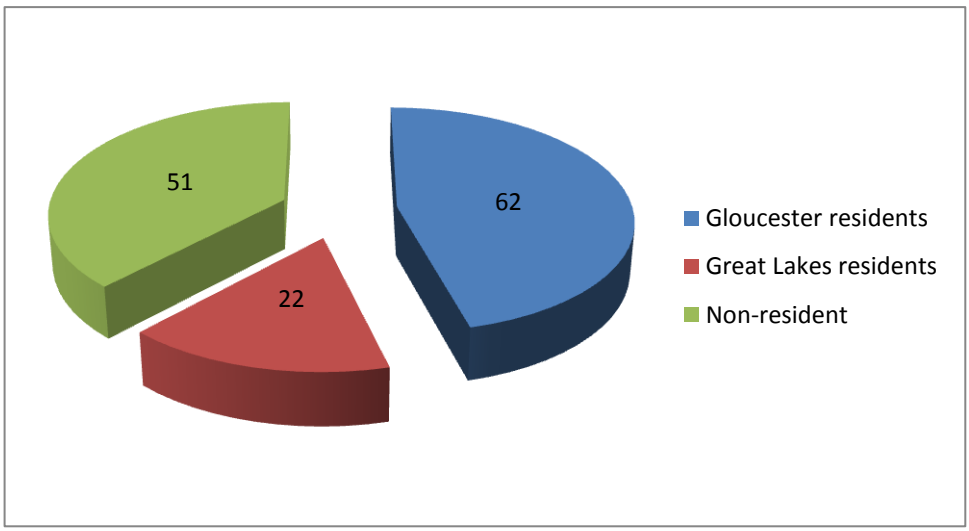
> *Around 70 people work at Duralie, with most employees living locally and are long-term employees.*[15]

Stratford Coal were contacted for clarification, we received no answer.

The economic assessment of the project suggests that 46% of Duralie's employees live in Gloucester LGA and 16% in Great Lakes LGA. They expect these rates to continue and estimates that of the 135 people will work directly on the project, 84 of which will live in the Gloucester or Great Lakes LGAs.

[15] http://www.leightoncontractors.com.au/projects/duralie-mine/

Figure 9: Estimates of Duralie employee location (Gillespie Economics 2009)



Source: Gillespie Economics 2009

As with the estimates of Stratford employment above, it seems uncertain that this many people will actually work on the project due to the reduced workforce discussed in (Ian Kirkwood 2013). Furthermore, given Gloucester's labour market conditions and the current outlook for the coal industry, it is unlikely that so many people will be sourced from, or relocate to, Gloucester LGA.

Employment in Gloucester Gas project

The Gloucester Gas project would employ a large workforce during the construction stage and a small workforce during the operational stage. While headline figures in the EIS (AECOM 2009) (and repeated by (Gillespie Economics 2012)) claim up to 465 construction jobs and 40 positions ongoing in the operational phase, decision makers should realise there is uncertainty surrounding these figures.

Most importantly, AECOM's assessment focuses on Option 1 of three development options:

> ***4.2 Alternative Project Development Options***
> *For the Stage 1 GFDA, three development options are currently being evaluated to determine which option provides the most commercially viable gas field development to deliver gas into AGL's gas portfolio whilst meeting corporate Heath, Safety and Environment objectives. These options include:*
> ***Development Option 1** – Field development would occur so that peak production is reached (approximately 80TJ/day) within a 12 month ramp up period with drilling being completed for the entire Stage 1 within 18 months.*
> ***Development Option 2** - The field development schedule would be matched to meet the market demand. Therefore well infrastructure and upgrades to CPF capacity (if required) would be scheduled in line with the market demand. Under this option, construction of the wells would likely occur over three years.*
> ***Development Option 3** – Under this option, the objective is to minimise development risks associated with reservoir performance and land access approvals. The field development schedule would be designed to optimise reservoir performance and minimise impact on the community. For this option, construction of the wells would likely to occur over 5 years.*

Development Option 1 represents the most intense construction period and so has been used in this EA as the basis for assessing potential impacts. (p4-2)

Planners should realise that Option 1 represents what is likely the most commercially attractive option to the proponents and not necessarily that which offers the greatest benefits for Gloucester or NSW. Development options 2 and 3 were not assessed for employment potential by AECOM. These options would likely result in lower employment numbers, extended over a longer period of time.

Within Development Option 1, a range of employment estimates are omitted by headline figures:

Figure 10: AGL Gas construction phase employment estimates

	Low	High
Field construction and drilling	50	60-100
CPF construction	40	50
Pipeline construction	200	300
Management	10	15
Total	**300**	**425-465**

Source: AECOM 2009, p5-2 and p16-14. Note that these two pages contain different upper estimates of Field construction and drilling estimates.

As with most major projects, there will be far fewer ongoing production jobs than construction jobs. AECOM's estimates of production phase employment also show only some of these positions are likely to be full time:

Figure 11: Gloucester Gas Project operations phase employment estimates

Area	Number of people	Duration
Field operators and monitoring	6	Year round
"Workover rig" crew	6	Monthly
Management and administration	10	Year round
Plant operators	2	Year round
Plant supervisor	1	Year round
Electrician	1	Year round
Maintenance staff	4	Year round
Various contractors	6	Every 3 months
pipeline technician	1	Year round
Hexham Operator	1	Year round
Maintenance	8	Once or twice per year
Total	**46**	
Year round total	**26**	

Source: AECOM 2009, p5-16

Given the possible variation in employment demand, through construction and operation planners will need to work closely with proponents to understand the staging and impacts of the proposal.

The proposal includes the use of workers camps, which would accommodate up to 300 workers in temporary facilities. According to AECOM:

> *Camps would include all required infrastructure including water and sewage management, electricity, ablutions facilities, wet mess, recreation facilities and sleeping quarters. Camps would be designed to be relatively self-sufficient to avoid reliance on public infrastructure and amenities, but would be located within reasonable proximity to townships to allow use of amenities and opportunities to access local retail and hospitality economies. Management principles would be applied to the construction workforce camp to minimise mass migration of workers to local towns on a regular basis, for example the construction workforce camps would be "wet" sites to prevent workers travelling to towns to utilise pubs, clubs and hotels. (p20-5)*

Decision makers should understand the potential costs and benefits of these camps. While social problems associated with large numbers of male workers in a small town may be reduced, housing workers in self-sufficient facilities reduces the benefits of the project to Gloucester's accommodation, food and entertainment businesses.

Employment in Rocky Hill project

The proponents estimate they will employ 100 people during construction, with an ongoing workforce of 150 people. It is difficult to assess this estimate or potential variation as at time of writing very little information was available to assess the viability and varying options for project development. Unlike the other coal projects, which are "brownfields" extensions of existing projects, backed by a major coal industry player, the Rocky Hill project is a "greenfields" project, proposed by a relatively unknown company. Such projects are facing great difficulty raising finance at the moment, as noted in the Australian Financial Review:

> *With coal prices low and Australian mining costs high, it would take a very brave board to approve a greenfields project.*
>
> *Brownfields extensions would make sense only if they lowered a mine's overall costs or if it was a very low cost mine in the first place, like Yancoal Australia's Moolarben mine in the Hunter Valley. Whitehaven Coal's $766 million Maules Creek project yet to receive final federal environmental approvals is about the only greenfields development in the market that looks to have a reasonable chance of going ahead because of highly attractive economics.*(Freed 2013)

As a greenfields coal project, the Rocky Hill project seems the least likely to proceed of these projects on financial grounds, although assessment is difficult given the current lack of information available on the economics of the mine. We feel the project requires a significant change in coal markets, both coking and thermal coal markets. The outlook for thermal coal markets in particular is bleak – see (Goldman Sachs 2013)

While all three coal projects highlight their potential to produce coking coal for steel production, in reality they are also dependent on selling thermal coal. Stratford and Duralie generally sell less than half of their production onto metallurgical (coking) coal markets. In their last quarter they managed only 33%[16].

The Rocky Hill project's fact sheets emphasises that:

> *Coking coal is the building block of society. It used to produce coke and is the principal coal to be mined at the Rocky Hill Coal Project.*[17]

However, It is unclear why Rocky Hill would produce significantly higher grades of coal than projects located in close proximity.

In an interview for this report, the CEO and CFO of Gloucester Resources Limited, the proponents of Ricky Hill, stated they aimed to source 75% of staff from the Gloucester LGA. This seems unlikely given the low unemployment rate (5.3%) and low workforce participation rate (37%) in the area (Economists at Large 2013a). As discussed above, other projects such as Stratford and Duralie employ less than 50% Gloucester residents. GRL were unable to provide a reason why Rocky Hill would be different to those projects.

[16] http://news.iguana2.com/yancoal/ASX/YAL/745545
[17] http://www.rockyhillproject.com.au/wp-content/uploads/2011/07/GRL-RH-Factsheets-cokingcoal.pdf

3. Cumulative employment numbers

Based on the discussion about projects and their potential employment impact above, we will now estimate various scenarios for the likely cumulative employment numbers from these projects. Assessing the cumulative impacts of these projects on employment and population in Gloucester LGA is difficult due to the uncertainties around:

- Project approvals
- Project financial viability
- Actual employment levels
- Rate of development and labour required

Below we present three scenarios which we believe represent possible low, mid and high estimates of the cumulative employment numbers. We emphasise that these scenarios are highly speculative and are intended to guide discussion rather than provide definitive quantitative analysis.

High scenario

Assuming that all projects begin next year according to their original proposals.

Project	Assumptions
Stratford	• continues with 125 current staff and next year begins extension with 30 construction staff. • In 2015, 125 additional construction staff begin, working until the end of the extension proposals approval in 2024. • Beyond 2024 the project continues beyond current approvals
Duralie	• The EIS's estimate of 120 existing staff are joined in 2014 by 15 extra staff associated with the extension project. • These 135 staff continue until the end of the approval period after which extended at the same level.
Gloucester Gas	• 20 staff this year. • Construction begins next year and continues for two years with 300 workers. • In 2016 construction scales down to 150 workers. • From 2017 the project continues into its production phase with an estimated 40 staff.
Rocky Hill	• Current staff of zero. • Construction begins next year with 100 workers. • Operations continue as planned with 150 workers.

Figure 12: Resource projects employment - High Scenario

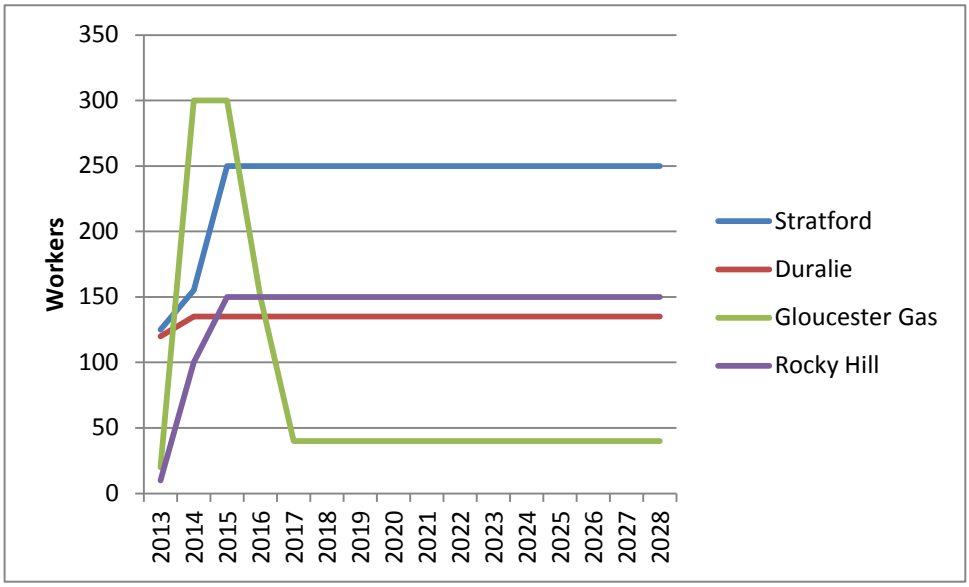
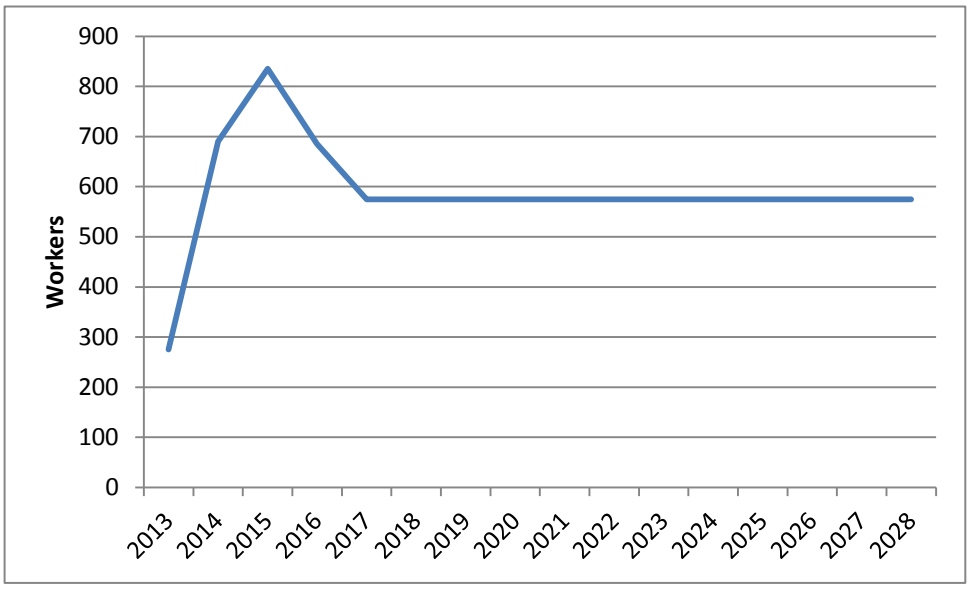


Figure 13: Resource projects employment - High Scenario - Total



(Note that these employment levels include Duralie workers who work and may reside outside Gloucester LGA, so are not directly comparable with estimates of Gloucester mining employment by place of residence or place of work provided in the Gloucester Socio Economic profile)

This scenario would present major challenges to Gloucester. With a peak of over 800 workers and a long-term increase in mining employment of over 300 people, more than doubling current levels, pressure would be put on roads, facilities and housing. Initially the bulk of this increase in labour demand would almost certainly be filled by non-resident workers. In the longer term, if employment was as steady as implied here, it seems possible that many workers could relocate to the LGA as residents.

This scenario seems unlikely. It would require the rapid approval, financing and construction of the Rocky Hill project. This seems unlikely as its EIS is only now being assessed, more than 6 months past the company's expectations, community opposition remains strong and financing is uncertain.

The Gloucester Gas project would also need to progress rapidly, along the scenario described by AECOM, which seems unlikely given the current debate around CSG exclusion zones in NSW. While the Duralie and Stratford projects are already operating, it seems uncertain that they will actually utilise this level of labour, demonstrated by their recent reductions in workforce. The long term operation of all these projects at high levels of production also seems to be against all forecasts of coal market trends and their positions on Australia's and global cost curves.

Low scenario

Most pessimistic estimates of current projects and future prospects.

Project	Assumptions
Stratford	• current staff of 120[18]. • Extension construction delayed until 2015 due to financing problems and market outlook. • Extension operations are more capital intensive than EIS predicts and result in only 30-50 extra positions, still considerably more than Duralie extension. • Production peaks in 2018-20, beyond which production declines and the project is not extended beyond 2024. • Beyond 2024 the project ends, with no continuing staff.
Duralie	• Current employment of 120 declines to Leighton's reported 70 staff[19]. • These 70 staff continue until the end of the approval period after which the project ends with no continuing staff.
Gloucester Gas	• 20 staff this year. • Construction begins 2015-16, following delays due to finances, community opposition and environmental concerns. • Construction proceeds along the less intensive proposal in AECOM (2009), continuing for five years with 100 workers. • Operations require around 30 full time equivalent staff.
Rocky Hill	• Current staff of ten. • Skeleton staff continue for four years. • Project is shelved due to financing problems and community opposition.

[18] http://www.stratfordcoal.com.au/about_us.php
[19] http://www.leightoncontractors.com.au/projects/duralie-mine/

Figure 14: Resource projects employment - Low Scenario

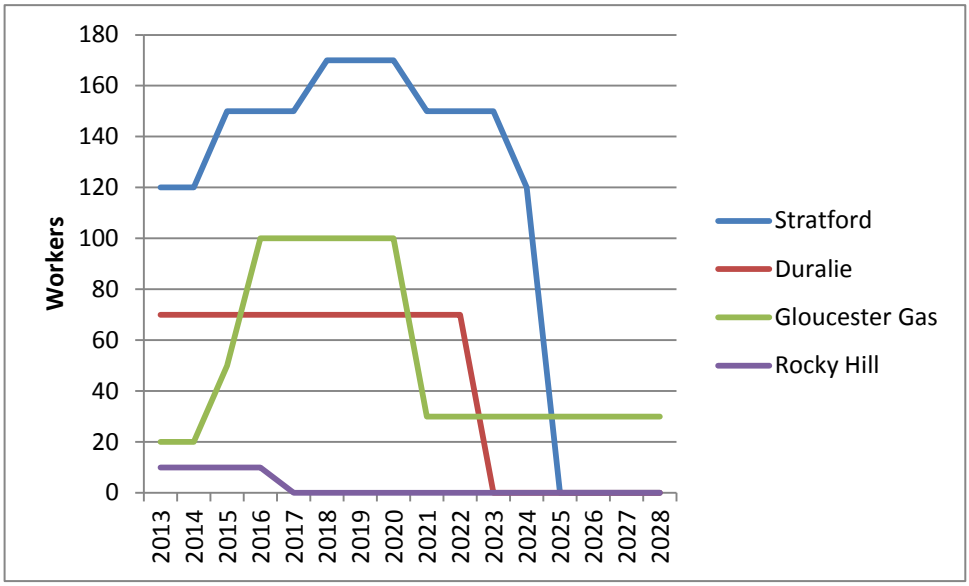
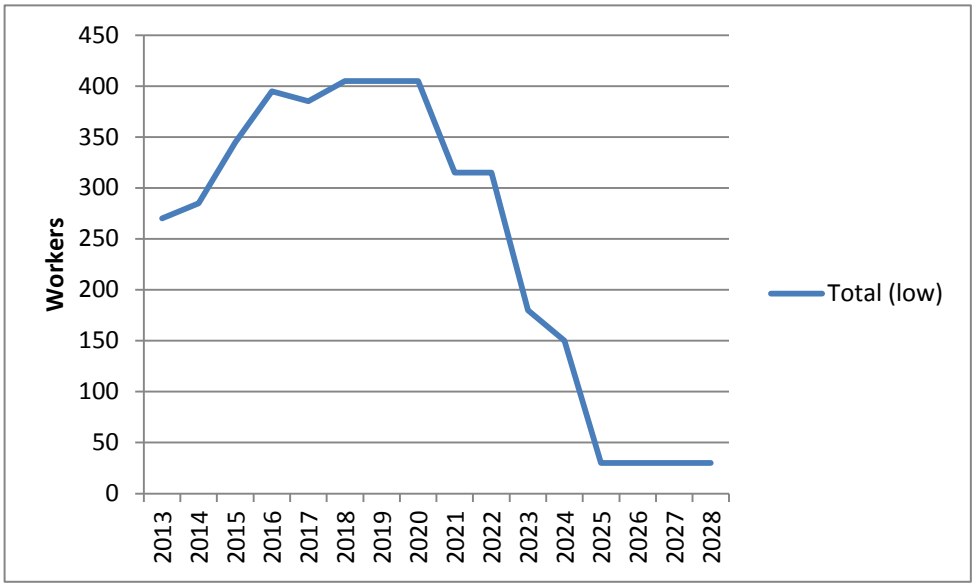


Figure 15: Resource projects employment - Low Scenario - Total



(Note that these employment levels include Duralie workers who work and may reside outside Gloucester LGA, so are not directly comparable with estimates of Gloucester mining employment by place of residence or place of work provided in the Gloucester Socio Economic profile)

In the medium term, this scenario seems more plausible than the high scenario. The Rocky Hill project may well fail to gain approval or financing. The Gloucester Gas project proceeding at a slower rate of construction and the Stratford and Duralie projects proceeding at levels of employment somewhat lower than forecast all seem relatively likely. More uncertain is the rapid termination of the Duralie and Stratford projects. With considerable reserves, these mines may be economic beyond their current approvals.

This scenario too would provide challenges to Gloucester's planning. The initial boost in construction staff and extra staff at Stratford would still be significant, but followed by a rapid decline. While such a rapid decline may be unlikely, decision makers should be aware of the potential for declining viability of these projects, particularly related to the economic outlook for thermal and coking coal.

Mid scenario

A mid scenario, based on the following assumptions:

Project	Assumptions
Stratford	• current staff of 120[20]. • Extension construction delayed until 2015 due to financing problems and market outlook. • Extension operations are more capital intensive than EIS predicts and result in only 30-50 extra positions, still considerably more than Duralie extension. • Production peaks in 2018-20, beyond which production declines. • Beyond 2024 the project continues but with declining staff requirements due to more capital intensive production and or reduced production.
Duralie	• Current employment of 120 declines to Leighton's reported 70 staff[21]. • These 70 staff continue until the end of the approval period after which the project requires less staff due to more capital intensive production and or reduced production. • Project ceases in 2017.
Gloucester Gas	• 20 staff this year. • Construction begins 2014-15, following some delay. • Construction ramps up from 50 workers in 2014 to 200 for 2015-17, perhaps in line with the mid proposal in AECOM (2009). • Operations require around 35 full time equivalent staff.
Rocky Hill	• Current staff of ten. • Skeleton staff continue for until 2018 due to financing and approval delays. • Project begins construction in 2019 with estimated 100 workers. • Project is less labour intensive than estimated, with staff declining from 100 to 80 in the final years of this period.

[20] http://www.stratfordcoal.com.au/about_us.php
[21] http://www.leightoncontractors.com.au/projects/duralie-mine/

Figure 16: Resource projects employment - Mid Scenario

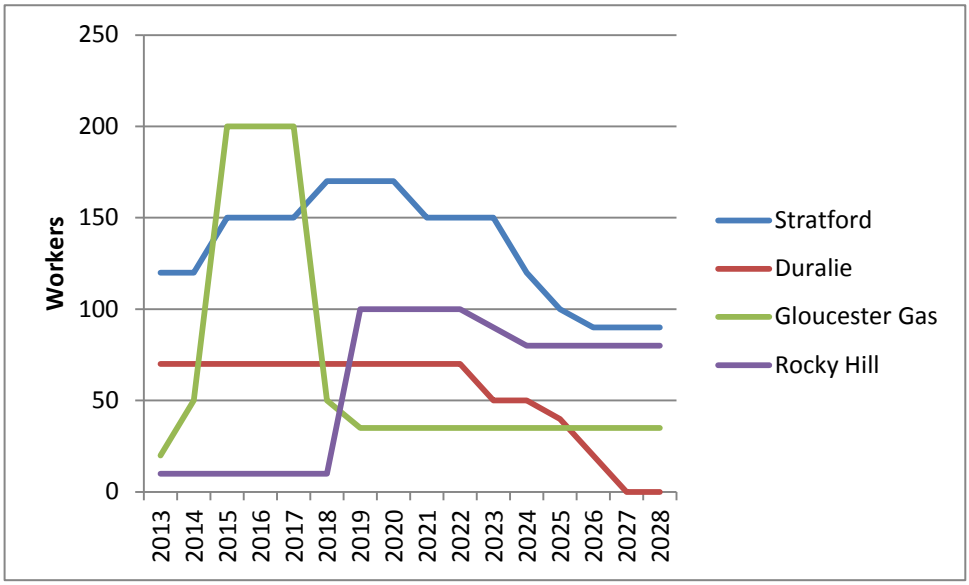
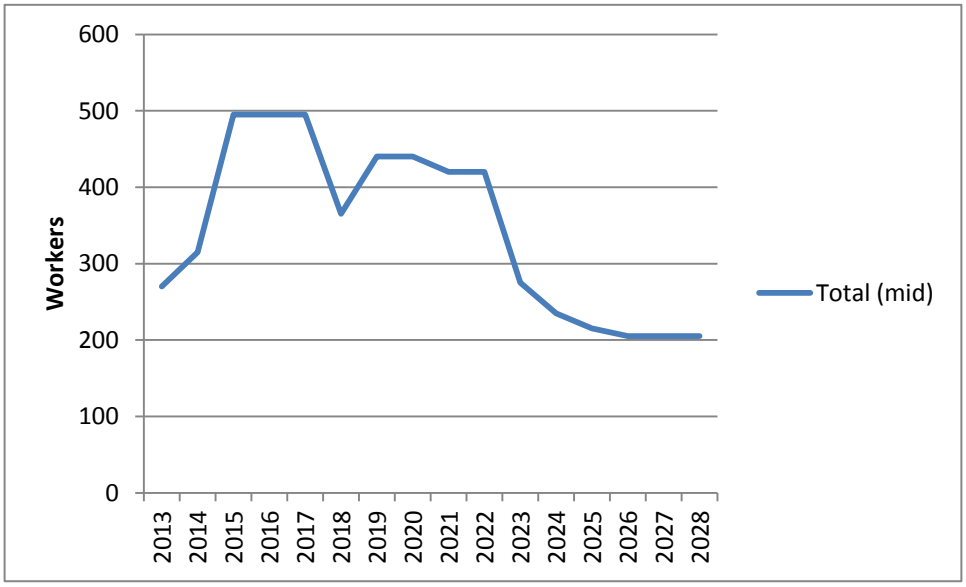


Figure 17: Resource projects employment - Mid Scenario - Total



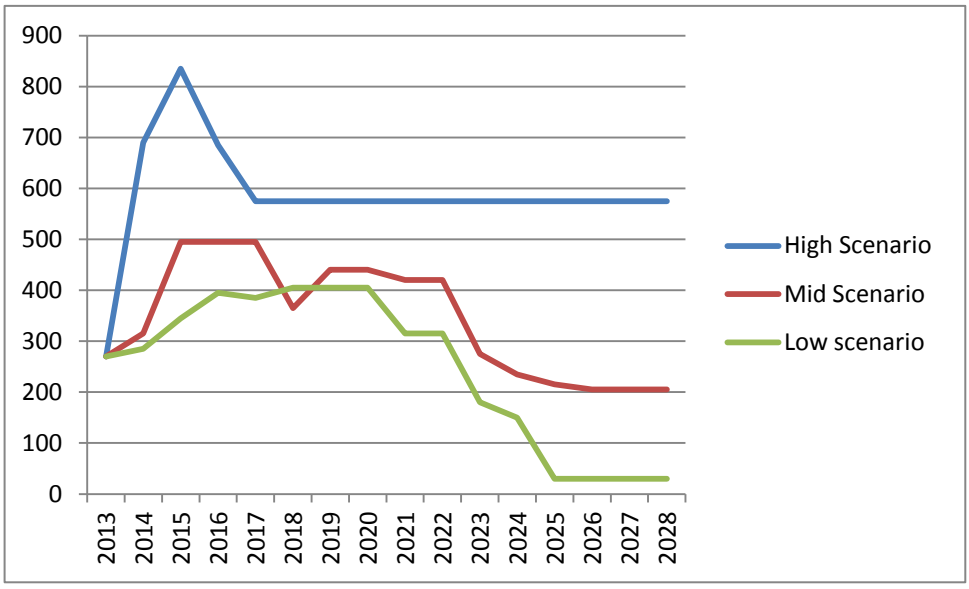
(Note that these employment levels include Duralie workers who work and may reside outside Gloucester LGA, so are not directly comparable with estimates of Gloucester mining employment by place of residence or place of work provided in the Gloucester Socio Economic profile)

While there is still great uncertainty, this scenario seems more plausible than the high scenario and possibly the low scenario. The Gloucester Gas project would result in significant employment over the near term, followed by increases in employment on Stratford and eventually Rocky Hill. The delay in Rocky Hill operations may reflect a takeover of the project by Yancoal or other future operator of the Stratford and Duralie operations. Some analysts are predicting an improvement in coal market conditions around 2018 that could assist that project, see Russell (2013). All coal projects would decline somewhat in line with increasing costs as the projects target more expensive parts of the resources and possibly wider declines in coal usage.

4. Comparison of scenarios

These scenarios, and the many other possibilities that surround the development of these projects, present planners with great challenges. With resource industry employment potentially varying from over 800 to almost zero over this period, planners' input into development assessments will be important. The potentially rapid influx of workers followed by a potentially equally rapid decline presents a number of potential problems for planners considering investment in long-term infrastructure to handle the increased population, of predominantly younger men. Considering alternative infrastructure will also be important. Planners need to maintain a good understanding of progress on each project and Gloucester's socio economic situation.

Figure 18: High, Mid, Low scenario comparison



Main considerations for planners regarding these projects

Gloucester Gas Project

The timing and intensity of the Gloucester Gas project is the most important influence on employment numbers in the Gloucester LGA. Whether this project procedes, with what level of construction workforce, and over what period, is uncertain.

The vast bulk of the construction workforce for the Gloucester Gas project will come from outside the LGA and is expected to be housed in temporary camps. These camps aim to reduce the social impact of the influx of workers, but at the same time are likely to limit economic benefits of the project to Gloucester businesses and accomodation owners.

Stratford and Duralie projects

Both Stratford and Duralie have total reserves (measured, indicated and inferred) large enough to continue their operations well beyond this period – Stratford with 98 million tonnes and Duralie with

148 million (Yancoal 2013). Whether the projects will be able to operate through this period and beyond will depend on:

- Their costs – they are relatively high cost mines in the Australian context of $105 to $110 cash costs per tonne (Yancoal 2013). Average thermal coal costs per tonne in Australia are $80 per tonne (Morgan Stanley 2013), coking coal is somewhat higher.
- Markets for semi-hard coking coal and thermal coal
- Further approvals and community engagement.

The number of people employed by these projects will also depend on these factors, changing technology and capital intensity of operations.

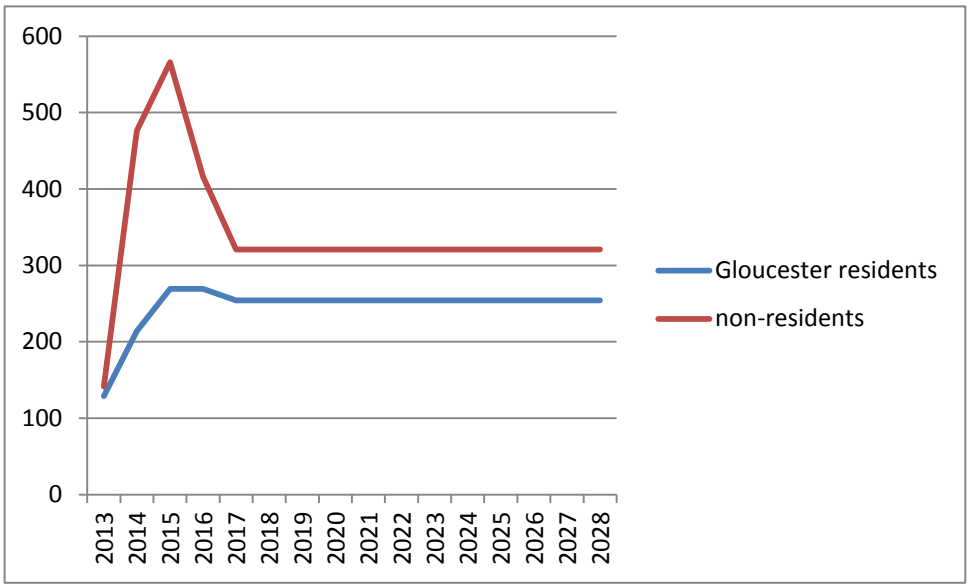
Rocky Hill project

As discussed above, the Rocky Hill project faces substantial community opposition and challenges with approvals, combined with a very difficult environment in which to raise capital for such a project. The prospects of the project for proceeding may improve in the future if coal market fundamentals change and if the project is taken over by a larger player, most obviously Yancoal or another future owner of the Stratford and Duralie operations.

Employment of local residents and non-residents

Of central interest to Gloucester is the number of local residents who will be employed, the number of employees likely to reside in the LGA long term and the potential for a large commuting, non-resident workforce. By applying the estimates of local employment in the Stratford and Duralie projects in Economics (2012)Economics (2009) to the above scenarios, some estimates of local employment can be made. These estimates are highly speculative and heavily dependent on whether the projects proceed, the timing of the projects and labour intensity.

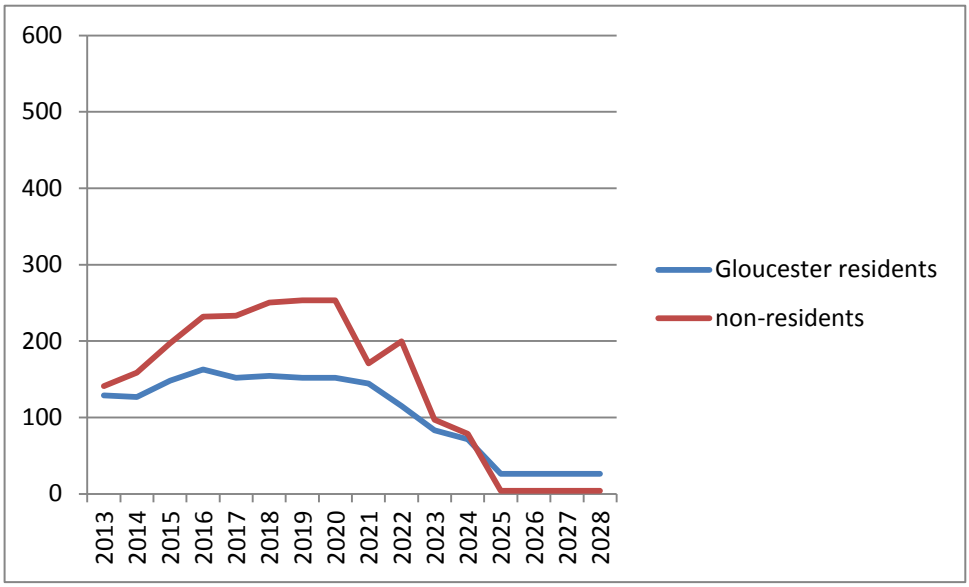
Figure 19: Gloucester resident and non-resident employment – High Scenario



Under the High scenario, we see a large peak in temporary workers, associated with the Gloucester Gas project – 300 non-resident workers in this scenario – along with the construction of Rocky Hill

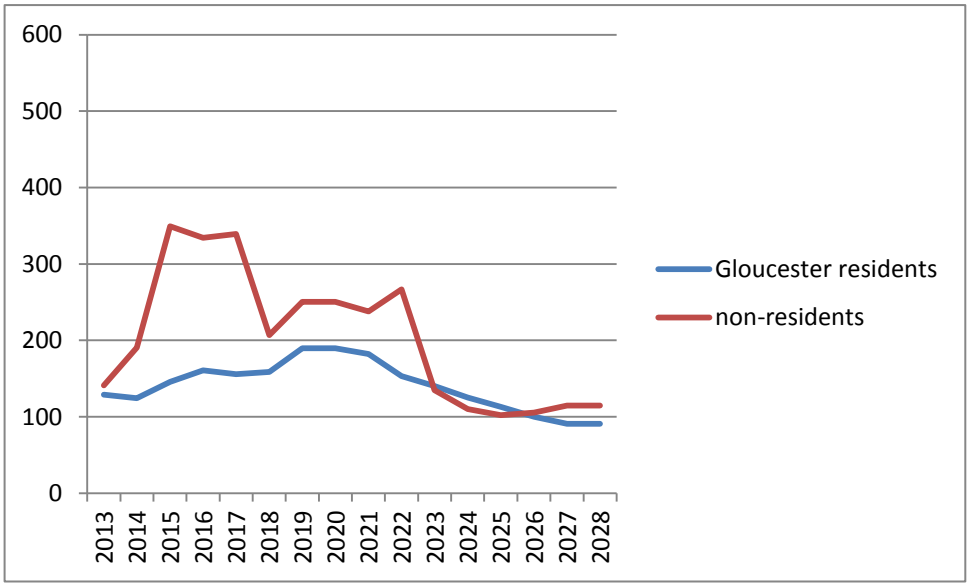
nad labour-intense assumptions about Stratford. Employment of Gloucester residents also surges with an extra 125 people working in the mining industry, nearly double current levels. Under these assumptions, both local and non-resident employment remains high over the long term, which seems unlikely as resources are depleted and/or more workers would likely move to Gloucester.

Figure 20: Gloucester resident and non-resident employment - Low Scenario



The low scenarios suggest modest increases in mining employment over the next ten years of 20-50 jobs, before a longer term decline. The construction of the Gloucester Gas project is the initial source of this increase, which takes longer under the "low" scenario. Under the Low scenario, coal operations eventually cease and the Gloucester Gas project is the only extractive project to employ in the long term.

Figure 21: Gloucester resident and non-resident employment - Mid Scenario



The more likely mid scenario also sees non-resident workers increase by around 200 on current levels in the next few years before dropping back in 2018 following the end of construction of the

Gloucester Gas project. Local employment sees a modest increase over the medium term with increases at Stratford and eventually Rocky Hill. Reductions in both workforces would occur as a result of lower production at Stratford and Duralie in the longer term.

There is great uncertainty around these estimates. In addition to factors discussed above there are other points to note:

- this chart uses Gillespie Economics (2012) estimate that only 35 of Gloucester Gas's construction workforce would be local employees. Although Gillespie Economics source this estimate from AECOM (2009), we can find no such estimate in the AECOM document. Given the size of this workforce, this assumption could be significant, although for a relatively short term.
- These estimates are only for residents of Gloucester, not of Great Lakes LGA, who are included as non-resident.
- Rates of local employment on the Stratford project have been applied to Rocky Hill.

A key uncertainty is if local employment rates reported by Gillespie Economics can be maintained, given Gloucester's already tight labour market.

5. Impacts on other socio economic aspects of Gloucester

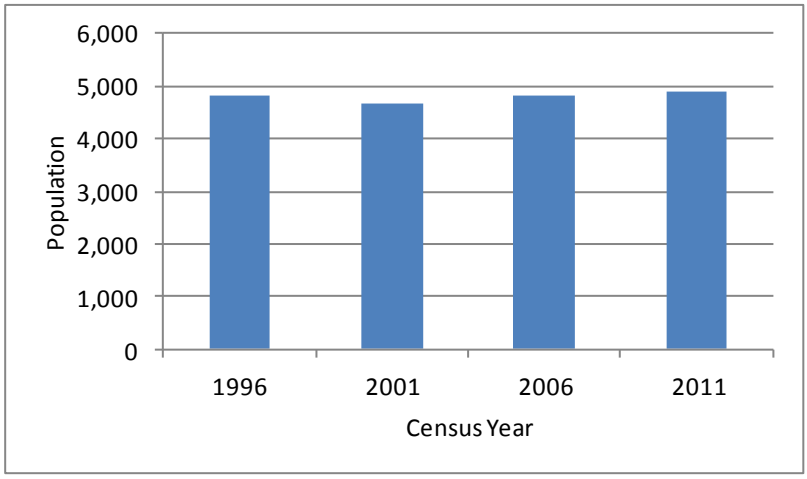
Given the uncertainty around the results in previous sections, quantitative estimates of impacts on other socio economic indicators in Gloucester are unlikely to be useful. Below we discus in general terms possible impacts of the above scenarios on the wider aspects of the Gloucester community and economy.

Population

In all of the above scenarios the most significant impact is an increase in numbers of people commuting into the LGA, rather than on resident employment. Under the high scenario a peak of 566 people are temporarily working in the LGA away from their place of usual residence. Even under the low and mid scenarios there is an increase of over 100 extra non-resident workers on current levels. Even with the proposed use of workers camps, enormous strain could be placed on accommodation and transport infrastructure. Given Gloucester's relatively small and stable population, the influx of non-resident workers would also have an impact on the social fabric of the LGA.

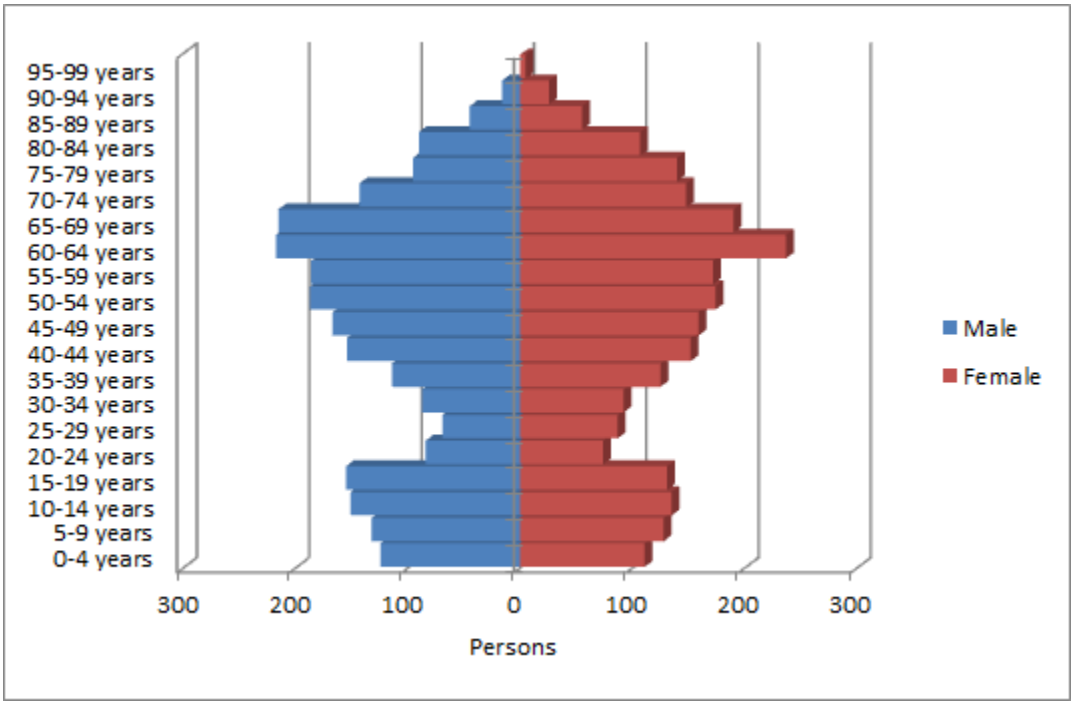
As reported in the Gloucester Socio-economic Profile (Economists at Large 2013), the population of Gloucester has been stable over the last four censuses. Like most neighbouring LGAs and much of rural Australia, there are lower numbers of young people beyond school age, as they leave for education and employment opportunities. Gender profiles are relatively even.

Figure 22: Gloucester population 1996-2011



Source: ABS census 2011

Figure 23: Gloucester age and sex profile



Source: ABS census 2011

Impacts on population of all of the above scenarios would depend on the real and perceived impacts of the Gloucester Gas, Rocky Hill and Stratford extension projects on local amenity and community. With greater impacts, the influx of population to work on mining projects may displace existing residents, or discourage people moving to the area for lifestyle reasons.

Under the High scenario described above, with an increase in resident mining employment from 129 residents to over 250, it seems likely that the increase would result in an overall increase in population, as 120 other residents leaving would seem unlikely, at least over the medium term. The more likely mid and low scenarios, however, show modest increases in resident employment in the medium term and longer term decline. With the slower development of Gloucester Gas and non/later development of Rocky Hill, such displacement may be reduced.

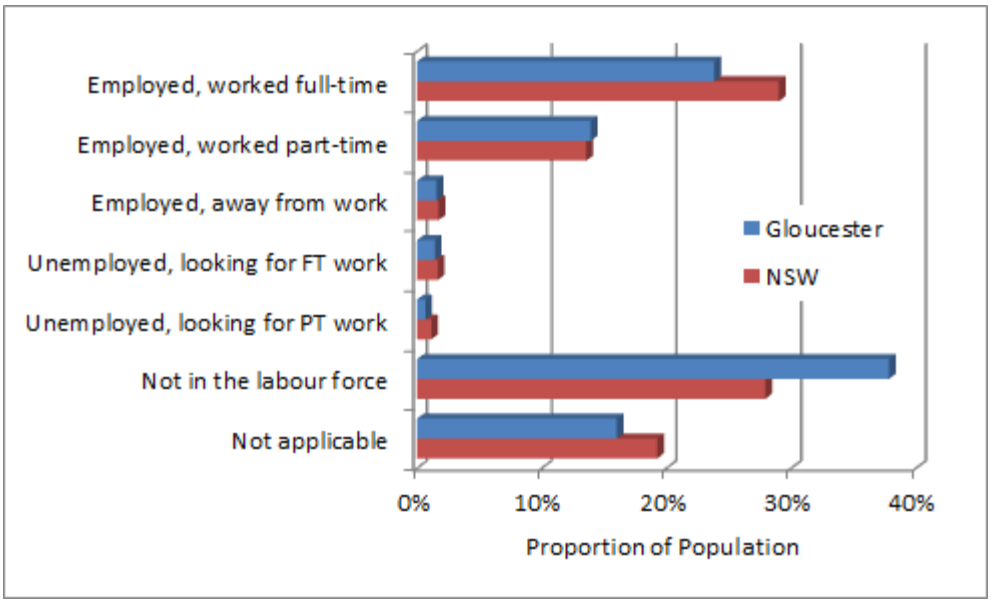
Another question would be if other industries are able to increase employment in the longer term as Gloucester's coal resources are exploited, particularly if there is an overall decline in coal markets.

An influx of mining workers would likely change the demographic profile of the LGA, with younger, predominantly male workers moving in and potentially displacing lifestyle residents who are predominantly older couples. It is unlikely, however, that the numbers of school leavers leaving the LGA would be significantly affected, as this is a long-term, Australia-wide trend. In research for the Socio Economic Profile, some residents emphasised that they encourage young people to leave the LGA to gain life experience and return if and when they want to. Whether this trend is a "problem" and if it needs "fixing" is a topic of debate in Gloucester and around Australia and largely beyond the scope of this research.

Employment

As discussed above and in the Economic Profile (Economists at Large 2013a), Gloucester has low unemployment and fairly high rates of long-term unemployed within unemployment. There is also relatively low workforce participation and a preference for part time or seasonal work (largely reported anecdotally):

Figure 24: Labour force status, Gloucester and NSW



Source: ABS Census 2011

While the resource development scenarios describe above would increase employment in the mining sector, their impact on overall employment and unemployment is less certain for several reasons:

- Mining jobs tend to be highly skilled and require experience in the mining industry or at least with related trades. These projects are unlikely to recruit from Gloucester's unemployed population, who will largely lack these skills and experience.
- More likely is that Gloucester workers from other industries will be transferred to mining projects. Engineering firms report losing apprentices and staff to mining projects. Tradesmen and agricultural workers skilled with machinery are also regularly recruited. It is not certain that the positions left behind in those industries will then be filled.
- Other industries, eg agriculture and light manufacturing, are negatively affected by increases in labour demand which push up local wages. These industries may then hire fewer workers.
- Many respondents in Gloucester believe perceptions of the area will change from being "a town with a mine" to a "mining town". This may affect the tourism and hospitality industries in particular offsetting overall employment levels.

Overall, the impact of these projects on resident employment is uncertain. They are likely to lead to greater rates of full time employment and higher wages, but may reduce employment in other industries.

Discussion of indirect employment

In economic assessments of the Stratford, Duralie and Rocky Hill projects, estimates are made of "indirect", "flow-on" or "multiplied" employment. All of these estimates use methodology which heavily overstates these effects. Input-output (IO) models and the multipliers behind them have several key assumptions which ensure these indirect effects are exaggerated. The shortcomings of IO modelling for project assessment are spelled out by the (ABS 2011):

Lack of supply–side constraints: The most significant limitation of economic impact analysis using multipliers is the implicit assumption that the economy has no supply–side constraints. That is, it is assumed that extra output can be produced in one area without taking resources away from other activities, thus overstating economic impacts. The actual impact is likely to be dependent on the extent to which the economy is operating at or near capacity.

> ***Fixed prices****: Constraints on the availability of inputs, such as skilled labour, require prices to act as a rationing device. In assessments using multipliers, where factors of production are assumed to be limitless, this rationing response is assumed not to occur. Prices are assumed to be unaffected by policy and any crowding out effects are not captured.*

In fact, the use of overstated impacts from input-output modelling to justify projects was a key reason the ABS stopped publishing tables of I-O coefficients:

> *Production of multipliers was discontinued with the 2001–02 issue for several reasons. There was considerable debate in the user community as to their suitability for the purposes to which they were most commonly applied, that is, to produce measures of the size and impact of a particular project to support bids for industry assistance of various forms.*(ABS 2011)

Decision makers need to understand that the results of IO modelling are certain to overstate the case for the project and make use of assumptions that may bear little relation to the reality on the ground. This was the strong finding of Preston CJ in the recent Warkworth decision in the NSW Land and Environment Court:

> *There is another, more fundamental issue with the I0 analysis. The I0 analysis only looks to economic impacts, not environmental or social impacts, and then only to economic impacts measured by reference to goods and services with a market value, not those without a market value. It provides, therefore, some information but only on one set of matters relevant to be considered by the approval authority in determining the project application. The I0 analysis is not a substitute for the decision- making process that the approval authority must undertake in determining the project application, and the conclusions the I0 analysis reaches cannot be substituted for the fact finding, weighting and balancing of all of the relevant environmental, social and economic matters required to be considered by the approval authority. The conclusions the I0 analysis reaches on the economic benefits of approving the Project, evaluated for their reliability and given appropriate weight, need to be*

balanced against all other environmental, social and economic benefits and costs. (Preston 2013) para 463

The NSW Treasury confirms these interpretations:

> *Model based economic impact assessment is not a substitute for a thorough economic analysis of a policy. The appropriate method for analysing policy alternatives is benefit cost analysis (BCA). BCA considers the best use of resources and as such treats labour inputs as a cost. An I-O based economic impact analysis is best seen as a complement to a BCA and does not provide evaluative guidance. An I-O model will estimate flow on impacts irrespective of the qualities of the policy triggering those impacts. (NSW Treasury 2009,* p4)

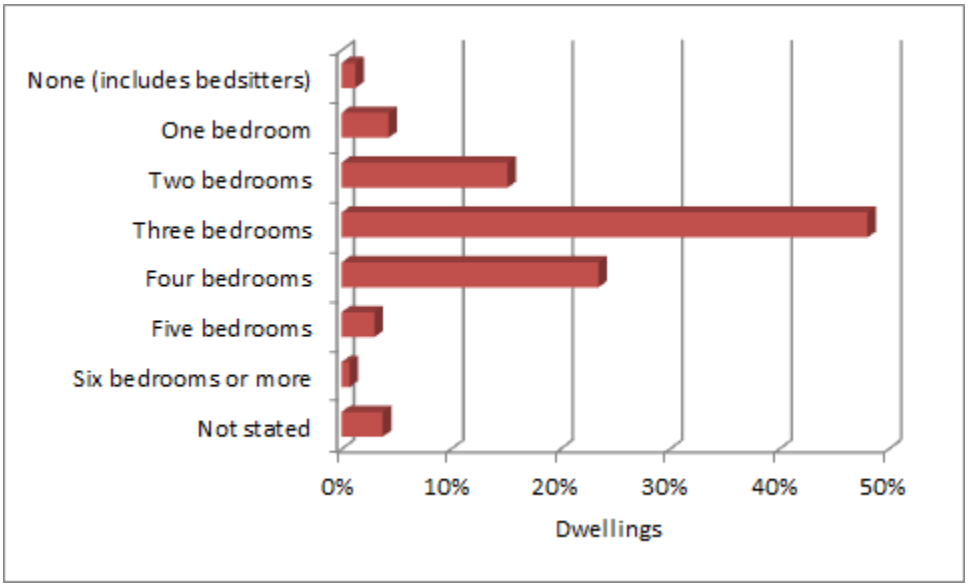
In fact projects such as these create few indirect jobs. In analysis currently before the NSW Land and Environment Court , the consultants to the Hunter Valley's Ashton South East Open Cut mine conceded that input output and multiplier modelling was inappropriate and instead carried out a different form of analysis, through a computable general equilibrium model. This model demonstrated that the project would reduce employment in other industries at a local level and estimated a total of two indirect jobs would be created at a state level, with 14 at a national level.

In general Economists at Large reject the results of input-output modelling of coal projects, particularly relating to downstream job creation. We urge decision makers to treat this analysis with extreme caution.

Housing

Gloucester's housing stock is weighted towards larger houses with three or four bedrooms.

Figure 25: Housing diversity, Gloucester



Source: ABS, Census 2011

This could provide difficulties for residents regardless of the resource industry scenarios explored above. Clearly if expansion went ahead at rates close to the High scenario a serious shortage of housing, particularly for smaller properties, could result despite the use of workers camps for the bulk of construction workers. Under the low and mid scenarios, the more modest influx of mining

workers could perhaps be accommodated with existing housing stock, depending on the timing of developments.

Estate agents interviewed for this research said that a majority of their rental properties were occupied by people receiving commonwealth rent assistance. A rapid expansion of extractive industries could place pressure on lower income renters in Gloucester if other housing options are not developed.

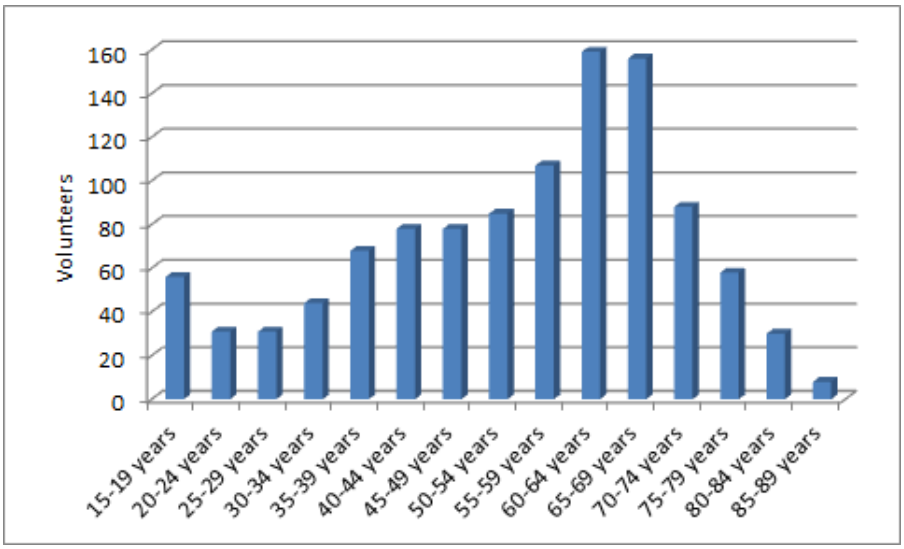
Education, training, health and emergency services

Given the uncertainty around most of these scenarios and their impacts on population, it is uncertain what impact might be felt on some of these services. If high numbers of new families moved to the area in the near term, considerable pressure could be placed on education, health and emergency services, however our understanding of the current capacity of these services is limited. We consider the most likely changes to population size in the medium term to be modest, although the composition of the population could change in a more significant way. We are unable to offer any detailed assessment of how these services might be affected.

Welfare, volunteer services and community groups

Gloucester has high rates of volunteering and community group involvement, due in part to its demographics.

Figure 26: Gloucester age breakdown for volunteers 2011



Source: ABS, Census 2011

While the uncertainty around development scenarios prevents detailed assessment, the likely effects of all scenarios is to increase levels of full time work and to reduce the relative importance of older age groups of the population. This is likely to reduce time available for volunteer services and volunteering rates.

This view is strengthened by discussion with a representative of the Gloucester golf club. Only one new player has joined from newcomers to the area, while several local players who now work at the Stratford mine find it difficult to play around working 12 hour shifts. While most of these players

retain their membership, their reduced participation has a financial effect and an effect on the "strength and vibrancy of the club".

6. Impacts on other industries

Agriculture

As discussed in the socio economic profile, agriculture is the major employing industry in Gloucester LGA, particularly beef and dairy cattle. The early stages of the resource projects have had different impacts on these parts of the industry:

- Some larger dairy farms have entered into strong partnerships with resource companies, securing generally favourable terms for land and water access.
- Beef herd sizes have been reduced land owned by resource companies has been taken out of production, or reduced stock numbers.

Impacts on employment and labour demand discussed above may have some impact on agriculture in the LGA. Most respondents to interviews for this research felt that resource projects had some impact on pushing up local wages, although the extent to which this might differ from wider trends in NSW and Australia is unclear. Dairy farmers and other employing agricultural businesses did not report particular difficulty in accessing staff and services to date, although some expressed concern that this could be a problem in the future if all resource proposals went ahead.

Most beef farming operations are non-employing businesses, staffed by landowners. In this respect, changing labour market conditions in Gloucester are unlikely to have a major impact. Of more concern may be the impact on land values and amenity. Smaller beef producers in Gloucester are often marginal operations, with lifestyle and amenity values a key consideration. Even larger commercial growers expressed that they stayed in Gloucester for lifestyle reasons, rather than moving to other areas where farming could be more lucrative.

Increases in land value driven by lifestyle movers have also been important to parts of the beef industry. Changes in the perception of Gloucester as a lifestyle and farming area could be detrimental to these parts of the industry.

Other parts of the agriculture sector in Gloucester could be impacted by resource developments in different ways. Some are closely related to the tourism sector, with significant revenues generated by farm door sales, farmstays and bus tours. If the perception of Gloucester as a tourism destination changes with the development of resource projects, these agricultural businesses could be negatively affected.

Some agricultural producers in Gloucester market their produce as being a "clean and green" product. They feel that their ability to attract a premium price in the market could be put at risk by the development of resource projects in the area and the perception of Gloucester as a mining area. While it is difficult to assess the validity of this concern, many people expressed that media coverage of resource controversies in the LGA had affected perceptions of the area.

Tourism and accommodation

Gloucester's tourism industry has developed considerably over the last 20 years and is a significant employer in the LGA. Most tourism operators strongly oppose resource developments in the LGA, particularly the Rocky Hill project, which they feel will impact on the amenity of the town itself and work contrary to the image of Gloucester as a tranquil, rural community in attractive natural surroundings.

Tourism industry representatives claim the potential impacts of reduced town amenity include:

- Reduced visitation numbers
- Reduced period of stay in the LGA
- Reduced number of tourism-focussed businesses - most tourism businesses in Gloucester are not motivated solely by financial profits, but have a significant lifestyle element to their businesses. Respondents suggested that if these businesses decline the reduced diversity in tourism offerings may further reduce visitation.

It is difficult to assess the likelihood and scale of these impacts. Tourism numbers have grown since the Stratford and Duralie projects have begun, suggesting impacts need not be major. Opponents suggest, however, that future developments will be of larger scale, closer to town in the case of Rocky Hill, and that all projects are now attracting greater media attention due to the controversy surrounding their development.

Some accommodation businesses, particularly motels, are strong supporters of resource developments, with mining workers being a major source of income. These businesses would likely benefit from any increase in non-local workers, likely under all scenarios.

Retail

Retail is a major employer in Gloucester. Impacts of resource development proposals are difficult to assess as they may have different effects on different aspects of the retails sector. Groceries, supermarkets, food shops, etc, would likely benefit from the increase in non-local workers under all scenarios, depending on the capacity and impact of workers camps. Clothing and more general retailers report that few resource company employees are customers and could be negatively affected if tourism numbers are reduced.

Other industries

The socio economic profile contains descriptions of other industries including light industry and manufacturing, professional and government services. Assessing the likely impacts on these sectors is difficult due to the potential for both positive and negative effects and the uncertainty surrounding the proposals.

Conclusion

The cumulative impacts of the resource projects proposed for Gloucester present planners with considerable challenges. If projects proceed according to original proposals, almost 800 people will be working in the LGA on new positions in the coming years. This number is nearly a quarter of Gloucester's existing population. Conversely, with the outlook for coal markets uncertain and continuing controversy around coal seam gas developments in NSW, employment in the resource sector could drop to near zero in the next decade. The most likely outcomes are between these extremes, but there is potential for considerable volatility in the sector, making planning difficult.

These potential changes will have impacts on other social and economic aspects of Gloucester, depending on their levels and the level of local and non-resident employment. If non-resident employment dominates, considerable impacts could be felt on demographics and social services.

In conclusion, the cumulative effects of resource projects proposed for the Gloucester LGA have the potential to seriously affect the amenity of the LGA, other industries important to the Gloucester economy and the overall welfare of Gloucester residents. The pace and nature of these developments should be made clear to planners who should work with agencies and proponents to ensure the economic and social welfare of Gloucester is protected.

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Appendix 5 - Rocky Hill Working Group Members

Name	Role/position
Cllr John Rosenbaum	Mayor
Cllr Frank Hooke	Deputy Mayor
Cllr Jim Henderson	Councillor
Cllr Tony Tersteeg	Councillor
Cllr Katheryn Smith	Councillor
Cllr James Hooke	Councillor
Cllr Aled Hoggett	Councillor
Danny Green	General Manager
Graham Gardner	Director Planning and Environment
Gil Gendron	Director technical services
Tania Parkinson	Environmental Services Coordinator
Norm Harwood	Manager of assets
Rebecca Connor	Planning & Regulatory Services Unit Manager
Alan Keown	GIS officer
Terry Hardwick	Community member, CCC
Trevor Sansom	Community representative
John Woodford	Community representative
Ray Dawes	Community representative, member of EIWG
Julie Lyford	Community representative, member of EIWG
David Marston	Community representative
Jeff Kite	Community representative
Di Montague and Chris Russell	Community representative
Rod and Robin Besier	Community representative
Graeme Healy	Community representative, Chair BGS Preservation Alliance
Philip Greenwood	Community representative, member of EIWG
Garry Smith	Community representative
Steve Robinson	Community representative
Gerald McCalden	Community representative
Lance Batey	Community representative
Denise Gilbert	Community representative
Michael Bowman	Community representative
Anthony Berecry	Community representative
Ed Robinson	Community representative
Ken Johnson	Community representative
Bruce Gilbert	Community representative