Groundswell Gloucester Incorporated

Submission in opposition to SSD-5156

Proposed Rocky Hill Coal Mine, McKinleys Lane via Gloucester

October 2016

Cover photo:

Gloucester Bucketts are the iconic symbol of the Gloucester Valley. This township, locality and Valley have been long regarded as a place of small scale, high quality rural scenery. It is this quality that has attracted people to the area for generations for a range of rural, settlement and retirement purposes. It is these qualities, and the community of the area that is being existentially challenged by this proposed mine.

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It is hard for the community to understand why it is required to be working so hard to ensure that this mine does not get approved. On two occasions the State Government has zoned the immediate surrounds of Gloucester, including the site of this proposed mine for environmental conservation purposes. Mines are prohibited in this zoning.

Obviously the Government and this community recognised the scenic and environmental qualities of the area to achieve this zoning. Many people made investment decisions to retire and build their dream homes with outlooks over the area that is now being considered for this mine.

The Council on behalf of the community has also planned for an eastern expansion of the town. Further development of existing rural residential estates and the planned expansion of the town are unlikely if this mine were to be approved.

There has been a long standing recognition of the delightful scenery of this Valley, captured in 1894 by Sir Arthur Streeton. Significant reports by Gloucester Council since 1953 onwards have promoted the scenic quality of this area. The reputation of Gloucester as a delightful, scenic, small scale, agricultural community will be seriously affected if this mine were to be approved.

This submission examines the range of potential impacts of the proposed mine; issues such as noise, dust, health, water, agriculture, visual, economic, ecological and tourism have all been addressed and reviewed. It is considered that despite the mitigation and management measures proposed in the EIS, there will be residual impacts for a whole new range of residents in the surrounding areas that cannot be mitigated.

Concerns about the way the mine is proposed to be carried out, a shortfall in material to achieve the final proposed landform, and the need for this small resource have all been addressed in detail.

The conclusion of the Groundswell Gloucester is that there are 32 solid reasons why this mine should not be approved. The community has been long and consistently oppose to this mine. It is strongly hoped that the assessment and decision making processes of the Government will come to the same conclusion, and that this application will be rejected.

1. Introduction

Groundswell Gloucester (GG) is a non-profit, incorporated Association formed by a group of residents who want our community to have the final say in the political decisions which determine the economic, social and environmental future of the Stroud Gloucester Valley. We look to a future where the beautiful environment of the Stroud Gloucester Valley sustains a healthy, productive and vibrant community. The Mission Statement from our webpage states as follows;

MISSION STATEMENT

For more than a decade the Gloucester community has been contesting plans for the industrialisation of our valley. AGL's proposal to drill up to 330 coal seam gas extraction wells has now been withdrawn, but leaves behind a number of exploration wells without clarity as to who is responsible for any future problems which might emerge.

On the coal mining front, Yancoal controlled by the Chinese government and mostly foreign owned Gloucester Resources Ltd, now own over 7,000 hectares of Valley land, much of which is good grazing land. They still have proposals for continued expansion.

Groundswell Gloucester's agenda is to continue our vigorous opposition to any further expansion of coal mining in the Valley; to push for rehabilitation of devastated lands insofar as this may be possible; and to promote a sustainable future for our Valley based on agriculture, tourism, lifestyle retirement, and their supporting service industries.

Additionally, Groundswell Gloucester actively supports community-led sustainability and renewable energy initiatives

GG has sought to develop a comprehensive submission to address its concerns, and the concerns of the local community in regard to this latest amended proposed mine application. In preparing the submission GG has drawn on the resources of its members and some limited external consultant advice. GG established a working group (see Appendix) to discuss the development application and the comprehensive information contained in the amended EIS. Most members of this group have tertiary qualifications relevant to the area of their assessment of the EIS, and have now spent many years of their retirement lives trying to address the real potential impacts of this mine in an earnest belief that it will unacceptably affect the community. We collectively believe that this proposed mine should not be approved by the State Government.

2. Groundswell Gloucester and the Community's position regarding the amended proposal

On behalf of this community the former Gloucester Shire Council (GSC) consistently opposed this development over all of the years it has been proposed. With the recent amalgamation of Gloucester Council as part of Midcoast Council, our community has lost the local representation we valued to advocate the community interest on issues such as this major proposal. As such GG feels it must strongly seek to represent the aspirations of the Gloucester community which has not changed with the amended application.

Over many years, GSC made a significant number of representations to State Government Agencies and State Ministers regarding this proposed mine and the on-going renewal of Exploration Licences over the land. This ongoing opposition was substantively based on the community's aspiration that the land around Gloucester township should be protected for its environmental values. 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. This zoning prohibits open cut coalmining as a land use in this area.

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. Despite the current modifications to the original application, 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, and the very close proximity between the two sites. 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 the town, and viewing the close proximity of the proposed development. The proposed mine is very close and would be ever present for a significant number of households.

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 respectively. 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. Over the years before the application for this mine, there were significant investments 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 20 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 other sustainable economic sectors. There is likely to be a very significant impact on future growth of lifestyle retirees who have a choice in terms of their destination. 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 Gloucester Council for the original application, an economic evaluation conducted by Gloucester Residents In Partnership (GRIP), and the assessment of economic impacts by The Australian Institute for GG have each raised significant concerns about the economic viability of the proposed mine. The proponent did relinquished part of their exploration licence closest to the Gloucester township, but they have retained extensive land around the mine for future expansion. That area is increasingly closer to the town and seriously compromises the planned expansion of the town.

GG recognises that there may be a small economic contribution that employment of local residents and the engagement of local services would bring to the local economy, but it is small and not sustainable in the long run. The social and economic benefits of this proposal also need to be carefully examined against the potential negative economic consequences to other sectors of the local economy.

GG has relied on the information contained in the new EIS to inform its response to this modified 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.

3. Landuse and Community Issues for Gloucester

a. Landuse Planning Issues

The proposed mine is in very close proximity to Gloucester and its urban settlements. It is easy to appreciate the extent of concern held in the local community about the scale, complexity and interrelationships between the proposed mining activity and the small-scale settlement of Gloucester.

GG's long-standing opposition to the proposed mine has been consistently advocated in representations to GRL, the community and the State Government over many years. There has been well documented broad community opposition to this proposed mine since it was first proposed. GSC undertook a community survey in regard to its intention to oppose the development and it identified that 78% of the local community supported its position to oppose this mine.

Economic Benefits versus the Economic Costs

The development has a potential to negatively impact many sectors in the community, and as all economic consultants engaged to review the development over the years (other than those engaged by the Applicant) 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, GG questions why it continues to be 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.

Inability to Mitigate Impacts

The fundamental concern for the community 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 about 50 vacant lots within these residential estates.

Reputational Impacts

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. GG believes that a setback to urban areas of 5km minimum is a reasonable separation given the nature and extent of impacts. The very close proximity of this mine to urban settlements in Gloucester is unacceptable to the community.

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.

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. Any view of the site from the rural estates at the southern end of the town show just how close the mine would be if approved.

As can be seen from Tale 4.3 in the EIS, the development has the following setbacks to key features of the town:

- distance to closest rural dwelling – 0.365 km
- 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 – 4.7 km
- distance to Gloucester High School – 4.5 km

The EIS includes many vague discussion about what constitutes 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 Council decided to provide additional land for housing development south of the existing town. Rather than extend sewage infrastructure in that direction, Council 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 reasonably 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 to be serviced by the town of Gloucester meaning an additional 3000 dwellings would be required in Gloucester and surrounds with approximately 2300 of these dwellings to be provided in the urban area.

In 2006 GSC 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.

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

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 by 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 Council revisited the LEP following its 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 areas zoned are shown on the following maps together with a detailed site map showing the proposed development in relation to current zonings 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, and undermines community confidence in the planning system in NSW.

Grounds for refusal

- The proposed mine compromises the 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 Gloucester Shire Council's Housing Development Strategy – 2006.

b. Historic Heritage Assessment

Defining the area
The Stroud-Gloucester Valley is the term used to describe geological formation extending from near Booral in the south to near Barrington at the northern extremity. It includes within its northern section the Gloucester township, the geological formation known as the Gloucester Bucketts and the proposed Rocky Hill coal mine site.

The term The Valley is used in Appendix 4, *Historic Heritage Assessment* to describe the northern section of the Stroud-Gloucester Valley which is the subject area for the Amended Rocky Hill Coal Project. The term The Valley corresponds approximately to the area historically known as The Vale of Gloucester.

Recognition of the Valley's heritage significance
The Vale's scenery drew comment on its first sighting by Robert Dawson in his exploration of November 1826. It has been noted as having a high level of heritage significance since its first history/heritage assessment by Eve Kean in 1953 in the commemorative publication The Vale of Gloucester, published by Gloucester Shire Council. 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.

An overview of the Valley's heritage assessments and recognition follows below.

- 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;
- the nomination to the Register of the National Estate 1976;
- the National Trust of Australia (NSW) revised listing 1981;
- provision of the Environment Protection (Scenic) Zone in the Gloucester LEP 2000;
- the National Trust of Australia revised listing 2009;
- nomination to the National Heritage List 2010, 2012;
- Publication of *The Stroud-Gloucester Valley: A Heritage Landscape Under Threat*, BGSP Alliance Inc., 2009; revised 2015, 2016.

Summary of the Valley's heritage significance under the NSW Heritage Office criteria.

The Stroud-Gloucester Valley in its entirety, including the highly scenic northern end, has been attributed with heritage significance under all seven of the New South Wales heritage assessment criteria. It is important to understand that significance under only one criterion is required to meet heritage assessment guidelines. The seven criteria are;

- Criterion (a) Historical significance,
- Criterion (b) Historical association significance,
- Criterion (c) Aesthetic significance,
- Criterion (d) Social significance,
- Criterion (e) Technical research significance,
- Criterion (f) Rarity, and
- Criterion (g) Representativeness.

The Valley's significance can be considered as falling into three broad areas;

- historical significance,
- natural geological significance and
- scenic significance.

The assessment of the Valley's history and heritage significance in Appendix 4 provides a comprehensive understanding of these special qualities, but the following concluding remarks give some insight into this significance and how it will be compromised if the mine is approved.

The project's impact

The conclusion is that the assessment under the NSW Heritage Assessment Criteria shows that the Amended Rocky Hill Project will have an adverse impact on the heritage qualities of the entire Stroud-Gloucester Valley and a severe impact on the highly significant and highly scenic northern end of the Valley.

This impact will occur over all heritage assessment criteria but will be particularly severe on some aspects of criterion (a) historic significance and criterion (c) aesthetic significance. By comparison with other similar developments it can be seen that the proposed mitigation measures will fall substantially short of satisfactorily mitigating that impact.

The impacts will be diverse in their nature and difficult to monitor, control and alleviate as the project advances. These impacts will not be restricted to The Valley's historic heritage qualities. Impacts on Aboriginal archaeology in the highly significant northern end of the Valley will remain largely unforseen in advance and will be impossible to control during the project's operations.

Assessments of coal mine sites elsewhere in New South Wales show that coal mining impacts on surface topography are far more enduring than the development applications acknowledge and that the Valley is unlikely to ever return to its pre mining state. The scenic changes will be substantial and will impact on the Valley's landform, land use, supporting domestic and rural infrastructure and all aspects of its appearance. This is acknowledged in the development application and is the underlying reason that the Historic Heritage Assessment goes to some length in its attempts to have scenic significance dismissed as a major component of the Valley's heritage significance.

Conclusion

It follows from the above that impacts on the Valley's heritage-scenic qualities will be substantial. These are matters that impact either directly or indirectly on the area's lifestyle, social qualities, tourism industry, land use and property values; the inevitable conclusion when due consideration is given to these matters is that the development application should be refused.

Grounds for Refusal of Consent

- The Amended Rocky Hill Project will have a significant detrimental and generally unmanageable impact on the Valley's long documented and recognised scenic heritage qualities.

- The project is in the highly scenic Vale of Gloucester and will be situated within the scenic and agricultural valley floor, and will be too close to the Gloucester Bucketts, the Gloucester township and residential areas, and the scenic Mograni Range.

- The proposed management of visual impacts will take significant time and are unlikely to be effective in creating unacceptable visual intrusions from the surrounding areas, major roads and many public viewing points and scenic lookouts.

- The impacts generally will be excessive in duration and extremely difficult to repair/remediate. Coal mining projects in NSW generally operate longer than the initial DA claims and create so much change that return to the original landscape is rarely fully achieved.

4. Mine Impact Issues

a. Filling The Void and the Final Landform

Introduction.

Section 2.16.5 of the EIS outlines the proposed filling of the final void and the development of the final landform. It states that the final landform *"was the adoption of the visual control strategy recommended by Richard Lamb and Associates"* presented in the original EIS.

Lamb's landform design, whilst perhaps laudable in concept, was totally discredited as a feasible concept in the submission prepared by GRIP (part 2 section 6) being impossible to build given the material availability.

Sadly nothing has been learned and the lack of material availability again renders this design an impossibility with barely enough material to fill the void let alone to construct the ambitious landform design.

It should be noted that in their responses to the original EIS, Richard Lamb & Associates, on behalf of GRL made extensive comment regarding the ability of GRIP to understand the concept and presented their opinion on the amount of material available. This varied from the GRIP figure by less than 5%. There was no opinion offered on the amount of material required. It can only be assumed therefore that they realised the massive shortfall and left this uncontested.

Material availability.

The amount of material available for the filling of the void and the development of the final landform is a simple case of mathematics based on the following

- How much material other than coal is available?
  (This comprises mainly overburden materials with a small amount of retained topsoil)
- How much ROM coal is to be removed to be processed?
  (This includes the final product coal and all rejects)
- How much of the rejects as a result of the processing of the coal are available for repatriation.

The amount of overburden and ROM coal are outlined in table 2.5 of section 2.7.4 of the EIS.

Section 2.8.3 of the EIS outlines the operation of the breaker station and suggests that 10% of the ROM material passing through the station would be returned as rejects. The remaining 90% to continue to Stratford for further processing and shipment. This is supported by figures given in table 2.7 of section 2.9.2

The concurrent application by Yancol with regards to the processing and despatch of the GRL coal via their CHPP suggests that the rejects produced will be retained at the Stratford

complex and not returned to the Rocky Hill Mine. Given that there are no references to these rejects being returned in the EIS this is assumed to be the case.

The table below outlines these material amounts and the year during which they are to be produced. Prior to being used for void filling or land form designs they would have various uses around the mine site or be stored in designated areas for later use.

Material quantities have been provided in various forms. These have all been converted to Bank Cubic Metres to allow for mathematical processes to be applied.

By definition

- A Bank Cubic Metre (bcm) is the “insitue” volume of the material.
- A Loose Cubic Metre (lcm) is the volume after the material “fluffs up” and expands in volume as a result of extraction. Advice from Mid Coast Council Engineering (previously Gloucester Shire Council) suggest an expansion of 20% would be expected.
- A Metric tonne is a weight not a volume and each material has a specific weight per bcm. In the case of bituminous coal this is 1.346 tonnes per bcm.

The amounts in the various tables previously mentioned have been adjusted so all are represented in Mbcm (Million bank cubic metres)

	a	b	c	d	e	f	g	h
YEAR	**Overburden**	**ROM coal**	**ROM coal**	**ROM sized coal**	**rejects**	**available material**	**available material**	**available material after 33% compaction**
	(Mbcm)	(Mt)	(Mbcm) b/1.346	(Mbcm) c x 0.9	(Mbcm) c-d	(Mbcm) a+e	(Mlcm) fx1.2	(Mm3) (g-f).67+g
1	4.7	0.2	0.149	0.134	0.015	4.715	5.658	5.347
2	4.7	0.5	0.371	0.334	0.037	4.737	5.685	5.372
3	4.7	0.5	0.371	0.334	0.037	4.737	5.685	5.372
4	6.4	1.1	0.817	0.736	0.082	6.482	7.778	7.350
5	9.8	1.4	1.040	0.936	0.104	9.904	11.885	11.231
6	9.8	1.4	1.040	0.936	0.104	9.904	11.885	11.231
7	9.8	1.4	1.040	0.936	0.104	9.904	11.885	11.231
8	9.8	1.6	1.189	1.070	0.119	9.919	11.903	11.248
9	9.8	1.6	1.189	1.070	0.119	9.919	11.903	11.248
10	9.8	1.7	1.263	1.137	0.126	9.926	11.912	11.256
11	8.8	1.8	1.337	1.204	0.134	8.934	10.720	10.131
12	8.8	1.8	1.337	1.204	0.134	8.934	10.720	10.131
13	8.8	1.8	1.337	1.204	0.134	8.934	10.720	10.131
14	8.8	1.8	1.337	1.204	0.134	8.934	10.720	10.131
15	5.7	1	0.743	0.669	0.074	5.774	6.929	6.548
16	5.7	1.4	1.040	0.936	0.104	5.804	6.965	6.582
TOTAL	**125.9**	**21**	**15.602**	**14.042**	**1.560**	**127.460**	**152.952**	**144.540**

These have then been summated as follows

Overburden (125.9Mbcm) + ROM rejects (1.56Mbcm) =

Available Material (127.46Mbcm)

This has then been converted to loose cubic metres by a factor of 20%

Available material (127.46Mbcm) x 1.2 = 152.952Mlcm

The available material, when placed in the void or used as part of the landform will undergo compaction. Some of this may be mechanical but certainly as a result of, in the case of the void, almost 200m of overlying material. The rate of compaction as advised by the Council engineers would be at 33% of the amount that the material had expanded from the bank state. For example, 1bcm would expand to 1.2lcm and that 0.2lcm would compact by a factor of 33% or to 0.134 compressed m3. The original 1bcm would have a compressed volume of 1.134 m3.

The total available material therefore is represented by,

(152.952Mlcm – 127.46Mbcm) x 0.67 + 127.46Mbcm = 144.54 compacted m3

Having determined the amount of material available the amount required needs to be considered.

Material Requirement

There are two requirements for the available material, to firstly fill the void, and secondly to complete the new landform design. If insufficient material is available than the ability to complete one or both will be impossible.

The Void

The void is simply the space left after the removal of the overburden and the ROM coal. The previous table outlines these volumes as

- Overburden 125.9Mbcm
- ROM coal 15.602Mbcm

This then gives a total requirement to fill the void of 141.502 Mm3 of material.

The Final landform

The design of the final landform is detailed in section 2.16.5 of the EIS and forms a critical part of the proposal. It is the applicant's promise to repatriate the site to its original state and usage. Fulfilment of the promise would be made at considerable cost to the applicant taking three years to complete and requiring extensive machinery and manpower resources. It would also be the first time such a repatriation has been carried out by a mining company at the cessation of resource extraction.

Existing versus Proposed

Figure 2.20 shows contour maps of section 2.16.5 detailing the existing and proposed landforms. This is reproduced below.

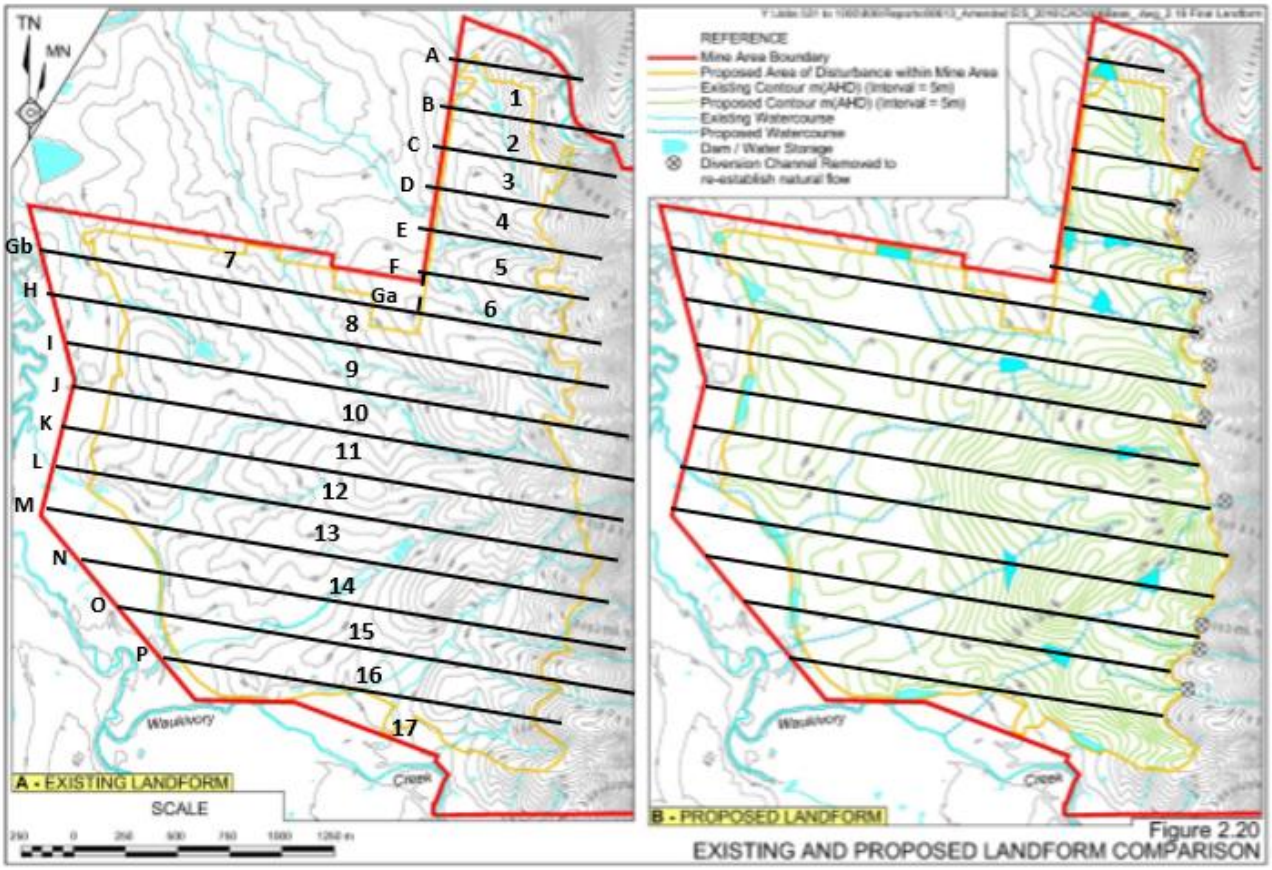
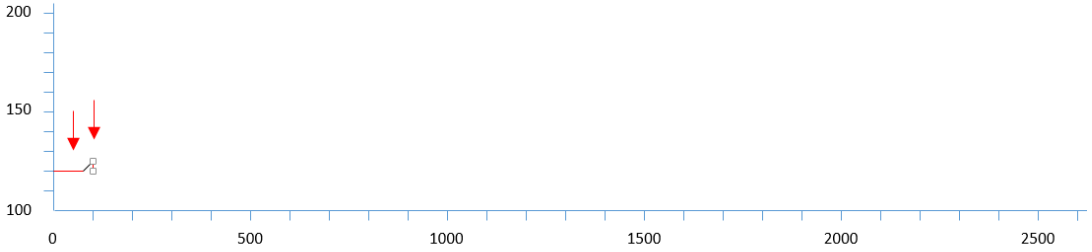


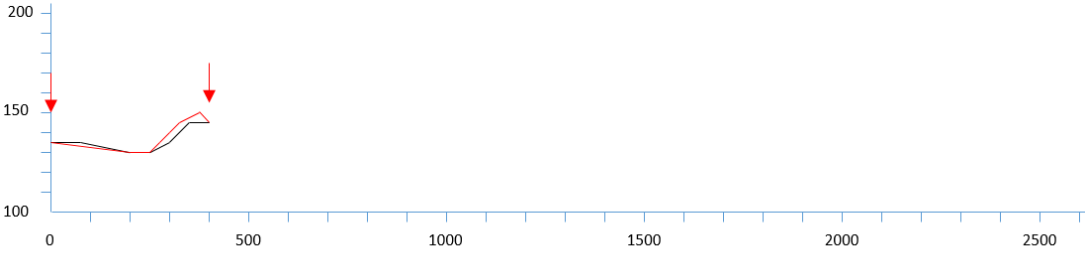
Figure 2.20
EXISTING AND PROPOSED LANDFORM COMPARISON

Section lines have been overlayed at 200m intervals lettered A – P. Each pair of these in turn produces a block of land numbered 1 – 17 (note: section A has a sectional area of 0m2 and as such there is no requirement for detailing a block to the north of A. The southern boundary of block 17 is the original terrain varying in distance from the area of disposal boundary. This distance has been averaged at 50m.

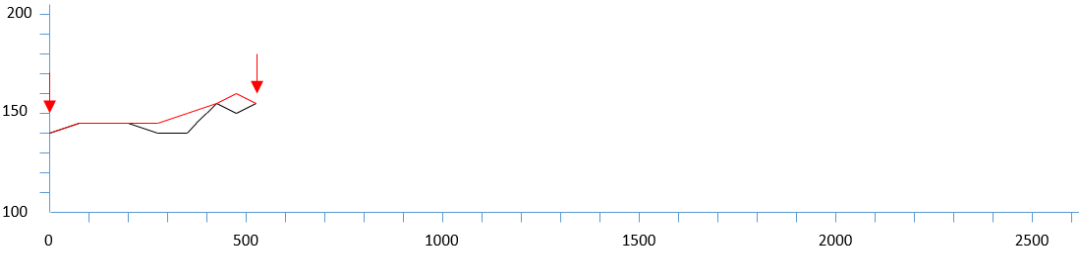
The sections detail the difference between the existing landform, shown in black, and the proposed landform shown in red. Elevation is vertical with each division representing 10m. Distance from the western mine area boundary is horizontal with each division representing 100m. The red arrows represent the area of disturbance. The blue arrow on section G represents the western edge of section F.



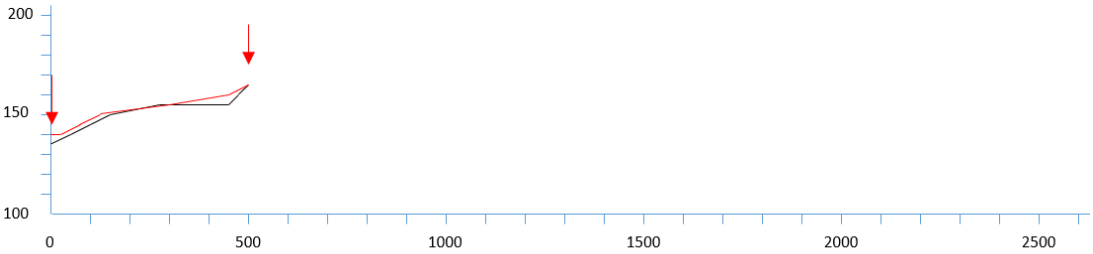
SECTION A



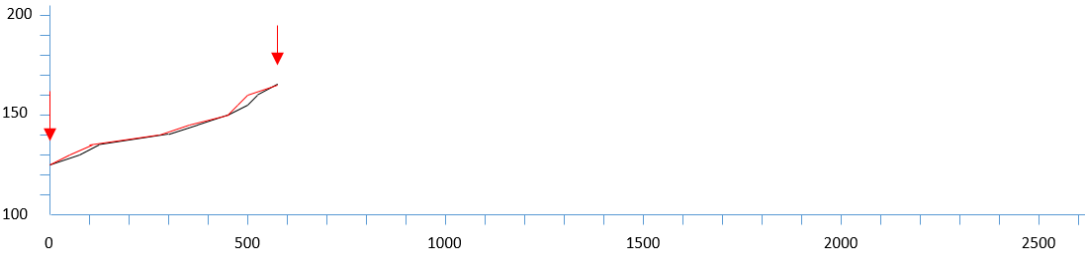
SECTION B



SECTION C



SECTION D



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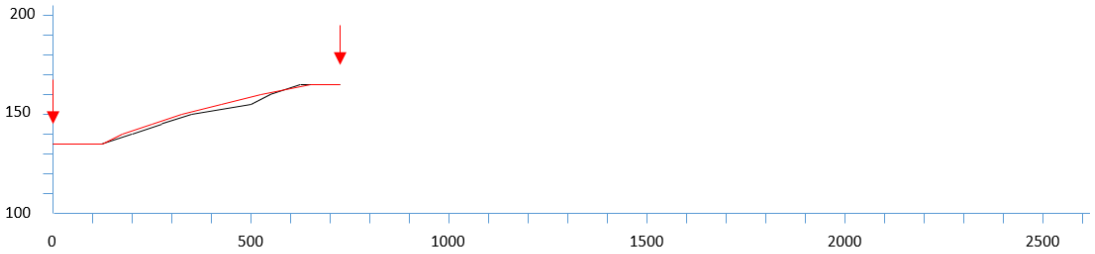

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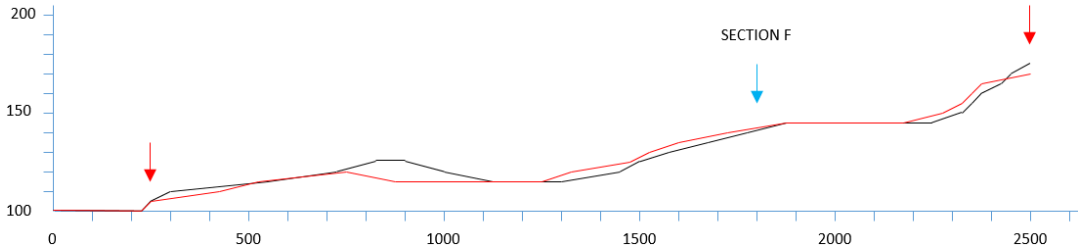

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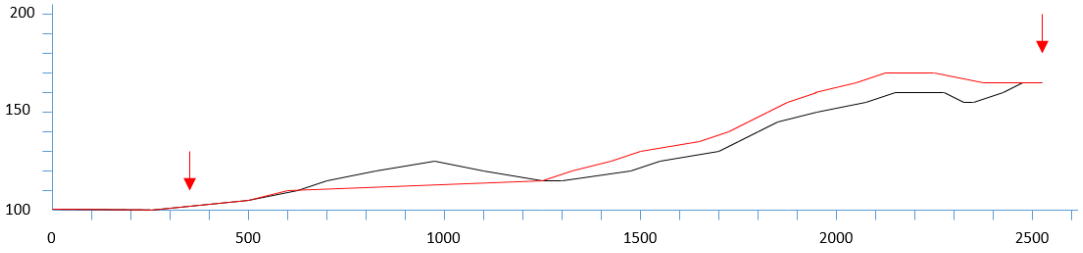

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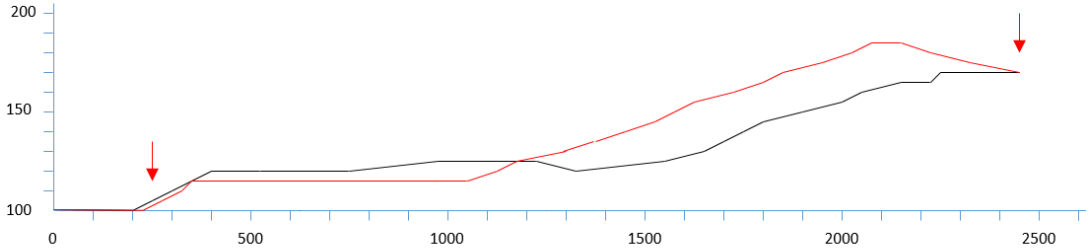

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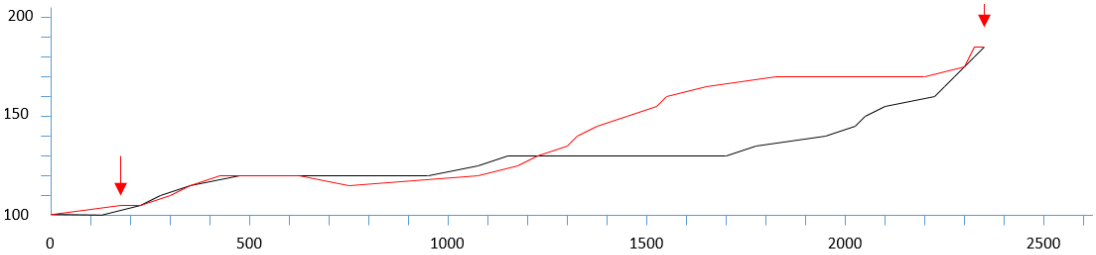

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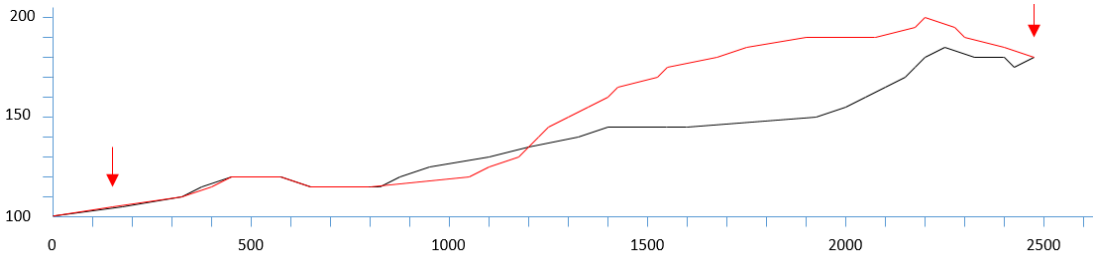

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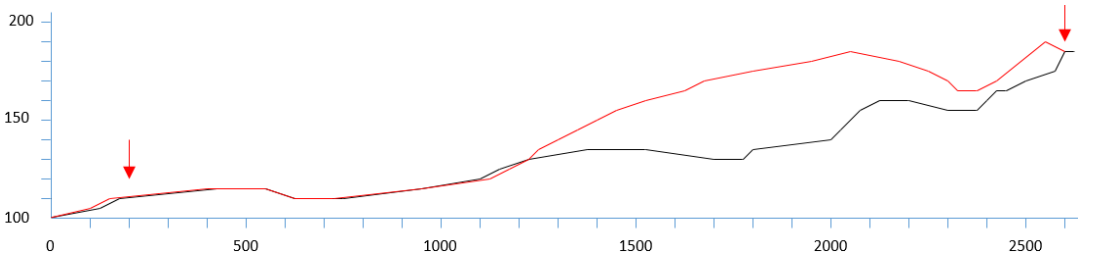

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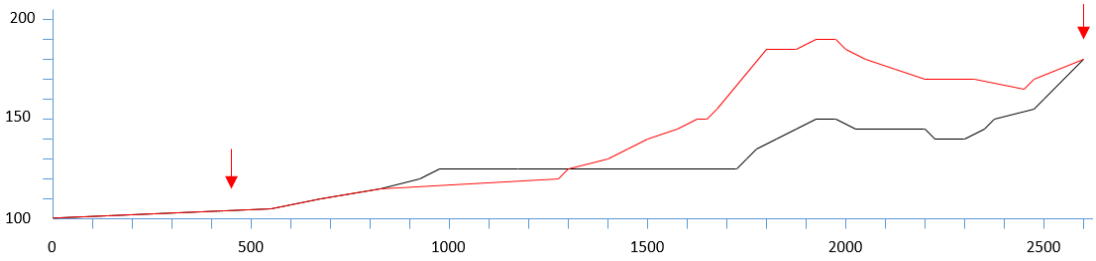

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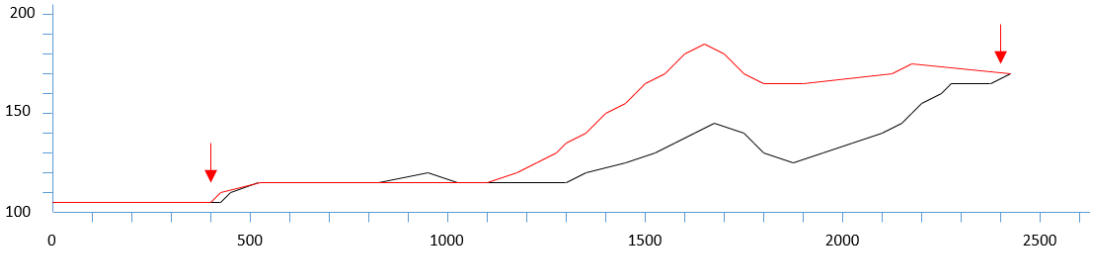

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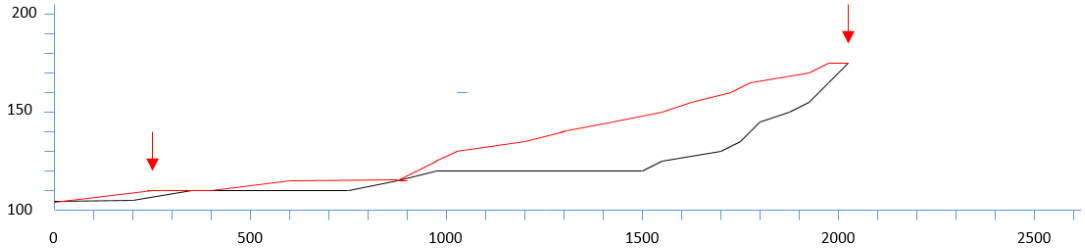

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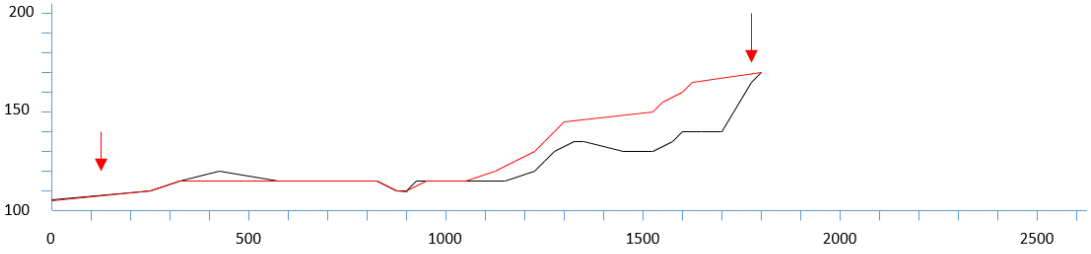


SECTION P

The existing landform is represented by the black line. The proposed landform by the red line. Where the red line lies below the black, material will be required to be removed to achieve the final landform. Where it lies above, material will be needed to achieve the final land form. Calculation of the sectional area of each allows calculation of the total sectional area of material required. The addition of the sectional areas of adjoining areas and division by 2 gives the average sectional area of each block between the sections. Multiplication by the block width allows the block volume to be calculated. Summation of the block volumes allows a total requirement to be derived. The table below outlines those calculations.

The total volume required 74.7625 Mm3

SECTION	Section Areas m2			average sectional area m2	BLOCK	block width m	block volume Mm3
	negative	positive	total (a)	(Sect A + Sect B)/2 = (b)			
A	0	0	0				
				437.5	1	200	0.0875
B	0	875	875				
				1562.5	2	200	0.3125
C	0	2250	2250				
				1562.5	3	200	0.3125
D	0	875	875				
				562.5	4	200	0.1125
E	0	250	250				
				375	5	200	0.0750
F	0	500	500				
				1000	6	200	0.2000
Ga	0	1500	1500				
				500	7	200	0.1000
Gb	4500	4000	-500				
				6125	8	200	1.2250
H	7000	19750	12750				
				20875	9	200	4.1750
I	9750	38750	29000				
				35125	10	200	7.0250
J	3750	45000	41250				
				47875	11	200	9.5750
K	2750	57250	54500				
				58875	12	200	11.7750
L	0	63250	63250				
				60625	13	200	12.1250
M	4250	62250	58000				
				56125	14	200	11.2250
N	1000	55250	54250				
				48250	15	200	9.6500
O	0	42250	42250				
				31375	16	200	6.2750
P	1000	21500	20500				
				10250	17	50	0.5125
Original landform		0	0				
					TOTAL MATERIAL REQUIRED		**74.7625**

Material Requirement versus Material Availability
As outlined above the material required to fill the void is 141.502Mm3 and the material required to complete the final landform is 74.763 Mm3.

Section 2.16.5 also suggests that area encompassed by the main pit would be filled between 1 – 5m above the surface level to allow for future compaction. Given that the area is 1.875km x 0.75km at an average depth of 2.5m this would require an additional 3.516 compacted Mm3.

The void plus addition 2.5m capping 145.018 Mm3 + Final landform 74.763 Mm3

The total amount required is 219.781 compacted Mm3

The Shortfall
Given a requirement of 219.781 compacted Mm3 and an availability of only 144.54 compacted Mm3 there will be a shortfall of 75.241 compacted Mm3

The total shortfall is 75.241 Mm3

This would suggest that not only would the final landform be completely impossible to construct but a shortfall of 0.478 compacted Mm3 exists in filling the void and capping.

Conclusion

Are we expected to believe such a massively flawed design will ever be built? Surely not.

The calculation of the amount of material required and amount of material is not complicated. Some simple cross sectioning, rationalisation of volume expressions and multiplication were all that was required. How then, with access to computer sophistication, is the end result so wrong, or is it? This is not a variance of a magnitude that can be explained by different philosophies on calculation methods, rounding of totals or averaging of answers. It represents a statement that more than 50% material is available than is calculated, equal to over 8 years of overburden and ROM extraction or absurdly 47 times the volume of the Melbourne Cricket Ground.

The degree of the shortfall raises the question; was the purpose of the final design to utilize the overburden from the main pit in an effective and environmentally appropriate manor or simply to provide an appealing solution to the issue of filling the void that no company yet has pursued to its satisfactory conclusion?

Grounds for refusal

- The EIS and documented mine planning fails to establish that adequate material will be available to undertake the proposed landform restoration for the proposed mine; estimated in this review to be in the order of 75.241 Mm3.

b. Noise

The location of the proposed project, particularly its proximity to the Forbesdale, Avon and Thunderbolts residential estates, will potentially result in a large number of residences in and around Gloucester being adversely affected by noise.

Groundswell Gloucester engaged a specialist consultant - Stephen Gauld of Day Design Pty Ltd – to provide an expert Acoustic Peer Review of the Noise, Vibration and Blasting Assessment prepared for the amended project. His report can be found at Appendix 2 .

The consultant found that the expected noise impact of the project would be clearly audible at nearby residential premises, especially in unfavourable weather conditions (southerly wind). Further, the consultant concluded that the proposal to continually monitor the weather and noise emission from the mine and to shut down items of plant to achieve compliance with the PSNLs is likely to be inevitable.

The intrusiveness of noise depends on more than just its power as measured in decibels. Where a noise source contains certain characteristics, such as tonality, impulsiveness, intermittency, irregularity or dominant low-frequency content, it can cause greater annoyance than other noise at the same power level.

Although noise from the Rocky Hill mining operations could reasonably be assumed to contain characteristics such as intermittency, irregularity and prominent low-frequency content, little attention has been paid to the characteristics of noise that would be generated in the proposed mining operations, and the need for adjustments to be made to the predicted noise levels to reflect the greater annoyance caused by those characteristics.

In the noise report prepared for the amended project the assertion that, if a dominant low frequency component in noise experienced at a receptor is due to distance attenuation only, it is a perverse outcome, is nonsense. The objective of noise management must be to minimise mine-sourced noise nuisance at affected residences. The amended project design fails to propose means by which the noise nuisance arising from the raised dominance of low frequencies can be controlled, given greater attenuation over distance of higher frequencies within the noise spectrum.

The impact of failure to adjust for such noise characteristics has been starkly demonstrated by the discordance between predicted/measured noise impacts and the actual experience of nearby residents as recorded in the complaints register for the Stratford Mining Complex (SMC).

Intrusive noise nuisance has been a constant source of complaint about the SMC since it commenced operations.

A survey of residents undertaken at the time the EIS for the Stratford Extension Project (SEP) was placed on public exhibition in late 2012, revealed that intrusive noise nuisance has been experienced over a wide area and at all points of the compass up to 5 km from the SMC. (Submission by the Barrington-Gloucester-Stroud Preservation Alliance to the SEP.)

There was little variation in the descriptions of the noise. It was usually described as being a constant low roar or rumble accompanied by the sound of heavy machinery operating under load. The nuisance is largely due to the constancy and nature of the noise rather than its volume.

Many of the residents who complained about intrusive noise were located in areas where noise modeling had predicted no noise impacts to occur. This suggests that the modeling is not a good indicator of potential noise impacts.

This is a common occurrence within communities throughout New South Wales where coal mining is extant. Groundswell Gloucester is firmly of the view that this discrepancy arises due to the inadequacy of the NSW Industrial Noise Policy (INP). There are three huge weaknesses.

Firstly, the Rating Background Level (RBL) is overestimated. The INP requires that the RBL be set at 30dB. But in fact the actual RBL in the Gloucester Valley is 24 to 26dB. This results in a huge difference between predicted and actual noise impacts.

Secondly, insufficient weighting is given to the low frequency component of the noise spectrum emitted by heavy machinery.

Thirdly, there is no regard at all for the context of the noise received. For example, a squawking flock of kookaburras may emit a greater sound pressure wave than distant industrial machinery, but at a residence in a bush environment, this is a natural sound and less intrusive than the alien sound of the distant industrial machinery.

There is great uncertainty that the noise assessment in the EIS adequately explains the potential impacts, and it is expected that there will be a great many new local residents unacceptably impacted by mining noise if this mine were to be approved.

Grounds for Refusal

- The project would result in a significant level of intrusive noise being experienced by residents of Gloucester and surrounding residential estates who are currently unaffected by levels and characteristics of noise such as that which would be generated by the mining and associated operations.

c. Health Impacts of the proposed Rocky Hill Coal Mine

Groundswell Gloucester opposes this Amended Development Application because the proponent mistakenly believes the health impacts are 'acceptable'. The risks are grossly underrepresented and the large majority of the Gloucester Community finds the health impacts totally unacceptable.

The health of humans living or working near coal mines is impacted by an interaction of psychological factors;

- air and water pollution,
- noise effects, particularly low frequency noise,
- to a lesser extent light and olfactory pollution.

Cardiovascular disease for example is increased by psychological stress, also by noise and also by particulates. This EIS by compartmentalising the health risks does not acknowledge a cumulative effect is the norm, consequently underestimating the impacts. Unless a proper Health Impact Assessment is undertaken where all those in the impact zone are examined before mining and then regularly monitored, no meaningful quantification of the health impacts can take place.

There is a common misconception in government agency and the extractive industry, that the consent levels imposed result in either no impact, or 'an acceptable level of impact'. There has never been a community discussion of what constitutes an acceptable degree of health impact. Animal health, including stock animals, is also adversely impacted with no monitoring of that impact.

The High Risk groups are;

- children and infants,
- the elderly,
- the chronically ill, and
- the socially disadvantaged.

A number of people came to live in an Environmental Conservation Zone because they had existing health concerns and were seeking 'clean air' and green surroundings.

Extent of the Health Impacts of Rocky Hill Mine

Rocky Hill Mine is unique in both its proximity to a densely populated town and the proportion of those living in the impact zone who are in one of the High Risk groups.

Local Impact

A housing estate built on land zoned for Environmental Conservation (Forbesdale Estate, average age 60+yrs) is between 900metres and 2km from the mine whilst two more housing developments (Thunderbolts and Avon Estates) are between 2km and 3km of the mine. Nearly 500 people live within 3km, 2000 people live within 5km and 3500 people live within 7km of the mine. The enclosed valley inhibits dispersion of air pollution. Many residents are

in at least one high risk group. The psychological impact, which includes suppression of the immune defence system, started with the announcement of the mine over 10 years ago. In future the physical health impacts will primarily be seen in more visits to the GP, medications prescribed, days off sick etc. This EIS ignores the past and current psychological impacts, their interaction with pollutants and the far more numerous health impacts other than deaths and hospital admissions.

Wider Impact

Horrifyingly there are five dairies located within the range of dust fallout from Rocky Hill and the largest and closest dairy will be spraying its pastures with mine water. There are also beef cattle. Cattle are permitted much closer to the mine and eat up to 50kg of soil each year with the grass, so it is naive to think the pollutants are not absorbed. Industry avoids testing anything except the chemicals purposely given to the cattle. The same area was the site of fracking by AGL and although those coal seams were deeper we know there are many faults and fractures and there are reports of bubbling in puddles when it rains, and bubbles in bores close to the mine. The endocrine disrupting chemicals of the CSG industry cause a range of problems for cattle in addition to the carcinogens, heavy metals and organic compounds such as Polycyclic Aromatic Hydrocarbons (PAH). PAH are heavy, not very volatile, some are carcinogenic and neurotoxic. They will stay on the soil surface. There is a lack of any evidence for a routine testing regime monitoring for mining pollutants in milk and beef originating from cattle properties elsewhere in mining areas. This food safety risk is not explored in this EIS, nor the animal health implications. The only discussion is to assure us that the dust doesn't put cattle off feeding on it.

Global Greenhouse Gas Impact

Burning of coal is the biggest contributor to global warming which was estimated in 2012 to already be causing up to 400,000 premature deaths, mostly children, each year. No arrangement has been made for the carbon capture and storage of the CO2 from this coal. Only coal which has such an arrangement should be mined if we (Australia) are to abide by the Paris Climate Change agreement. Whilst Rocky Hill Stage 1 may only add 14+ million tons, to the global output of 7500mta, this equates to about an extra 50 deaths, mostly children, over the life of the mine. Australia's deaths currently are mainly from our excess of extreme weather events (heatwaves, cyclones etc), which also generates much psychological trauma.

Air Quality

Air pollution is the largest single environmental health risk and a leading cause of disease and death globally affecting the respiratory and cardiovascular systems.

Particulates PM 10

Mining (including blasting) creates both particulates and gases which impair our health in a multitude of ways. Particulates are monitored but the industry is strenuously avoiding the WHO guideline for PM 10 particles for the past 3 years that the annual criterion should be lowered to 20 microgm/m3 average maximum, rather than the 30 microgm which the EIS

authors try to reassure us is a criterion taking into account the most sensitive groups within the population. The WHO use that identical phrase about 20microgm/m3. The real truth is that any extra particulate load will be a harmful proportionate to that extra load.

There is no evidence of a threshold for particulates below which no adverse effects occur.

The many health impacts of PM 10 particles are acknowledged and discussed in the EIS. The proponents just bizarrely conclude that this mortality and morbidity is 'acceptable' despite other mines being closed whilst still having good access to metallurgical coal in much less populated areas. If the advice of the WHO was followed and the criterion for PM 10 was 20microgm then the annual maximum would still be exceeded at four residencies, some very substantially.

PM 2.5

The fine PM 2.5 particulate level around Rocky Hill at the moment is 4.6microgm/m3 annual average with a maximum criterion currently set at 8microgm. Worryingly in 2013, the first year of the Stratford TEOM operation, when there was both mining and coal processing at Stratford, the annual level was an exceedance of 8.2microgm. This dropped to 6.9 and 6.8 microgm when mining stopped at Stratford in 2014 and 2015 but it appears the children of Stratford will be put at unacceptable risk when the Stratford Extension is operating closer to the village and Rocky Hill coal is being sent there for processing with their coal. If processing 2MT/a resulted in unacceptable PM 2.5 levels what will processing 4MT/a do with the additional burden of Roseville West Mine extending to only 1km from the village.

There is a preoccupation with just the size of these particles when their chemical composition is also indicative of health damage e.g. Heavy metals, black carbon and silica.

PM 1

Each particle size has different health problems associated with it. There is no WHO guideline for the most numerous PM 1 particles but that doesn't stop them being perhaps the most serious risk. Ultrafine particles such as hydrocarbons are so small that they can enter inside cells. This suggests they may well be the particles causing the increased risk of lung cancer. They are known to cause an increase in the volume of the brain ventricles in mice and if this also occurs in humans it is hypothesised it may explain a cause of the escalating rate of autism reported in the Upper Hunter and elsewhere and also a cause of schizophrenia.

Hauling of coal uphill to Stratford (up to 33,000 return trips/yr) increases the amount of dust emitted of all particulate sizes from the load which they plan not to cover because it is a private road, and the additional impacts from the extra diesel over what a train would have used. The study of coal rail wagons in Newcastle found empty wagons emit more dust than full wagons because they are not hosed down before the return trip. GRL have been deceptive in stating that there will be a sealed haul road when in fact the larger portion of the road within Stratford mine will remain unsealed. Coal trucks should be covered to reduce dust and should be washed down before the return trip to Rocky Hill.

TSP

Current dust deposition averaged over 5 years is commented upon as being low (1gm/sqm/mth). This type of low baseline measurement should lower the maximum criterion. Rural communities should not be given city appropriate standards. This just gives a license for the mine to be sloppy because they have more leeway.

Blasting

Blasting is a cause of air pollution, structural damage to brick houses from vibrations, flyrock housing damage, excessive noise impeding hearing and communication, exacerbating tinnitus and an anxiety provoking event that can cause terror in Vietnam veterans and children who imagine the house is about to fall in on them. Advance warnings may be a little help but only a little. It is a big imposition to have to leave your house for a couple of hours three times per week so in practice very few people do that. It is an activity where theory and practice frequently are out of alignment with brown choking plumes and excessive bangs each causing many complaints. Surely much smaller blasts should be the order of the day.

Gases such as NO2 and SO2 combine with water to become acidic, resulting in acidification of domestic rainwater supplies (see next section). NO2 with sunlight gives rise to ozone which is very toxic with particulates for the respiratory system, especially the undeveloped lungs of young children who breathe more quickly than adults. Similarly this combination is very bad news for those with existing lung impairment. The Asthma Council, alarmed at the possibility of this mine, funded several nurses to be trained in spirometry (lung function testing) which we offered to all the local community. More than 200 persons have been tested but of those, 23 have a Forbesdale address and 8 of those 23 (35%) had abnormal lung function. This is an indication that a proper baseline Health Impact Assessment is required to get proper assessment and education for this community. The community intends to continue with this testing to ensure ongoing information on impacts is available should this mine be approved and become operational.

Spontaneous Combustion

This has been a problem at both Stratford and Duralie Mines with fumes and odour from incompletely burnt sulphur compounds being an annoyance and health hazard to the local community which persists for months after the event. The Hazelwood mine fire, where this caused 13 deaths showed how serious this problem can be when you place a mine close to a population base. The choice of LDO to perform the review of this problem, which they found *not significant*, exemplifies the concerns of the community. This review needs to be repeated by an independent body.

Domestic Rainwater Tanks

This is a very serious issue which seems to be misunderstood by the authors of this EIS. The community was alerted to it initially when Stratford School discovered lead in their drinking water, which was also acidic. The Education Department and Council combined to install first flush filtering and to add a calcium carbonate float to their tank, and the tank was

cleaned. The school was instructed to run their water for three minutes each morning before allowing the children to drink water to clear the water that had been sitting all night in pipes. Unfortunately the public were not alerted, and so no other domestic rainwater tanks were corrected. Alarmed by this, it was fortunate that Professor Damian Gore of the Environmental Science Department of Macquarie University contacted the community because he wanted to involve his students in practical field work. Professor Gore has a special interest in heavy metals and is a scientist of international standing. It was arranged for samples from the kitchen tap of 103 homes with domestic rainwater tanks to have both their tank water sampled and soil analysed from under the eaves and in the garden away from the house. This happened to include some homes which are close to Rocky Hill Mine. 17% of the tanks (including some featured residencies in this EIS) had lead levels above the guidelines, with the worst being a sevenfold level above the guideline. A similar number had copper levels in the health affecting range. 97% of the tanks had a pH between 5.0 and 6.0 (mildly acidic) and the soil under the gutters contained increased lead levels. Unfortunately dust from within the house was not sampled but there is a big risk that contaminated soil is brought into the house on shoes etc. Individual house owners were told of the results for their home but the publishing of this study has not yet occurred. GG has a draft in a personal communication (2). The overburden dust contains sulphur compounds and some other emissions which are acidic. It may be that other factors may have contributed to the water acidification. Stratford Mine has been operating for 13 years and reporting about 40kg of lead dust and 66kg of copper yearly to the NPI. No doubt these compounds have been accumulating in the garden and tanks, and it appears that the biggest factor in which the drinking water had elevated lead was the age of the house, particularly if it was over 50 years old. Atmospheric lead has not been measured.

Of the three studies which the EIS uses to try to dismiss our concerns, only the local Council study is relevant as the only one with our local conditions and it confirms elevated lead was found in tanks of old houses. The mine pays for regular cleaning of the domestic rainwater tanks in Camberwell village. If the authors of the EIS visited and communicated with the 'At Risk' community their reports would be much improved. Such communication should not be restricted to the Social Impact Study.

Conclusion

Mining, on the balance of probabilities, is responsible for some of the lead and some of the acidity which combine to create this problem. These compounds each present in 17% of Gloucester Valley domestic rain water tanks. Professor Mark Taylor, from the same Environmental Science Department at Macquarie University published a study (1) earlier this year of the impact of atmospheric lead on children and found it was associated with cognitive and behavioural problems including aggressive crime later in life. Whilst the lead in the domestic rain water tanks is not atmospheric lead it would surely be having the same impacts on the brains of the children of the area.

The issue is particularly important because the NSW Health Department do not take responsibility for overseeing water quality of private domestic rainwater tanks and individual owners are not aware of the likely problems. The conditions surrounding Rocky

Hill are largely similar to Stratford and so, on the balance of probabilities the same scenario could develop. In addition to heavy metals is the possibility of carcinogenic hydrocarbons also being in the water. Many Stratford residents complain of an oily film on their tank water. No-one is testing for this, and it is noted that the test is more expensive than for metals.

Domestic rainwater tanks near the proposed Rocky Hill and the existing Stratford Mines need regular monitoring for heavy metals and hydrocarbons and regular cleaning until town water is extended to Stratford which should be as soon as possible if coal mining continues.

Noise

The significance of noise as a health hazard is reflected by the WHO statement that traffic noise is harming the health of every third person in Europe and costing 40billion euros each year. Also one million healthy years are lost to premature death from noise each year in Western Europe. Noise is used as a weapon of torture which epitomises its potentially psychologically noxious nature.

Noise is responsible for both auditory and non-auditory health damage. Non auditory damage being much the more important for the community surrounding a heavy mining setting. The Industrial Noise Policy is a poor instrument for protecting communities from mining noise since low frequency noise is so prevalent from large machinery while the standard measurements are of middle frequency, or 'A' rated noise, designed to safeguard against industrial deafness, not the stress and cognitive impairments induced by further travelling low frequency noise.

Evolution has led to us being hard wired to be on guard for a low frequency growl coming from a large beast that can harm us. Even whilst asleep our bodies respond with a stress response to low frequency noise raising cortisol levels, pulse rate and blood pressure. This does not have to be sufficiently loud to awaken us. This is not being monitored.

The quiet and peaceful area of the Gloucester Valley has attracted noise sensitive individuals. Rural communities are treated particularly poorly by the INP because it is common for the background noise level in the evening and night to be in the 20dB to 25 dB range but industry finds it very difficult to work to that range. Instead of instructing the industry to go to a less populated area the INP penalises the community by pretending the background level is 30dB. Our physiological systems don't know this deceit has occurred and will be aroused by an increase of 15dB above the real level that their body is used to, with the result that many rural homes suffer evening and night time noise disturbance. This needs to be confirmed by baseline sleep quality measures being performed before disturbance commences and any subsequent disturbance can at least receive appropriate monetary compensation when it inevitably occurs.

People vary in their sensitivity to noise, similar to the way some people are more incapacitated by motion sickness. The Industrial Noise Policy acknowledges this when it states its limits are to provide protection to 90% of people 90% of the time. (Why are the unfortunate 10% not delineated and compensated?) However the local 'At Risk' community

are not assessed to determine what will be a 90% level for them. There is an unwarranted assumption that all communities are the same. Forbesdale, who are the closest community, have an average age of over 60 years, and so are definitely an atypical community with a high incidence of those with hearing deficits. This group of people have difficulty with background noise which makes both personal communication and many cognitive functions (e.g. concentration, learning, memory formation) more difficult. Children's learning and behaviour are particularly affected by both daytime and night-time noise. The transgression of this basic quality of life is completely overlooked in this EIS.

The project noise emissions were predicted to be such a problem at night that the mining is limited to ceasing at 7pm initially and 10pm when the mine gets deeper. This is deceptively promoted as an act of community goodwill by the company and a solution to the problem of sleep disturbance, which is the only non-auditory noise problem that the 'out of date' INP acknowledges. It is certainly true that sleep disturbance is a major problem but what seems not to be recognised is that wakening by night noise is only one cause of sleep disturbance. Anxiety and depression is probably an equally important cause so that sleep disturbance health problems are still likely to be common and this needs to be monitored with a baseline prevalence and regular measurements of sleep quality and next day sleepiness which is known to lead to traffic and other accidents, irritability and cardiovascular adverse impacts.

The charts of predicted noise levels illustrate how the mine is positioned to have an impact on virtually the whole of Gloucester as well as the much closer farms and new housing developments. Clearly the 'Sensitive Receptors'; hospital, schools and nursing homes, are important institutions to protect. However there are many sick, elderly and very young people living much closer to the mine and will be that much more heavily affected by unwanted noise. It is callously insensitive that the affected community is not individually assessed and appropriate management advice provided when government approves such devastating projects. 'Sensitive receptors' should also include people who have past history of mental disorders and have been misled or uninformed into purchasing in an Environmental Conservation Zone only to discover mining is permitted. Noise is particularly harmful for many people with autism and schizophrenia, and also many other mental disorders. The anger caused in such deception is a powerful factor in exacerbating mental disorders previously under control.

It is grossly unreasonable that large numbers of the community are affected for a week by excessive construction noise with 56 residences experiencing 'appreciably excessive' noise and a further 12 residencies experiencing moderately excessive noise. This potential impact should be enough on its own to warrant refusal of this application.

The noise, air blast and vibration from blasting is similarly predicted to affect a large number; 16 out of 32 mining company owned residencies to the extent that regular evacuation of buildings may be necessary. These people are probably getting monetary compensation in the form of low house rentals but are they informed of the likely health impacts? It tends to only be disadvantaged people who seek to live so close to mines.

Allowing any occupation of these buildings is unethical and should not be allowed if approval is contemplated.

Psychological Illness

Just as people with a chronic physical illness such as asthma can have their illness exacerbated by small changes in air quality, so too can stress exacerbate illness in people with past treatment for anxiety, depression, psychosis etc. The longer stress continues the more it becomes destructive. This mine has been under exploration for 10 years already there are instances (including hospitalisations) that have been noted in the community. The noise and dust of mining would reactivate these stresses with more morbidity and possibly mortality. This important Stress-Pollution Interaction is explained in depth in the 2011 online article by Catherine Cooney (3) focussing on the importance with children. The toxic nature of PAH on children's impulsivity and emotional problems is described by Margolis et al (4). Stratford Mine emitted 3.7kg of PAH in 2013-14. Stress can also trigger first episodes of mental illness.

Solastalgia, a pining for the solace previously provided by a now damaged landscape, is a phenomenon that some previous reviews of mining projects have focussed upon. Perhaps unknowingly to the exclusion of the commonly appreciated mining induced mental health issues mentioned above. Solastalgia is particularly felt by indigenous people but also by multigenerational families and people who have left all behind to spend the rest of their lives in "beautiful and pristine" surroundings. The EIS is incorrect when it states this is not measureable. Many of the experts in Solastalgia live in the Hunter Region and could measure this in any local mining affected community if funded to do so.

Health Risk Assessment in the EIS

This assessment is not comprehensive as the name implies, as it is just limited to air quality. Whilst the IES states that '*vulnerable people are carefully considered*' there is no evidence of this. There is no acknowledgement that this community has recently been exposed to proposed CSG fracking or that it has been downwind of Stratford Mine for 21 years, or that the immunity level of those living close to the proposed mine has been affected by the stress of the threat of unwanted mining. There is no breakdown of the age and health status of the community in the impact zone. Health Risks are restricted to just hospitalisation and deaths to achieve figures that look small. The most 'At Risk' residencies, the mining owned residencies are excluded. The approach of accepting residential occupation of dwellings owned by the mine, which do not comply with impact criteria is not acceptable.

Peer Review

The term '*Peer Reviewed*' is normally attached to an anonymous critical review of the research in question, and the author then responds to the suggestions and criticisms. There is no evidence that this is what has occurred in the case of this application.

The contribution of the 'Peer Reviewer' is at times a separate commentary on loosely related topics. At other times he wholeheartedly endorses the Health Risk Assessment. To our knowledge no effort has been made to acquaint himself with the special problems of this project. The Peer Reviewer extends his review outside his area of special expertise.

The end result is an appearance that his academic title has been used to give the EIS greater superficial credibility.

Costing of Health Damage

Deloittes only calculated the economic impacts of noise and dust. They have neglected to cost mental health impacts nor the impacts of pollution on food (milk and beef) coming from the Valley nor the Australian health costs from the extra global warming caused by making steel from this coal.

The calculation of air pollution depends on assuming all air quality can be represented by PM 2.5 levels and a formula dependent on population density. Both these bases for calculations seem erroneous but in different ways. It is suspected that Deloittes have not been informed of the 32 mine owned premises which are all very close to the mine are likely to result in significant health impacts for any occupants.

The PM 2.5 predictions seem unrealistically low in that the Stratford TEOM levels when the mine was last operating in 2013 exceeded the annual advisory level and only came under that level when mining ceased.

Whilst PM 2.5 levels are important they are not indicative of all air quality. PM 10, another important cause of damage, has levels that do not go in parallel with PM2.5 levels and PM 10 particulates cause health damage well inside even the current WHO recommended limit of 20microgm/m3. Blasting gas impacts similarly are important and the fact 16 of the 32 mining company residencies have very large exceedances of noise indicates their unhealthy proximity to blasting.

Deloittes appear to believe the population density of the affected community is that of the Gloucester LGA of 1.5 people/sq km. This is ridiculous. Gloucester town has an area of about 4sq km with a population of 2800 (700 people/sq km). The impact zone closer to the mine is less densely populated. PM 2.5 being fine does not settle quickly and with the frequent atmospheric inversion patterns, the impacts are likely to cover 50 sqkm with a population of about 2500 persons giving an average density of 50 persons/sqkm which is 30 times the financial impact of the remote population density that was used.

Deloittes seem to have made no estimate of the impacts on the tourism industry which the local industry says is very substantial, nor the impact on cashed-up retirees that are likely to be put off coming to the area.

Ambient Noise costing similarly is grossly flawed since it assumes the noise is urban traffic noise. There are no corrections for the different age profile of this community. Mining company residences are excluded. Non auditory noise induced health effects are not covered etc.

The whole costing needs to be repeated by a firm who speak to all sides of this issue.

Grounds for Refusal of consent;

- The proposed mine will have an unacceptable impact on the health of the Gloucester residents in the vicinity of the mine due on the basis of psychological, lung function and sleep interference impacts.

REFERENCES

1) Taylor et al, Environmental Health (2016) 15:23 - The relationship between atmospheric lead emissions and aggressive crime: an ecological study.
2) Gore D, (2016) Personal Communication
3) Catherine M Cooney, Environmental Health Perspectives published online 1st October 2011. Stress –Pollution Interactions: An Emerging Issue in Children's Health Research.
4) Margolis et al, Journal of Child Psychology and Psychiatry (2016) - Prenatal exposure to air pollution linked to impulsivity, emotional problems in children.

d. Geology and Coal Resources

There are a number of key issues related to the geological aspects of this proposed coal mine that are of significant concern to Groundswell Gloucester.

1. Failure to satisfy DGR requirements of "efficiency of coal resource recovery".

Rocky Hill's intentions to recover 95% high quality coking coal and 5% steaming coal product raises some questions. Stratford Mine which is recovering the same seams, 10km to the south of Rocky Hill currently achieves about 40% and up to 50% coking coal product of variable quality.

In the early 1980's, I was the geologist who did the exploration work for BMI Mining, now Yancoal's Stratford Coal mine. At the time the Avon coal member and the Weismantel coal member were known. For mine planning I was involved in testing the overburden sites. Through drilling and geophysical downhole analysis, I was responsible for correlating and naming the Cloverdale, Roseville, Bowens Road, Bowens Road Lower, Glenview, Rombo, Glen Road, Valley View and Parkers Road coal seams. These seams are present in the Stratford Coal mine area and project north into Rocky Hill's proposed mine.

For GRL to achieve 95% coking coal product, of any quality, they would have to be selectively mining the available seams discarding the lower quality portion of thermal coal.

The Avon and Bowens Road seams are the thickest of the seams in the mine area and comprise, at best 50% coking coal and 50% thermal coal. The upper half of the Avon Seam and part of the Bowens Road Seam do have higher vitrinite percentages but not to the 85% - 91% quoted by GRL. The rest of the seam has lower vitrinite percentages, in the order of 30-40% and represents more than the stated 5% steaming coal.

The Cloverdale and the Roseville seams would produce coking coal of medium to high quality. These are the seams that GRL are chasing in the pit that go to a depth of 220m. So to achieve 95% coking coal they would have to be committing a lot of the Avon and Bowens road and other seams to the overburden pile or leaving them in the ground effectively sterilising part of the resource.

The extensive EIS of more than 4000 pages has numerous details on sound, air quality and geochemical testing on overburden and reject materials but only a few general paragraphs on geology and coal reserves and coal quality. We were told in a Community Consultative Committee meeting by GRL that it is the best coking coal in Australia, and none of the GRL mining management team would name the top quality coking coal seams. The project, which is marginal at best, hasn't presented enough detail on which seams are to be mined nor does it included any test results on coking coal quality.

By examining the open cut pit cross section, (see Figure 2.6), the Main Pit is chasing the better quality Cloverdale and Roseville seams down to a depth of 200 – 220m. Whereas the Bowen Road Pit and the Avon Pit which comprise the thicker coal seams mined by Gloucester Coal, only go to depths of 80 – 110m and 100 – 130m. It appears that a large

percentage of the resource is not being recovered, thereby effectively sterilising a significant portion of the deposit.

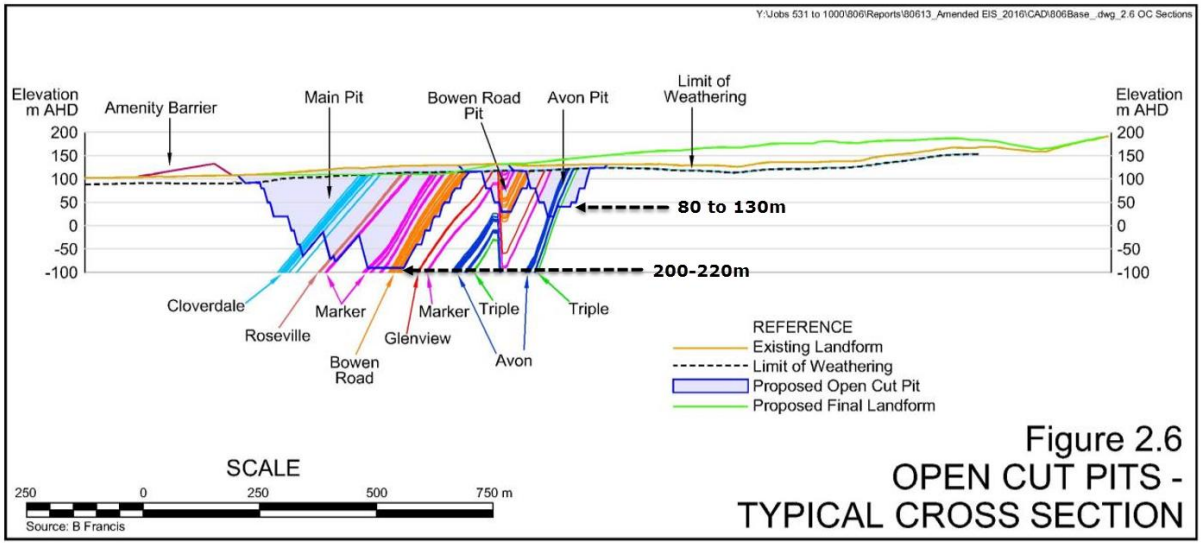


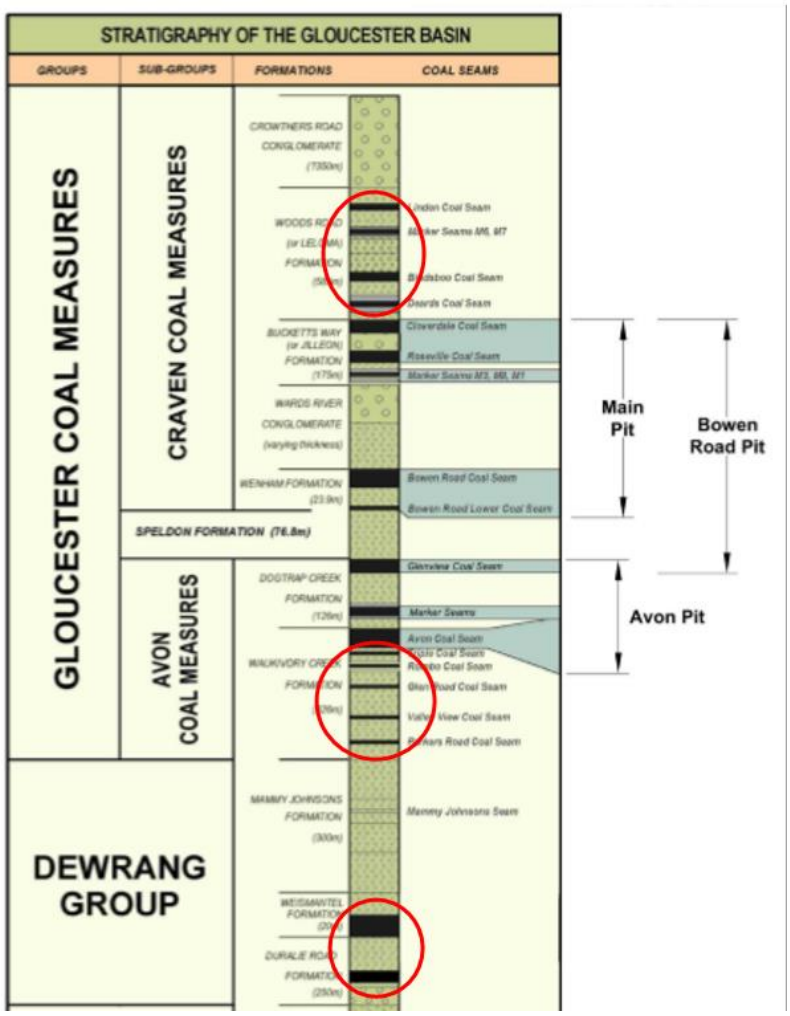
Fig 2.6 from the EIS has the depth to proposed pit floors marked.

Section 2 states that these depths are "*based on current planning, the open cut pit depths nominated are approximate only given the steeply dipping nature of the coal seams, the extent of the geological knowledge, and the potential effects of changes in controlling economic factors. The ultimate depths of development in each open cut pit would reflect the optimisation of coal quality, the outcomes of detailed planning as coal extraction progresses and market factors"*.

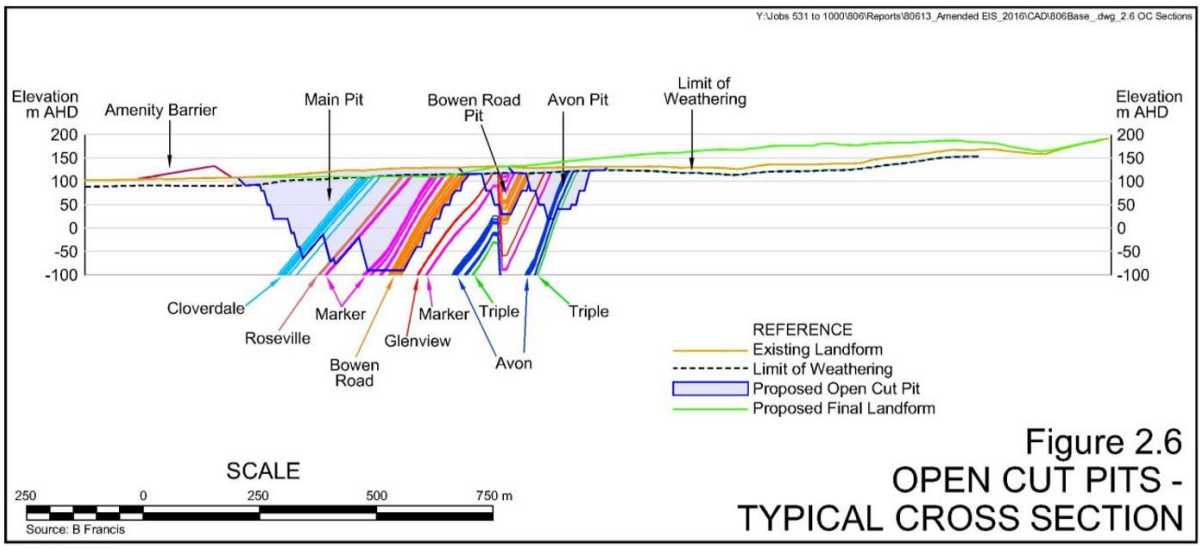
This suggests that either there has been insufficient exploration work done for mine planning or an intention to cherry pick the deposit.

In section 2 it states that the Clareval seam "*dips at approximately 75 degrees, is heavily banded, low yielding and consequently, uneconomic. The Weismantel seam…… is no longer considered to be economically recoverable due to low predicted yields, the high proportion of uneconomical thermal coal and difficult to mine, steeply dipping seam and narrow pit geometry*".
There is no information for this decision to drop the Weismantel and Clareval seams considering Yancoal are still mining the seams to the south of the proposed Rocky Hill Mine. Duralie mine produced 2Mt of raw coking coal from the Weismantel and Clareval seams in 2013-2014.

This is evidence that they are selectively mining the higher quality seams. GRL's reasoning is that the Weismantel and Clarval seams are dipping at 70°, are banded and of poor quality. If 70° dip is a mining concern, then surely the other seams dipping at between 45° to 50° are also a mining concern.



From the stratigraphy column above we see some 8 other seams, (circled), which have been left off the cross-section diagram (Figure 2.6) although they are in the mine area. The following cross-section from the Amended EIS shows the pit area and seams targeted.



In the next cross section, the missing seams have been added, location approximate. These seems are within the mine area. The main pit will intersect four coal seams (Linden, Markers M6 & M7, Bindaboo and Deards) which on the mine plan to be excavated and classified as overburden. How will this coal material be treated?

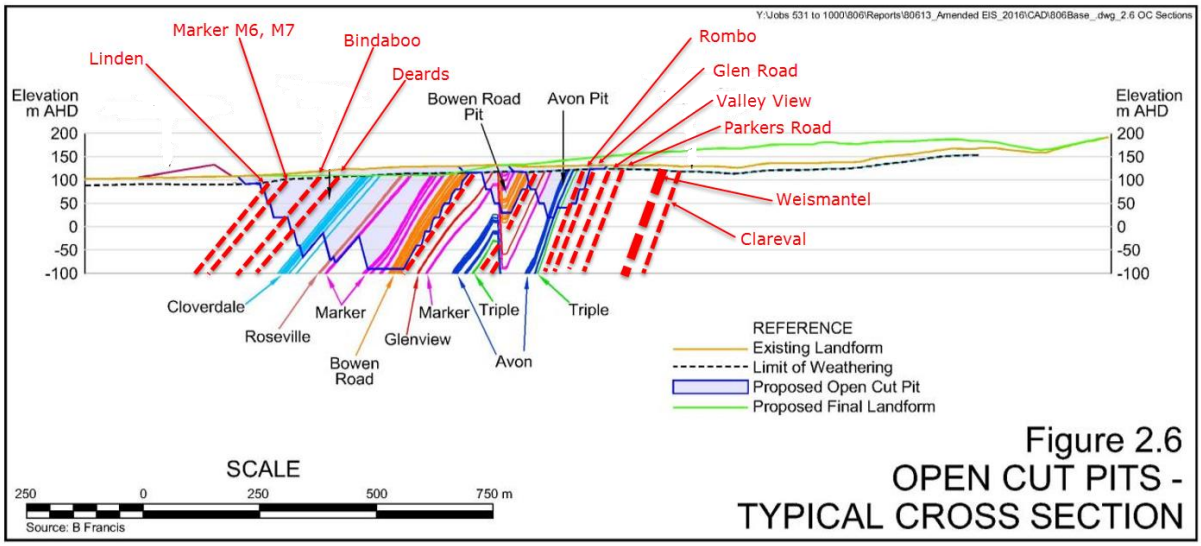


Figure 2.6
OPEN CUT PITS - TYPICAL CROSS SECTION

Just for the record, the missing seams include:

Linden Coal Seam
Marker Seams M6 and M7
Bindaboo Coal Seam
Deards Coal Seam
Bowens Road Lower Seam
Rombo Coal Seam
Glen Road Seam
Valley View Coal Seam
Parkers Road Coal Seam
Weismantel Coal Seam and
Clareval Coal Seam

There are two main concerns about the lack of information in the Amended EIS:

1. The missing seams demonstrate that GRL are selectively mining the resource to maximise the percentage of coking coal product. This is grounds for refusal. I am not suggesting that GRL are deliberately misleading the DGR but there is insufficient data to make an assessment on this project.

2. “Acid Mine Drainage”. There is no consideration of these seams by RGS as PAF materials and how they are to be managed. The stated high percentage of high quality Coking Coal, more than double that of Yancoal 10km to the south, may well see a lot of thermal coal (50% of Bowens Road and Avon Coal seams and other smaller seams) find their way into the overburden mounds without being treated.

This is a high risk with low reward project and suggest that this application should be rejected outright.

Coal Quality

GRL states that Rocky Hill's Coking coal is the best in Australia. The EIS shows that there is some high quality coking coal but it will be blended with lower quality coking coal to produce an overall medium quality coking product. The table below from the Department of Industry Resources and Energy shows the quality of NSW deposits and the yellow highlighted column shows the average coking coal quality.

Department of Industry Resources & Energy

Quality of coal deposits in New South Wales

The major coal deposits in NSW range in rank from bituminous coking and thermal coals to sub-bituminous thermal coals (brown coal). The quality of thermal coals ranges from medium-ash to high-ash, low-sulphur coal used for domestic power generation and cement manufacture; to low ash to medium-ash, high energy, export quality coal. Prime, low-volatile, hard coking coal and low ash, semi-soft coking coal, used for iron and steel production, supply both the export and domestic markets.

		Southern			Western			Hunter			Newcastle		Gunnedah		Gloucester		Oaklands	
Coal field coal type		Export / Domestic Hard coking	Export Thermal	Cement	Export Thermal	Domestic Thermal	Cement	Export Thermal	Domestic Thermal	Export Soft Coking	Export Thermal	Domestic Thermal	Soft Coking	Export Thermal	Export Soft Coking	Export Thermal	Coking	Domestic Thermal
Moisture%	(ad)	1.0	1.1	1.1	2.5	2.6	3.2	2.7	3.9	2.7	2.3	2.3	2.3	4.0	4.0	1.5	1.5	-
	(ar)	7.9	6.4	6.4	8.9	8.0	-	9.1	9.5	9.9	8.5	7.5	8.1	-	-	9.0	9.0	28.0
Ash%	(ad)	9.3	19.5	19.5	13.7	20.4	24.5	13.5	25.9	8.9	15.1	22.0	8.1	10.0	6.5	17.5	10.0	12.00
Vm%	(ad)	22.9	20.8	20.8	30.5	28.7	25.3	32.7	30.4	34.7	30.6	26.7	36.3	37.0	37.9	26.8	29.3	22.0
Ts%	(ad)	0.40	0.45	0.45	0.65	0.55	0.40	0.60	0.90	0.55	0.60	0.40	0.90	0.45	0.45	0.65	0.65	0.20
Se	(kcal/kg)	7570	6750	6750	6890	6600	5460	6810	5430	7250	6760	6010	7480	7050	7400	6800	-	4180
	(Mj/kg)	31.8	28.2	28.2	28.8	27.6	24.5	28.5	22.7	30.4	28.3	25.0	31.4	29.1	-	28.9	-	17.5
CSN		6.5	1.5	1.5	1.0	1.0	-	1.5	2.0	5.0	2.0	1.5	6.0	-	5.0	-	-	-
Aft(°C)	Deform	1560	1460	1460	1420	1460	-	1270	1330	1380	1380	1480	1290	1400	-	1530	1530	1390
	Flow	1590	1530	1530	1560	1570	-	1510	1510	1540	1540	1590	1550	1550	-	1600	1600	1540
HGI		68	64	64	49	45	49	50	49	51	52	52	49	45	45	65	65	100
Gray-King		G3	-	-	-	-	-	-	-	G2	-	-	G6	-	20	-	G8	-
Max. Fluid	(ddm)	1800	-	-	-	-	-	100	-	130	-	-	7420	-	200	-	5000+	-
Phosphorus%	(ad)	0.061	0.030	0.030	0.011	0.009	0.010	0.027	0.031	0.025	0.032	0.024	0.045	0.006	0.005	-	0.060	0.002

GRL say that they can produce at least 95% of the output from the Rocky Hill Mine Area consisting of a medium volatile, high fluidity coal which is suited for the manufacture of metallurgical coke with fluidity values of at least 10,000ddpm, with some high volatile samples having >30,000ddpm.
GRL states that Rocky Hill coals have 85.6% to 91% Vitrinite which is the reason the coal has high fluidity value. The coal rank from clean coal composites of each seam having an RVmax varying from 0.79 to 0.93. Once these values are getting into the window of 1.0 to 1.3 and higher then this is associated with coal seam gas production. This is why AGL was interested in extracting the coal seam gas adjacent to Rocky Hill mine. By removing and disturbing these coal seams, Rocky Hill will be releasing CH4 and its associated BTEX chemicals into the atmosphere and water flows.

From the EIS Section *2.3.2.3 Coal Quality, Washability and Anticipated Yields.*

"Each of the seams and plies have differing coal quality attributes which affect the overall product specification and hence its saleability. The Applicant has evaluated the various seams and plies through laboratory analysis relevant coal quality attributes, washability and anticipated CHPP yields. These seam attributes were considered in the open cut pit planning

process to ensure that the seams targeted for extraction are of suitable saleable quality and would yield economically viable, predominantly coking coal products."

The following Table shows some examples of product specifications of mines around NSW and the interesting feature is the Max Fluidity. The highest Fluidity occurs in the underground mines of Austar and Tahmoor. The open cut mines vary for 200 to 800. Quite a difference to Rocky Hills 30,000ddpm.

Mines - key below	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Moisture % (ad)	2.5	1.0	2.5	2.5	1.5	2.5	2.5	2.5	2.5
Moisture % (ar)	10.0	9.0	9.0	9.0	9	9 (max)	9.0	10	9.0
Ash % (ad)	5.5	9.5	9.0	9.5	9.5	9.5 (max)	9.0	9.5	9.0
VM % (ad)	40	21-22	34.5	36	27.5	36	35	33	33.5
TS % (ad)	1.75	0.38	.55	.60	0.40	0.60	0.55	0.55	0.55
SE (kcal/kg) gar	7700		6860	6813		6813	6860	7220	7250
SE (kcal/kg) gad							7350		
SE (Mj/kg) ar	32.2		29.72	28.53		28.53	28.72	30.4	30.4
CSN	6-7	6.5	6	6	7	7	6	6	6
AFT (°C) – Deform	1200		1350	1300		1300	1380	1500	1450
AFT (°C) – Flow	1520		1550 +	1500		1500	1550	1560	1560
HGI	35	75	50	50	65	48 (min)	50	50	50
Gray-King	G6	G3		G2					G1
Phosphorus % (ad)	0.03	0.070		.034	.05	0.03		0.015	0.015
Max. Fluid (ddm)	>10000	800	200		>3000	200	200	150	150

Department of Industry Resources and Energy

1. Yancoal Austar UG Coking
2. Bulli Coking
3. Bulga OC Semi-soft
4. Mt Owen Semi-soft Coking
5. Tahmoor UG Hard Coking
6. Liddell OC Semi Soft Coal
7. West Wallsend UG Semi-soft Coking
8. Rio Tinto Hunter Valley Operations OC Coking
9. Mount Thorley / Warkworth OC Coking

The next table (*Department of Industry Resources and Energy*) compares Stratford and Rocky Hill and indicates the Newcastle benchmarks for Prime hard coking coal and low ash Soft coking coal. Also note that Stratford Coal has a high sulphur content.

Gloucester Qualities	**A**	**B**	**Rocky Hill**	**C**	**D**
Moisture % (ad)	1.5	1.5			
Moisture % (ar)	9.0	9.0			
Ash % (ad)	9.9	10.0		9.0	8.0

VM % (ad)	33-34	28.6			
TS % (ad)	1.05	0.6		<0.40	<0.60
SE (kcal/kg) gar	7550	7400			
SE (kcal/kg) gad					
SE (Mj/kg) ar					
CSN	8.5	9		6.5	5.0
AFT (°C) – Deform		1370			
AFT (°C) – Flow		1600			
HGI	55	71			
Gray-King		G8			
Phosphorus % (ad)	0.003	0.05			
Max. Fluid (ddm)	>5000	>1500	>30,000		
%Reactive Macerals		+85%	85.6 – 91.1%		
Ro(max)		0.98	0.79 – 0.93		

A. Gloucester Semi Hard Coking Coal (Note Duralie Coking coal is blended with Stratford Coking Coal)
B. Stratford Coal Mine Indicative Coal Quality in the Main Pit - 10% Ash Coking Coal
C. Newcastle Benchmark Prime Hard Coking Coal
D. Newcastle Benchmark Low Ash Soft Coking Coal

2. The Increased Potential of PAF materials to leach Acid Mine Drainage.

It is unclear from the EIS what is actually going into the overburden piles. RGS has tested the overburden, interburden and the floor and roof material of the targeted 6 seams in the mine area. These seams are the Cloverdale, Roseville, Marker 1, Bowen Road, Glenview and Avon Seams. Missing is the Linden, Markers: M6 M7 M3 M2 and M8, Bowens Road Lower, Rombo, Glen Road, Valley View, Parkers Road, Weismantel and Clareval Coal Seams.

Part 6: Overburden and Reject Characteristic – ES5 2

"*Potentially Acid Forming (PAF) breaker reject materials should be disposed within the open cuts (where possible) or randomly blended with overburden materials, with prompt covering (within one week) by reduced permeability NAF overburden materials*"

It is noted that breaker reject material should be <0.7% of total overburden. However, there is a possibility that the thermal quality coal (~50% of both the Avon and Bowens Road plus other seams) may end up in the overburden piles. This will increase the 0.7% to a higher percentage of PAF material and increase the risk of acid mine drainage polluting the creeks and rivers.
The EIS calls for this breaker reject to be held in pits but it will be year 7 before a pit becomes available for tipping the rejects and uneconomic coal seams.
The other aspect of the PAF being buried into the overburden piles/amenity barriers/visual barriers is that GRL are intending to move these overburden piles to backfill the open cut pits and to reform the landscape. This process will mix and expose PAF material and be difficult to control.

Part 6: Overburden and Reject Characteristic – ES5 4

"*As a precautionary measure, all uneconomic coal seams and immediate coal seam roof and floor materials reporting to storage areas should be emplaced in a similar manner to breaker reject materials*"

There is insufficient information as to what is going to be handled as uneconomic seams and how much there will be. Also what is GRL's definition of uneconomic, perhaps good thermal quality coal is being buried as uneconomic coal. What is the geochemical nature of this coal and what is the actual tonnage?

RGS spell out the process as to how the PAF breaker rejects are to be handled if there is no capacity within open pits to accommodate this material – *randomly blended with overburden materials and encapsulated in reduced permeability NAF overburden materials within the western and northern amenity barrier and permanent out-of-pit overburden emplacement area at least 5m from the final batters or upper surfaces. Lime dosing of PAF breaker reject materials should be also considered should water quality monitoring indicate a pH<5.0*

There is a great risk to the environment should this process not be handled correctly.

RGS "*In addition to visual monitoring for pyritic material, ongoing geochemical testing……should be undertaken throughout the operational stage of mining*…."
Who will police this and why only during mining?

I view this project as a high risk with low reward scenario.

3. Smallest mine in NSW and Qld - will it be viable?

Approximately 25.5Mt exported from NSW each year – GRL's 0.6Mt is Insignificant

It must be noted that this proposal is for a small mine, if not the smallest in NSW and definitely if Queensland is considered. It is a small mine but has a large impact on the people of Gloucester due to its closeness to the town and surrounding urban residents. It is also situated on the side of the valley and would be clearly visible from all angles.

Gloucester's growing Tourism industry relies heavily on our scenic capital which will suffer due to Rocky Hill scarring the picturesque rural landscape.

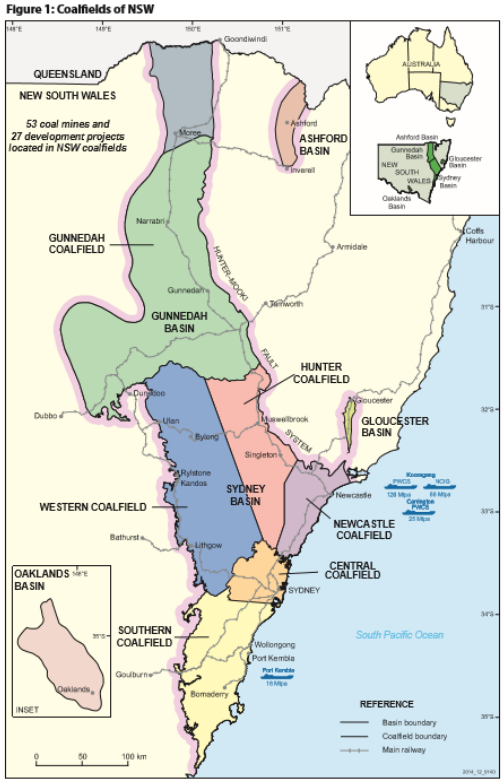
Pollution from dust, noise and light imposed on the people of Gloucester and associated health and security risks, over a period of 20 years is unreasonable for such a small economic gain.

The World Health Organisation says that 1 in 8 deaths are due to air pollution and burning fossil fuels plays a large part. Residents in Gloucester already complain of coal dust in their pool filters from the Stratford mine some 15km from the town centre, and they are astonished that Rocky Hill is being considered to mine so close to town.

The local people refer it to a “Small Insignificant Development” rather than its given status of “State Significant Development”. Remember, 80% of the people in Gloucester region don’t want this mine.

The following Figure from the Department of Industry Resources and Energy show the size of the Gloucester coal field to other coal fields in NSW.

Figure 1: Coalfields of NSW



The figures from the Department of Industry Resources and Energy’s web site, has the remaining recoverable reserves for metallurgical coal in NSW in excess of 3.8 billion tonnes. That puts Rocky Hill’s 600,000 tonnes per year into perspective. This figure doesn’t take into account the state of Queensland which is a much larger exporter of metallurgical coal than NSW and produces a high fluidity coal.

NSW exported 25.5Mt of coking coal in 2015-16. GRL are intending to add approximately 0.6Mt per year over the whole life of the mine.

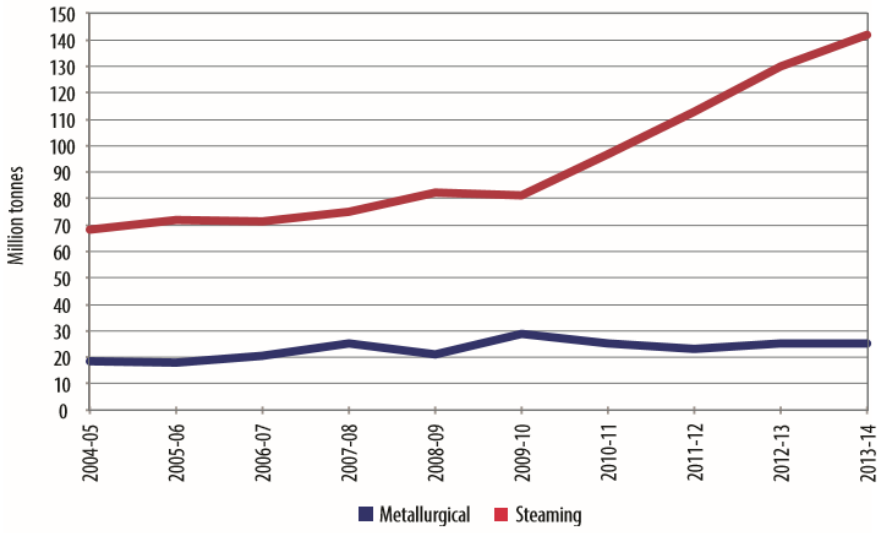
It is interesting to note thermal coal exports have nearly doubled over the period from 2009-2010 to 2013-2014 whilst Coking coal has been stable.

Table 2: Summary coal statistics for NSW

Production '000 tonnes	2009-10	2010-11	2011-12	2012-13	2013-14
Raw Coal production ('000 tonnes)	**188 797**	**204 852**	**221 002**	**245 825**	**261 000**
Underground mines	62 804	62 134	60 462	68 992	74 353
Open cut mines	125 993	142 718	160 540	176 833	186 647
Saleable Coal production ('000 tonnes)	**145 369**	**156 951**	**167 171**	**185 553**	**196 635**
Underground mines	50 765	50 308	49 310	55 507	59 795
Open cut mines	94 604	106 643	117 861	130 046	136 840
Number of mines (as at June)	**62**	**61**	**61**	**55**	**51**
Underground	30	30	30	28	25
Open cut	32	31	31	27	26
Production employment (as at June)	**19 109**	**21 126**	**24 972**	**22 945**	**21 863**
Underground mines	8 768	9 776	10 906	10 014	8 799
Open cut mines	10 341	11 350	14 066	12 931	13 064
Saleable Output per employee tonnes	**8 130**	**7 750**	**6 996**	**7 832**	**8 833**
Underground mines	5 820	5 410	4 735	5 385	6 340
Open cut mines	10 320	9 740	8 743	9 717	10 666
Exports '000 tonnes	**109 903**	**121 801**	**136 342**	**155 266**	**167 312**
Metallurgical	28 827	25 063	23 284	25 470	25 146
Steaming	81 076	96 738	113 058	129 796	142 166
Domestic sales '000 tonnes	**33 974**	**33 467**	**28 394**	**28 740**	**27 460**
Power stations	28 537	27 785	23 624	24 228	23 148
Steel industry	4 413	4 879	4 074	3 862	3 723
Other	983	803	696	650	589
Mine stocks '000 tonnes (as at June)	**11 159**	**11 697**	**13 726**	**15 184**	**17 558**

The following chart from the Department of Industry Resources and Energy shows the increase in thermal coal but shows a stable demand for Coking coal.

Graph 9: Coal exports from NSW by type



"High grade metallurgical coal is in relatively short supply in the Asian region and this scarcity is predicted to increase in the coming years and its price increase accordingly" GRL Amended EIS."

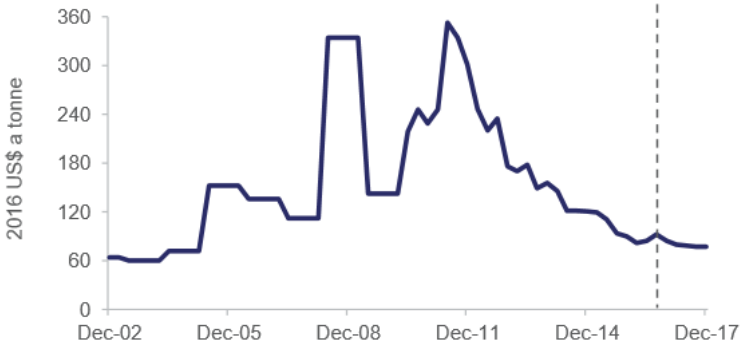
This is a false or ramped up comment.

It was mentioned previously that NSW has 3.8billion Tonnes of metallurgical coal and not to forget Queensland which has much more recoverable reserves than NSW.

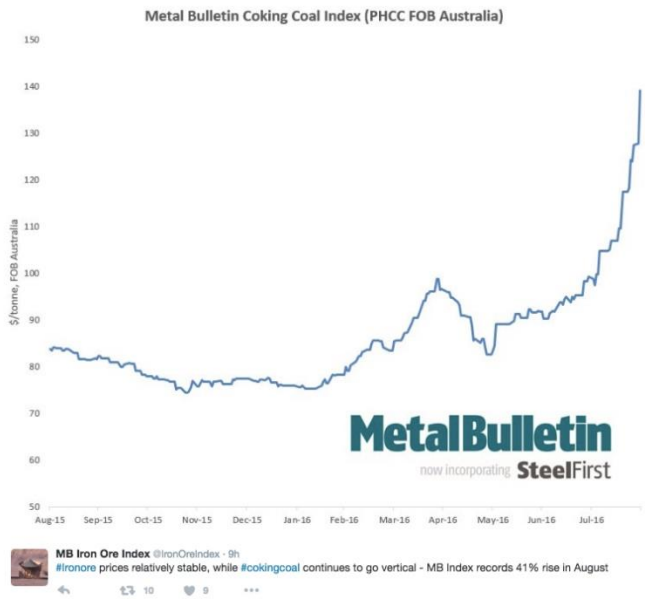
The above table 2 shows that whilst there was a large increase in steaming coal over the last 5 years from 2010 to 2014 the export of coking coal has been stable at 25,558,000 tonnes, with a peak of 28,827,000 tonnes in 2009-10. The graph shows this phenomena going back to 2004-05 a period of 10 years where export of coking coal is basically flat lining.

GRL also states that there is an increase in demand of Coking coal and as a result there is an expected increase in coking coal prices. However, the following graph shows coking coal price falling in $US terms. No doubt if prices do rise then an increase of supply will keep prices low. The Australian Dollar is also rising and this will put downward pressure on the spot price.

Figure: 5.2: Benchmark contract prices for Australian metallurgical coal



Source: Department of Industry, Innovation and Science (2016)



This chart is in Australian dollars and shows an increase from $90 a tonne to $140/tonne, but the Resources and Energy Quarterly is forecasting a fall in 2017. This is also confirmed by a forecast in dropping oil prices in the short future.

"*Benchmark metallurgical prices are forecast to* ***decline*** *to average US$80 a tonne in 2017". "While the recent rally in metallurgical coal prices is not expected to be sustained, it has reduced the extent of the decline in Australia's export earnings in 2015-2016*" Resources and Energy Quarterly June 2016.

"*The spike in prices was principally in hard coking coal with more modest price gains in low volatility pulverised coal injection (PCI) and semi-soft coking coal*" Resources and Energy Quarterly June 2016.

Table 36: Average FOB prices, NSW coal exports ($A/tonne)

Period	Hard coking	Other metallurgical	Steaming	Total exports
2004-05	83.47	68.99	61.15	63.43
2005-06	142.66	103.13	65.98	74.92
2006-07	119.98	78.37	61.47	67.46
2007-08	110.83	101.37	75.56	82.52
2008-09	270.62	273.12	138.49	165.95
2009-10	168.53	120.60	92.31	102.16
2010-11	201.90	172.31	99.47	115.80
2011-12	206.31	182.65	109.24	123.11
2012-13	145.30	121.94	90.01	96.41
2013-14	127.29	110.07	86.68	90.86

Prices of coal peaked in 2008-09 and there was another increase in 2011-12. These prices have since fallen off even though the value of the Australian dollar has dropped. The price for hard coking coal, which is the premium product, had a medium price over the 10 years from 2002 to 2014, of $139.69. And there is no reason to suspect that prices will climb away from the medium price over the proposed life time of the Rocky Hill mine.

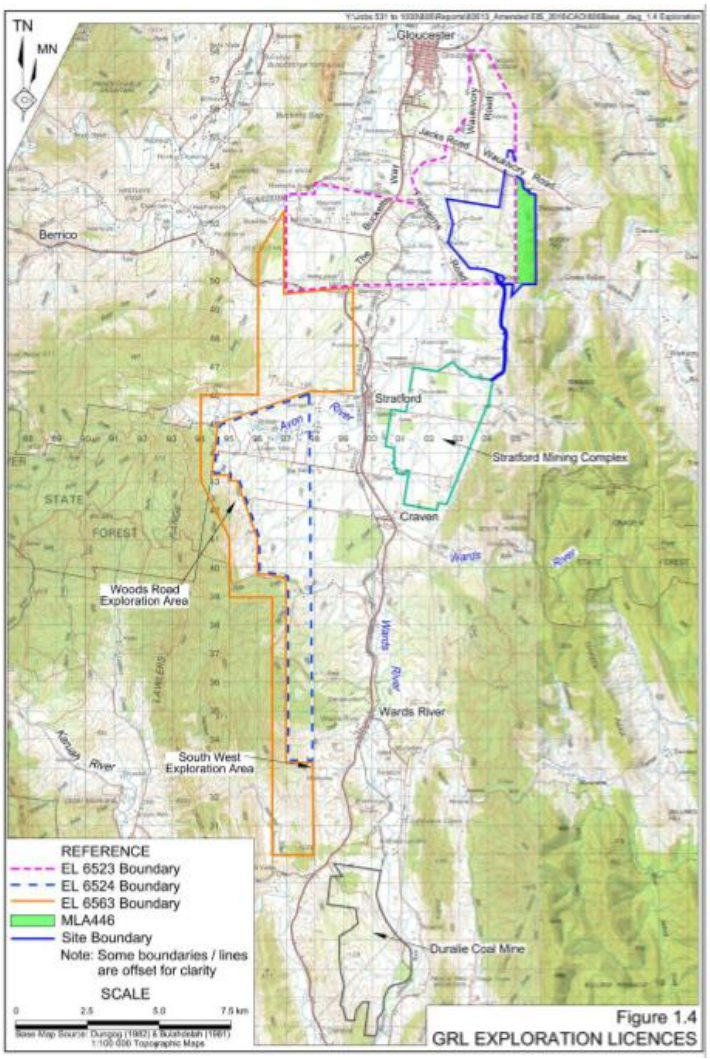
A major concern is that this project is designed around a marketability and saleability perspective, and not one of efficient resource recovery, which is one of the DGR requirements.

This is not an essential export or income generator for the State.

"The Australian coal industry directly employs 0.4% of the Australian workforce, produces 12% of Australia's exports14, and accounts for 2% of revenue for the budgets of Australia's two main coal producing states (NSW and Queensland). While coal accounts for a significant portion of Australia's exports such an outcome is a double edged sword – the high exchange rates that accompanied the recent mining boom were directly responsible for a significant portion of reduced manufacturing, tourism and education exports and, in turn, employment in those industries". – Australia Institute

4. Mining risks and proximity to Gloucester township and surrounding neighbourhoods.

The map illustrates the reason for the significant fear Gloucester people have that if this mine is approved, this valley will become a mining valley.



This is a small mine proposal and it must be viewed in context of other coal mines.
Rocky Hill is not like any other Hunter Valley mine and it even varies from Stratford mine in that it is perched on the edge of the valley in steep topography.

The pit area slopes 40m over 800m (108m AHD to 148m AHD) and the disturbed area slopes about 100m (104m to 200m AHD). From the top of Rocky Hill to the centre of the mine is a distance of approx. 2km has a fall of 340m (100m AHD to 440m AHD). The typical Hunter Valley mine site has gentle sloping topography with almost flat coal seams.

Rocky Hill is dealing with 41 to 70° dipping coal seams in a complex structural geology. It has one major reverse fault in the magnitude of 200m throw along strike. There are also numerous faults and shear zones in a north-south direction and at right angles in an east-

west direction. This is a fact that GRL are aware of but it seems from their EIS that they have decided to define these structures after they get approval for the mine.

The complex nature of this site requires a huge exploration effort to ensure that this mine can be commenced with confidence, and that it can be done economically and profitably. The viability of this mine should be based on the lowest price of coking coal scenario, to ensure that it can be completed including total rehabilitation of the mine and surrounds. The economic projections should not rely on the increasing price of coking coal to be viable.

GRL proposes to continue drilling and exploring ahead of the bulldozers to ascertain the position of faults, dip of seams, position and effect of igneous intrusions and provide information on coal quality.

Recently, the geological complexity of the Valley presented Durallie with a major wall collapse prompting a slowing down of mining and 45 workers lost their jobs.

Stratford Mine some time ago had an exposed coal seam spontaneously combust. It took a couple of years to extinguish the burning seam. The noxious fumes could be smelt for over several kilometres from the mine.

If something like this occurred in GRL's mine it will have an immediate detrimental effect on the Gloucester township and surrounding areas. Rocky Hill has gone through the more obvious fire plan analysis with bushfire and spontaneous combustion of the coal stock pile but has not looked into a coal seam burning.

High Vitrinite Coals (Coking Coals) have high percentages of methane gas and carbon dioxide gas which will be released straight into the atmosphere on blasting, excavation, in the rotary breaker, in the loading bins and whilst being transported in the 60 tonne trucks. This health risk pollution is too close to urban dwellings.

Saline water has finally been accepted as a real outcome of mining, and is proposed to be treated with reverse osmosis. However, this will remove salts but not the BTEX chemicals and dissolved heavy metals, another high risk factor which has not been accounted for. AGL had significant problems around BTEX and other heavy metals like cadmium, arsenic, and mercury.

Blasting mishaps will occur and it is too close to town.

Acid Mine Drainage is a real risk. As discussed before there is not enough information to know what will happen to the breaker rejects and parts of the seam that are not economic coking coals, i.e. parts of the Avon, Bowens Road and other seams omitted from the report, that may find their way into the overburden piles. This is a real environmental disaster waiting to happen.

The risks attached to Rocky Hill involve a lot of people who live within the 5 km radius of the mine. The risks are twofold:

- a mine disaster could affect the safety and health of Gloucester residents and visitors beyond the continual health risks of the operating mine, and
- any problems with the recovery of the coal in a geological complex situation, may well see the early closure of the mine, leaving the mess for the ratepayers and taxpayers to clean up.

This is a High Risk venture with very small rewards for the Gloucester, NSW and its own investors.

Grounds for refusal of consent;

- There has been a failure to satisfy DGR requirements of “efficiency of coal resource recovery” given the steeply sloping seams and complex nature of the geology.
- The mine plan has the potential outcome of increased PAF materials in the overburden which will lead to leach of acid to downstream land and waters.
- This proposed mine as the smallest mine in NSW and Qld does not justify the potential environmental, social and economic damage to the local area and in itself may be non-viable.
- The potential mining risks and proximity to Gloucester township and surrounding neighbourhoods are likely to result in unacceptable residual impacts on surrounding residents.

e. Water Issues

i. Surface Water Assessment - (Vol 3 part 5 of the EIS)

Comments on the Executive Summary page 5 – 15

This Executive Summary contains a number of incorrect and/or misleading statements that throw doubt on the credibility of the whole analysis and design. It also simply states what the magnitude of some of the modelled changes in water quality and quantity may be, but the document fails to discuss the impacts of many of the issues. This is totally inadequate as a basis for project determination.

Saline Water Zone

The statement that "groundwater seepage…… is likely to have elevated salinities" is blatantly deceitful and ignores the fact that in section 4.4 it is stated that approximately 32,800 tonnes of salt will have to be trucked from the site during the life of the project. The statement also fails to recognize the levels of water salinity in coal seam reported by AGL during their gas exploration at the same area. Groundwater seepage and surface runoff from this project **will be** more saline than the pre-mine situation.

The statement that the water treatment plant "is to be sized and operated to contain water capture within the Saline Water Zone without release to the environment" is false and designed to hide the fact that the water treatment plant will discharge water to areas outside the mine site and to the Avon River under some circumstances. Page 5-16 states that "saline water will be removed from the Saline Water Zone in later stages of mining".

Using this saline water as "the first priority water source for dust suppression" is not technically sensible as sections of the overburden material is sodic or dispersive (see next paragraph in the Summary page 5-15). The salty water spray on this will result in increased dispersion of soil particles and hence increase the dust problem.

Dirty Water Zone

The statement that "runoff from the overburden emplacements would be directed to a series of sediment dams constructed upslope of the proposed amenity barriers" is not correct. Six sediment dams are to be constructed downslope of the western and northern amenity barriers and on the flood plain (see Figure1.3 page 5-25). These dams are designed to discharge outside the mine area and into the Waukivory and Avon River system as stated in sentence 5 of the same paragraph. The final sentence in this paragraph states that "a program of water monitoring would be required to ensure water collected in the sediment dams is suitable for release". There is no statement about what happens to this water if it is not suitable for release; this is an unacceptable situation.

There is a statement that because the dams will be revegetated the suspended sediment in the dams will settle and be suitable for release off the site. It is physically and chemically inaccurate to suggest that vegetation on the bank of a dam will reduce suspended sediment; the addition of a chemical flocculating agent would be required for this to occur. The so-called inside or "non-visible components" of visibility barriers will not be revegetated

because at 35° slope (the angle of repose for the overburden material) they are too steep to manage. Any steeper than this and the banks will collapse into the mine void.

The final sentence is nonsense: monitoring of water quality does not "ensure water collected in the sediment dams is suitable for release". At best, monitoring will indicate whether water quality is suitable for release but the problem is that the monitoring may be after the dam has spilt during wet weather and the damage is done to the Avon River.

Clean Water Zone

The statement at the end of the final paragraph on page 5-15 stating that the "two clean water diversion channels" will "have a gentle gradient" is absolutely contradicted by statements about these channels on page 5-20 that state "the outlets… will comprise steep channels, and will require significant energy dissipation works to mitigate the potential for localized erosion."

Site Water Balance and Salinity Balance

There are major inconsistencies between this Executive Summary and the details in Sections 3 and 4 of the actual report text. For example, Figure 3.1 (page 5-80) does not include any reference to rainfall and surface runoff which are stated in the summary to be significant at up to 713ML/yr which is almost as large as the groundwater inflow at 795ML/yr.

Nor is there any reference in the Summary to the sensitivity analysis that is in Section 4.7.4 (page 5-124) of the actual report. Figure 4.11 in the text shows that if the sediment dams could not be released into Waukivory Creek and the Avon River due to high sediment loads, the water collected in the mine pit would be 3 to 4 times greater than normal and mining operations would be impacted.

Another issue not discussed is that approximately 50% of saline water from the pit (up to 416ML/yr) is sprayed back onto the ground within the saline area to control dust. This will add up to 1361 t/yr of salt to the roads, which will concentrate on the soil surface and increase the salinity of runoff in the area but this fact is not considered in the salinity balance.

The executive summary states that "modelling shows that a treatment capacity of 2.5ML/day will effectively balance the water management system. However, Section 3.3 of the main text states that in Year 8 the plant will have to operate for 349 days per year and therefore there would be no capacity to manage equipment failure or above average rainfall. This is unacceptable design criteria; exacerbated by the fact that in a wet year less water is used on dust suppression and groundwater inflows would double (page 4-10 Figure 5.123).

Even with the water treatment plant operating at full capacity the water in the saline zone storages (pit and dams) will be approximately twice the salt concentration of the natural groundwater. The fact that this will seep into the groundwater flows into the river is not acceptable design and this problem is not discussed other than to say "that it will be important to ensure this water is not allowed to enter the adjacent waterways. There is no

information about how the proponent proposes to “ensure” this environmental catastrophe does not occur.

Impact on downstream water flows

Direct extraction from the Avon

The executive summary notes that GRL has water Access Licences for an entitlement of 267ML/yr. It does not indicate whether GRL has the necessary Water Use Approval to spray this water for dust suppression in a situation where the proponent will increase in consequential sediment dams that will have to be disposed of at the end of the project. Therefore, this use should be regarded as a non-sustainable use and approval should not be granted.

Interception of saline runoff

The statement that the management “effectively removes the Saline Water Zone catchment from the receiving water catchment during the period of operations” is not correct. The previous sentence says that “any excess saline water will be treated and irrigated on surrounding farmland.” This means that water will be discharged out of the Saline Water Zone but that salt will not. There is no information as to which catchment will be used for irrigation with this treated water or about whether the proponent has Water Use Approval for this operation to transfer water between catchments.

There is no information about the salinity and heavy metal content of surface water or leachate flowing from the western and northern “Amenity Barriers”. As these are basically un-compacted fill from the mine void, the material will contain salt and heavy metals which will leach into the Avon flood plain and downstream. Again this will be unacceptable environmental pollution of the watercourse.

The document goes on to say that estimates of water loss to creeks as a result of the Diversion Channels, Flood Barriers and Saline Water Zone barriers are “proportionally small”, “conservative”, “interim” and for a “limited period”. Without any analysis it is inferred by these qualifications that the impacts are insignificant and acceptable: not correct and must be justified.

Interim change in runoff characteristics in the Dirty Water Zone

The statement that “the proposed overburden emplacements are likely to see enhanced infiltration until they are topsoiled and revegetated” is correct. However, the fact that this could take up to 5 years is not adequately discussed and the modelling has not allowed for this. The other problem not taken into account is that the increased infiltration will flow through the un-compacted overburden until it reaches the original land surface where it will flow laterally as seepage out of the mine area and onto the floodplain. This seepage will take with it the acidity, salinity and heavy metal content from the mine excavation spoil.

The reduced runoff that the report discusses in reality becomes increased sub-surface seepage through the overburden and then turns into increased runoff downstream of the

emplacement. As this is mainly beyond the mine area it is an environmental pollution that has not been addressed.

The statement that “the runoff characteristic of the post-mine landform should be similar to those existing pre-mining” is unacceptable as no timeframe is given for this. Because the material will be up to 80m thick in places and un-compacted, the time taken to reach pre-mine equilibrium is totally unknown but could be in excess of 50 years; not the 16 years modelled. Fifty years of toxic pollution is unacceptable; even 16 years of polluted leachate into the Avon River is unacceptable.

Loss of baseflow recharge due to impacts on the local groundwater profile

The statement that “if mine life is extended….” is most telling. It gives credence to the underlying tenor in the whole application that the mine will need to be expanded to make it financially viable. Alternatively, the statement is suggesting that either the mining rate will be reduced or extraction will be delayed. In either case the concept is unacceptable because it extends the period of environmental degradation and subsequent recovery.

A major omission in this section is the lack of any analysis of the impact on recharge of raising the final land surface by 50-60m. The fact that this landscape will not be compacted to the density of the original soil and rock will have a considerable impact on recharge of local groundwater but this has not been considered in the analysis.

The fact that the mine pit will be refilled with unconsolidated rock and overburden to an unknown height but approximately 1-5m above the new groundwater equilibrium level will have an effect on baseflow recharge and local groundwater. This effect has not been analysed and the impacts have not been identified.

Combined effect of losses

Three conclusions are drawn by the proponent from data on surface water changes. These conclusions are simply a rewrite of the data and do not in any way consider the implications of the data. For example, it is stated that water flows will increase in lower section of Oaky Creek but there is no information on the impact of this on stream erosion, morphology or ecology. Similarly, there is no information on the impact of a decrease in flows of Waukivory Creek.

There is a nonsense statement about the impact of reductions of flow in the Avon River. The document says “the relative impact on the Avon River and downstream waterways will reduce significantly downstream due to the contribution of other tributaries to total flow”. This is a general statement about the river system. It says nothing about the impact of the decreased flow caused by the mine and again tries to hide the issue.

Cumulative Impacts

This section states numbers for cumulative impacts on water flow in the Avon River from both the Stratford mine (approved) and the proposed Rocky Hill mine. The reduction is nearly 5% of annual average flows but again there is no analysis of the impact of this

reduction on the environment. No information is presented on the environmental impacts in dry or wet years.

Impacts on availability of water to downstream users

The mine will result in an increase of the times and duration when irrigators can pump from the Avon River. The document says that "the impact of the amended Project on the frequency and duration of cease-to-flow periods is likely to be small". This is not correct as the data indicates that the frequency will be increased by 40% and the duration by 30%. These are significant economic losses to irrigators. It could also impact on the ability of the mine to pump water from the Avon River and this would be a problem before the water treatment plant was operating or if it was not functioning.

Impact on downstream water quality

This section is simply an expansion of the statement that water will be released outside the mine area in accordance with water quality objectives and a water quality monitoring plan. It does not indicate how the objectives will be met and it does not state what will happen if the objectives cannot be met. The NSW Water Quality Objectives are designed such that management of natural systems should keep quality parameters below these values. They are not designed to allow the proponent to pollute up to this level but that is what is proposed in this development application.

The proponent wants approval to pollute water both inside and outside the mine area so that water levels in the pit do not impact on mine operations or profits. This proposal is scientifically, environmentally and morally unacceptable with respect to water management.

Potential impacts on Flooding and Stream Morphology

The northern and western "amenity barriers" will increase the extent, depth and velocity of flooding in the Avon system. This is unacceptable and no approval should be given for these heaps of overburden to be stored within the flood plain. There is nothing physically preventing the proponent from moving the location of the overburden outside the flood zone.

Because there is so little data on which the proponent has undertaken the flood modelling, the use of 1 in 100 AEP flood levels for design and analysis of impacts is not satisfactory. For a state significant project with at least an operation life of 16 years, the design flood levels should be at least 1 in 200 AEP for this environment. The document offers no explanation as to why the Gloucester Council Flood study (2015) is not used or at least cross checked against their own flood study; this lack of robust analysis is unacceptable.

The proposed "haul road' will also increase flood levels and hence flood damage. This is unacceptable and the proponent must be required to change the road design so that river flows are not impeded.

There are several issues with the temporary diversion of upslope catchments:

The use of a 1 in 20 AEP is unacceptable and at least 1 in 100 AEP should be used in order to access long term damage to Oaky Creek.

Diverting water from Waukivory Creek to Oaky Creek is environmentally and hydrologically unacceptable when it is being done simply for the convenience of the proponent.

The document states that “significant energy dissipation works” will be required to “mitigate the potential for localized erosion on the creeks and their floodplains but no designs or analyses of their impacts are available. To simply state that these issues will be resolved is unacceptable.

It is stated that “post flow event” monitoring of the stability of the creeks will occur “so that changes to channel morphology can be identified through comparison with the baseline channel survey.” This is simply about measuring the final damage to stream morphology; it is not even considering other environmental damage. There needs to be continual assessment of impacts so that remedial measures and design changes can be implemented as soon as damage occurs and before further damage can occur.

The proponent states that “the final landform would be shaped to re-establish broad, free-draining, stable, vegetated watercourses along the approximate alignments of the existing watercourses.” This is nonsense as the existing watercourse are being dug up to depths of 200m and/or covered with un-compacted overburden to depths of 60m. It is not hydrologically possible to re-establish watercourses in such circumstances. Rainwater and overland flow water will simply infiltrate through the overburden until it reaches a compacted surface and then flow laterally as groundwater or accumulate in the old mine pits. The concept that these “re-established surfaces” will be stable and revegetated to pre-existing conditions by the end of year 16 is an unrealistic dream.

The resulting area will be a complex array of dry ridges, swampy areas, contaminated dams, steep cliffs and eroding slopes that is visually unacceptable and an environmental disaster. Stating that “the design of these waterways would be addressed in detail in the Rehabilitation and Landscape Plan” only introduces another level of uncertainty without any stakeholder input. This landscape concept is environmental vandalism and should not be approved.

Conclusion

The fact that for many of these issues the EIS states that *the final design and operating system will be developed as the project develops* is not acceptable. If the proponent has enough information to suggest that the mine is viable then they should be required to show all management plans so that they can be judged in the public arena. The operation of a yet to be defined salinity water treatment plant, the decision to discharge dirty water to the river in a water management plan, or the contamination of groundwater through mine operational plans cannot be publically questioned once overall approval is given and this is not treating the public and other resource users with respect. The miners will be gone in 16 years but the contamination legacies will impact on the Valley for generations. This

application for approval to mine coal does not contain adequate protection for the water resources of the Avon and Gloucester valleys.

Grounds for refusal of consent;

- The EIS for the proposed mine has failed to establish a credible water balance assessment to enable confidence in predictions of potential water impacts as a consequence of its operations.
- There are likely to be unacceptable water quality impacts on local surface waters from salts and BTEX chemicals in the waste material placed on the site.
- There are likely to be water quantity losses as a consequence of the proposed mine due to loss of baseflow for local streams, especially during extended drought periods.

ii. Groundwater

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 3, Part 4 of the Compendium.

Because of the complexity of the interactions between groundwater and surface water, many of the key issues relating to groundwater have already been addressed in the Surface Water section. Further comment on some of these issues will be made in this part of the submission. However, a full understanding of water issues can only be obtained by reading both the Surface Water and Groundwater parts of the submission.

ii.1 Analysis of the issue

The environmental impacts of the Rocky Hill Mine Coal Project (RHCP) on groundwater and groundwater related issues are of major concern. The 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:*

- *there would not be any substantial reduction 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 10 years after the cessation of coal extraction*."

The Executive Summary also:

- acknowledges that with respect to aquatic ecology, "….*the Avon River system as a whole is significant*…" and
- 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 significant problems with the EIS that cast doubt on these categorical statements. Some of the assumptions made in relation to water resources generally and in particular, the groundwater model that many of these statements are based on, are highly questionable. For instance, the groundwater analysis is based on average rainfall over a short period. The critical time for groundwater systems and associated base flows, is during drought conditions and particularly a series of drought years and these have not been properly considered in the EIS. More details are provided in the section on Surface Water and below.

ii.2 Concerns/problems/issues

The EIS identifies a number of risks that could result from the proposed mine in section 4.6.1.and these risks and ratings identified by the consultants are as follows:

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

Continuing the theme of no or negligible impacts, most of these risks have been assessed as low. However, perhaps the most important risk, has been set at medium. This is the risk of "*Reduction in baseflow…….",* which must then be considered as a potentially very significant impact. This is discussed further below.

Interestingly, the second risk of "*Discharge of poor quality groundwater from the post closure landform*" is rated in the Amended EIS as low whereas it was rated as medium in the original EIS. To add to this, GRL has included as a high risk something that was not listed at all in the original EIS i.e. "*Reduced water quantities within groundwater systems irrespective of saline quality*".

It is not at all clear why GRL has done this but it would seem that one factor may be that they are trying to play down the stated risk of discharging poor quality water into the Avon River and Waukivory Creek. GRL should also have very specifically addressed the high risk issue as to what the likely impacts will be. Nothing significant has otherwise changed between the two EIS's that could lead to this additional risk.

Section 4.6.4 identifies related "*potential environmental impacts*". The issues associated with the proponent's identified risks above and the stated potential environmental impacts, together with other issues not specifically listed by the proponent, are addressed below.

Without doubt, the most significant risk, related to Groundwater impact and also relating to most other impacts, is the inevitability that should this project go ahead, GRL will apply to expand mining into other areas of their exploration lease which are even closer to Gloucester.

In the case of groundwater and surface water resources, extension of the mine to these areas would mean that the impacts will be even more significant than for the current development due to the location of likely economic coal seams below or close by to the Avon River and associated alluviums.

The Environmental Impact Assessment process in NSW does require consideration of cumulative impacts from likely future expansion at the time of the initial determination and proponents like GRL are usually very careful not to provide any detail or even make any reference to future stages except for the requirement for ongoing exploration. It is noted that there is at least one place that the EIS states "*if the mine life is extended*….." This is the 'leg in the door' approach which was used by Stratford Coal and appears to be supported by Government. In reality, this is a very misleading approach used by the mining industry and apparently supported by the Government.

ii.2.1 Complex Hydrogeology & Groundwater Modelling

Section X on Geology and Coal Resources describes just how complex the geology, and therefore the hydrogeology, is for this mine. As such, accurate modelling of groundwater flow and drawdown at an acceptable scale is extremely difficult.

The modelling package used by AGE can couple groundwater flow with surface water flow. This was touted as a major strength of the package by the consultants. However, in section 11.5 (Part 4), it is stated that "*the groundwater model should not be used to assess the flow reductions to the surface water system*." This is likely to be 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. It is also interesting to note that this coupling is not even referred to in the section on Surface Water.

Section 10.4.3 on Transient Calibration of the model states 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*." In GRL's previous response to submissions, it was basically stated that this is accurate enough for this kind of modelling and this was supported by the peer review. This is still challenged as not being sufficiently accurate for the situation where we are looking at impacts on groundwater levels in the alluvium and also in base flows and river pools.

To further illustrate this, the difference between a river having a surface base flow compared to the water table being 3 metres below the riverbed is huge when it comes to the protection of aquatic systems and critical riparian trees. You cannot possibly model the impact of groundwater abstraction and pit drainage quantities on water level trigger points using such a coarse level of accuracy.

In Section 4.6.5, the document states that "*It is considered that the predicted inflows to the mine, and water to be managed within the pit, is likely to reduce by up to 20% after taking these factors into account. This factor has been incorporated into the overall water balance model*." This comment is mainly related to assumed reductions in evaporation due to the geometry of the coal seams. To apply such as very large reduction factor on the water quantity to be managed in the pit, based on such limited evidence is remarkable.

The modelling uses historical rainfall to calibrate its steady state condition. However, for transient calibration, it only used the period 2011 to February 2016. This is a very short period for such a calibration. As stated above, the critical time for groundwater systems is during extreme drought conditions and especially during a series of drought years. The EIS does not address periods of extreme drought by using the longer historical rainfall records available for Gloucester or simulating a series of years of very low rainfall. This is not acceptable.

To add to this, there is evidence of the Avon River having no flow or minimal flow for extended periods. It has been acknowledged by a consultant who worked on the AGL project, (Dr Richard Evans in Gloucester Water Study Project – Independent Peer Review, May 2014) that it would appear that the calibration of the DPI (Water) main gauging station on the Avon River may not be accurate during low flows and that it shows continuing flow when in fact may be no flow or very minimal flow. This is likely to have significant implications for the calibration of AGE's model.

As well GRL's groundwater investigations are mostly based on 15 monitoring bores which were drilled in 2011 and appear to have been monitored on approximately a monthly basis. The deepest bore is only 97 metres deep and only 4 are actually screened in coal seams. The main pit will be up to 220m deep. Two bores are screened in the Avon seam, with only one bore each in the Weismantel and Cloverdale seams. AGE might consider that the data collected is "*adequate and suitable*", however this is a very small dataset to be used for such

a critical coal mine. Some of AGL's data was used but with the extremely complex geology, it is questionable whether this data is representative.

As indicated above, in Groundswell Gloucester's opinion many of the assumptions made by AGE in relation to the groundwater model and associated investigations are highly questionable and should not be accepted by Government as a suitable basis for approving this mine.

ii.2.2 Water Table Drawdown and impact on river users

The modelling for this project predicts very small drawdowns except immediately adjacent to the pits. The EIS also states that the impacts on the alluvium will be minimal. This is difficult to understand when the alluvial soils actually intersect the open-cut in at least at two places. Why hasn't this fact been acknowledged by GRL. Note that DPI (Water) states in their submission there should be detailed monitoring "*within the area of the intersection of the main pit and the alluvium*." The whole western and southern sides of the open-cut are relatively close to the alluvium. No concrete grout curtains or similar are proposed to mitigate impacts on the alluviums, which are directly connected to the Avon River and Waukivory Creek.

It is acknowledged in the EIS that there will be impacts on the flow in the watercourses that will increase the number of days that irrigators are unable to pump. The likely increase in cease to flow conditions is from 13.9% to 16.8% of the time. According to DPI's (Water) submission, the proponent has not done sufficient analysis of the possible impacts on water users, that is, both for licensed use and basic landholder right users.

We note that DPI's submission also states that "*The proponent has not sufficiently demonstrated ability to obtain sufficient groundwater entitlement to account for a maximum take of 1100ML/yr*" and "*the EIS discusses the proponent's ability to account for an average loss of alluvium of 100ML/yr but the licensing strategy should be based around the proponent's ability to account for its maximum take, which is predicted to be 193ML/yr*."

GRL want to convert their surface water licences to groundwater licences to provide water for the operation of the mine. DPI have stated that GRL will "*be required to undertake a dealing to convert sufficient entitlement from its currently held unregulated river licences to aquifer category…..*". GRL have stated that it will negotiate with Yancoal and AGL to do this. This is clearly not a '*done deal'* as GRL seem to indicate in the EIS.

Again, the EIS prepared by GRL is completely inadequate with respect to water licensing and should be rejected. At very least GRL must be required to clear all these matters before the Government makes any determination on this project and should not just be told to deal with it after any approval through a "Water Management Plan" as GRL suggest.

ii.2.3 Reduction in baseflow in the Avon River and Waukivory Creek

The water table drawdown will also cause a reduction in baseflows in the waterways as it is discharge from the alluviums and other aquifers that provides this baseflow when the streamflow is very low. It has been said that there are no free lunches when it comes to removing water from natural water systems ie all abstractions will have some impact downstream. It is very difficult to accept that, given the large quantity of groundwater to be abstracted 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 was experienced in late 2013 when the previous EIS was on exhibition. The Avon River stopped flowing and the river was just a series of shallow pools. It can be expected that with climate change and the climate extremes we are already experiencing, this situation will occur much more often. These pools and dependent vegetation provide critical habitat to fauna species which are likely to include 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 mitigation is proposed.

ii.2.4 Impact on groundwater dependent ecosystems

The original EIS stated a number of times 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 that does not appear to be repeated in the amended EIS. It appears that GRL is purposely trying to play down this issue.

Riparian River Oak communities 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. Any 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.

These potential impacts on riverine and groundwater dependent ecosystems, and in particular the impact on riparian River Oak communities needs to be considered as a high risk issue.

ii.2.5 Inflow of coal seam water into pits and water quality.

It needs to be recognised that coal seam water is the same as 'produced water' which is a major problem for coal seam gas abstraction and was a critical issue for the failed AGL proposal. This water is collected in open 'wells' at the bottom of the pits and pumped into storages for use in reducing dust or for treatment for irrigation or for river release after the 4th year.

As identified by the NSW Chief Scientist and Engineer in her review dated July 2013, coal seam water is likely to include;

- Dissolved Solids, particularly sodium chloride and sodium bicarbonate
- Oil and grease
- Organic and inorganic chemicals including trace elements of metals including heavy metals, organic acids and polyromantic hydrocarbons
- Semi-volatile organic chemical collectively known as BTEX and
- Naturally occurring low levels of radioisotopes such as radium, thorium and uranium.

Like AGL, GRL is proposing to treat their saline water using reverse osmosis to remove the salt. Even with pre-treatment, it is very difficult to ensure that removal of heavy metals, hydrocarbons, BTEX and other contaminants will be achieved. Testing of coal seams by AGL confirm the presence of all these chemicals.

GRL do not appear to have done any detailed chemical analysis of the coal seams to check for the presence of most of the potentially toxic chemicals. In fact, testing of GRL's monitoring bores have only checked for the normal physio/chemical constituents including a few metals/heavy metals. Even for this suite of chemicals, their deepest monitoring bore is only 97 metres deep whereas GRL plan to mine to a depth of 220 metres. The only sites where they have tested for a wider range of potentially toxic chemicals are at surface water sites. These chemicals should have been tested for in the monitoring bores.

Clearly, this is totally unacceptable. It is this water chemistry that GRL have used to describe typical water qualities for their 'saline water' including the raw water which will go to their treatment plant.

GRL is promoting the benefit of the coking coal because it has a high fluidity. This means that it is more volatile as described in the section on Geology and Coal Resources above. However, it also means that it has higher levels of some toxic chemicals associated with hydrocarbons including BTEX.

ii.2.6 Treatment and Management of 'Saline Water' and Waste Products

GRL are hoping to use up to 50% of its saline water for dust suppression. Presumably this would apply only to use at the mine site. This effectively disperses all the contaminants in the saline water around the mine site. If it also applies to the unsealed sections of the haul road to Stratford, it would be of even greater concern.

Then like AGL, GRL is proposing, during the 4th year of operation, to treat the rest of their saline water and use the final treated water for irrigation of pasture for dairy and beef cattle. When there is more saline water coming into the water treatment plant than can be irrigated, GRL propose to discharge the water into the Avon River and Waukivory Creek. Clearly this is totally unacceptable.

GRL is proposing to treat the saline water using reverse osmosis after pre-treatment. Little detail is provided by GRL about the pre-treatment. In their submission, the EPA raised its concerns about water management and specifically states in its covering letter (the whole paragraph is shown here for clarity):

"*Further information is needed in the following areas: preventing seepage from salty mine water storages; better characterisation of 'dirty' (sediment laden) water; clear information on the unit operations that are proposed in the water treatment plant; details of how/where brine will be managed/disposed; an assessment of the ephemeral watercourse that is proposed to receive discharges from the water treatment plant; discussion as to whether the treated water needs to be "conditioned" prior to reuse or discharge; better exploration as to whether the proposed reuse of some saline water onsite is appropriate or not, and an appropriate assessment of discharge limits for the water treatment plant*."

Even with appropriate pre-treatment, it is still very difficult to remove some dissolved metals and other contaminants. AGL identified that sodium, magnesium, silica, manganese, iron and strontium would need to be addressed in pre-treatment design. They also identified that boron is of concern as it appears that RO membranes have had to be specifically developed for produced water to achieve a greater rejection than normal membranes.

For the disposal of the contaminated salt after RO, GRL state that it will go to an authorized waste disposal site/company. AGL never actually identified where their contaminated salt would go. It is understood that in Queensland, this waste is just being stock piled. For GRL to just blandly say it will dispose of the contaminated salt at an authorized site is again totally unacceptable.

GRL does not seem to even consider the various pre-treatment waste that will be produced and where this waste might be disposed of. When it was identified that some of the AGL waste included BTEX chemicals, AGL was not able to find a disposal site in NSW and were forced to take the 'flowback' water to Queensland. The EPA must not let itself get trapped in the ridiculous situation that occurred with the AGL Gas Project, where AGL was already producing waste with no place identified for disposal.

The case to dispose of the treated saline water by irrigation of pasture has also not been adequately addressed in the EIS. Although the output from the RO plant will be low in salt, it is far from clear what trace metals and other contaminants might still be in the water. The dairy industry and beef farmers must be very cautious about allowing cattle to graze on pasture being irrigated with this water. GRL needs to address this issue to clearly prove that the final effluent is suitable for this purpose.

GRL needs to specifically address the fate of BTEX chemicals. With the level of concern identified during the AGL debacle, it is up to them to identify the levels of BTEX in various coal seams and what happens to it once it is mobilized.

Clearly, based on EPA's submission and the other issues raised above, GRL's EIS does not address many critically important water issues and should be rejected outright. Groundswell Gloucester totally agrees with concerns listed in the EPA submission.

There is more discussion on this issue the section on Surface Water.

ii.2.7 Runoff from Irrigated Areas and Discharge of Treated Water to River

Projects such as this that are planned to make large financial gains should not have the right to just discharge potentially contaminated water into local rivers. This is particularly so when there is a major public water supply and domestic/stock riparian rights downstream of the coal mine and associated infrastructure.

In their submission on this proposal, MidCoast Water (MCW) raised a number of key issues that need to be addresses by GRL. Quoting from their submission, "*Both Duralie and Stratford mines dispose of excess water through on-site agricultural irrigation*…." Even though it is understood that this water is not actually being used for irrigation for agriculture, the point is that both mines have "*no release*" policies regulated through their EPA licence. GRL should be required to apply the same approach.

MidCoast Water go on to say: "*The adopted strategy relies too heavily on discharges to local waterways. In addition, (the) EIS makes misleading statements around discharges*." One of these misleading statements relates to GRL using the term '*a closed*' system for the Saline Water Zone while showing in Figure 3.1 that there will be "*no discharges to the Avon River*". MCW is particularly concerned about these issues because the Saline Water "*is likely to have elevated salinities, dissolved metals and hydrocarbons*."

Another MidCoast Water concern is that GRL has assumed an application rate for the irrigated water that was used by AGL on its Tiedman property. MCW rightly states that AGL were irrigating during an extremely dry period on heavily modified soils and that this would lead to an "*underestimation of the frequency of river discharge*…."

However, the real point here is that large potentially polluting industrial and mining developments should not be allowed to be developed in such an important public water supply providing high quality domestic water to 75,000 plus people.

Again, the information provided in the EIS is completely inadequate.

ii.2.8 Seepage Water from Overburden Dumps including 'Amenity Barriers'

This issue has been addressed in the section on Surface Water. However, one additional point is that, as described in the section on Geology and Coal Resources, GRL has not clearly stated what materials will be included in the overburden dumps. There will be very large

quantities of uneconomical coal from the shallow parts of the targeted coal seams and from seams that are not being targeted by GRL. This is in addition to the breaker rejects.

The EIS states that this material will be managed in a similar fashion to the breaker rejects. However, in practice, whether it is possible for this material will be able to be separated out from the 'clean' overburden is highly questionable.

The presence of this material in overburden dumps and amenity barriers is very likely to lead to the contaminants from coal, being mobilised and seeping into the Avon River.

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 ii.2.

- The groundwater model is over simplified largely because of the great complexity of the hydrogeology makes 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.

- GRL have failed to properly address treatment, waste disposal and management of Saline Water. How many opportunities does a proponent get to keep reviewing such a flawed project?

- There is inadequate consideration of how the proponents will manage groundwater that is saline and other poor quality water.

iii. IMPACTS OF FLOODING AND STREAM MORPHOLOGY

The northern and western "amenity barriers" and the haul road will increase the extent, depth and velocity of flooding in the Avon system. With the current design, there is a risk of erosion of parts of the amenity barriers and haul road embankments during major flood events. There is likely to also be impacts on the stream morphology for the Waukivory and Oaky Creek where the catchment for these streams has been increased to divert water flow for creeks which would otherwise be in the Mine Area.

In GRL's EIS Executive Summary, it is concluded that "Impacts of the western and northern amenity barrier and the bridge over Waukivory Creek on flood flows and behavior would be negligible. Groundswell Gloucester is not convinced that this statement can be supported by the information provided.

GRL and their consultants have used a 1 in 100 Annual Exceedance Probability (AEP) for design purposes. This is not acceptable, particularly when the amenity barriers are planned to be left permanently as part of the final landform. As stated in the submission by the Midcoast Council: "*The NSW DPI (Refer to website – Science and Research) highlights the impact of climate change on mining with changes in the frequency and intensity of storm events having potential to impact on mining operations (e.g. tailings dams, sediment and erosion control). Design of structures must recognize sensitive catchment and climate change impacts.*" There is a general movement in government and industry recognizing the need to use higher AEPs for flood affected large developments.

In the case of this development, a 1 in 200 or even a 1 in 500 AEP would be more appropriate for design purposes. Increasingly also, it is being accepted for flood affected large developments that the Probable Maximum Flood (PMF) should be considered as part of the sensitivity analysis.

As it turns out, more details are provided in the Flood Study in Appendix C. GRL's consultants did a sensitivity analysis for the 1 in 500 AEP, 1 in 1000 AEP and PMF events. Why GRL's consultants did not recognize this in their Executive Summary is somewhat mystifying. The Summary does mention that the "floodplain behavior is relatively insensitive to modelled climate change impacts". Sensitively analyses for increases in rainfall by 10%, 20% and 30% were undertaken.

Amenity Barriers

For the 1 in 100 AEP, the EIS states that in two areas near the amenity barriers there is an increase in modelled flood level of 0.3m and that there are three localised areas where the velocity increase exceeds 0.4 m/s. However, looking at the detail in Figure 4.12 in Appendix C indicates that the increase in velocity at these localized areas is between 0.5 and 1.0 m/s.

In Section 4.5.6, the sensitivity analysis for climate change indicates that for a 10% increase in rainfall, which equates to more than the 1 in 500 AEP, the level increases by about a further 0.1m or up to 0.4m for a 30% increase in rainfall.

Appendix C section 4.5.1 also states that "*The difference in flood levels and extent between the 1 in 10, 1 in 100 and 1 in1000 AEP flood events is not large due to the wide flat floodplain and steep valley hill slopes at the edge of the floodplain*". While this may be correct, the velocities increase significantly, but the figures showing this do not give the same level of detail as Figure 4.12.

Even without the more detailed mapping, we are not talking about 'negligible impacts' on velocity. There clearly is the potential for significant erosion. This is totally unacceptable.

Haul Road

The OEH submission states that the flood impacts include "*increases in flood level at the northern end of the haul road in the vicinity of the Waukivory Creek crossing. These increases include magnitudes of 0.5 to 1 m increase in level and up to 2m/s increase in velocity*" and that "*the impact indicated by the WRM study is considered significant*…". The GRL consultants have recommended that localized scour protection may be required in this area.

Upslope Areas of Waukivory and Oaky Creek

There are several issues with the temporary diversion of upslope catchments:

- The use of a 1 in 20 AEP is unacceptable and at least 1 in 100 AEP should be used in order to assess long term damage to Oaky Creek.
- Diverting water from Waukivory Creek to Oaky Creek is environmentally and hydrologically unacceptable when it is being done simply for the convenience of the proponent.
- The document states that "*significant energy dissipation works*" will be required to "*mitigate the potential for localized erosion on the creeks and their floodplains*" but no designs or analyses of their impacts are available. To simply state that these issues will be resolved is unacceptable.
- It is stated that "*post flow event*" monitoring of the stability of the creeks will occur "*so that changes to channel morphology can be identified through comparison with the baseline channel survey*." This is simply about measuring the final damage to stream morphology; it is not even considering other environmental damage. There needs to be continual assessment of impacts so that remedial measures and design changes can be implemented as soon as damage occurs and before further damage can occur.

Grounds for refusal of consent;

- The EIS fails to adequately assess potential impacts of flooding and climate change in regard to the proposed mine.

- There is likely to be unacceptable flood impacts on the proposed visual barriers which is likely to result in scouring of the barriers and creek beds, and potential water quality impacts on downstream watercourses.

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f. Visibility Impacts - Section 4.5

Section 4.5.4.2 on page 4-115 emphasizes that community consultation told the Proponent that minimising the impact of the final landform on the scenic quality of the Mine Area was very important. However, there are several fundamental problems with how the Proponent suggests that they will go about this task.

1. There are no detailed plans for minimising visual impact only concepts without supporting methodologies.
2. The mine is actually destroying an area that was gazetted in the LEP to be protected for scenic beauty.
3. Rather than accepting that this area is judged by the community as being of substantial scenic value, the document goes through a series of abstract analyses (page 4-111) to conclude that the area has moderate to high visual quality (p 4-108).
4. It talks about the scenic quality of the Mine Area as though it is already approved.
5. It assumes that if the final landform is similar to the existing landform then it will be accepted even if it is 80 metres higher.
6. It assumes without any evidence that the rehabilitation will be successful.

The visual mitigation concept is predicated on the construction of a series of "*amenity barriers*" to hide the mine operations (section 4.5.4.3). The problems with this approach are:

1. It fails to recognize that these 'barriers' themselves are visual pollution.
2. The outer face of the western 'barrier' is 75ha in area (p 4-115) and visible from everywhere.
3. It assumes almost instant vegetative cover on the overburden heaps so that they look like green hills rather than brown, black and grey heaps of mine waste.
4. The term "*amenity barrier*" is patronising to the community when really they are overburden heaps.

The extensive use of "*photorealistic photomontages*" is a sham. The disturbed areas are coloured green to disguise any landscape damage and the assumption is that because pasture seed is spread on the overburden heaps, the seed will grow and the "*amenity barrier*" will become invisible. The community has seen how long it takes to revegetate overburden at Stratford and Duralie mines and hence cannot accept this concept and the related statements in the document. There are 15 pages (p134-149) of these photomontages that are a gross attempt to gloss over the issue that the overburden heaps will be visible for a long period of time creating visual pollution. They will also contribute to surface water pollution through leaching of seepage from the overburden containing salt, heavy metals and acid mine drainage.

Figure 4.28 on page 4-112, with a heading of "*Principle viewing situation categories*" is again misleading. It does not indicate the location of major sites such as Kiaora Lookout, Bucketts Mountain or the Bucketts Way road even though these are 'analysed' in the Consultant's report. It then shows houses with "*possible views*" even though these houses will have direct views of the Mine Area and the visual pollution activity.

Location of barriers

The fact that the western "*amenity barrier*" is constructed on the Floodplain of the Avon River is unacceptable. There is evidence from the Proponent, in the surface water section, that this structure will increase the depth and velocity of flood water in the area and that the bottom "toe" of the heap of overburden may have to be protected from flood damage. It is unacceptable to place this

overburden on the flood plain where it will introduce soil, coal rejects and contaminated leachate into the water system. The document recognises that there will be continuing erosion from the overburden 'barrier' and plans to construct sediment dams (on the bottom of the embankment) on the floodplain to collect this contaminated water but to release the water as the dam gets full: another unacceptable impact from a terrible design. The plan is to then leave these contaminated dams in place for the final landform; again unacceptable long term contamination of the water system.

The purpose of internal NE-SW barriers is unexplained and there are no visibility points shown to the southeast. This is a shameful attempt to avoid calling them overburden heaps and explain that they will leach contaminated water into the mine's planned "dirty water" area for use elsewhere.

Construction of barriers

The document states that revegetation of barriers will occur constantly throughout the year but it provides no information on how this will be done or with what species in various situations. It makes no reference to the difficulties of establishing vegetation at various time of the year due to climatic and weather effects. It incorrectly states that revegetation of 18 degree slopes with a pasture mix is easy (p 4-129). There is no information on how this will be achieved, with what machinery, or with which species.

Rather than developing and explaining a system of revegetation that makes allowances for difficulties of soil and weather, the document simply states that mine personnel will regularly view the areas and make changes as required (section 4.5.4.6). This is an un-satisfactory basis for planning to reduce any visual impact.

No strategies are presented to address the situation when the overburden stockpiles cannot be satisfactorily revegetated and therefore they will remain a hideous eyesore that erodes onto and pollutes the floodplain. There are many physical and climatic reasons while this failure scenario could happen and it is not acceptable that there are no strategies to remediate this type of problem.

Final Landscape

The concept of having a final landform that is similar to the original landform shape but up to 80 metres higher than originally, is not acceptable to the community. There are no explanations as to how the area will be constructed or the volumes of soil, rock or overburden, and reject coal, involved to justify the shape and elevations.

The concept has been proposed by the Visual Impact consultants and used in the Proponent's document without physical analysis. There is extensive visual impact analysis but all of this is on the basis that the landform can be constructed and will be sustainably revegetated. It is highly unlikely that the final landscape will resemble anything like that shown in Figure D of the Executive Summary page 11.

It is deceitful that Section 4.5 is called "Visibility" but contains no information on or analysis of the final landform visibility. All of the analysis in section 4.5 is about the interim "amenity barriers" with cross sections and photomontages but none of this is presented for the final landform. One reason for this is that the Proponent cannot provide information on the height and shape of the final landform; even Figure D calls it "*Indicative Final Landform*". This lack of information does not allow a credible analysis of this issue.

A fundamental problem for the Proponent, but not discussed, is that the constructed landform will subside after the overburden is re-positioned in the landform. There is no proposed layering of soil

and rock layers, no compaction, and no testing to ensure that the landform can carry water. It is most likely that differential settling and subsidence will result in high and low spots in the landform which will result in swampy areas, salt accumulation, areas of acid mine drainage, and death of vegetation. It is most likely that the reconstructed stream will not flow as planned and there will be erosion and chemical pollution onto lower areas and into the Waukivory Creek. This likely result is totally unacceptable.

Grounds for refusal of consent;

- The proposed Visibility Barriers will be inadequate in mitigating the visual intrusion of the proposed mine in the Gloucester Valley landscape; will take an unacceptable period of time to be constructed and vegetated; and will in themselves be an unacceptable impact in the landscape.

g. Agricultural Lands and Enterprises – (Section 4-16)

The Conclusion drawn about the impact of the mine on agriculture in section 4.16.6 (page 4-384) is wrong because it is based on incorrect analyses and false assumptions.

The first sentence states "*that all land disturbed is rehabilitated to the current land and soil capability classes and the final void is backfilled to overcome potential void issues*".

- The land to the east of the mine void where up to 60m of overburden will be permanently stored cannot be of the same soil capability class as it was before being buried.
    - The overburden will be chemically different to current soil profile due to increase levels of salinity and heavy metals from depths of up to 200m in the mine pit.
    - The overburden will be physically different to the current profile because the density of the material will be less and vertical infiltration will be greater and surface runoff will be less.
    - There are no statements in the report or in the Agricultural Impact Statement (Vol 5 Part 13) that give any indication that the soil profile within the plant root zone will have the same water holding capacity so plant growth and hence land capability will be less.
- The concept that "the final void will be (sic) backfilled to overcome issues" is a theory with no factual basis.
    - There are no statements in the section about how the void filling will occur or how the appropriate physical properties of the land surface will be achieved.
    - The concept of re-constructing watercourses over 250m hills of mine overburden is unproven and scientifically unsound.
    - The differential settling of the "raised land profile" will create low areas that accumulate salt from the leaching of the overburden.
    - The constructed watercourses will be a mixture of swamps and eroding gullies.

The second sentence says that "*the Applicant considers that the amended project represents an excellent balance between use of the land for ongoing agriculture and nature conservation and acceptance of mining as being a temporary land use*".

- This strange opinion by the applicant and the author of the Agricultural Impact Statement (AIS) is not based on fact; there is no analysis presented on which to judge the subjective claim of an "excellent balance".
    - The mine site cannot be used for agriculture for 16 years while the mine is in operation.
    - Nature conservation is not to be practiced on the mine site; in fact the area will be stripped and an alternative area of agricultural land has been

purchased to "*off set*" the environment destroyed so agriculture loses out twice.
    - No evidence is presented that mining is accepted as a temporary land use; accepted by whom?
- In fact the Conclusion of the AIS embellishes the statement by saying that it is "*temporary use of the land for mining a scarce and high quality mineral resource*".
    - The scarcity of the resource is nonsense because the same coal seam exists in many other parts of the Gloucester Geological Basin; at other mines and in GRL Exploration Leases.
    - If the coal is such a valuable (scares and high quality), why is the mine proposal stopping at the Speldon boundary and not proceeding further north along the coal seam to Jack's Road or beyond?
    - The mine site is not a temporary use because the rehabilitation plan is not practical or proven.
    - It is not proven that the mined land will not end up polluted and be permanently alienated.

Sentence three says "*the increased productivity observed to date as a consequence of the partnership between the Applicant and the Speldon Partnership… provides a clear example of how the Applicant is approaching the development of the amended Project and its co-existence with the local agricultural industry*."

- This statement is deceitful as the partnership between GRL and Speldon is not related to any actions by GRL on the land of the Mine Site. Speldon is leasing land from GRL to expand its operations; land that GRL has purchased from other farmers over the last 8 years.
- This statement by the applicant makes no reference to the significant number of farms that GRL has purchased and changed the use of the land.
- Likewise it makes no statement about the 267ML per year of water licences that GRL has purchases and removed from being used for agriculture.
- This Development Application and associated EIS is for the land named as the Rocky Hill Mine Area and as land will be taken out of agriculture for the mine it is not accurate to say that mining is co-existing with agriculture on this land.
- If mining and agriculture are so compatible, why has the Applicant purchased so much agricultural land within 20km of the proposed mine?

Table 4.77 on page 4-383 of the EIS is used to justify this concept but the table is incomprehensible.

- The columns and rows refer to different and undefined areas or aspects.
- The units within each of the columns or rows are inconsistent.
- The data source is unknown and not explained even in the full AIS.

A further statement on page 4-383 states that "*the increased volumes in dairy and beef production that have occurred up to March 2016 due to the Speldon partnership agreement have more than offset the potential labour losses from historical beef farming operations, even during years of maximum disturbance*."

- This statement is also deceitful in the context of the EIS and AIS because the same gains could be made irrespective of the proposed coal mine or even GRL
- The gains are the result of a financial investment and not dependent on coal mining.

The final paragraph of the Conclusion continues to describe a hypothetical situation of "*short-term adverse impacts*" and "*long-term positive net benefit on surrounding agricultural resources*".

- If the proposed rehabilitation does not work in practice, then the land will be lost permanently to agriculture – not short-term.
- The long-term net benefits are not due to or a result of coal mining – they are simply due to a higher level of investment in agriculture and could be achieved by any investor.

In a statement on Cumulative Agricultural Impacts (page 4-384) the author demonstrates a lack of understanding as to the meaning of cumulative impact. The fact that "*cumulative impacts would be minimal with each development subject to their own impact assessment and mitigation*" misses the point that together the impacts will be greater than each one individually. This section is unacceptable due to its omissions.

- The fact that in excess of 4,000ha of agricultural land has been purchased by this proponent (GRL), Yancoal and AGL has not been considered even though this has cumulatively impacted on
    - Cattle sales through the Gloucester saleyards
    - The welfare of at least 20 farm families
    - Agricultural labour and service industries
- The fact that each of these coal and coal seam gas projects could cumulatively impact on water quality and quantity has not been discussed.
- The fact that river flow will reduce and "*cease to Flow*" irrigation restrictions will be collectively increase substantially has not been mentioned in this agriculture section even though the Rocky Hill impact on this is documented in another section on surface water.

The Executive Summary of the AIS contains an unacceptable number of erroneous and contradictory statements that undermine its credibility.

- The statement that "*the AIS focusses upon the area of disturbance within the Mine Area*" (page 13-9) is contradicted by the large focus on the benefits of the Applicant buying land outside the mine and leasing it to Speldon Partnership Dairy which is

"*one of the Region's largest milk producers*" (page 13-10) and then arguing that this demonstrates "*long-term positive net benefit on surrounding agricultural resources*".

- On page 13-12 it states that surface water "*would be managed…. to ensure no water quality impacts are experienced by downstream agricultural and other users*" but this is not consistent with information in the Specialist Surface Water Assessment report that indicates mining induced changes to surface water flows will impact on water quality.
- The impact of increased "Cease to Flow" water shortages to agriculture are discussed in the Specialist Surface Water Assessment report but omitted in this agriculture report; a significant issue of credibility.
- Paragraph 2 on page 13-13 states that "*use of appropriate soil stripping, handling and stockpiling procedures, together with appropriate erosion controls, would result in minimal impact to soils within the site*" but this is not true:
    - Soil over the majority of the site will be permanently disturbed and relocated.
    - There is no plan to reconstruct soil profiles after disturbance or relocation.
    - The backfilling of mine pits with overburden to a depth of up to 200m will permanently change the soil characteristics and agricultural capability.
- These erroneous statements about soil management are repeated in the final paragraph on the page to claim that "*these procedures would also help to ensure the success of the proposed rehabilitation and long-term land use of the Mine Area*."
    - Again not correct.
    - No matter how good the topsoil is, if the substrata are incorrect the land will be useless.
    - The quality of the stockpiled soil will not influence the success or failure of any reconstructed watercourses.
- To claim that the "*agricultural potential of the soils within the Mine Area would be greater than if the amended Project did not proceed*" as a consequence of the Project adding "*proposed soil ameliorants*" is again deceitful.
    - Addition of appropriate soil ameliorants can improve crop or pasture growth if other factors are not limiting but it is not unique to mining.
    - In fact, if as is likely, the soil profile of the reshaped landform is not able to hold adequate water for plant growth, no amount of fertilizer will change the agricultural potential.

The complete Agricultural Impact Assessment is predicated on the Proponent being able to "*re-establish the pre-mine landform at an increased elevation*" and believe that this will have "*a long-term positive benefit on surrounding agricultural resources and enterprises*". This has not been demonstrated because no information has been presented on how they will do this nor any data on why it will be successful.

The concept that the new landscape after mining will be beneficial to agriculture is unproven and deceitful.

If GRL wanted to develop long-term sustainable agricultural benefits it would not mine this coal but invest the $150m to expand current agriculture, support new industries, invest in the development of local agricultural processing and value-adding. This would provide increase jobs and revenues to the district for a very long time rather than the 10 years of coal extraction and its consequential degradation of agricultural soil and water resources.

Grounds for refusal of consent;

1. The aggregation of land for the mine has had an unacceptable impact on farming activity in the locality and the proposed extraction of the resource would create long term negative impacts of the same nature.

h. Economic Assessment and Impacts

Introduction

Gloucester Resources Limited (GRL) has amended their application for the Rocky Hill Coal Project. The amendment differs from the previous 2013 application in that it does not involve:

- constructing and operating an on-site Coal Handling and Preparation Plant (CHPP);
- constructing and operating a Rail Load-out Facility, including a rail loop and overhead loading bin, to despatch the product coal to the Port of Newcastle;
- developing a 3 kilometre partially-enclosed overland conveyor, to link the CHPP to the Rail Load-out Facility;
- operating the mine during night-time hours; and
- operating the mine during evening hours for the first three years of the mining operations.

Instead, the amended project involves:

- developing and operating an open-cut coal mine, to produce up to 2 million tonnes of run-of-mine (ROM) coal per year for up to 21 years;
- constructing and operating a private coal haul road to link the Rocky Hill Coal Project with the Stratford Coal Complex, approximately 9 kilometres to the south;
- hauling sized ROM coal on the private coal haul road between 7:00 am and 6:00 pm only, Monday to Saturday;
- using the private coal haul road to deliver heavy equipment and construction materials to the Mine Area; and
- rehabilitating the site.

The reason for this amendment is that Gloucester Resources Ltd now has a commercial agreement with Yancoal Australia Limited to utilise their existing facilities at the Stratford Mining Complex to process and despatch coal from Rocky Hill.

The 2013 Rocky Hill Project application (the “2013 Project”) was opposed by the then Gloucester Shire Council and many other local interest groups. Over 1,370 submissions from individuals opposed the 2013 project, with 327 supporting it.

On 2 June 2015, the CEO of Gloucester Resources Ltd, Grant Polwarth, requested that the application be “*placed on hold and not progressed*” in a letter to Oliver Holm at the NSW Department of Planning and Environment. No public record of the response by the Department is available, but given that an amended application is being considered, this unique request appears to have been complied with.

The proposed mine location is shown in Figure 1, along with the new private haulage road connecting to the existing Stratford mining complex. The pit is planned on the western part of the site area, and the majority of the area will be disturbed. The whole site sits in the Environmental Management Zone of the local plan, and adjoins an Environmental Conservation Zone to the north east. The location is around 6km from the centre of Gloucester town, while the nearest dwelling is 500m away, and the large Forbesdale residential area is between 1km and 2kms away. The former Gloucester Shire Council identified a number of environmental factors that would negatively affect the community in their submission, including heavy vehicle traffic, noise, air quality, effect on water courses, and overall amenity impacts being on conflict with their anticipated rural “lifestyle” growth.

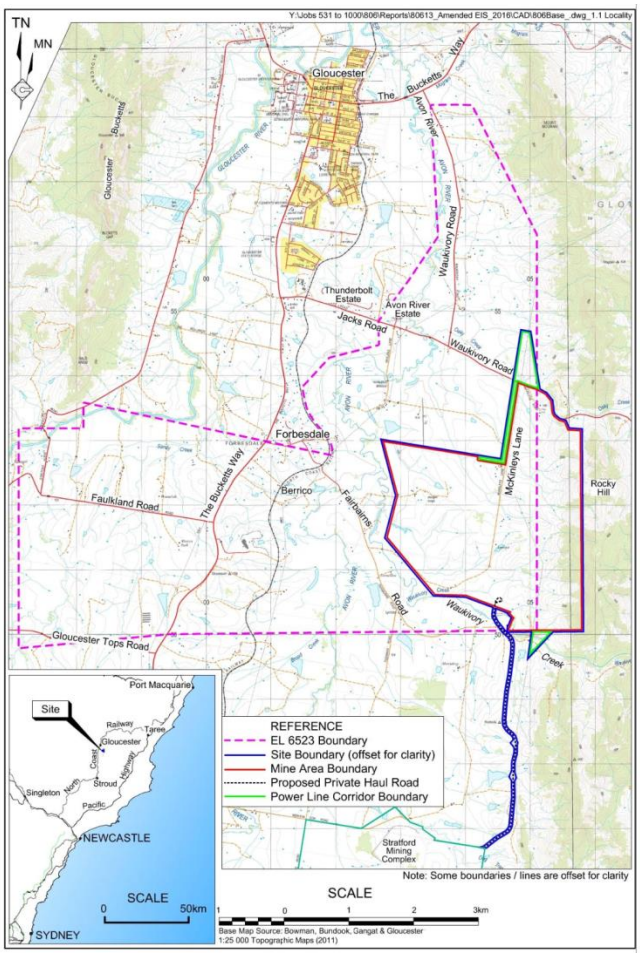


FIGURE 1: PROPOSED ROCKY HILL MINE LOCATION

The focus of this section is on the Economic Assessment of the Amended Rocky Hill Coal project prepared by Deloitte Access Economics[1] (the "Deloitte EA"). The main points made in this section points are that:

1. The base case coal quality and price are optimistic over the life of the project.
2. Large local negative externalities, particularly on residential and rural land values, now and in the future, are not considered. Nor are any social costs.
3. A nearby coal mine close to the rail facility has currently stopped producing because of unfavourable market conditions, despite their 2015 approval to expand, indicating that the project is highly unlikely to proceed as proposed, skewing the net benefit calculation.

Together, these points indicate that the Rocky Hill application may primarily be tool for commercial negotiations amongst miners, rather than a genuine application by a party interested in pursuing the investment in the project case being put forward.

Financial case

The Deloitte EA was based on the assumption that 97% of coal extracted from Rocky Hill would be metallurgical coal, with only 3% thermal coal. Nearby Stratford and Duralie mines report that only 39% of coal extract was metallurgical, and 61% thermal, between June 2011 and September 2013 according to quarterly Yancoal production reports. While we have no geological data at hand, the claim that Rocky Hill will produce almost entirely coking coal of very high quality seems highly implausible.

Additionally, the base case price forecast seems optimistic over the entire life of the mine. Recent unprecedented global price movements for coking coal and thermal coal have meant that forecasts used in the Deloitte EA have recently been met after a surprise doubling of coal prices. Whether such prices last of the life of the mine seem questionable, given the overall declining trend in global resource prices. Indeed, the variability of prices, and the ability for an approved mine to temporarily shut down production, reducing local gains from employment but increasing local external costs by extending the mine life, must be considered.

Of interest is that the Deloitte EA chose in their sensitivity analysis to consider only very asymmetric price changes, of -9%, and +54%. Australian prices for coking coal have more than doubled this year to be over $USD 200/tonne, which is a four year high. Thermal coal prices have risen around 50% this year to be around $USD70 /tonne as of August 2016.

To show the potential effect on the net benefits to NSW from this project under a wider range of scenarios, Table 1 conducts a sensitivity analysis of a model matching closely the one in the Deloitte EA, but extended to account for coal quality ratios similar to Stratford mine.[2] Notice that where the mine is not profitable the net benefits are zero compared to the base case of no mine and continued agricultural production. The red italicised numbers are the cases where the mine is unprofitable with a 20% increase in prices, which is another risk to this project, given the project costs in the Deloitte EA are argued to included ongoing site rehabilitation and a variety of other activities seeking to mitigate amenity impacts.

TABLE 1: SENSITIVITY OF NET BENEFITS ($MILLION) TO NSW - COAL QUALITY, PRICES, AND DISCOUNT RATE

	COAL RATIO 97:3			COAL RATIO 39:61		
	Discount Rate			Discount Rate		
	0.04	0.07	0.10	0.04	0.07	0.10
HIGH (1.5)	245	177	130	154	111	80
BASE (1)	126	90	65	0	0	0
LOW (0.9)	*103*	*73*	*52*	0	0	0
LOWER (0.5)	0	0	0	0	0	0

Overall, there appears a reasonable likelihood that the project is only viable in times of abnormally high global coal prices, even with improved efficiencies in the amended project that utilise existing rail facilities at Stratford. This means that the overall economic benefits are highly unlikely to meet the base case scenario in the Deloitte EA.

[2] The model uses data extracted from graphs and tables provided in Deloitte EA, and simplified adjustments for costs, profits, and taxes, where information is not sufficient to replicated exactly.

Limited consideration of negative externalities

The Deloitte EA assessment quantifies just three types of potential negative externality from the Rocky Hill Coal Project, arising from noise, air quality, and greenhouse gas (GHG) emissions. Other types of negative externality are addressed in written qualitative comments only.

Given that many local submissions were made on the earlier 2013 Project proposal by local residents concerned about amenity in all forms, the consideration given to such effects seems limited. For example, a 2014 the NSW Valuer General's office reviewed the land value effects of coal seam gas development in the Gloucester area, and noted that:

> *Agents report that potential purchasers have an aversion to the CSG and mine areas of Gloucester but the main concern is the [Rocky Hill] mine. (NSW Valuer General, 2014)*

Due to the close proximity of the proposed mine to current residential areas, and proposed future residential estates, there are likely to be quite clear and quantifiable effects on property values from the Rocky Hill mine. As the Gloucester Shire Council submission to the 2013 Project application shows, significant future residential development is planned on the eastern side of the township near the proposed mine. Many current residents are also in close proximity of the proposed mine, and the presence of the proposal itself has already compromised their property values, including for nearby agricultural properties.

> *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. (GSR, 2013)*

The Deloitte EA does not consider any conflicts with residential and agricultural uses, current or future. Yet the economic literature has shown many times that proximity to coal mines and other resource infrastructure has substantial negative effects on home values, sometimes considerably, as the below summary shows.

Study	Type of resource activities	Residential value effects
Williams, A. 2011	Open cut coal (US)	-0.34% to -1.7%
Trigg, A and Dubourg, W. 1993	Open cut coal (UK)	-10% to -40%
Boxall, P. et al. 2005	Shale gas (Canada)	-4% to 8%
Gibbons, S. et al. 2016	Shale gas (UK)	-1% to 1.5%
Ganegodage, R. et al. 2016	Power plants (Australia)	-7% to -21%
Davis, L. 2011	Power plants (US)	-3% to -7%

To provide a rough estimate of the effect of the proposed Rocky Hill mine on residential values only, the total value of residential property in the town of Gloucester can adjusted by the expected value changes. Because land values nearby to the mine are so high, even small effects will have large economic outcomes.

The NSW Valuer General, for example, estimated that the total value of all land in the former Gloucester local government area was $722 million at July 2014 (NSW Valuer General, 2015). This includes agricultural, residential and commercial land. A rough estimate of the total value of residential property (land and buildings) can be derived from by using average home values and the total number of household in the area. According to the latest 2014 ABS estimates, there are 2,000 households in the former Gloucester Shire Council area. The median house value is $288,655, while the average value is expected to be much higher, given a brief survey of advertised property on 5 Oct 2016 showed 18% of homes in Gloucester advertised with a price above $1million (author calculations from realestate.com.au). Using a conservative $300,000 per home average, and

multiplying by the 2,000 homes in the area, gives a total current residential property value of $600 million.

Every 1% negative effect on property values reduces the property wealth of residents by around $6 million, which is nearly twice the total negative external costs considered in the Deloitte EA (which mostly comprised an allotted share of GHG emissions to NSW). A conservative estimate of residential property value declines given the above research would be about 3%, which would be $18 million. While mine proponents may argue that such declines are temporary, given that the approved mine will operate till 2034, the evidence from other mines in the valley suggests that this life will likely be extended if it begins operations at all, with temporary closures during times of low coal prices.[3]

For other negative external factors, ad hoc assumptions are made about their ability to be offset. Traffic and transport for example, was a major focus of Gloucester Shire Council's submission to the 2013 Project, in which they noted the high cost of maintaining local roads given the additional heavy vehicle traffic.

The assessment that the total negative external costs to the NSW community from the proposed Rocky Hill mine is just $3.3 million over the life of the project seems implausibly low, and is the result of assuming away risks while claiming mitigation measures will be enacted, and are budgeted for. For example, end of mine rehabilitation costs have been incorporated into ongoing operating costs without any way to assess their validity.

The decision in Bulga Milbrodale Progress Association Inc v Minister for Planning and Infrastructure and Warkworth Mining Limited [2013] NSWLEC 48 is significant here, for it noted that proposed local environmental offsetting was inadequate to compensate for environmental losses. There is no rationale provided for why proposed environmental offsets neatly cancel out damage is provided in the Deloitte EA.

This legal case is also relevant to social costs. It was found that the principles of ecologically sustainable development (**ESD**) are a matter to be taken into account as aspect of the consideration of the "public interest". Regarding social costs, it was concluded that

> *"the Project's impacts in terms of noise, dust and visual impacts and the adverse change in the composition of the community by reason of the acquisition of noise and air quality affected properties, are likely to cause adverse social impacts on individuals and the community of Bulga. The Project's impacts would exacerbate the loss of sense of place, and materially and adversely change the sense of community, of the residents of Bulga and the surrounding countryside"*

Such arguments have been made in multiple submissions to the 2013 Project, and remain valid considerations. Social costs are assumed away in the Deloitte EA.

Reality check from local comparison case

In 2013 the Stratford Extension Project was proposed, which sought to extend the life of the nearby Stratford coal mine by 10 years, with 2.6 million tonnes per year to be extracted. Accompanying this proposal was an economic assessment that suggested the net benefits of the project were between $145 million and $174 million. This expansion has not gone ahead. In fact, all coal production at

[3] Of course, the other mines studied in the economic literature also have limited life spans.

Stratford have ceased, and Yancoal's other nearby Duralie mine has reduced production to one pit, laying off 45 of the 185 workers in September 2016.

Yancoal reports in their 2016 mid-year financial report they have made significant write-downs of the capital of their Gloucester Valley coal projects at Stratford and Duralie of $74.3 million, noting that:

> *Management may consider reversals of the impairment provision previously recognised if there is either an increase in the average long term real revenue over the life of the mine due to either an increase in USD coal prices, or a further weakening of the AUD/USD foreign exchange rate or a combination of both, or further reductions in the current and life of mine operating costs, capital expenditure requirements, or an increase in the reserves. (Yancoal, 2016)*

It is not clear how the high-cost Rocky Hill project being proposed will be viable while the neighbouring established Yancoal projects remains unviable, yet will continue to handle coal from Rocky Hill. The Deloitte EA itself notes this unusual situation:

> *In May 2015, development consent (SSD-4966) was granted for the Stratford Extension Project which would involve an extension of the existing Roseville West Pit and development of two new open cut mining areas together with the extension of two existing overburden emplacements throughout the 11 year life of the project. The Stratford Extension Project is yet to commence.*

Of relevance to planning authorities is that none of the $174 million worth of net benefits to NSW from the Stratford mining extension have been realised, and may never be. Overplaying economic gains from mining projects is now common place. Typically, the base case scenario is highly stylised and optimistic, as it appears to be in the case of Rocky Hill.

The reason that the ex-post economic reality of major projects differs so much from proposed "base cases" is that the approvals granted are optional; that is, they require no obligation on the applicant to undertake the amount of investment proposed, nor meet the timelines proposed. Within the limits of the approvals, various real options exist and are often utilised, such as delaying investment, decreasing investment, changing the nature of the investment. Indeed, the case of Rocky Hill itself demonstrates this optionality. The application for the original 2013 Project appeared to a bargaining chip for a commercial negotiation, rather than a promise to deliver, as the request for delay and subsequent amendment reveal.

Ensuring approvals deliver on claimed benefits, a minimum investment level in a timely fashion, commensurate with those promised in the application, can be made a condition of any approval. Alternatively, payment upfront of royalties that reflect forecasts, along with assurance bonds reflecting clean-up costs, could put the onus of determining the plausibility of the project on its financiers, who would have a strong interest in assessing the most highly likely scenario.

By granting the option to develop the proposed mine, but not the obligation to do so, will mean that unless all of the optimistic forecasts from GRL are met, the outcome will be vastly different than the proposed base case. Indeed, it may well be the case that only the negative costs on the community

are realised, as the mine commences during a period of high global coal prices, only for it to temporarily shut when prices fall. In such cases the gains will be delayed, while the external costs to the community are already incurred, turning a net benefit to NSW from the project into a net cost.

For example, a 5-year delay in the project base case from year 3 to year 8, assuming that a new approval grants an extension at the end of the 17-year project for an additional five years, reduces the net economic benefits by 27%, to be $66 million, under all the same assumptions as the Deloitte EA project case (with the mine remaining somewhat profitable). A 10-year delay would from year 3 would reduce net economic benefits by 49%, and risk profitability altogether. Again, this assumes the generous price and coal quality assumptions of the Deloitte EA. Under less favourable assumptions about coal quality the project is already unprofitable under most scenarios.

Conclusions

In a period where coal mines are closing due to unprofitability the amended application by GRL at Rocky Hill appears strange on its face. The very fact that the 2013 Project application was put on hold reveals the mismatch between approvals sought, and commercial intentions.

Grounds for refusal of consent;

2. The uncertain economic viability of the proposed mine establishes uncertainty about its construction if approved, and yet its potential has sterilised economic investment in economic sectors such as retirement, tourism and lifestyle industries.

i. Ecology

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.

Impacts on threatened fauna

Ten fauna species listed under the NSW TSC Act were detected within the study area. This figure represents a quarter of all subject species listed under the Act. Four of these species were recorded in the roadside vegetation along McKinleys Lane – the Grey-crowned babbler, Squirrel glider, Eastern bent-wing bat and the Large-footed myotis. Also reported to occur here is the Brush-tailed phascogale.

It is evident from the Terrestrial Ecology report prepared by Biota that despite the proposed mitigation measures there is a very high risk that clearance and other disturbance associated with the amended project would lead to the complete loss of the small populations of the threatened Grey-crowned babblers and Squirrel gliders that currently occupy habitat in the proposed mine area.

The measures to mitigate the temporary loss of habitat and native vegetation that would be an unavoidable part of the amended Project include the temporary planting of the western and northern amenity barrier with indigenous trees and shrubs, and the establishment of roadside vegetation corridors along Waukivory Road (4.12.4.3).

Waukivory Road carries far greater traffic than McKinleys Lane, rendering roadside plantings a far less viable habitat for displaced fauna. Combined mine & general traffic is predicted to be 400-500 vehicle movements per day on Waukivory road, compared to the very low current traffic on McKinleys Lane – estimated to be less than ten vehicle movements per day.

Further, in the absence of supporting evidence, there can be little confidence that temporary plantings on amenity barriers would be utilised by displaced arboreal / ground fauna – particularly strongly territorial species such as Grey-crowned babblers, given the high exposure to noise, lighting, blasting & vehicle movements in adjacent mine pits.

The EIS acknowledges that despite the proposed mitigation measures and the recorded resilience of the species, it remains possible that the amended Project could have an adverse impact on the group of Grey-crowned babblers that inhabit the McKinleys Lane area by forcing them to relocate to sub-optimal habitat elsewhere. While the EIS asserts that "*This would be unlikely to result in a noticeable decline in the local population of this species*", the Terrestrial Biodiversity consultants – Biosis – noted that "*recent research shows that use of sub-optimal areas reduces the long term viability of Grey-crowned babbler groups*" (V4, Pt7, p 122.

The likely negative impact of this forced re-location is compounded by the fact that the proposed Biodiversity Offset Area does not contain habitat suitable for the Grey-crowned

babbler.

The EIS notes that it is possible that the amended Project could also have an adverse effect on the local population of Squirrel gliders that exists in the McKinleys Lane Corridor, including potential mortality of individual gliders. The proposed project would remove up to 15.8ha of potential foraging, sheltering and breeding habitat for the Squirrel glider.

The fauna surveys conducted for the proponent have failed to establish the extent of the local population of Squirrel gliders, including the number of individuals in the area that would be removed as part of the amended Project,

Furthermore, it has not been established whether another threatened species – the Brush-tailed phascogale – is present on the site. If a local population is present it too would very likely be lost as a consequence of clearing for the project.

It is acknowledged in the EIS that should a Brush-tailed phascogale population occur within or traverse the Study Area, it is possible that the amended project could have an impact on the life cycle of that population as a result of road kills.

As Biosis considers the area of suitable habitat for this species within the proposed area of disturbance is likely only to be occupied by up to six females and two males, there is a high risk that the "*impact on the life cycle*" of that population due to road kills and deaths of individuals during clearing operations could amount to the loss of that population.

The Biosis report (V4, pt7) concludes that although the amended Project is unlikely to have a significant effect on any of the subject threatened fauna species such that it would be placed at risk of extinction, but "*small and tenuous known local populations of the Squirrel glider and Grey-crowned babbler may be impacted along McKinleys Lane due to mining associated activities and if currently present, any local population of the Brush-tailed phascogale could also be impacted in the Mine Area and along the private haul road*".

Biosis further qualifies its conclusion, noting that "*the impacts on the local Squirrel glider and Grey-crowned babbler populations are difficult to assess due to the viability of the current populations being tenuous as a result of their apparent isolation*". The impacts are also made difficult to assess by the fact that the size of the current populations has not been established.

In addition to the impacts of mine-related activity and traffic movements the EIS acknowledges that the requirement for a generally cleared easement for the relocated 132kV power line along the boundary between the proposed Mine Area and the proposed Biodiversity Offset Area is likely to impose a partial impediment to ground and arboreal fauna movement east from the Mine Area during construction and west from the Biodiversity Offset Area post-construction.

The EIS goes on to state that "*it is understood that the vegetation within the watercourses along the re-located easement can be largely retained due to the greater distance between the ground and the power lines. These watercourses will continue to provide important*

movement corridors. In addition, potential for retaining low vegetation and/or fallen timber within the easement would be explored with TransGrid during the detailed design required for the power line relocation".

No evidence is presented to support the assumption that there that species utilising habitat other than the moist gully habitats would use the watercourse corridors to access dry sclerophyll remnants west of the cleared power line easement. Further, the prospect of retaining fallen timber etc in the cleared easement should have been established for the EIS. Since it hasn't been established, it cannot be taken into account in assessment of the revised Project.

The cleared power line easement also has the potential to reduce the effectiveness of the mitigation measures designed to provide greater connectivity between McKinley's Lane roadside vegetation and the more extensive vegetation along the Mograni Range.

Impacts on threatened flora

i) Pale Yellow Double-tail Orchid

The various field studies undertaken to assess the effects of the amended Project did not detect any threatened flora species within the Study Area. However the critically endangered Diuris flavescens - Pale Yellow Double-tail orchid - with the potential to occur in the Study Area - flowers only in September - October and none of the site surveys were undertaken in those months. Outside the flowering period identification of that orchid would be virtually impossible.

As survey efforts to target this threatened flora species were inadequate, the possibility remains that the species does occur in the study area. If a local population is present, the scale of ground disturbance proposed in the amended Project would threaten its continued existence.

The failure to establish whether this particular threatened species occurs in the area that would be affected by the amended Proposal unavoidably casts doubt on the rigor with which the entire threatened flora species assessment was conducted.

ii) Dry Rainforest

Under the amended Proposal, 4.2ha of a Vulnerable Ecological Community - dry rainforest - would be destroyed.

The permanent clearance of the affected outliers of this VEC would be inconsistent with the objectives of the NSW Office of Environment and Heritage to assist conservation and recovery

of this community. If they are completely cleared, then all of the other measures / objectives set out by the OEH are rendered pointless in relation to those remnants.

The Terrestrial Biodiversity report (prepared by Biosis) asserts that the habitat to be lost or modified is of little overall importance to the long-term survival of the ecological community in the locality, due to the presence of substantial patches of the same community in watercourses to the east of the area of disturbance and beyond. However the destruction of 4.2ha of this Ecological Community represents a continuation of the process of incremental destruction of that has resulted in its "Vulnerable" status.

The limited area of the ecological community that would be lost belies its ecological significance which derives in large part from its physical location: it includes the lower ends of rainforest gully patches that extend downslope from the proposed Biodiversity Offset Area.

The proposed Biodiversity Offset Area does include significant areas of Dry Rainforest, but Biosis (p133) acknowledges there is potential for the composition of the ecological community within the Biodiversity Offset Area to undergo indirect modification where small areas are removed at the ends of the retained gully patches. These could be affected by edge effects such as hydrological changes, weed invasion and increased light at the newly created edges.

Destruction of the Dry Rainforest "outliers" in the area of disturbance would occur primarily as a result of their being covered by overburden – commencing in year 3 of the amended Project. The area required for out-of-pit overburden emplacement was determined on the basis of the volume of material required to be stored which was in excess of available in-pit storage capacity and, inter-alia, the mine development sequence.

The EIS maintains that avoidance of the Dry Rainforest outliers would preclude achievement of objectives "*which are material to the design of the amended Project*" (4.12.5.2). However no information has been provided about other options (if any) that may have been considered, including reasons why they could not be adopted.

Avoidance of the destruction of the remnants of the threatened ecological community should have been assigned a priority at least equal to that afforded to other factors when determining the design of the amended Project.

In light of the apparent shortfall of material available for establishment of the final landform (discussed elsewhere in this submission), the design of the permanent overburden placement should be revised to avoid destruction of the dry rainforest outliers.

The impact of the proposed incremental loss of a threatened ecological community is exacerbated by the failure to provide for post-mining re-establishment of Dry Rainforest along the narrow watercourses entering the site from the adjoining Biodiversity Offset area. The inclusion of generalized native vegetation / tree lots as part of the proposed rehabilitation would not adequately remediate the impact of the amended Proposal on the ecological community.

Establishment of the Biodiversity Offset Area

The proposal that securing the Biodiversity Offset area would occur by the end of Year 2 of operations is inconsistent with the Terrestrial Ecology report and 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.

Impacts on Aquatic ecology

Increased flows into Oaky Creek from the northern clean water diversion channel are likely to cause some erosion along Oaky Creek at points upstream of its confluence with the Avon River. Remedial work would be undertaken to mitigate the erosion, however any persistent erosion would increase sediment loads and turbidity. The aquatic fauna in Oaky Creek – particularly fish and macro-invertebrates – is already stressed, and consequently is vulnerable to additional pressures stemming from the amended Project.

Grounds for Refusal of consent;

- The size of the local populations of three threatened fauna species (Grey-crowned babblers, Squirrel gliders and Brush-tailed phascogales) and their movement patterns are unknown. These gaps in knowledge of the threatened species that would be adversely affected by the proposed project are such that it is not possible to adequately assess those effects or the likely efficacy of proposed mitigation.

- 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 has failed to include details of alternatives considered in relation to the clearance of the Dry Rainforest outliers.

- The design of the permanent overburden placement will cause destruction of the Dry Rainforest outliers.

- The delay in securing the Biodiversity Offset area (which may not occur until the end of Year 2 of operations) is inconsistent with the Terrestrial Ecology report and is not justified.

j. Economic Impact on the Gloucester Tourism Industry

The operations of a short-term unsustainable sector of the local economy should not put at risk the entire economic contributions of the traditional long-term sustainable sectors operating within the valley.

About Gloucester and its brand

In marketing terms Gloucester has an unbeatable brand positioning of being the closest town to 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. On top of this world recognised accolade, the *Vale of Gloucester* was first listed by the National Trust in 1976 as a declared Significant Heritage Landscape. Our logo is the platypus, which represents healthy rivers and healthy river catchments. Our Brand Values are as follows, as compiled by members of Tourism Advancing Gloucester Aug 2011 and updated Aug 2015;

1. A remarkable setting at the foot of the Buccan Buccans (the Bucketts Mountains)

2. Easily accessed by road and by rail, in a location handy to major centres

3. Thriving rural heritage with a strong sense of community

4. A comprehensive range of shopping options on a relaxed main street

5. Cafes, wineries, pubs and clubs for all tastes and all seasons

6. Extensive accommodation choices for any budget

7. Impressive sporting facilities for all skills and abilities

8. World heritage nature nearby for adventure and wellbeing

9. Pristine rivers for swimming, paddling and platypus habitat

10. Beautiful and productive farmlands providing food for the state

11. Scenic drives that will change your outlook and maybe your life

12. An emerald-green network of national parks, forests and conservation areas

13. A year-long agenda of unique and entertaining events

14. A farmers market that inspires other markets

15. A wonderful place to live, work and play.

So 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.

Gloucester Tourism's economic contribution

Tourism is one of the critical economic drivers for the Gloucester region, specifically listed in our (pre-amalgamated) Council's Community Strategic Plan as a key opportunity for the next 10 years in achieving long-term financial sustainability for our region.

Proof is in the independent research data from Tourism Research Australia published annually by Destination NSW that shows our Visitor Economy is worth $51 million each year (as identified by Destination NSW) for the Gloucester local government area.

Over the same 21 year life of the Rocky Hill open-cut coal mine, that's a $1,071 million contribution. Yes, $1.07 billion. And all of it is earned, retained and churned back into the local economy each and every year by small scale tourism operators who create jobs for 241 people in the local industry (Gloucester VIC survey, Oct 2012).

Meanwhile the Rocky Hill EIS claims the local economic benefits of their open-cut coal mine will be $864 million over the operating life of the mine (EIS p26 - $48m operational costs plus $6m payroll costs over 16 years) which is of course unsubstantiated and grossly overstated according to other economists. But even if it were true, this does not justify putting at risk the $1.07 billion generated by the tourism sector over the same time horizon.

Rocky Hill ignores Gloucester tourism but says it's working with it

Rocky Hill's Environmental Impact Statement is more than 300,000 words about the benefits of its coal mine but includes just one short paragraph with just three relevant sentences about the impact on Gloucester's tourism industry. Two of these simply state and then restate "no affects" (p. 61 –EIS). So in all those 300,000 words there's just one small sentence which mentions - and then immediately dismisses - any impacts to "visual amenity". There's no mention of the promised 2,520 mine blasts, the constant heavy machinery noise 6 days per week from 7am to 10pm, the light pollution at night, the risks to the waterways, the heavy traffic movements nor the constant dust. All these things will affect Gloucester's $51 million tourism industry.

Even more surprising is the concurrent claim made by Rocky Hill in their marketing and newspaper advertisements (Community Newsletter Sept. 2016) that "*they are working closely with Gloucester tourism*". The Applicant has never approached the Gloucester Tourism Manager to discuss their open-cut mining proposal and they have never approached Tourism Advancing Gloucester either. It is disappointing that the Applicant is saying one thing and doing another.

Rocky Hill has convinced some businesses in Gloucester that the financial benefits of the coal mine will flow to them, while their Community Newsletter notes "*direct benefits to the local area*" and the "*financial boost to the local economy*". However Rocky Hill's Local Effects Analysis (Sect. 15 Econ Assessment - p53) reveals they have defined the "*local area*" to be the SA3 regional statistical area of Gloucester-Taree with a population of 51,000. This includes the communities of Wingham, Taree, Coopernook, Harrington and Old Bar. So all those "*local benefits*" promised by Rocky Hill will be spread across a much larger region and population than they are telling the people of Gloucester. This also means that mine

employees living 84km away by the beach at Old Bar will still be classified as “local employees” without having to move to Gloucester, shop in Gloucester, send their kids to school in Gloucester or even care about Gloucester.

The risks to Gloucester’s $51 million visitor economy arise from the following issues:

1. Water security issues

Tourism Advancing Gloucester believes that pristine rivers and aquifers are an essential component of Gloucester’s brand. The activities of the Rocky Hill open-cut coal mine threaten this key component, and so threatens our businesses. Dried-up streams from disappearing aquifers and murky mining discharge in our pristine rivers will significantly damage the tourism market.

2. Air quality issues

Other sections of this submission deal with the effects of poor air quality on the health of the most vulnerable community members - children and seniors - of any community located close to mining operations. No one would dispute the right to enjoy fresh, clean air, especially when located so close to world heritage listed national parks, forests and conservation areas. Tourism Advancing Gloucester believes that poor air quality issues arising from the Rocky Hill open-cut coal mine threatens this key component of Gloucester’s brand, and so threatens our businesses.

Dusty air filled with particulates will impact on our visitor’s peaceful enjoyment of the region, with immediate knock-on effect 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.

Dry coughs, dusty skin and gritty eyes hardly make for an enjoyable holiday, so every dusty particle inhaled will be echoed by the sound of Gloucester tourism choking.

Even if it is believed that dust can be controlled, the perception of such impacts will threaten the tourism market.

3. Noise impact issues

Throughout their marketing material Rocky Hill states “NO night-time mining operations” (their use of upper case) yet a few paragraphs later they mention mining from Year 4 onwards: Monday to Saturday until 10.00pm. It’s an unbelievable stretch of reality to state that up to 10.00pm is considered “daytime”. Most of the local community is in bed by 10.00pm. In winter in Gloucester it’s fully dark - night-time - at 5.00pm. No-one will be able to get to sleep until after 10.00pm in Gloucester no matter what age or working hours they keep. This is an unacceptable impact on the physical and mental health of Gloucester’s community.

Rocky Hill is proposing a three year “introductory noise holiday” of restricting heavy mining activity to six days a week, Monday to Saturday 7am to 6pm, to be extended in Year 4 to 10.00pm. No reasonable assessment could consider that this as giving respite or respect to the Gloucester community. Apparently everybody who objects to the almost constant barrage will have moved out by Year 3 and all those remaining will have become used to the impacts or working for the mine.

Rocky Hill is also proposing noise mitigation mounds. It is an extraordinary failure to think these earth mounds will be effective in Gloucester’s short and narrow valley. Gloucester is not located in the flat terrain of broad plains found in mines surrounding the Hunter Valley, Mudgee and Gunnedah in western NSW. Gloucester sits within a narrow bowl with high-sided forested ridges. The width of Gloucester’s valley across the Rocky Hill mining zone is just 8km from western ridge to eastern ridge. Let’s compare that to the Hunter Valley which is 76km wide in an east-west line running through the mining town of Singleton or 81km wide in another line running through the mining town of Muswellbrook. On Gloucester’s quiet rural land, any noise travels easily and the steep-sided valley amplifies and projects the sounds of heavy machinery. The Gloucester Valley acts like a hi-fi stereo speaker, so Rocky Hill’s proposed earth mounds are likely to have only minor mitigation of the noise impacts.

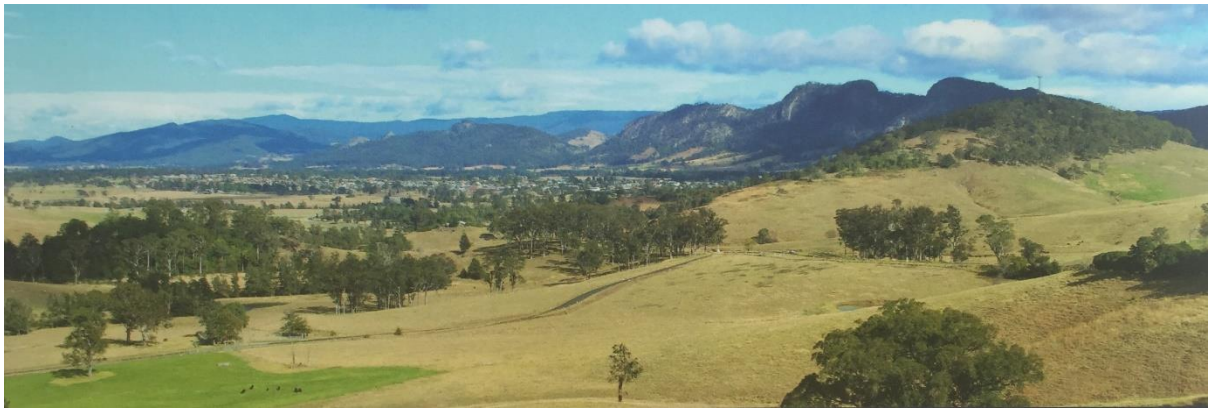
Tourism Advancing Gloucester believes that the noise impact from the Rocky Hill open-cut coal mine will be detrimental to Gloucester’s brand. Noise will impact on our visitor’s peaceful enjoyment of the region, with immediate knock-on effect against visitor satisfaction, against word-of-mouth recommendations, against visitor numbers and against the economic contribution of tourism to Gloucester.

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, so every decibel heard is a scream against Gloucester tourism.

4. Visual impact issues

You’d think that this is a no-brainer: an open-cut coal mine in a scenic narrow valley, on land zoned Environmental and Scenic Protection. So what’s the proposed solution to ruining the view? Build some earth mounds and plant a screen of trees from (some) vantage points to hide the spoiled view! Hide it, eventually that is, because for the next 21 years we’ve been asked to get used to the interim ugliness.

And how do you hide the view of all that new ugliness from the most popular lookout on the main eastern approach to Gloucester from Taree, at the Mograni Lookout?



Tourism Advancing Gloucester believes that the visual impact from the Rocky Hill open-cut coal mine will not be mitigated by their earthen mounds and so the mining activities will be detrimental to Gloucester's brand. The tree screens already planted by Rocky Hill along parts of the Bucketts Way South are actually closing off some of the delightful scenery enjoyed by tourists.

How close is too close?

The Rocky Hill mine site will be 0.9km from the backyards of Gloucester residents in the Forbesdale estate and just 5km from the centre of Gloucester. That is simply too close. Gloucester Resources Limited are on record as having stated: "*We shall mine as close to Gloucester as we are allowed*."

To find some perspective, below are some examples of what 0.9km looks like elsewhere in Gloucester;

- The width of Gloucester township
- The distance from Gloucester Primary School to the Olympic pool
- The Roundabout Inn to the Gloucester River bridge
- Billabong Park to the Council Chambers
- Gloucester Bowling Club to the garden centre
- Gloucester High School to the Senior Citizens Centre

Tourism Advancing Gloucester believes 0.9km is too close to Gloucester homes and their residents. We believe that 5km from the centre of town is too close. And we also believe that an open-cut coal mine operating on a high-sided valley just 8km wide is too close.

The high-probability risk

The Rocky Hill EIS states the total net benefits to the State of NSW over the life of the mine as $89.5million. As discussed earlier, Gloucester tourism is worth $1.07 billion over the same time horizon. So if Gloucester's tourism industry is impacted by just as little as 10%

then all the claimed benefits of Rocky Hill coal mine to the state of NSW will be negated. That's a high-probability outcome.

Our plea

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 sustainable in any sense of the word. What will happen to Gloucester in 21 years 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?

There are already enough mining towns across the country whose existence is in jeopardy due to end of the so-called mining boom. Gloucester has been bailed out previously when the timber and dairy industries were deregulated. We don't want to go down that path of governmental assistance again. We'd rather be strong, sustainable and prosperous on our own terms, without mining. We are already well on our way with a strong, sustainable tourism industry based on nature and wellbeing.

Consequences of Rocky Hill coal mine proceeding:

- It will destroy productive farmlands, impact pristine rivers and provide 21 years of noise, dust, visual impacts, community health problems, mental health problems, destroyed lives and broken tourism businesses.
- Rocky Hill cause unacceptable impact on Gloucester's scenic beauty and change forever the scenic rural perception of the region.
- It will unacceptably impact on the long earned tourism brand for the Gloucester Valley.

Grounds for refusal of consent:

- The proposed mine is likely to have an unacceptable negative impact on the local tourism industry which provides a sustainable economic contribution of $51 (in current $'s) on an on-going basis.

6. Mining Issues

a) Section 6 - Evaluation and Justification

Introduction

In Section 6 GRL seeks to Evaluate and Justify its project in terms of its value versus its impacts.

It lists a loose set of "six elements" that seem to be the criteria GRL suggests should guide critical thinking:

I. The emphasis placed on design to avoid or minimise adverse impacts
II. The applicant's commitment to high standards of environmental performance
III. Satisfaction of the principles of ecologically sustainable development
IV. Compliance with various regulations and Gloucester's LEP 2010
V. Key amendments to the 2013 project addressing environment
VI. Importance to the local community, State and Australia to produce high quality coking coal for Asian steel manufacturers

Then GRL proceeds to discuss the merits of coal mining in a closely settled area citing these strengths:

6.1.2 Emphasis Placed on project design
6.1.3 Applicants Environmental Performance and Commitments
6.1.4 Ecologically Sustainable Development – including the precautionary principle

It then advocates various features; concludes with its rehabilitation plans; and notes its apparent coexistence with Speldons Dairy.

Evaluation and Justification

Groundswell Gloucester notes that Section 6 does not qualify as an 'evaluation' or 'justification'. The claimed merits need to be seen in their practical environmental/ecological and human/community context. A disciplined approach would to lead to justification or otherwise.

In 'Identification of Amended Project Objectives' (6.1.4.2 on page 6-7) GRL have presented their objectives:

Principal objectives:

1. *develop and operate in a safe and environmentally responsible manner*
2. *meet state and local requirements/industry standards*
3. *meet reasonable community expectations*
4. *to the extent practicable... [achieve]... improved outcomes from those identified for the 2013 Project*

Context and Choice

The major failing with this section is that GRL has not grappled with the fact they are seeking to place an open-cut mine within a closely settled peaceful area beside a township, on a floodplain, in a catchment leading to a 75,000 person water supply and fisheries industry.

Because GRL has failed to deal with the context, their objectives lack coherency. They show the outward signs of a company trying to justify coal-mining in a closely settled area that doesn't need it. That context was and has remained entirely GRL's choice.

In essence:

1. The difficulties GRL faces are GRL's making.
2. The community did not invite GRL. From the day secret land deals were discovered, GRL received strident opposition.
3. The Gloucester environment did not need their stewardship.
4. Gloucester community demographics have never needed GRL's intervention.
5. Gloucester's industry has not benefited by GRL's being here - but tourism and lifestyle dependent industries will benefit by their departure.

The following table brings more discipline to the evaluation process. Five evaluation criteria have been derived from GRL's claimed project objectives. The criteria are discussed in the table below, taking note of GRL's professed concern to apply the Precautionary Principle.

Proposed Evaluation Criteria:

1. Is the new increment in coking coal essential to steel production in Asia?

2. Is that increment so essential that Gloucester must be mined?

3. Is there another way to achieve the increment?

4. Can the project meet its stated objectives?

5. Are there uncosted qualitiative risks?

6. Will harm result from NOT proceeding?

Criterion	Project Assessment (Most argument is presented in the appropriate Section)	RESULT
Is it essential? (in terms of opening new coking coal capacity) Is it esential? (in terms of the asserted imperative to mine Gloucester and benefits of GRL's approval)	Inasmuch as GRL would increase Australian coking coal capacity by less than 1%, it is unnecessary. Its claimed rank as premium semi-hard coking coal is comparable or lesser quality than competitors in Australia and overseas. Australian and world supply capability exceeds demand. There is already enough under-utilised capacity to satisfy Asian steel manufacturers and to suppress price as it becomes more attractive. Since GRL proposes now to reduce coal production, it would seem GRL itself may have decided to not fully achieve the goal of satisfying Asian steel manufacturing needs. Other GRL-claimed Gloucester Objectives: increase employment – GRL only states its best case employment; does not account for the productive families it displaced from the mine area; makes no provision for cyclic unemployment in the industry; and does not countenance routine staff reductions associated with technology and cost-cutting over the next 20 years. Thus the employment benefit is substantially less than its objective/benefit claims. A better NET employment number by the end of the project is likely to be in the order of 45 people – most of whom are already employed. rebalance Gloucester demography – It is surprising that GRL should claim this as a project goal or benefit. Unworthy of disciplined response. The dependency ratio does not apply. revitalise Gloucester before it dies of old age – Gloucester has the opportunity to continue to encourage tree-changer/ lifestyle industries for the VERY long term. GRL cannot compete in this arena. Tree-changers and lifestylers import funds and spend locally and generate the need for MORE services and industry. Many do not compete for jobs. Their presence CREATES jobs – including a growing building industry. Sydney will grow by 2.1 million people in this project's life. The Central Coast will increase by 40%. Gloucester has an assured future of wealth inflow – if its brand remains NON-coal.	Overall production impact on Asian steel NEGLIGIBLE Aust/ world necessity: NIL Claimed employment benefit inflated by at least 50% Demographic rebalancing not required for prosperity Prosperity is achievable without GRL's interference Reason to Damage Gloucester: NIL

	2011 ABS figures note specifically that Gloucester had a population growth of 1.9%. Since then AGL and GRL and Stratford Coal extensions have switched off this vital source of growth. inject $48 million per year - locally – this is addressed elsewhere in the GG submission.	
Is there another way of achieving it?	Open-cut appears to be the only option for a Gloucester mining development but since the project is unnecessary, no alternative is required. The production can be achieved in Australia from other sources if needed. A decision to increase NSW production by <1% would see no change in royalties or appreciable impacts from established mines.	Alternative production available: YES
Can it achieve its objectives? (safe and env responsible, compliant, community, other non-product outcomes) NOTES: The notes above referring to context apply directly here. The measure of success is not one of simple compliance. The measure must be more demanding – one appropriate to ANY reasoning community. Avoidance or elimination of risk and the	This is dealt with throughout the GG Submission. Here are just some of the issues regarding GRL's stated objectives. (Note that the community has another set.) • coal mining dusts will affect the township, isolated properties, pastures and residential estates for more than 16 years Fixable? NO • dusts footprint will now extend 9km along the Avon catchment Fixable? NO • heavy industrial noise profile will displace natural valued noises for every waking moment Fixable? NO • displaced a valued community living in the footprint Fixable? NO • understated the dust impact by asserting that Gloucester population density is 1.2/km2 Fixable? YES • 8 million tonnes of coal waste emplaced on the Avon River catchment Fixable? NO • 32,800 tonnes of produced water salts with no planned disposal method Fixable? Not in wider context • Intent on irrigating using desalinated water with known heavy metals for the next 20 years beside	Environmental objectives for a closely settled area on a water supply catchment achievable: NO

Precautionary Principle all aimed at zero harm are key measures of success. Changes in the amount of ROM, number of pits, timeframe, transportation and location of processing centre are insufficient and analogous to squeezing a balloon.	the Avon Fixable? NO • Road dust suppression using progressively more contaminated water Fixable? YES • Additional 24 hour operations at Stratford Fixable? YES • 600,000 60tonne truck movements on the haul road plus many other movements Fixable? NO • Compliant with government regulations to the minimum extent possible is implied by GRL's recognition that there will be exceedances. Fixable? YES Essentially GRL are trying to live within a set of constraints which over eight years should have been abundantly clear to them. The constraints are only there because GRL chose to insert itself into a closely settled valley where it can't fit. No matter how it seeks to move within the impacts envelope the result MUST be the same: an unviable mine. Constraints: 1. If it increases the 'visibility-amenity barriers-overburden piles to try to dull the noise, the batter slopes become unconstructable. 2. Abandonment of another pit will further impact on viability, employment, profit and royalties. 3. Disposal of the 32800 tonnes of chemical salts – one of AGL's concerns. 4. Disposal of the heavy metals without resorting to irrigation and dust suppression. 5. Control the spread of particulates and coal dusts along the new 9km road through the Avon catchment. 6. Create the claimed landform without relying on the additional 75 million tonnes of material needed. 7. No advance towards residential areas. 8. Re-creating soil water holding capacity in rubble-filled voids. 9. Stopping the 8 million tonnes of ROM rejects plus other coal rejects from leaching into the Avon and Manning water systems in the immediate and legacy years. 10. The 20-year life of mine.	

	11. Downturns, layoffs, and cost-cutting which impact on viability and employment projections. 12. Ensuring tourism and lifestyle support and building industries will lose NONE of their growth trajectory – including depressed areas near the mine. 13. Mining only on days when there will be NO exceedances. 14. Operating so there are no water discharges. 15. The inversion layer that will amplify noise impacts throughout the seasons. 16. Eliminating light emissions. 17. Exploring closer to residences without breaking the 'no stage 2' claim.	
Are there uncosted/qualitative risks – ie should the Precautionary Principle apply?	1. Gloucester relies heavily on its reputation for being clean and peaceful. Many developments are consistent with this. Coal mining is the antithesis. 2. GRL will not disclose its ambitions for the valley and even denies there is a Stage 2 – despite the approval to explore and the two adjoining 'expired-current' ELs along the Bucketts Way. 3. The cost of community health impact has not been deliberately calculated and there is a significant body of evidence that health impacts from coal mining dusts should be expected. There is no evidence to suggest that coal dust is risk free. 4. There is no evidence to suggest that heavy metals sprayed into pasture and the air is safe for humans or the food chain. Heavy metals carry proven health and environment risks which GRL has chosen to ignore. 5. Gloucester's population density for dust health impacts has been seriously understated – where it should have been fully discussed under GRL's professed desire to apply the precautionary principle. 6. Gloucester's feel as a clean rural/lifestyle locality will be impacted if it becomes a mining town. 7. Rehabilitation plans cannot be achieved and there is no assurance regarding long-term legacy effects of leaching from the loose filled overburden containing coal waste and heavy metals irrigated on the site over its 20 year life. 8. The health and water impacts of this are unknown - but are inevitable.	Are there risks that qualify for the Precautionary Principle? YES

	These risks all carry the responsibility for decision makers to decide on a policy of no harm – for which the burden of proof of public, individual and environmental safety, is to be borne by the applicant.	
Will harm result from Not Proceeding?	GRL employment for out of work miners will not be available in the short term - until coal prices justify re-employment in their previous roles. Other employment options will grow according to the business, tourism, lifestyle and agriculture cycles – and new business attracted to Gloucester once GRL has gone. GRL's presence has a stultifying impact on Gloucester and its people. Contributions to service clubs will return to normal levels and no doubt rise.	NO

The following notes are presented following the claims of GRL's Justification.

Positive Environmental Effects

There are no environmental benefits. A wider bridge, a roundabout, a better road are not remotely claimable environmental benefits.

Even the claimed example of GRL's co-existence with Speldons Dairy, is based on injustice and the destruction of people's lifestyle and dreams. This project started with secret land deals that created fear in good people. The increase to Speldons grazing lands is a cynical reinvention of the truth. GRL ended highly valued lifestyles for families, children, grandchildren and income producing businesses. Section 6.1.4.3 claims of 'social equity' are completely contradicted by this one act.

High Standards?

GRL has consistently cast its impacts as though it were environmentally sensitive. It claims to have a commitment to high standards. But 'High standards' in coal mining translates as 'compliance'. In practice, compliance means the achievement of minimum prescribed standards, most of the time. Outliers are called exceedances.

A 'small modern mine', truly seeking to be the best, would seek to eliminate exceedances and seek new measurements for monitoring. This would demonstrate GRL's intent to pursue high standards. This looks like an unreasonable criticism. But inasmuch as GRL has

consciously decided that it is economic to introduce a high impact industry into the midst of a peaceful community, it must have understood that new policies and a truly new model of behaviour would be needed to match its 'commitment' claim. The claimed extraordinary value of the coal only has that value if GRL can absorb the costs – all of them.

Ecologically Sustainable Development

The rehabilitation proposed cannot be achieved. There's not enough material for the revised landform. (Insufficient by 75 million tonnes) There is barely enough material to fill the voids after initial settling, and these voids will contain randomly distributed coal wastes exceeding 2.1 million tonnes (35,000 60 tonne truck loads) at Rocky Hill and an additional 5.9 million tonnes at Stratford.

Satisfy Asian Steel Needs

GRL suggests that Rocky Hill coking coal is something the Asian steel market has been clamouring for. We have seen no evidence of this and note that coking coal has a number of variables of value to steel makers. The qualities sought vary within the industry and they are discounted or valued based on market conditions. There is nothing especially excellent about Rocky Hill's coal that makes it indispensible and there is nothing about the coking coal market that suggests that Rocky Hill's small contribution would be felt on the world stage.

Evaluation Result

The Project should not proceed. GRL has failed a most important test. Because future mining on stage 2 and the other two ELs is being denied, the community – and the government – has every right to reject this EIS as an unconscionable and unworkable proposal.

GRL should not develop a mine in Gloucester LGA.

Matters Arising for NSW Government Decision Processes

This evaluation raised underlying process and policy issues that directly affect NSW Government's stewardship responsibilities. Groundswell Gloucester suggests the following matters of fact and process be visibly incorporated into the Rocky Hill EIS assessment:

1. If the goal is for NSW to gain greater royalties, then digging up Gloucester is inefficient – higher costs are attached to a green field site for what is clearly is a high risk mine. Mining in a closely settled area carries unavoidable costs, community risks and unacceptable impacts.
2. If the goal is to industrialise the Gloucester valley by enabling GRL's entry and to foster the exploration on GRL's other two expired ELs, then this needs to be open to public discussion before this EIS is assessed.

3. Groundswell notes particularly that the NSW government has allowed this matter to continue beyond a reasonable timeframe within a small rural community that has continually raised important human issues and sought intercession.

Government Duty of Care

NSW Government has an obligation to the community to avoid known risk and to hedge against unknown risk. There is now unequivocal human health evidence directly related to:

1. coal mining dusts noise and blasting impacts near a community of 3000.
2. unknown animal health impacts from 24 hour breathing of dust and ingestion of dust-contaminated pasture and water.
3. Heavy metals planned to be sprayed for 20 years throughout the mine area and along the Avon catchment with consequent health and environment risks and legacy issues of dust and leaching and as yet unknown long term health and environment impacts from heavy metals.

Human Health - Food Security

There is strong evidence that if consumers were aware that cattle products from Gloucester were linked to contaminated pastures and water, Gloucester's cattle industry would be severely impacted. The NSW community would probably demand full disclosure of this information. Thus, the government might be perceived to have a duty of care to the people of NSW for what would reasonably be perceived as uncertain quality of meat and milk products from the mine area.

These impacts are avoidable and for the most part are due to the insertion of a coal mine into a closely settled productive agricultural environment.

Human Health - Water Security

Water supplies to Gloucester and the Manning catchment will be impacted by water run-off from dust infused pasture from the mine and now from the dust spread along the 9km route to Stratford; over 6million tonnes of reject coal rubble, washery slurry and the waste of the 5% thermal coal which will be rejected to fill voids with other non-coking coals that are seen to be uneconomic to recover. Groundswell does not know the amount of non-coking coals that will not qualify for ROM. But it is clear that the 2.1 million tonnes of waste coal material declared by GRL is understated and increases the projected contamination suspended in the voids. This will lead to leaching within the voids as the watertable recharges to a claimed 95% in 10 years. Old aquifers will mobilise the contaminants into the Avon, Gloucester and Manning rivers.

Human Health - Noise

Noise is a critical factor for this proposal. Heavy industrial noise and infrasound are planned to be continuously generated by mining operations for every waking hour 6 days per week. GRL has imbedded in the EIS the provision for operations to increase in three years. There is

nothing to suggest they will wait the three years. Government and GRL know that, even in its current artificially constrained scale, Rocky Hill will generate TOO MUCH NOISE for a population of 3000 whose expectation is peace. In that there is an almost continuous and somewhat unpredictable weather inversion in this enclosed valley, noise will be amplified outwards past the visibility-amenity-rubble barriers. The barriers will not stop the noise. Government must recognise that within this community there are many who have traded-off other amenities and services to withdraw into the peace of Gloucester for the emotional quiet it delivers. Take that away and for some there will be elevated stress and perhaps social difficulties which are entirely avoidable and for which the Precautionary Principle should be applied.

Gloucester's Brand

Gloucester's brand is highly valued in the community. GRL chooses not to discuss it or the adverse impacts that should reasonably be expected. With massive population growth in the major centres over the next 20 years Gloucester can become a rural icon for its peace and beauty or it can become a mining town. Even in Rocky Hill's artificially constrained scale of this first stage, it dwarfs the town. Since GRL also 'owns' two expired-current ELs along the Bucketts Way, there is every prospect that more mining will occur to achieve viability. There is no evidence to suggest that further mining will not happen but there is clear evidence that there will be more mining. Further mining will deliver more harm to Gloucester's people, environment, reputation and future peaceful development.

Duty of Care and the Precautionary Principle

Government has a duty of care to stop GRL's excesses before they start. The Precautionary Principle should be invoked to eliminate the potential to damage Gloucester's growth and business trajectory. There is no evidence produced that there will be no harm from mining over the next 20 years and no evidence that Gloucester's reputation will be enhanced by having a mine – anywhere along the Bucketts Way or beside Gloucester.

Conclusion

All factors of evaluation lead to one conclusion: The project should not proceed in the Gloucester LGA or in any closely settled area.

Impact of Not Proceeding.

If this project were not to proceed, most social and environmental impacts would evaporate. Some early impacts will take time to heal. Families will remain separated from their dreams. The current unemployed mine workers in the Gloucester area will have to find other income to meet financial commitments prompted by a mining boom which has passed and the mooted policy of social adjustment compensation should apply to the coal mining industry.

b) **The Mine Viability and its Implications**

New unheralded world tensions and structural changes will continue to influence metcoal demand. There is no current argument that prices will return and sustain themselves near their historic highs.

Market forces and exchange rates variations will directly impact on Rocky Hill viability. And whereas early closure of Rocky Hill might be an acceptable risk for GRL's wealthy backers, the costs and consequences of early closure are absolutely critical for Gloucester's community.

Today, industry predictions are of sustained depressed prices. Peaks will be small and relatively short-lived due to absorption of demand by underutilised capacity and due to the influence of new low cost international producers whose supply chains are being improved.

For these reasons, viability is a central concern of Gloucester residents. Mine failure or closure leaves prospect of:

- extended GRL presence in the Valley,
- an un-rehabilitated landscape
- a mine or mines placed in long term 'care and maintenance',
- legacy health issues,
- unfulfilled employment and local expenditure claims.

As much as GRL's employment and financial figures are fanciful, the failure/closure of the mine would assure no benefit to the community and hardship for some. Early closure would involve other costs not surveyed here.

Non-viability raises more questions than answers:

- Why is GRL persisting with this project after their first EIS was knocked back twice?
- Why was the first EIS so drastically modified, without formal governmental rejection, if not to have 'one last shot' at getting approval by any means?
- Can there be any other plausible reason for GRL to extend the years of operation while reducing coal production and profitability - other than to minimise disclosed impacts and gain approval by any means?
- Why would the scrapping of their vaunted "world's best practice coal loader" in favour of an agreement with an opposition company to provide the vital service be a good idea – other than to just gain approval?
- Why would the main pit abruptly stop at the northern boundary? Is there no coal beyond that point? Or is it about not wanting impacts assessed at this time in the impacts assessment process?

The only reasonable conclusion is that approval is being sought at any cost – because there's another undisclosed game being played for this closely settled peaceful valley.

6. Consequences of Proceeding with the Mine as Proposed

- There will be further loss of the community faith in the planning system in NSW due to the lack of recognition by the State Government of its decision to legally recognise the Environmental Conservation zoning it legislated for this site which prohibits mining as a landuse.

- Gloucester's future as a destination for "Tree Change" retirees is likely to come to an end.

- Other industries reliant on Gloucester's "clean and green, peaceful and delightful rural character" such as tourism and lifestyle activities will be existentially challenged.

- The mine if established is likely to seek consent to grow further into the Lease area and closer to the existing town.

- The loss of farming families due to acquisition of the site area for the mine will become a permanent outcome for the Gloucester community.

- Farm labour losses to the local farming and business community will be further consolidated as a condition of the local economy.

- Loss of farmland to the local economy will become consolidation for many decades with very long term recovery only a possibility.

- Gloucester's function as a rural service town will be significantly challenged.

- Likelihood of Gloucester to encourage its young rural population to return to bring up their children will become more challenged.
- There will be permanent damage to the brand of Gloucester….it will become a "mining town" rather than the "beautiful rural town" that it is.

- The significant loss of property values for residents in the rural residential estates at the southern end of Gloucester will be consolidated and exacerbated.

- The lives of residents in these estates will be impacted for the whole of their waking days, every day the mine operates (ie. 6am to 10pm).

- The silence and solitude of the Valley around Gloucester will be impacted all day and every day that the mine operates.

- There is a very high risk that clearance and other disturbance associated with the amended project would lead to the complete loss of the populations of the threatened Grey-crowned babblers and Squirrel gliders that currently occupy habitat in the proposed project area.

- Populations of a third threatened species reported to occur in the mine area – the Brush-tailed phascogale – are likely to be lost, and others occurring in areas along the haul-road are likely to be depleted through road-kills.

- Remnant areas of Dry Rainforest – a vulnerable ecological community – comprising some 4.2ha would be destroyed.

- There will be an average of about 200 x 60T truck movements every day between Rocky Hill and Stratford.

7. Recommendations and Consolidated Grounds for Refusal

1) The proposed mine compromises the ongoing intent to protect the scenic qualities of the town of Gloucester from inappropriate development, as specified in the Gloucester Local Environmental Plan 2010.
2) 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.
3) 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.
4) The Amended Rocky Hill Project will have a significant detrimental and generally unmanageable impact on the Valley's long documented and recognised scenic heritage qualities.
5) The project is in the highly scenic Vale of Gloucester and will be situated within the scenic and agricultural valley floor, and will be too close to the Gloucester Bucketts, the Gloucester township and residential areas, and the scenic Mograni Range.
6) The proposed management of visual impacts will take significant time and are unlikely to be effective in creating unacceptable visual intrusions from the surrounding areas, major roads and many public viewing points and scenic lookouts.
7) The impacts generally will be excessive in duration and extremely difficult to repair/remediate. Coal mining projects in NSW generally operate longer than the initial DA claims and create so much change that return to the original landscape is rarely fully achieved.
8) The EIS and documented mine planning fails to establish that adequate material will be available to undertake the proposed landform restoration for the proposed mine; estimated in this review to be in the order of 75.241 Mm3.
9) The project would result in a significant level of intrusive noise being experienced by residents of Gloucester and surrounding residential estates who are currently unaffected by levels and characteristics of noise such as that which would be generated by the mining and associated operations.
10) The proposed mine will have an unacceptable impact on the health of the Gloucester residents in the vicinity of the mine due on the basis of psychological, lung function and sleep interference impacts.
11) There has been a failure to satisfy DGR requirements of "efficiency of coal resource recovery" given the steeply sloping seams and complex nature of the geology.
12) The mine plan has the potential outcome of increased PAF materials in the overburden which will lead to leach of acid to downstream land and waters.

13) This proposed mine as the smallest mine in NSW and Qld does not justify the potential environmental, social and economic damage to the local area and in itself may be non-viable.
14) The potential mining risks and proximity to Gloucester township and surrounding neighbourhoods are likely to result in unacceptable residual impacts on surrounding residents.
15) The EIS for the proposed mine has failed to establish a credible water balance assessment to enable confidence in predictions of potential water impacts as a consequence of its operations.
16) There are likely to be unacceptable water quality impacts on local surface waters from salts and BTEX chemicals in the waste material placed on the site.
17) There are likely to be water quantity losses as a consequence of the proposed mine due to loss of baseflow for local streams, especially during extended drought periods.
18) The groundwater model is over simplified largely because of the great complexity of the hydrogeology makes 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.
19) 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.
20) 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.
21) GRL have failed to properly address treatment, waste disposal and management of Saline Water. How many opportunities does a proponent get to keep reviewing such a flawed project?
22) There is inadequate consideration of how the proponents will manage groundwater that is saline and other poor quality water.
23) The EIS fails to adequately assess potential impacts of flooding and climate change in regard to the proposed mine.
24) There is likely to be unacceptable flood impacts on the proposed visual barriers which is likely to result in scouring of the barriers and creek beds, and potential water quality impacts on downstream watercourses.
25) The proposed Visibility Barriers will be inadequate in mitigating the visual intrusion of the proposed mine in the Gloucester Valley landscape; will take an unacceptable period of time to be constructed and vegetated; and will in themselves be an unacceptable impact in the landscape.

26) The aggregation of land for the mine has had an unacceptable impact on farming activity in the locality and the proposed extraction of the resource would create long term negative impacts of the same nature.

27) The uncertain economic viability of the proposed mine establishes uncertainty about its construction if approved, and yet its potential has sterilised economic investment in economic sectors such as retirement, tourism and lifestyle industries.
28) The size of the local populations of three threatened fauna species (Grey-crowned babblers, Squirrel gliders and Brush-tailed phascogales) and their movement patterns are unknown. These gaps in knowledge of the threatened species that would be adversely affected by the proposed project are such that it is not possible to adequately assess those effects or the likely efficacy of proposed mitigation.
29) 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 has failed to include details of alternatives considered in relation to the clearance of the Dry Rainforest outliers.
30) The design of the permanent overburden placement will cause destruction of the Dry Rainforest outliers.
31) The delay in securing the Biodiversity Offset area (which may not occur until the end of Year 2 of operations) is inconsistent with the Terrestrial Ecology report and is not justified.
32) The proposed mine is likely to have an unacceptable negative impact on the local tourism industry which provides a sustainable economic contribution of $51 (in current $'s) on an on-going basis.

Appendix 1

Economic Impact Assessment

The Australia Institute
Research that matters.

Rocky Hill coal project

2016 amendment

Economic assessment of the Rocky Hill project understates costs and overstates benefits. It is unlikely to be in the economic interest of NSW or the Gloucester community to approve this project.

Submission

Cameron Murray and Rod Campbell

October 2016

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Summary

The Rocky Hill coal project (2016 Amendment) proposes to develop a new open cut coal mine near Gloucester, New South Wales (NSW).

This submission makes three main points relevant to the economic assessment by Deloitte Access Economics that accompanies the public exhibition of the project.

4. All economic assessments of coal mines in the Gloucester Valley in recent times have overstated the economic cases for the projects. The benefits predicted in two earlier assessments of the Rocky Hill project have failed to materialise. The nearby Stratford coal mine, close to the rail facility, has currently stopped producing because of unfavourable market conditions, despite their 2015 approval to expand. This indicates that the Rocky Hill coal project is highly unlikely to proceed as proposed, skewing the net benefit calculation.

5. In particular, the financial and economic case for Rocky Hill is overstated due to optimistic assumptions about coal quality and price over the life of the project.

6. The economic case for Rocky Hill coal project is overstated due to large local negative externalities being assumed to be perfectly offset by on-site mitigation measures. There is no basis for this assumption. It is already clear that there are significant effects from the mine proposal on nearby residential and rural land values. Based on land value effects in the economic literature, this external cost is likely to be $24millon or more. No social costs are considered at all.

These three points alone should provide a clear case that approving this mine is not in the overall interest of New South Wales, nor the local interest of the residents of the Gloucester Valley.

Importantly, the project is not consistent with the former Gloucester Shire Council's strategic economic plan and represents a move to change the socioeconomic profile of the area. The project is not a marginal expansion of an established local industry, but a major change in the nature of the local economy – a change not welcomed by the community.

Introduction

Gloucester Resources Limited (GRL) has amended their application for the Rocky Hill Coal Project. The amended development application and revised EIS are on exhibition from 17 August to 14 October 2016.[4] According to the application, the amendment differs from the previous 2013 application in that it does not involve:

- constructing and operating an on-site Coal Handling and Preparation Plant (CHPP);
- constructing and operating a Rail Load-out Facility, including a rail loop and overhead loading bin, to despatch the product coal to the Port of Newcastle;
- developing a 3 kilometre partially-enclosed overland conveyor, to link the CHPP to the Rail Load-out Facility;
- operating the mine during night-time hours; and
- operating during evening hours for the first three years of the mining operations.

Instead, the amended project involves:

- developing and operating an open-cut coal mine, to produce up to 2 million tonnes of run-of-mine (ROM) coal per year for up to 21 years;
- constructing and operating a private coal haul road to link the Rocky Hill Coal Project with the Stratford Coal Complex, approximately 9 kilometres to the south;
- hauling sized ROM coal on the private coal haul road between 7:00 am and 6:00 pm only, Monday to Saturday;
- using the private coal haul road to deliver heavy equipment and construction materials to the Mine Area; and
- rehabilitating the site.

The reason for this amendment is that Gloucester Resources Ltd now has a commercial agreement with Yancoal Australia Limited to utilise their existing facilities at the Stratford Mining Complex to process and despatch coal from Rocky Hill.

The 2013 Rocky Hill Project application (the "2013 Project") was opposed by the then Gloucester Shire Council and many other local interest groups. Over 1,370 submissions from individuals opposed the 2013 project, with 327 supporting it.

On 2 June 2015, the CEO of Gloucester Resources Ltd, Grant Polwarth, requested[5] that the application be "placed on hold and not progressed" in a letter to Oliver Holm at the NSW Department of Planning and Environment. No public record of the response by the department is available, but given that an amended application is being considered, this unique request appears to have been complied with.

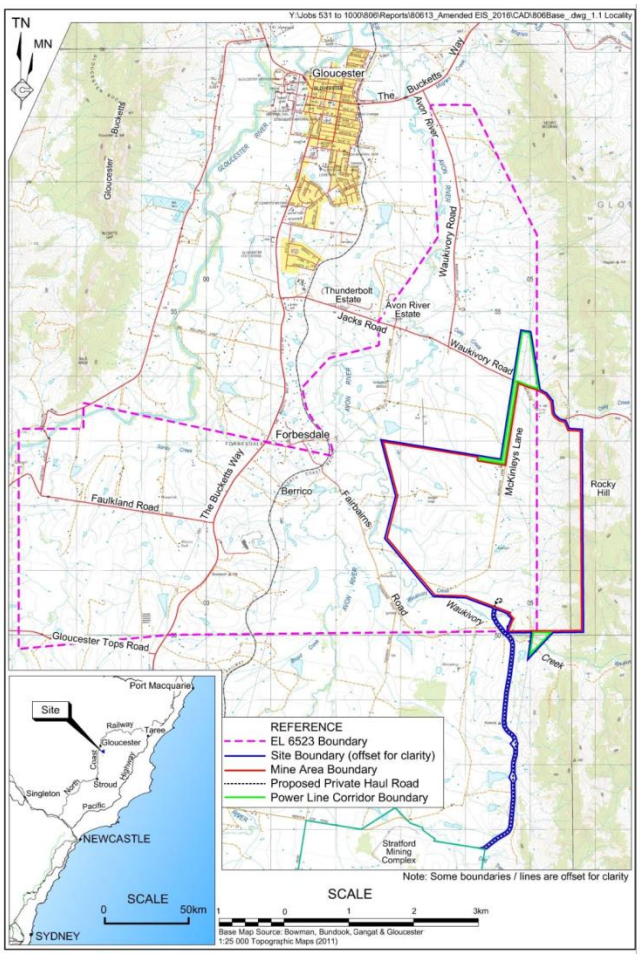
The proposed mine location is shown in Figure 1, along with the new private haulage road connecting to the existing Stratford mining complex. The pit is planned on the western part of the

[4] Available to view at http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=5156

[5] Available to view at https://majorprojects.affinitylive.com/public/2779954a03557c24015b64f79a8425e9/Letter%20Request%20On%20Hold%20to%20DPE%20020615.pdf

site area, and the majority of the area will be disturbed. The whole site sits in the Environmental Management Zone of the local plan, and adjoins an Environmental Conservation Zone to the north east. The location is around 6km from the centre of Gloucester town, while the nearest dwelling is just 500m away, and the Forbesdale residential area is between 1km and 2kms away. The former Gloucester Shire Council identified a number of environmental factors that would negatively affect the community in their submission, including heavy vehicle traffic, noise, air quality, effect on water courses, and overall amenity impacts being on conflict with their anticipated rural "lifestyle" growth.

FIGURE 2: PROPOSED ROCKY HILL MINE LOCATION



The main focus of this submission is on the Economic Assessment of the Amended Rocky Hill Coal project prepared by Deloitte Access Economics[6] (the "Deloitte EA"). The main points made in this submission are that:

1. All economic assessments of coal mines in the Gloucester Valley in recent times have overstated the economic cases for the projects. Most obviously, the benefits predicted in the two earlier assessments of the Rocky Hill project have failed to materialise. The nearby Stratford coal mine, close to the rail facility, has currently stopped producing because of

[6] This economic assessment is available for download at https://majorprojects.affinitylive.com/public/949b1f2c3aa8d40c84224414bb33b280/60.Rocky%20Hill%20Amended%20EIS%20SCSC%20Vol%205%20Part%2015%20Economic%20Assessment.pdf

unfavourable market conditions, despite their 2015 approval to expand, indicating that the project is highly unlikely to proceed as proposed, skewing the net benefit calculation.

2. The base case coal quality and price assumption are optimistic over the life of the project

3. Large local negative externalities, particularly on residential and rural land values, now and in the future, are not considered. Nor are any social costs.

Together, these points indicate that the Rocky Hill application may primarily be tool for commercial negotiations amongst miners, rather than a genuine application by a party interested in pursuing the investment in the project case being put forward.

Certainly, the project is not consistent with the former Gloucester Shire Council's strategic economic plan (GSR, 2012) and represents a move to change the socioeconomic profile of the area (Economists at Large, 2013). The project is not a minor change to an established local industry.

The (former) Gloucester Shire Council's Strategic Plan, along with local town planning instruments, express the community's desire to limit mining expansion in the following passage. The Strategic Plan notes:

While the majority of respondents agreed that mining makes an important contribution to the economic future of Gloucester Shire, there was overwhelming opposition to any expansion of mining operations beyond current boundaries toward residential locations. In particular, there was strong opposition toward the expansion of mining activity toward Gloucester township and into the scenic protection zone. (GSR, 2012)

While the Local Environmental Plan has a number of environmental protection zones, with the Rocky Hill project in the E3 zone, that has the following objectives

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.
(GSR, 2013)

Clearly the Rocky Hill coal mine proposal conflicts with community desires for their own economic and social development, something that is not considered in the Deloitte EA. Nor does the Deloitte EA refer to previous analysis of the local economy by other parties, seemingly ignoring many of the issues raised such as the Rocky Hill mine being in conflict with tourism and agricultural growth, and local land value effects already being seen from the 2013 Project proposal.

Economic assessments of coal in the Gloucester Valley

Economic benefits predicted in economic assessments of coal projects in the Gloucester Valley have not materialised. Most obviously, in 2014 Deloitte estimated the net present value of the 2013 Project to be $363 million (Deloitte, 2014). The project was to have already spent $60 million in capital expenditure (by end of 2016). Clearly this has not occurred, due to choices made by the project proponent, and Deloitte's previous forecast was too optimistic.

Prior to Deloitte's 2014 study, the project's response to 2013 submissions contended that the project was viable and criticised the analysis in the Economists at Large (EAL) and Gloucester Shire Council submission:

There is no evidence or substantiation provided in the EAL report, barring some comparisons with Yancoal which operates a significantly different mine, and produces a substantially different mix of products than the Proposal (Gloucester Resources Ltd, 2014, p160)

Three years on, the historical evidence is that the EAL submission was based on more realistic assumptions than either the Deloitte (2014) assessment, or the discarded and discredited initial analysis by Key Insights (2013).

As a comparison case, in 2013 the Stratford Extension Project was proposed, which sought to extend the life of the nearby Stratford coal mine by 10 years, with 2.6 million tonnes per year to be extracted. Accompanying this proposal was an economic assessment that suggested the net benefits of the project were between $145 million and $174 million. This expansion has not gone ahead. In fact, all coal production at Stratford has ceased, and Yancoal's other nearby Duralie mine has reduced production to one pit, laying off 45 of the 140 workers in September 2016 (Yancoal, 2015; Kirkwood, 2016).[7]

Yancoal reports in their 2016 mid-year financial report they have made significant write-downs of the capital of their Gloucester Valley coal projects at Stratford and Duralie of $74.3 million, noting that:

Management may consider reversals of the impairment provision previously recognised if there is either an increase in the average long term real revenue over the life of the mine due to either an increase in USD coal prices, or a further weakening of the AUD/USD foreign exchange rate or a combination of both, or further reductions in the current and life of mine operating costs, capital expenditure requirements, or an increase in the reserves. (Yancoal, 2016)

It is not clear how the high-cost Rocky Hill project being proposed will be viable while the neighbouring established Yancoal projects remains unviable, yet will continue to handle coal from Rocky Hill. The claimed abnormally high coal quality would have to outweigh the additional capital costs, and it is not clear this is a likely scenario. The Deloitte EA itself notes this unusual situation:

In May 2015, development consent (SSD-4966) was granted for the Stratford Extension Project which would involve an extension of the existing Roseville West Pit and development of two new open cut mining areas together with the extension of two existing overburden emplacements throughout the 11 year life of the project. The Stratford Extension Project is yet to commence.

Of relevance to planning authorities is that none of the $174 million worth of net benefits to NSW from the Stratford mining extension have been realised, and may never be. Overplaying economic gains from mining projects is now common place. Typically, the base case scenario is highly stylised and optimistic, as it appears to be in the case of Rocky Hill.

[7] Yancoal's general manager of investor relations and corporate affairs, James Rickards', recently commented that the NSW approvals process was delaying mining expansions and costing jobs, which is certainly strange, since they themselves have delayed investment in an approved mine extension (Ker, 2016a)

The reason that the ex-post economic reality of major projects differs so much from proposed "base cases" is that the approvals granted are optional; that is, they require no obligation on the applicant to undertake the amount of investment proposed, nor meet the timelines proposed. Within the limits of the approvals, various real options exist and are often utilised, such as delaying investment, decreasing investment, or changing the nature of the investment. Indeed, the case of Rocky Hill itself demonstrates this optionality. The application for the original 2013 Project appeared to a bargaining chip for a commercial negotiation, rather than a promise to deliver, as the request for delay and subsequent amendment reveal.

Ensuring approvals deliver on claimed benefits as well as external costs, conditions can be included in approvals to ensure a minimum level of investment is made in a timely fashion, commensurate with those promised in the application. Alternatively, payment upfront of forecast royalties, along with assurance bonds reflecting clean-up costs, could put the onus of determining the plausibility of the project on its financiers, who would have a strong interest in assessing the most highly likely scenario, and filtering out ambit claims.

Granting the option to develop the proposed mine, but not the obligation to do so, will mean that unless all of the optimistic forecasts from GRL are met, the outcome will be vastly different than the proposed base case. Indeed, it may well be the case that only the negative costs on the community are realised, as the mine commences during a period of high global coal prices, only for it to temporarily shut when prices fall. In such cases the gains will be delayed, while the external costs to the community will mostly already have been incurred, turning a potential net benefit to NSW from the project into a net cost.

For example, a 5-year delay in the project base case from year 3 to year 8, assuming that a new approval grants an extension at the end of the 17-year project for an additional five years, reduces the net economic benefits by 27%, to be $66 million, under all the same assumptions as the Deloitte EA project case (with the mine remaining somewhat profitable).[8] A 10-year delay would from year 3 would reduce the present value of net economic benefits by 49%. Again, this assumes the generous price and coal quality assumptions of the Deloitte EA. Under less favourable assumptions about coal quality the project is already unprofitable under most scenarios, again suggesting the actual outcome will be far different from the proposal.

Financial and economic case

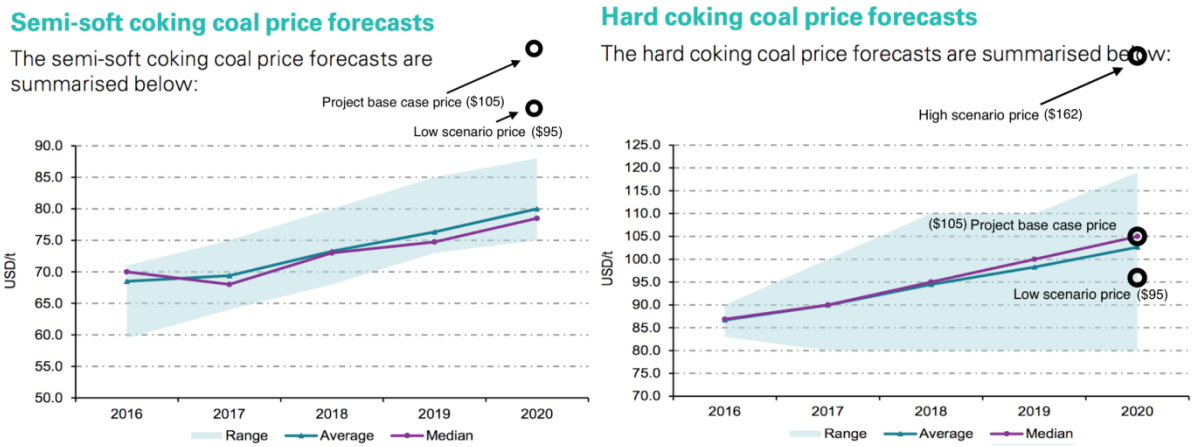
The Rocky Hill project is presented as being financially and economically strong, just like the 2013 project, and just like Stratford extension project, neither of which the proponents progressed. The current proposal is no different in exaggerating financial viability, and in doing so, the exaggerating the benefits of the proposal. This point is important. Every cost benefit analysis (CBA) makes implicit assessments of project viability in order to understand probability of benefits occurring. Where financial viability is unlikely, so too are economic benefits. This is clearly the case in the Rocky Hill project, where the financial case, and hence economic benefits, are based on optimistic assumptions.

[8] This assessment is made on the basis of a DCF model that replicates the Deloitte EA using data extracted from graphs and tables presented, and simplified adjustments for costs, profits, and taxes, where information is not sufficient for exact replication. A summary of this model is in the Appendix.

The Deloitte EA was based on the assumption that 97% of coal extracted from Rocky Hill would be metallurgical coal (semi-hard coking), with only 3% thermal coal. Nearby Stratford and Duralie mines report that only 39% of coal extract was metallurgical and 61% thermal, between June 2011 and September 2013 according to quarterly Yancoal production reports. While we have no geological data at hand, the claim that Rocky Hill will produce almost entirely coking coal of very high quality as to warrant a price at 90% of the hard coking coal price (or a 33% premium over semi-soft coal) seems highly implausible.

Additionally, the base case price forecast seems optimistic over the entire life of the mine. Recent unprecedented global price movements for coking coal and thermal coal have meant that forecasts used in the Deloitte EA have recently been met. Australian prices for hard coking coal have more than tripled this year to be over $USD 190/tonne, which is a four year high. Thermal coal prices have risen around 50% this year to be around $USD70 /tonne as of September 2016. Whether such prices last of the life of the mine seem questionable, given the overall declining trend in global resource prices.[9] Indeed, the variability of prices, and the ability for an approved mine to temporarily shut down production, reducing local gains from employment but increasing local external costs by extending the mine life, must be considered.

FIGURE 3: FORECAST PRICES IN DELOITTE EA COMPARED TO CONSENSUS (KPMG, 2016)



Of interest is that the Deloitte EA chose in their sensitivity analysis to consider only very asymmetric possible future price conditions, of -9%, and +54% of their base case forecast of $USD 105/tonne ($AUD 139) for their semi-hard coal product. In Figure 2 the price forecasts used in the Deloitte EA are marked on the forecast consensus from KPMG. Of note is the high premium expected on the semi-soft coking coal price. Figure 2 shows that the base case price forecast for Rocky Hill's semi-hard metallurgical coal is $105 US per tonne in 2020, 31% above the range predicted for semi-soft coking coal by KPMG. Despite the expected quality of Rocky Hill's metallurgical coal being less than hard (semi-hard), Deloitte's forecasts are in line with forecasts of hard coking coal prices, with the high scenario price 54% above consensus, and 35% above the highest forecaster estimate. Given the discrepancy with Yancoal's published results for Stratford, these coal price forecasts are not reliable.

[9] Global prices are now also leading to Chinese policymakers modifying controls on domestic coal mining to allow for expansion and reduce reliance on expensive imported coal, which is likely to feed back into global prices, keeping them lower than otherwise (Ker, 2016b).

To show the potential effect on the net benefits to NSW from this project under a wider range of scenarios, Table 1 conducts a sensitivity analysis of a model matching closely the one in the Deloitte EA, but extended to account for coal quality ratios similar to Stratford mine.[10] Notice that where the mine is not profitable the net benefits are zero compared to the base case of no mine and continued agricultural production. The red italicised numbers are the cases where the mine is unprofitable with a 20% increase in costs, which is another risk to this project, given that the project costs in the Deloitte EA are argued to include ongoing site rehabilitation and a variety of other activities seeking to mitigate amenity impacts.

TABLE 2: SENSITIVITY OF NET BENEFITS ($MILLION) TO NSW - COAL QUALITY, PRICES, AND DISCOUNT RATE

	COAL RATIO 97:3			COAL RATIO 39:61		
	Discount Rate			Discount Rate		
	0.04	0.07	0.10	0.04	0.07	0.10
HIGH (1.5)	222	165	125	156	111	80
BASE (1)	120	88	66	0	0	0
LOW (0.9)	100	*73*	*54*	0	0	0
LOWER (0.5)	0	0	0	0	0	0

Overall, there appears a reasonable likelihood that the project is only viable in times of abnormally high global coal prices, even with improved efficiencies in the amended project that utilise existing rail facilities at Stratford. This means that the overall economic benefits are highly unlikely to match those in base case scenario in the Deloitte EA.

[10] See Appendix for model details.

Limited consideration of negative externalities

The Deloitte EA quantifies just three types of potential negative externality from the Rocky Hill Coal Project, arising from noise, air quality, and greenhouse gas (GHG) emissions. Other types of negative externality, including social effects, are addressed in written qualitative comments only.

Given that many local submissions were made on the earlier 2013 Project proposal by local residents concerned about social changes and impacts on amenity in all forms, the consideration given to such effects seems limited.

Land values

One way to quantify the negative external effects of resource extraction activities is to look at changes to nearby land values. In 2014 the NSW Valuer General's office reviewed the land value effects of coal seam gas development in the Gloucester area, and noted that:

Agents report that potential purchasers have an aversion to the CSG and mine areas of Gloucester but the main concern is the [Rocky Hill] mine. (NSW Valuer General, 2014)

Due to the close proximity of the proposed mine to current residential areas, and proposed future residential estates, there are likely to be clear and quantifiable effects on property values from the Rocky Hill mine. As the Gloucester Shire Council submission to the 2013 Project application shows, significant future residential development is planned on the eastern side of the township near the proposed mine. Many current residents are also in close proximity of the proposed mine, and the presence of the proposal itself has already compromised their property values, including for nearby agricultural properties.

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. (GSR, 2013)

The Deloitte EA does not consider any conflicts with residential and agricultural uses, current or future. Yet the economic literature has shown many times that proximity to coal mines and other resource infrastructure has substantial negative effects on home values, sometimes considerable, as the literature summary in Table 2 shows.

TABLE 3: SUMMARY OF STUDIES ON RESIDENTIAL LAND VALUE EFFECTS OF RESOURCE ACTIVITIES

STUDY	RESOURCE ACTIVITY	AREA	COUNTRY	LOW	HIGH
WILLIAMS (2011)	Open cut coal	County	US	-0.34%	-1.7%
TRIGG AND DUBOURG (1993)	Open cut coal	Towns <3km	UK	-10%	-40%
BOXALL ET AL. (2005)	Shale gas	< 4km	Canada	-4%	-8%
GIBBONS ET AL. (2016)	Shale gas	< 20km	UK	-1%	-1.5%
GANEGODAGE ET AL (2016)	Power plants	< 15km	Australia	-7%	-21%
DAVIS (2011)	Power plants	< 3.2km	US	-3%	-7%

Table 2 shows that much higher land value effects occur in closer locations, with county level effects still around 1%, while land within a 4km radius of coal and shale gas is likely to have much larger price effects. The whole town of Gloucester is within 7km of the proposed Rocky Hill mine, meaning the land value effects are likely to be at the higher end of these estimates.

To provide a rough estimate of the effect of the proposed Rocky Hill mine on residential values only, the total value of residential property in the town of Gloucester can adjusted by the expected value changes. Because land values nearby to the mine are so high, even small effects will have large economic outcomes.

The NSW Valuer General, for example, estimated that the total value of all land in the former Gloucester local government area was $722 million at July 2014 (NSW Valuer General, 2014). This includes agricultural, residential and commercial land. A rough estimate of the total value of residential property (land and buildings) can be derived from by using average home values and the total number of household in the area. According to the latest 2014 ABS estimates, there are 2,000 households in the former Gloucester Shire Council area. The median house value is $288,655 (homesales.com.au, 2016) while the average value is expected to be much higher, given a brief survey of advertised property on 5 Oct 2016 showed 18% of homes in Gloucester advertised with a price above $1million (author calculations from realestate.com.au). Using a conservative $300,000 per home average, and multiplying by the 2,000 homes in the area, gives a total current residential property value of $600 million.

Every 1% negative effect on property values reduces the property wealth of residents by around $6 million, which is nearly twice the total negative external costs considered in the Deloitte EA (which mostly comprised an allotted share of GHG emissions to NSW). A conservative estimate of residential property value declines given the above research would be about 4%, which would be $24 million, while a high end estimate would be around $48 million if there is an 8% negative price effect on just the residential land in Gloucester. These estimates ignore also the value of future residential areas over the life of the mine, and the non-residential value effects on rural and commercial property. While mine proponents may argue that such declines are temporary, given that the approved mine will operate till 2034 before final rehabilitation even commences, the evidence from other mines in the valley suggests that this life will likely be extended if it begins operations at all, with temporary closures during times of low coal prices.[11]

Offsets neatly sum to zero

For other negative external factors, ad hoc assumptions are made about their ability to be offset. The Deloitte EA compares the external cost to rural amenity and culture they accounted for, which are zero, with the estimates of the same external effects from the economic assessment of the 2013 Project, which were $7.8million. To avoid accounting for such external costs, mitigation measures and environmental offsets are assumed to be budgeted for, and enacted, to perfectly compensate for any effects on local amenity and culture, and environmental effects including impacts on underground and surface water. These unjustified assumptions seem implausible.

The decision in Bulga Milbrodale Progress Association Inc v Minister for Planning and Infrastructure and Warkworth Mining Limited [2013] NSWLEC 48 is informative here, for it noted that the proposed local environmental offsetting in that case was inadequate to compensate for environmental losses. There is no rationale provided for why proposed environmental offsets neatly cancel out damage is provided in the Deloitte EA, nor whether indeed there is any offsetting effect at all from the proposed 267Ha of conservation of land adjacent to the east, which would certainly have been conserved in the no-project base case as well. The hidden nature of the assumption that proposed environmental offsets will be effective is revealed in the comment made by the NSW Department of Primary Industries on the project

[11] Of course, the other mines studied in the economic literature also have limited life spans.

- *The proponent should clarify how much agricultural land is proposed to be removed for the purpose of establishing biodiversity offset areas.*
- *The proponent should provide evidence in the rehabilitation plan that it is physically possible to return land from the disturbance area to previous or better production levels.*
  (Department of Primary Industries, 2016)

Such comments again reveal that the Deloitte EA is based on an overoptimistic case, also in terms of negative external costs.

Rehabilitation or expansion

End of mine rehabilitation costs have been incorporated into ongoing operating costs without any way to assess their validity, nor any mechanism to hold the project proponents to account. Failure to rehabilitate is common when mines reach the end of their life, and the industry as a whole has externalised many billions of dollars of costs to the public by avoiding rehabilitation obligations. Given the financial viability is of the proposed project is tenuous, it would be in the interest of the miner to avoid these costs. Importantly, there is no example of an open cut mine of this size completing rehabilitation in NSW. The potential for a long-term degradation of the site should also be considered in the economic assessment.

The nearby Stratford mine, which was proposed to run for 8 years from 1995 then rehabilitated, has now been running for 21 years, with another 11-year extension approved in 2015, is an example of how expansion could be a more economical path for Rocky Hill than promised rehabilitation. Miners also commonly avoid rehabilitation costs by “mothballing” the site pending coal market conditions. The main point is that under these scenarios the true environment cost will be far higher than the zero cost accounted for in the Deloitte EA in terms of local amenity, biodiversity, and other environment costs.

Social costs

The abovementioned legal case is also relevant to social costs. It was found that the principles of ecologically sustainable development (**ESD**) are a matter to be taken into account as aspect of the consideration of the "public interest". Regarding social costs, it was concluded that

The Project's impacts would exacerbate the loss of sense of place, and materially and adversely change the sense of community, of the residents of Bulga and the surrounding countryside…

Such arguments have been made in multiple submissions to the 2013 Project, and remain valid considerations, however all social costs are assumed away in the Deloitte EA.

From the numerous submissions made to the 2013 Project and community surveys (GSR, 2011; Key Insights, 2013), the Gloucester community sees itself predominantly as a community that thrives on agriculture, and services targeting tree-changers and tourism. The council’s economic plans support this objective. It is not the Hunter Valley, and allowing new greenfield projects is a fundamental change to the nature of the town, rather than a marginal expansion of a major existing industry. The Rocky Hill project imposes a social, if not economic, cost on pursuing this alternative future path.

The existence of local trade-offs between coal mining and rural tourism is regularly reported in survey data, but clean economic assessments of the marginal effects are difficult to find. However, the well-established effects on residential and rural property values suggests that there is likely to be

some negative effect in tourism accommodation and occupancy also. While there may be little data and prior research to establish the size of any economic effect from mining on tourism, it remains a valid social concern, given the expressed community desires about the nature of future development in Gloucester.

Final remarks

In a period where coal mines are closing due to unprofitability the amended application by GRL at Rocky Hill appears strange on its face. The very fact that the 2013 Project application was put on hold reveals the mismatch between approvals sought, and commercial intentions.

The approval does not exclude options to expand to the north in the future, which is likely to be more profitable than the proposed rehabilitation, and a situation similar to Stratford, where the 8 year "boutique" mine has been going for 21 years, with an additional 11-year extension.

It is hard to believe that the project as proposed is in any way likely to represent true outcomes over next 17 years.

The application, given that it was made earlier in circumstances even less likely to be profitable than in late 2016 suggests there are other motivations for this approval, which could include:

1. An approval is a way to reduce risk and therefore increase the possible sale price of the mining lease, quite possibly to Yancoal, who have previously expressed a dislike of rigorous mining application processes (Ker, 2016a), are already involved in the project, and may gain economies of scale from further operations in Gloucester Valley.
2. An approval is a first step to blunt community opposition to a larger second stage mine that expands north towards Gloucester town, improving the financial performance to justify investment in the first stage.
3. An approval provides the option to begin mining only if, or when, the coal price recovers for long enough to secure contracts that would support the upfront investment.
4. A combination of the above three options.

Moreover, the Deloitte EA accompanying the amended application, like many economic assessments of mining projects, was optimistic about private benefits, and limited in their assessment of external costs. The main way this can be seen is in the forecast of coal quality and price, but also the dismissal of all local amenity and environmental effects.

Rather than $3 million in external costs, the value is likely to be higher than $24 million, under best case conditions. Under a scenario where coal quality matches the nearby Stratford and Duralie mines, the Rocky Hill project makes no financial sense on its own, unless there are large and sustained prices rises from their already elevated level in global coal market. It is hard to see a likely scenario for this mine where there are positive net benefits to NSW.

Indeed, recent price gains are likely to be temporary as global markets account for Chinese government policy which is now allowing for greater domestic coal production to avoid higher-priced coal from international sources like Australia (Ker, 2016b). Such direct price targeting policy will no doubt undermine the financial viability of many future coal projects in Australia. Yet even under the most extreme scenario of no new coal mines approved and undertaken, the economic impact would be extremely small (The Australia Institute, 2016). This is because of the large already-approved capacity, and the relative unimportance of mining to overall employment and the complex

interactions of the domestic economy. The Rocky Hill project is just one of many economically marginal projects that will need to be rigorously scrutinised to ensure they can generate net benefits for NSW and Australia.

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Appendix

The baseline DCF model relies on cash flow assumptions and methods described in the Deloitte EA. Table 3 summarises the project case in this model. All values are in $AUD million unless stated otherwise.

The $3.3million 2016 present value of external costs according to the Deloitte EA are subtracted from the present values of NSW benefits from the project using discount rates of 4%, 7% and 10%. Negative company tax value in early years remain, as losses will roll over to future accounting periods. The close match between this model and the Deloitte EA results and sensitivity analysis indicate that it closely reflects GRL forecasts.

TABLE 4: DCF MODEL ASSUMPTIONS MIRRORING DELOITTE EA PROJECT CASE

	METALLURGICAL COAL PRICE ($/TONNE)	THERMAL COAL PRICE FORECAST ($/TONNE)	METALLURGICAL COAL OUTPUT ('000 TONNES)	THERMAL COAL OUTPUT ('000 TONNES)	TOTAL OPERATING COSTS	TOTAL CAPITAL COSTS	REVENUE	COSTS	ROYALTIES	GROSS PROFIT	COMPANY TAX	COMPANY TAX (NSW SHARE)	NSW NET BENEFIT
2018	125	77	0	0	0	35	0	35	0	-35	-10	-3	-11
2019	134	77	108	0	24	22	22	46	2	-26	-8	-3	-7
2020	138	78	308	10	32	6	65	37	5	22	7	2	12
2021	138	78	308	8	32	6	65	38	5	22	7	2	12
2022	138	78	696	23	54	6	147	60	12	75	22	7	35
2023	138	78	857	28	75	6	181	81	14	85	26	8	41
2024	138	78	857	28	75	6	181	81	14	85	26	8	41
2025	138	78	857	25	75	6	180	81	14	85	26	8	41
2026	138	78	1,005	33	81	6	212	87	17	108	32	10	51
2027	138	78	1,005	33	81	6	212	87	17	108	32	10	51
2028	138	78	1,005	33	81	6	212	87	17	108	32	10	51
2029	138	78	1,082	35	80	6	228	86	18	124	37	12	57
2030	138	78	1,082	35	80	4	228	84	18	126	38	12	58
2031	138	78	1,082	35	80	3	228	84	18	126	38	12	58
2032	138	78	1,082	35	80	4	228	84	18	126	38	12	58
2033	138	78	611	20	48	2	129	51	10	68	20	7	32
2034	138	78	859	278	58	1	181	59	14	107	32	10	48

Model notes: Royalties are calculated at 8.2% of revenue less $3.50 per tonne.
Company tax = (revenue – costs – royalties) x 0.3
Share of company tax attributable to NSW is 32%
Gross profit = revenue – (operating plus capital costs) – royalties
Share of profit attributable to NSW is 5.9%
NSW net benefit = royalties + company tax x 0.32 + (profit-company tax) x 0.059
High, Base, Low, Lower prices are 1.5, 1, 0.9 and 0.5 times each coal price from Table 3.
Present value prices are at 2016 using 4%, 7% and 10% discount rates.
For 61:39 coal ratio case, the total coal volume is held constant, and new volumes for each coal are estimated.
If the present value of gross profits is negative at each discount rate, the project is assumed to be

unprofitable and a zero benefit and zero cost are given for NSW, as the project would not proceed in those scenarios.

Appendix 2.

Noise Impact Assessment

The following report was commissioned through the Environmental Defenders Office on behalf of Groundswell Gloucester.

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Acoustic Peer Review
Amended Rocky Hill Coal Project
Including Stratford Modification 1

REPORT No
6062-1.1R

DATE ISSUED
6 October 2016

Prepared for and instructed by:
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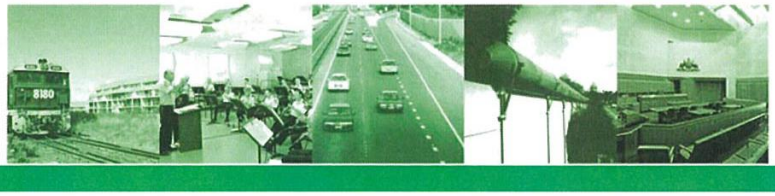

Revision History

Report	Date	Prepared	Checked	Comment
Draft	20/09/2016	Stephen Gauld	Thomas Roseby	To client for comment
Draft 2	05/10/2016	Stephen Gauld	Thomas Roseby	Stratford added
Final	06/10/2016	Stephen Gauld	Thomas Roseby	

Document R\6062-1.1r, 12 pages plus attachments

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EXECUTIVE SUMMARY

1. Day Design Pty Ltd has been engaged by EDO NSW to provide an expert Acoustic Peer Review of the Noise, Vibration and Blasting Assessment prepared by SLR Consulting dated July 2016 provided as part of the Environmental Impact Statement for the Amended Rocky Hill Coal Project.
2. The implementation of the Amended Rocky Hill Project relies on the approval of the Stratford Mining Complex, Modification 1 which allows coal from the proposed Rocky Hill Mine to be transported to and processed at the existing Stratford Mine. A review of the Noise Assessment for the Stratford Modification dated 16 June 2016 is included in this report.
3. This report may be included in the submission to the Department of Planning and Environment by the Gloucester Community in their response to the Department of Planning and Environment.
4. I have reviewed the Noise, Vibration and Blasting Assessment prepared by SLR Consulting for the Amended Rocky Hill Coal Project. I have also reviewed the Noise Assessment prepared by SLR Consulting for the Stratford Mining Complex Modification 1.
5. The impact on the town of Stratford is minor as there are no additional coal train movements proposed, and there is no application to increase the existing approvals for the Stratford Mining Complex.
6. The noise impact of the Stratford Modification has not been assessed during adverse weather as SLR conclude that there are no prevailing winds during the daytime.
7. This peer review focuses on the likely acoustic impact to the Gloucester residential community due to the proposed amended project.
8. The predicted noise impact from the Amended Rocky Hill Coal Project is significantly less than the predicted noise impact from the 2013 Rocky Hill Coal Project due to a reduction in the number of fixed plant proposed for the Amended Project.
9. There are few outstanding errors in the SLR assessment, however the noise criteria for the Gloucester residences should be 35 dBA, not 37 dBA as reported. This error has an insignificant effect on the outcome of the report.
10. Assuming the noise modelling is reliable, the expected noise impact of the proposal will be clearly audible at nearby residential premises, especially in unfavourable weather conditions (southerly wind).
11. It is proposed to continually monitor the weather and noise emission from the mine and to shut down items of plant to achieve compliance with the Project Specific Noise Levels (PSNLs). This is likely to provide exceedances of the noise criteria on a regular basis.

12. The noise assessment for the Amended Rocky Hill Coal Project prepared by SLR generally meets the requirements in the NSW Industrial Noise Policy (INP). The failings of that Policy in relation to residents affected by noise from the proposed mine have been discussed in this report.

13. The extent to which the residents are affected by mining noise will depend heavily on the management of the mine, the mine operator's continual monitoring of noise emissions and weather and the mine operator's response to potential and actual noise limit exceedances.

INTRODUCTION

14. I, Stephen Gauld, Principal Acoustical Engineer and Managing Director of Day Design Pty Ltd, have been engaged by EDO NSW to provide an expert peer review of the Noise, Vibration and Blasting Assessment prepared by SLR Consulting dated 18 July 2016 provided as part of the Environmental Impact Statements for the Amended Rocky Hill Coal Project to be presented to the Department of Planning and Environment.

15. In this report, I provide a critical review of the Noise, Vibration and Blasting Assessment to assist the Department in their consideration of the matter.

16. I have read the documents provided to me, as listed in Appendix "B".

17. I have not visited Gloucester or any other areas surrounding the proposed mine site. My review is limited to a desktop study. I have not reviewed the noise model prepared by SLR nor have I modelled the mine's noise emission myself.

ABOUT THE AUTHOR

18. I, Stephen Gauld, am the Managing Director and Principal Acoustical Engineer at Day Design Pty Ltd, Consulting Acoustical Engineers, of Suite 17, 808 Forest Road, Peakhurst, NSW, 2210.

19. I have practiced as a Consulting Acoustical Engineer since December 1997. I was awarded my Bachelor of Engineering (Mechanical) in 1997 and my Masters of Engineering Science (Noise and Vibration) in 2007. My curriculum vitae is attached in Appendix "A".

20. I have read Division 2, Part 31 of the Uniform Civil Procedure Rules 2005 and the Expert Witness Code of Conduct in Schedule 7. This report is prepared in accordance with these documents and I agree to be bound by their terms.

21. My evidence in this statement is within my area of expertise, except where I state that I have relied upon the evidence of another person.

DESCRIPTION OF THE SITE AND SURROUNDING AREA

22. It is assumed that the readers of this review will be familiar with the site and surrounding areas.

23. For a summary please refer to Section 1 in the Noise, Vibration and Blasting Assessment prepared by SLR Consulting Australia on 18 July 2016.

ACOUSTIC PEER REVIEW

General Overview

24. The Rocky Hill Coal Project originally included a coal handling and preparation plant (CHPP), overland conveyor, loop and train load-out facility. The amended Project no longer includes this infrastructure as the coal is proposed to be transported to the nearby Stratford Mining Complex via a proposed private haul road.

25. This amendment improves the noise impact on all residences as the removal of the fixed plant provides a significantly reduced noise impact, which is a desirable result.

Stratford Modification 1

26. The Stratford Modification 1, to accommodate the Amended Rocky Hill Coal Mine primarily consists of a new haul road from the proposed Rocky Hill Mine to the existing Stratford Mine.

27. The existing CHPP and rail loading and unloading infrastructure will be utilised for the coal mined at Rocky Hill. No additional hours of operation at the Stratford Mining Complex are proposed to accommodate the processing of the coal from the Rocky Hill Coal Mine.

28. The SLR report shows the PSNL is met at all privately owned residential premises during the daytime in calm weather.

29. It is noted that the SLR report assesses weather during the daytime and finds that there is no prevailing wind (Section 4.1). Therefore adverse weather has not been assessed. We have no weather information to the contrary.

30. If it is known that prevailing winds do exist, it would be worthwhile carrying out a weather analysis to demonstrate this from historical weather data.

Long Term Ambient Noise Levels – July 2010 and July 2012

31. Unattended background noise levels were measured at several locations during the day, evening and night periods. The Rating Background Levels (RBLs) are reported in Table 14 of the SLR report.

32. The RBLs are no greater than 35 dBA during the day and no greater than 30 dBA in the evening. The night time RBLs are not reported.

33. Table 16 of the SLR report then distills this data into five general residential localities. The residences along The Bucketts Way are reported as having the highest RBL of 35 dBA during the day. The Gloucester urban residences are reported as 32 dBA. All other residences are reported as the minimum allowed of 30 dBA.

34. The one odd location that doesn't fit this pattern is Location 16, identified as 3 Beech Close with an RBL of 30 dBA in Table 14 of the SLR Report, however the assigned RBL for the Gloucester Township is 32 dBA in Table 16.

35. Given that Location 16 is the nearest residential location in the Gloucester township to the mine and its measured RBL is 30 dBA, the RBL for the Gloucester township should be conservatively assigned as 30 dBA.

36. The RBL at closer locations such as Location 2 and 3 are both 30 dBA. If the noise limit of 30 dBA is met at these locations, then the noise level affecting the Gloucester township should be less than 30 dBA.

37. In general, the assigned RBLs are as conservative as the INP allows, and have been increased by up to 6 dB (from 24 dBA) in accordance with the INP methodology.

Industrial Noise Policy

38. I accept that the INP requires the RBL to be set at 30 dBA if the measured RBL is less than 30 dBA in the day, evening or at night.

39. Where this is the case, the intrusiveness criterion then is set to 35 dBA.

40. On page 1-46 of the SLR report the author states that "*the INP states that the PSNLs are based on preserving the amenity of at least 90% of the population living in the vicinity of industrial noise sources by limiting the adverse effects of noise for at least 90% of the time. Provided the PSNLs are achieved, then most people would consider the resultant noise levels acceptable.*"

41. I accept that the INP puts this case forward. I also accept that it is true where the measured background noise level is 30 dBA or above.

42. In cases such as in the Gloucester community, where the measured background noise levels can be 26 dBA in the day time and 24 dBA in the evening, I cannot accept this statement.

43. Annoyance due to intrusive noise levels is primarily due to the emergence of a noise above the background noise level. In Gloucester, at 19A Boorer, for example (SLR, Table 14), the emergence can be 11 dB above a background of 24 dBA during the evening, which is significantly greater than 5 dB, which is commonly regarded as acceptable.

44. To provide some understanding of the implication of this large emergence, I refer to Appendix E in AS1055-1973,[1] attached to this report as Datasheet AC519.

45. Appendix E states that an exceedance of 0-5 dB above the acceptable noise level will have "Marginal" Public reaction.

46. Appendix E states that an exceedance of 10-15 dB above the acceptable noise level will have "Medium" Public reaction and sporadic and widespread complaints to threats of community action.

47. Appendix E states that an exceedance of 15-20 dB above the acceptable noise level will have "Strong" Public reaction and widespread complaints to threats of community action.

48. The emergence of 11 dB above the background noise level is comparable to an exceedance of 6 dB above the acceptable noise level, using a 'background + 5 dB' criteria.

49. It is my opinion that while the INP allows a noise criteria of 35 dBA in very quiet rural communities, this does not protect the community against noise pollution and certainly does not protect 90% of the people 90% of the time. In my opinion, this is a major failing of the INP.

Voluntary Land Acquisition and Mitigation Policy

50. Following this argument, in areas with low background noise levels, such as Gloucester, I contend that the exceedance of a noise criteria by 0-2 dB above the PSNL is NOT considered negligible as stated in the SLR report.

51. In fact these noise levels can be 13 dB above the background noise level, which in any other situation would be considered a significant exceedance.

52. For the Voluntary Land Acquisition Policy (VLAMP) to state noise levels of 0-2 dBA are 'not discernible by the average listener and therefore would not warrant receiver based treatments or controls' is misleading given the emergence can be 13 dB above the background noise level.

[1] AS1055 has been updated several times since 1973, however the Table referred to has been removed in later editions. To my knowledge, the information in the Table has not been demonstrated to be incorrect.

53. It is my opinion that for quiet rural communities, special consideration should be given and the PSNL should be achieved through noise mitigation and management measures at all privately owned residences.

54. In locations where the PSNLs cannot be met, treatments to residences or land acquisition should be offered, without allowing up to a further 5 dB above the PSNL before these offers are made.

Low Frequency Noise Criteria

55. Section 4.3.2 of the SLR Report refers to the Warkworth Continuation Project Environmental Assessment Report and makes an argument that the Broner Low Frequency Noise Criteria should be applied.

56. The Broner criterion was not endorsed by the Planning Assessment Commission in that process, the Land and Environment Court in the Warkworth Appeal or the EPA in their Draft Industrial Noise Guideline (DING).

57. It is surprising that SLR rely on the Broner criterion when neither the current INP nor the proposed DING mention it at all.

58. The SLR low frequency noise assessment should be carried out in accordance with the INP, which requires a C-A difference of greater than 15 dB for the modifying factor to be applied.

59. It is reasonable for the threshold of hearing for low frequency noise to also be considered as drafted in the DING.

60. It is irresponsible to defer to the unauthorized Broner Method to enable easier compliance in the low frequency range.

61. The INP states "where a noise source contains certain characteristics, such as ... dominant low-frequency content, there is evidence to suggest that it can cause greater annoyance than other noise sources at the same noise level".

62. It is understood that the assessment is made at the receiver not at the source. If the dominant low frequency is present, then the evidence suggests it is likely to cause greater annoyance.

63. Section 4.3.3 of the SLR report downplays this and suggests that if the dominant low frequency is due to distance attenuation only it is a perverse outcome. I disagree.

64. If the dominant low frequency is present due to operation of the coal mine, regardless of why is it present, then it is likely to cause greater annoyance and therefore should be penalised in accordance with the INP modifying factors.

65. Until the Broner Method is adopted as a reliable indicator of annoyance, then it should not be used for assessment of low frequency noise.

Sleep Disturbance Assessment

66. It is noted that the amended Project is not proposed to operate at night and therefore a sleep disturbance assessment is not required.

67. I agree with the SLR report in Section 4.4, with one exception.

68. The fourth paragraph commencing "It is noteworthy" contains a statement that "It follows, that an external $L_{A1(1\ minute)}$ noise criteria of 60 dBA would appear to be consistent with the current research to this matter".

69. The reference to $L_{A1(1\ minute)}$ is an error as it should be L_{Amax}.

70. $L_{A1(1\ minute)}$ is always lower than the L_{Amax}.

71. The EPA allow the L_{Amax} to be substituted for $L_{A1(1\ minute)}$ which results in a higher predicted noise level (ie more conservative).

72. I have never seen, and I suggest the EPA do not allow the reverse, being the $L_{A1(1\ minute)}$ substituted for L_{Amax} as this would allow a higher noise level prediction.

Proposed Noise Controls

73. Table 25 of the SLR Report shows the calculated evening operational intrusive noise levels across a range of years, together with examples of mitigation and the 'Achievable Noise Levels' predicted after two stages of equipment shutdowns.

74. The Table shows that during a 3 m/s southerly wind, noise levels in the order of 35-40 dBA will be common during all years.

75. The noise mitigation relies heavily on continual real time monitoring to determine the weather conditions and noise levels from the mine.

76. From experience at other mine sites and in discussion with communities near mine sites, an unacceptable noise impact is common as often an exceedance occurs, then some hours later, the mining equipment may be shutdown.

77. It is preferable for the mitigation to rely on passive controls such as noise controls to equipment and barriers rather than rely on the continual monitoring by the mine.

78. It is unacceptable for the community or the EPA to be required to police the noise emission to prove that exceedances occurred.

79. On page 1-59 of the SLR report it states "*GRL considers that it is not reasonable to further reduce mine operational intrusive noise levels at properties 6 Campbell (40 dBA with shutdowns) and 7 Ansell Murray (36 dBA with shutdowns) due to their proximity to the Mine Area*". No reason is given for this.

80. The report should determine the noise controls required to achieve the PSNL and then discuss the reasonableness of those controls.

Stephen Gauld, BE (Mech), MEngSc (Noise and Vibration), MIEAust, MAAS
Managing Director and Principal Acoustical Engineer

On behalf of Day Design Pty Ltd

APPENDICES

- **Appendix A** – Stephen Gauld's Curriculum Vitae
- **Appendix B** – List of Documents Supplied and Read
- **Appendix C** – Summary of Acoustic Terminology
- **AC519** – Public Reaction to Noise

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Curriculum Vitae

Stephen Gauld

Stephen Gauld is the Managing Director of Day Design Pty Ltd and works in a technical capacity as the Principal Acoustical Engineer. Stephen provides oversight on all projects and checks the majority of the reports that leave the office. He manages the larger projects and provides training to staff in acoustic measurement and noise control design. Sound level meters and long-term noise monitors are used in the field to measure different types of noise sources and computer software is used to analyse and design noise control.

Qualifications:

Bachelor of Engineering (Mechanical),
University of New South Wales (1997)

Masters of Engineering Science (Noise & Vibration),
University of New South Wales (2007)

Memberships:

Member - Institution of Engineers Australia (2001)

Member - Australian Acoustical Society (2001)

Corporate Member – Association of Australian Acoustical Consultants

Professional Experience:

February 2004 - Present
Managing Director and Principal Acoustical Engineer
Day Design Pty Ltd

October 1998 – February 2004
Consulting Acoustical Engineer
Day Design Pty Ltd

November 1997 – October 1998
Acoustical\Quality Engineer
Acoustic Dynamics Pty Ltd, Glebe, NSW
Consulting Acoustical Engineers

A short overview of the nature of **Mr Gauld's Professional Experience** is provided below:

Churches and Places of Worship:	Thornleigh Uniting Church; Corrimal Uniting Church; Glenmore Park Anglican Church; St Johns Church Kirribilli; Roseville Uniting Church; Lakes Baptist Church; Dapto Anglican Church; Heathcote Gospel Trust; Holy Family; Marayong.
Schools and Child Care Centres:	Schools located at Prestons, Bass Hill, Greenacre, Edensor Park. Childcare Centres located at Kingsgrove, Greenacre, Quakers Hill, Gymea, Kirrawee, Mount Annan and Thornleigh.
Hotels/Clubs	Bangor Tavern; Narellan Hotel; Billabong Hotel; Royal Oak Hotel; Dooleys Lidcombe Catholic Club; Easts Leagues Club; Gymea Hotel; Summer Hill Hotel; St Johns Park Bowling Club; Five Dock RSL Club; Royal Hotel at Richmond; Welcome Inn at Thirlmere; Wentworth Leagues Club.
Hearing Loss Assessments:	Assessment of occupational noise exposure for many and varied occupations including but not limited to, sheet metal workers, printers, labourers, hotel employees and drivers.
Industrial and Mining:	Gulf Conveyor Engineering - Appin Colliery main conveyor; BHP Billiton Illawarra Coal – West Cliff Mine; IE Engineered Products – New Ackland Coal Mine machinery; Hanson Construction Materials – Hanson's Quarry, Seaham.
Legal Assignments:	SHCAG Pty Ltd v the Minister for Planning and Infrastructure & Anor, Berrima Colliery Dewharp Pty Ltd v Sutherland SC, Night Club Noise Impact; Ghassibe v Wingecarribee SC, Dog Breeding Facility; Shelly Bear Pty Ltd v Canterbury CC, Child Care Centre; Martin v Camden Council, Child Care Centre; Robert Creed Architects v Strathfield MC, Residential Development Spiro Houteas v Parramatta CC, Residential Development.
Occupational Noise:	Pilkington Alexandria and Ingleburn; United Group Rail; Franklins; Transfield Services; King Gee Clothing; Tyco Electronics.
Residential:	Building Defect Claims - Sydney Mansions and 'The Rivage'; Collins Street, Kiama; Gymea Bay Rd, Gymea Bay; Chapel Street, Rockdale; Auburn Centre; Main St, Blacktown; Taylor Street, Annandale; Queen Victoria Street, Bexley; Willoughby Rd, Crows Nest; Trelawney Street, Woollahra.
Traffic:	Casula Powerhouse Arts Centre; Davies Road Expansion at Padstow; Lindenwood Development at Kellyville; Residential Units at McEvoy Street, Alexandria; President Avenue, Miranda; Bulwara Road, Ultimo; Soho Apartments, Waterloo.

List of Documents Supplied and Read:

6062-1
Appendix B

1. Division 2, Part 31 of the *Uniform Civil Procedure Rules 2005*
2. Expert Witness Code of Conduct
3. NSW Industrial Noise Policy – January 2000
4. Amended Rocky Hill Coal Project – Part 1 Noise, Vibration and Blasting Assessment – July 2016
5. *A Simple Outdoor Criterion for Assessment of Low Frequency Noise Emission* by Dr Norm Broner, Acoustics Australia 2011 Vol 39 No 1

GLOSSARY OF ACOUSTICAL TERMS

Appendix C

Sheet 1 of 2

AMBIENT NOISE – The ambient noise level at a particular location is the overall environmental noise level caused by all noise sources in the area, both near and far, including road traffic, factories, wind in the trees, birds, insects, animals, etc.

BACKGROUND NOISE LEVEL – Silence does not exist in the natural or the built-environment, only varying degrees of noise. The Background Noise Level is the average minimum dBA level of noise measured in the absence of the noise under investigation and any other short-term noises such as those caused by cicadas, lawnmowers, etc. It is quantified by the L_{A90} or the dBA noise level that is exceeded for 90 % of the measurement period (usually 15 minutes).

- **Assessment Background Level (ABL)** is the single figure background level representing each assessment period – day, evening and night (ie three assessment background levels are determined for each 24hr period of the monitoring period). Determination of the assessment background level is by calculating the tenth percentile (the lowest tenth percent value) of the background levels (L_{A90}) for each period (refer: NSW Industrial Noise Policy, 2000).
- **Rating Background Level (RBL)** as specified by the Environment Protection Authority is the overall single figure (L_{A90}) background noise level representing an assessment period (day, evening or night) over a monitoring period of (normally) three to seven days.

  The RBL for an assessment period is the median of the daily lowest tenth percentile of L_{90} background noise levels.

  If the measured background noise level is less than 30 dBA, then the Rating Background Level (RBL) is considered to be 30 dBA.

dBA – The human ear is less sensitive to low frequency sound than high frequency sound. We are most sensitive to high frequency sounds, such as a child's scream. Sound level meters have an inbuilt weighting network, termed the dBA scale, that approximates the human loudness response at quiet sound levels (roughly approximates the 40 phon equal loudness contour).

However, the dBA sound level provides a poor indication of loudness for sounds that are dominated by low frequency components (below 250 Hz).

dBC – The C-weighting adjustment takes into account the low-frequency component of noise within the audibility range of humans. If the difference between the "C" weighted and the "A" weighted sound level is 15 dB or more, then the NSW Industrial Noise Policy recommends a 5 dB penalty be applied to the measured dBA level.

EQUIVALENT CONTINUOUS NOISE LEVEL, L_{Aeq} – Many noises, such as road traffic or construction noise, vary continually in level over a period of time. More sophisticated sound level meters have an integrating electronic device inbuilt, which average the A weighted sound pressure levels over a period of time and then display the energy average or L_{Aeq} sound level. Because the decibel scale is a logarithmic ratio the higher noise levels have far more sound energy, and therefore the L_{Aeq} level tends to indicate an average which is strongly influenced by short term, high level noise events. Many studies show that human reaction to level-varying sounds tends to relate closely to the L_{Aeq} noise level.

FREQUENCY – The number of oscillations or cycles of a wave motion per unit time, the SI unit being the Hertz, or one cycle per second.

GLOSSARY OF ACOUSTICAL TERMS

Appendix C

INTRUSIVE NOISE LEVEL, L_{Aeq} – The level of noise from a factory, place of entertainment, etc. in NSW is assessed on the basis of the average maximum noise level, or the $L_{Aeq\ (15\ min)}$. This is the energy average A weighted noise level measured over any 15 minute period.

MAXIMUM NOISE LEVEL, L_{Amax} – The rms maximum sound pressure level measured on the "A" scale of a sound level meter during a noise survey is the L_{Amax} noise level. It may be measured using either the Fast or Slow response time of the meter. This should be stated.

NOISE – Noise is unwanted sound. Sound is wave motion within matter, be it gaseous, liquid or solid. "Noise includes sound and vibration".

OFFENSIVE NOISE - (Reference: Dictionary of the Protection of the Environment Operations Act 1997). *"Offensive Noise means noise:*

(a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:

(i) is harmful to (or likely to be harmful to) a person who is outside the premise from which it is emitted, or

(ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or

(b) that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances prescribed by the regulations."

SOUND PRESSURE LEVEL, L_p – The level of sound measured on a sound level meter and expressed in decibels, dB, dBA, dBC, etc. $L_p = 20 \times \log (P/P_o)$ ... dB

where P is the rms sound pressure in Pascal and P_o is a reference sound pressure of 20 μPa. L_p varies with distance from a noise source.

SOUND POWER LEVEL, L_w – The Sound Power Level of a noise source is an absolute that does not vary with distance or with a different acoustic environment.

$L_w = L_p + 10 \log A$ ... dB, re: 1pW,
where A is the measurement noise-emission area in square metres in a free field.

STATISTICAL EXCEEDENCE SOUND LEVELS, L_{A90}, L_{A10}, L_{A1}, etc – Noise which varies in level over a specific period of time (usually 15 minutes) may be quantified in terms of various statistical descriptors:

The L_{A90} is the dBA level exceeded for 90 % of the time. In NSW the L_{A90} is measured over periods of 15 minutes, and is used to describe the average minimum or background noise level.

The L_{A10} is the dBA level that is exceeded for 10 % of the time. In NSW the L_{A10} measured over a period of 10 to 15 minutes. It was until recently used to describe the average maximum noise level, but has largely been replaced by the L_{Aeq} for describing level-varying noise.

The L_{A1} is the dBA level that is exceeded for 1 % of the time. In NSW the L_{A1} may be used for describing short-term noise levels such as could cause sleep arousal during the night.

Estimated Public Reaction to Noise AC519

APPENDIX E

ESTIMATED PUBLIC REACTION TO NOISE WHEN THE ADJUSTED MEASURED NOISE LEVEL EXCEEDS THE ACCEPTED NOISE LEVEL

Amount in dB(A) by which Adjusted Measured Noise Level exceeds the Acceptable Noise Level	Public reaction	Expression of public reactions in a residential situation
0 - 5	Marginal	From no observed reaction to sporadic complaints
5 - 10	Little	From sporadic complaints to widespread complaints
10 - 15	Medium	From sporadic and widespread complaints to threats of community action
15 - 20	Strong	From widespread complaints to threats of community action
20 - 25	Very strong	From threats of community action to vigorous community action
25 and over	Extreme	Immediate direct community and personal action

Appendix 3.

The Mine Viability and its Implications

Michael Bowman

1: INTRODUCTION:

The viability of the Rocky Hill Coal Project should not be the concern of the Planning Department.

Companies should be free to make their own decisions on what is viable commercially to them and their shareholders.

However it is the Planning Department's responsibility to ensure that all aspect of the EIS from the payment of royalties and taxes, to the community benefits and even the completion of all repatriation works will be possible. This is dependent entirely on the ongoing viability of the project.

If the situation exists that this viability is questionable, then, serious doubts are raised as to either the ability of the company to produce the results outlined in the EIS, or are there other factors that would contribute to the ongoing viability that are not being stated.

This is definitely the case with The Rocky Hill Coal Project.

2: VIABILITY:

A project's viability is simply the relationship between the total potential income from the sale of product and the total expenses involved in its production. If the income exceeds the expenses to the extent that it satisfies the owners or shareholders then it is viable.

Viability is not discussed in the EIS but information supplied by Gloucester Resources Limited or its various consultants allows this be assessed.

The incomes and expenses expressed in the EIS and accompanying SCSC are done so in both exact dollar amounts and as net present value amounts.The table below details the revenues and expenses in both. Information on the methodology used in the conversion of NPV amounts to actual dollars is included.

The table has been produced primarily from the identical tables Table 4.83 in Section 4.18 of the EIS and Table 4.2 Section 4.3 of Part 15 of the SCSC.

Precise definitions of each item are covered in parts 4.3.1.2 to 4.3.1.14 and 4.3.2 to 4.3.4 of part 15 of the SCSC.

It should be noted that this table covers the years 2018 to 2034, presumed to be the first 16 years of the project and not including any of the 3 rehabilitation years.

Table 2.1

ITEM	Project Case $m, NPV	Project case $m, Actual	NPV as a % of actual
INCOME			
Total Revenue	**793.6**	**1803.4**	
Gross Mining Revenue	793.6	1803.4[1]	44.01%
Residual value of land	0		
Residual value of capital	0		
EXPENSES	**714.2**	**1559.64**	
Total Costs	**583.6**	**1253.52**	46.56%
Operating Cost	490.6	1115.0[4]	44.00%
Capital Costs	81.4	119.0[3]	68.40%
Decommissioning Costs			
Environmental mitigation Costs	0.7	1.59[4]	44.00%
Transport management Costs			
Rehabilitation Costs			
Purchase Costs for Land	8.0	11.43[5]	70.00%
Local Contributions	2.9	6.5[2]	44.62%
Total Taxes	**67.2**	**162.12**	
Corporate Income Tax	59.8	146.0[2]	40.96%
Payroll Tax	3.9	8.86[4]	44.00%
Local Government Taxes	3.5	7.26[2]	48.21%
Total Royalties	**63.4**	**144.0**	
Ad Valorem Coal Royalties	63.4	144.0[2]	44.03%
INCOME less EXPENSES	**79.4**	**243.76[6]**	

1. Figure obtained by calculation. The annual amounts of saleable coal from Project Forecast Production Profile 2018-34 (Chart 4.1 Section 4.3.1.2 of Part 15 of the SCSC) totalling 12.76mt coking coal and 0.39mt thermal coal were multiplied by the annual Coal Price Forecasts (Chart 4.2 Section 4.3.1.2 of Part 15 of the SCSC)) for each respective year and coal type.
2. Figures obtained from Section 4.18.12 of the EIS headed Actual Financial Payments and Net Present Values.
3. Figure obtained by totalling amounts on Chart 4.5 Amended Project Capital Costs 2018-2034

4. Figure obtained by calculation. Operating Costs, Payroll Tax and Environmental Mitigation Costs are assumed to be payable throughout the life of the project hence these amounts have been interpolated using the % values for revenue and royalties.
5. Figure obtained by calculation. Land Purchases occur in a pattern approximating that of Capital expenditure. With a weighting to earlier stages of the project, a % factor similar to Capital Expenditure has been used.
6. Figure represents the balance between income and expenses

If at this point we make the assumption that the figures provided by Gloucester Resources Limited are accurate, the assumptions and forecasts by various consultants to be true and the compilation and presentation of these figures by Deloitte to be correct then the Rocky Hill Coal Project will show a Net Producer Surplus to owners and shareholders of

$Am243.76 in Actual Dollars or $m79.4 NPV dollars.

2.1: ANALYSIS OF INCOME (as shown):

The income derived from the sale of the coal is governed by four factors

- The total amount of coal available
- The percentage of each particular grade of coal
- The price obtainable at any given time for that coal
- The relationship between the $A and the $US at any given time

2.1.1: Coal Availability

Figures provided by GRL would indicate that a total of 21mt of ROM coal would be extracted, this in turn would result in approximately 13mt of saleable coal.

2.1.2: Coal Quality

GRL also indicate that the 13mt will consist of 97% metallurgical coking coal and 3% thermal coal.

Whilst we are in no position to argue the validity of these figures it is of interest that:

- The ratio of coking to thermal at 97:3 is massively different to the 40:60 last extracted from the same coal seam configurations at the adjoining Stratford Mine.
  This represents a significant increase in value of 25% over that of Stratford mix compared to Rocky Hill mix.
  This would amount to over $Am360 given the income stated in the table.

- The metallurgical coal will not only be of the highest grade hard coking coal it will also be one of the highest fluidity coals available in Australia allowing a premium to be charged.

2.1.3: Coal Pricing

The price obtainable used in the table above indicates a sharp rise in value for coking coal per tonne from $A125 to $A139 averaging $A137.82 over the entire life of the mine. This represents a figure of 90% of a consensual forecast figure. Therefore the consensual forecast would be $A153 per tonne. Today's value of premium **hard coking coal** (not GRL's lesser **semi-hard**) varies around the $A110 to $A120 per tonne.

This would require a significant increase of 33% in today's Premium Hard Coking Coal price to be achievable – and sustained over that level for the entire life of the mine.

This is highly unlikely according to predictions readily available from numerous industry sources.

2.1.4: Currency Exchange rate

The current exchange rate sits at approximately $A 1 = $US 0.75. There is no reason to assume any significant change to the dollar ratio in the near future at least.

2.2: ANALYSIS OF EXPENSES (as shown)

The expenses outlined in Table 2.1 fall into three main categories

- Costs
- Taxes
- Royalties

There is little need to discuss taxes or royalties other than to state that they are entirely dependent on either volume of coal or employment numbers with the exception of Local Government Rates. Any early closure of the mine due to unviability, either temporary or permanent, would significantly impact these figures.

Costs form the bulk of the expenses incurred and consist in this case of eight main components. Only operating costs have been reviewed for the purpose of this submission, other costs will be assumed to be as stated.

2.2.1: Operating Cost

" Operating costs encompass the expenditure incurred as a direct result of extracting ROM coal, processing it into a saleable product and delivering it to a port before loading – known as free on board (FOB) costs – as well as ongoing expenditure on the purchase and maintenance of equipment

and machinery necessary for production, environmental monitoring, mitigation and rehabilitation activities." Section 4.3.1.5 part 15 SCSC.

The mine operating cost are broadly divided into five main groups:

- Machinery Costs
  - Initial Costs
  - Maintenance
  - Fuel
- Wages and Associated Costs
- Coal preparation and Delivery Costs
- Power Costs
- Other Costs

2.2.1.1: Machinery Costs

Machinery costs cover obtaining the machinery for the period required, plus all the operating costs of that machinery, provision of lubricants and replacement of broken and worn components, tyres, etc. The single largest operating expense is fuel and therefore is treated separately.

2.2.1.1.1: **16 year Machinery Costs** can be either the outright purchase cost or leasing amount over the period required. The Mobile Machinery to be used over the 16 year period is based on the Indicative Mobile Equipment List supplied by GRL in table 2.6 Section 2.7.5 of the EIS.

type	**Model**	**Qty. required[1]**	**$m Cost / unit[2]**	**Total $m Cost**
Drill	Terex (SKF 12)	2	0.5	1.0
Excavators	70t (PC850)	1	0.6	0.6
	120t (PC1250)	1.9375	1.0	1.94
	200t (994-200)	1	1.5	1.5
	350t (EX3600)	1.375	2.0	2.75
Haul Truck	Cat (789XQ)	6.375	5.0	31.88
	Haulmax (3900 EQ)	8.1875	5.0	40.94
Scraper	657G	2	2.0	4.0
Grader	16H	1	0.4	0.4
Front End Loader	Cat 992	1	0.6	0.6
Bulldozer	D10XQ	1	1.5	1.5
	D11XQ	2.75	1.5	4.13
	Rubber Tyre	1	0.6	0.6
	690RTD			
Water Cart*	Road truck	1	5.1	5.1

	Cat777XQ	1		
Fuel Truck		1	0.2	0.2
Coal Haulage	Euro 5 Prime mover 2 x trailers plus dolly	7.9375	0.75	59.53
TOTAL				**156.67**

*included as one vehicle

1. Total machine years (sum of number of units years 1-16) divided by 16
2. Based on information in supplied by Hitachi, Komatsu, Liebherr and Westrac (2013) on exact or equivalent models.

The total purchase cost of the mobile machinery listed above is $156.67m

Advice from Westrac Finance and CBA Finance suggests that large machinery purchases such as this are generally by way of lease over 5 years with 50% residual (rates typically 5.8% - 6.5%). The machinery is then traded, new machinery is released and so on for the term of the project.

Lease payment payable on $156.67m over 16years @ 6% = $150.40m

2.2.1.1.2: **Maintenance of vehicles** is generally by way of contract.
Additional would be tyres, lubricants, components and replacement parts.
Includes contract labour but not GRL labour cost.

Cost $1.0m / year = total $16m over 16 years.

2.2.1.1.3: **Fuel** usage is outlined in Table 2.8 Estimated Annual Fuel Section 2.10.3 of the EIS
Usage totalling 135.9ml. Over 16 years. At a nominal value of $1.10/l delivered.

Cost $149.49m over 16 years

2.2.1.2: Wages and Associated Costs

Wages and associated costs are based on the number of people employed at any given time and the average wage paid. There are four key elements.

- Direct pre-tax wages
- Provision for annual, sick and long service leave
- Superannuation guarantee contribution
- Workers compensation insurance

2.2.1.2.1: **16 year Direct Wages** are based on employment numbers for the 16 years are outlined in part 2.14.2 of section 2.14 of the EIS. Section 5.3 Local Employment Effects of Part 15 of the SCSC outlines the average net FTE

income for employees as $73941 (post tax) using the current ATO tax schedule this is equivalent to $101500 (pre-tax)

Employee Numbers per period….total wages per period

Year 1	Year 2	Year 3	Year 4	Years 5-14	Year 15	Year 16
45	60	85	105	110	100	90
$4.568	$6.09	$8.628	$10.658	$111.65	$10.15	$9.135

Wages total for 16 years = $160.88m

2.2.1.2.2: **Superannuation Guarantee** is currently 9.5% of the Gross Wage.

Total Payable = $15.28m

2.2.1.2.3: **Provisions** for sick leave (1 week / year) and holiday leave (4 weeks per year) per employee. Total employee years 1585 x weekly pay $1952

Total Payable = $3.09m

2.2.1.2.4: **Workers Compensation** based on figure supplied for 110 employees in the mining industry earning a total of $11.17m annually (based on information supplied by GIO given the employee numbers, wage and employment classification)

Total Payable = $6.6m

2.2.1.3: Coal Preparation and Delivery Costs

These are outlined in section 4.3.1.5 of Part 15 of the SCSC at $28.99/tonne of product coal. With 13mt of product coal to be processed through the Stratford mine.

Total Payable = $376.87m

2.2.1.4: Power Costs

These are outlined in section 2.10.1 of the EIS and are estimated at 290,000MW hours over the 16 operational years. At a rate of $0.15/kw hour

Total Payable = $43.5m

2.2.1.5: Other Costs

These are all those other cost from explosives to toilet paper required to be expended during the 16 years. The total of which is simply the mathematic difference between the total and the sum of the above aforementioned costs

Total Payable = $192.89m

Table 2.2

ITEM	Project Case $m, NPV	Project case $m, Actual	Revised Costs
INCOME			
Total Revenue	**793.6**	**1803.4**	**1803.4**
Gross Mining Revenue	793.6	1803.4[1]	1803.4
Residual value of land	0		
Residual value of capital	0		
EXPENSES	**714.2**	**1559.64**	**1559.64**
Total Costs	**583.6**	**1253.52**	**1253.52**
Operating Cost	490.6	1115.0[4]	1115.0
Machinery			**315.89**
Purchase / lease			150.40
Maintenance			16.00
Fuel			149.49
Wages & Associated Costs			**185.85**
Wages			160.88
Superannuation			15.28
Provisions			3.09
Workers Compensation			6.60
Coal Preparation & Delivery			**376.87**
Power			**43.5**
Other Costs			**192.89**
Capital Costs	81.4	119.0[3]	119.00
Decommissioning Costs			
Environmental mitigation Costs	0.7	1.59[4]	1.59
Transport management Costs			
Rehabilitation Costs			
Purchase Costs for Land	8.0	11.43[5]	11.43
Local Contributions	2.9	6.5[2]	6.5
Total Taxes	**67.2**	**162.12**	**162.12**
Corporate Income Tax	59.8	146.0[2]	
Payroll Tax	3.9	8.86[4]	
Local Government Taxes	3.5	7.26[2]	

Total Royalties	**63.4**	**144.0**	**144.0**
Ad Valorem Coal Royalties	63.4	144.0[2]	
INCOME less EXPENSES	**79.4**	**243.76[6]**	**243.76**

2.3: REVENUE ASSUMPTIONS AND EXPENSE OMISSIONS

2.3.1: Revenue Assumptions

The revenue outlined in the table provided in the EIS is based on crystal ball forecasts in relation to the coal price and currency exchange rates over a 16 year period starting 2 years from today. The volatility of the coal price is graphically shown below - thermal coal varying from $US 23/tonne to nearly $US 200/tonne

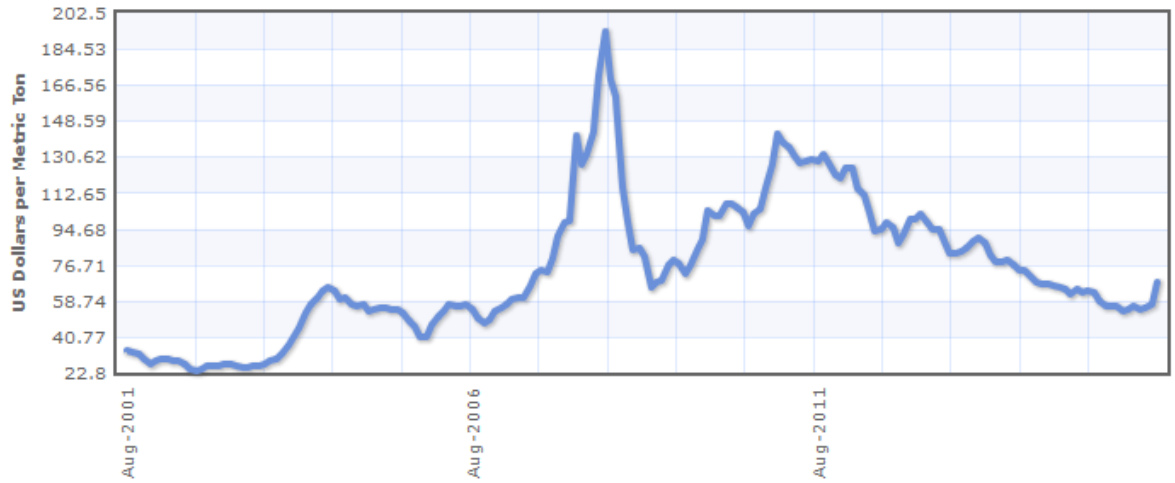

Chart above from index mundi

Similarly the currency exchange rate has fluctuated from lows of $A 0.64 to highs of $A 1.10 against the $US

This could potentially value thermal coal at anywhere from $A 312.50 / tonne to $A 20.91 / tonne given the best and worst cases being aligned.

It would make complete sense when looking at the Projects Viability to assess everything at today's value then vary the parameters to test the future viability of the project.

The revenue from the Rocky Hill Mine today is based on:

- 13mt of product coal
- 97% or 12.61mt of premium hard coking coal and 3% or 0.39mt thermal coal
- Pricing for premium hard coking coal $US 90.00 / tonne (Note GRL's claim is semi-hard)
- Price for thermal coal $US 70.00 / tonne
- $A 1 equals $US 0.75

This produces revenue of

- 12.61mt at $A120.00 / tonne = $A1513.20
- 0.39mt at $A93.33 / tonne = $36.40

Total Mine Revenue at today's price and exchange rate = $A1549.60

2.3.2: Expense Omissions

In assessing viability, all expenses must be taken into account not just those incurred during the years of coal production as presented by GRL.

- For this project significant costs have already been incurred ranging from land purchases, licence fees, to preparation of the EIS itself.

- The FOB costs outlined in the EIS do not take into account the extensive off-site construction and construction costs of on-site infrastructure.

- At the cessation of coal removal, 3 years of rehabilitation will begin. These extensive costs must be considered.

2.3.2.1: Preapproval Costs

Includes but is not limited to the cost of licences, land acquisitions, wages (both employee and contractors), EIS preparation costs including consultant fees and government taxes and charges.

Total Estimated Cost = $60.00m

2.3.2.2: Non FOB costs

These include all expenses incurred, both on and off site prior to any coal extraction. These would include but not be limited to:

- Construction and provision of mine site infrastructure including offices, workshop, fuel depot, construction of service infrastructure, water mitigation works, boundary and security fencing and construction of the Breaker Station and ROM pad.

  Total Estimated Cost = $15m

- Design and construction of the 4.4km haul road, loop road and sized coal stockpile area, bridge and underpass works. Includes contracted labour and material delivery to site. Estimated cost based on $2000 per metre.

  Total Estimated Cost = $10.8m

- Design and construction of off-site works as outlined in 2.6.6 of Section 2 of the EIS. Significant cost is involved in a number of road upgrading projects away from the mine site. Cost would include design and construction costs as well as contract labour and material supply.

  Total Estimated Cost = $5m

This would give a non-FOB costs of = $30.8m

2.3.2.3: 3 Year Rehabilitation Costs

Rehabilitation to fill the void, develop the final landform and decommission the mine site has three years of substantial costs. The main areas of cost are the same as incurred during the operational years.

2.3.2.3.1: 3 year Machinery Costs

The mobile machinery that is required for rehabilitation works varies in composition from that of the operational phase notably by the elimination of the drills, smaller excavators, haul trucks and road haulage vehicles. Calculation of the costs uses the same method and criteria as the 16 operational years.

type	Model	Qty. required[1]	$m Cost / unit[2]	Total $m Cost
Excavators	200t (994-200)	0.67	1.5	1.01
	350t (EX3600)	2	2.0	4.0
Haul Truck	Cat (789XQ)	7.67	5.0	38.35
	Haulmax (3900 EQ)	2	5.0	10
Scraper	657G	2.33	2.0	4.66
Grader	16H	1	0.4	0.4
Bulldozer	D11XQ	3.67	1.5	5.51
	Rubber Tyre	1	0.6	0.6
	690RTD			
Water Cart*	Road truck	1	5.1	5.1
	Cat777XQ	1		
Fuel Truck		1	0.2	0.2
TOTAL				**69.83**

1. Total machine years (sum of number of units years 17-19) divided by 3
2. Based on information in supplied by Hitachi, Komatsu, Liebherr and Westrac (2013) on exact or equivalent models.

The total purchase cost of the mobile machinery listed above is $69.83m

Advice from Westrac Finance and CBA Finance suggests that large machinery purchases such as these are generally by way of lease over 5 years with 50% residual (rates typically 5.8% - 6.5%). The machinery is then traded, new machinery is re-leased, and so on for the term of the project.

Lease payment payable on $156.67 over 3years @ 6% = $12.57

2.3.2.3.2: Maintenance of vehicles is generally by way of contract.
Additional would be tyres, lubricants, components and replacement parts.
Includes contract labour but not GRL labour cost.

Cost $1.0m / year total = $16m over 3 years.

2.3.2.3.3: **Fuel** usage is outlined in Table 2.8 Estimated Annual Fuel section 2.10.3 of the EIS.
Usage totalling 18.4ml. Over 16 years. At a nominal value of $1.10/l delivered.

Cost = $20.24m over 3 years

2.3.2.4: **3 year Direct Wages** are based on employment numbers for the 3 years as outlined in part 2.14.2 of Section 2.14 of the EIS. Section 5.3.

Employee Numbers per period….total wages per period

Year 17	Year 18	Year 19
75	67	60
$7.61	$6.80	$6.89

Wages total for 3 years = $20.5m

2.3.2.4.1: **Superannuation Guarantee** is currently 9.5% of the Gross Wage.

Total Payable = $1.95m

2.3.2.4.2: **Provisions** for sick leave (1 week / year) and holiday leave (4 weeks per year) per employee. Total employee years 1585 x weekly pay $1952.

Total Payable = $0.39m

2.3.2.4.3: **Workers Compensation** based on figure supplied for 110 employees in the mining industry earning a total of $11.17m annually (based on information supplied by GIO given the employee numbers, wage and employment classification).

Total Payable = $0.84m

3: PROFITABILITY

The table below outlines the profitability after adjusting the figures provided in Section 4.3 of Part 15 of the SCSC by:

- Changing the revenue to reflect today's coal prices and currency exchange rates.
- Including those costs that have already been expended and would be incurred prior to the start of coal production.
- Including those costs that would be incurred in the post-production rehabilitation phase.

Table 2.3

ITEM	Adjusted Project case $m, Actual (Sept 2016)
INCOME	
Total Revenue	**1549.60**
Gross Mining Revenue	1549.60
EXPENSES	**1709.93**
Total Operating Costs	**1403.81**
Pre-Approval Costs	**60.0**
Mine development expenses	**30.8**
Machinery	**351.7**
Purchase / lease	162.97
Maintenance	19.00
Fuel	169.73
Wages & Associated Costs	**209.53**
Wages	181.38
Superannuation	17.23
Provisions	3.48
Workers Compensation	7.44
Coal Preparation & Delivery	**376.87**
Power	**43.5**
Other Costs	**192.89**
Capital Costs	**119.0**
Environmental Costs	**1.59**
Purchase Costs for Land	**11.43**
Local Contributions	**6.5**
Total Taxes	**162.12**
Corporate Income Tax	146.0
Payroll Tax	8.86
Local Government Taxes	7.26
Total Royalties	**144.0**
Ad Valorem Coal Royalties	144.0
INCOME less EXPENSES	**-160.33**

Given the figure outlined and using GRL figures for:

- Product coal quantity and composition
- Machinery type and duration of use
- Fuel consumption figures
- Employee numbers and wages
- Coal preparation and distribution costs
- Power consumption figures
- Capital Costs
- Environmental Mitigation Costs
- Land purchase costs
- Local contributions
- State, Federal and Local taxation obligations
- State Royalties payable

The mine would LOSE = $160.33m

OR

Loss in NPV terms of $70.55m.

See section 6 for detailed income and expenses.

4: VIABILITY REVISITED

4.1: Consequences of Unviability

The simple consequence is that at some point during life of mine it will cease operation. Cessation may be temporary or become permanent.
Negative financial and social consequences would follow for the State, Federal and Local governments as well as individuals and the local community.

4.1.1: State, Federal and Local Government Consequences

Section 4.3 of part 15 of the SCSC details the costs and benefits to government.

It attributes 5.75% of Profit to NSW. But with a LOSS of $160.33m this would amount to a LOSS of $9.23m to the State. The State would also lose payroll taxes payable on wages and royalties based on coal extraction. These would total a LOSS of $152.86m.

The Federal government would lose the Corporate Income tax payable of -$146.0m and local government taxes of -$7.26m.

The exact LOSSES of potential income depend on the point of closure in the mine's life.

4.1.2: Consequences on individuals and the local community

Section 5 of part 15 of the SCSC outlines the benefits to the mine's employees by way of wages and the flow-on to the local community. It also covers the benefits the community will accrue due to the claimed increased local purchasing and business opportunity the mine will bring. If we assume all this to be true then there would be a swathe of community consequences associated the mine's closure due to lack of viability.

Over the mine's life between 45 and 110 persons might be employed at any given time. They may be long term locals, have moved to Gloucester for the work opportunity, or continue to live out of area. Regardless, if the mine closes they will all be out of a job and the claimed benefits of mine employment will evaporate. More importantly however is the social impact on individuals and their families over loss of employment.

One doesn't have to look any further than to the adjoining Stratford Mine and Duralie to see this scenario in action.

Two years ago approval was given for significant changes in hours of operation and extensions in areas to be mined. This would bring accompanying benefits to the community, the promise of more state royalties and extended and new employment opportunities. A short 2 years later the Stratford mine is all but closed with only a few individuals blending Stratford and Duralie coal and despatching the coal to port. Duralie appears now to have ceased operations.

Employees retrenched, coal still in the ground, benefit to government, community and individuals…. all reduced to Zero. Despite the company promises.

5: CONCLUSION

At what time does a company decide that a project is viable?

A projected LOSS of $160m would hardly be that time.

Given that the costs of the mine are fairly fixed, the potential for the mine to be constructed, operated and finally rehabilitated over a 19 year period rests solely on factors totally beyond the control of the company, the government or any individuals involved.

The world price of coal, the balance of exchange rates, new major industry entrants, and existing under-utilised metcoal production capacity will determine the profitability and therefore the viability of The Rocky Hill Project. The prediction of these factors in the short term is difficult but in the long term have proven historically to be impossible. How can assumptions as to the future coal price as outlined in Chart 4.2 of section 4.3.1.2 of part 15 of the SCSC be given any credence when the erratic nature of prices is so evident historically as outlined in revenue assumptions previously? The volatility of exchange rates simply compounds the issue making an impossible predictive task even more so.

The question then should be raised that if the viability of the mine is so obviously questionable then:

- Why are Gloucester Resources Limited persisting with the push to get the mine approved?
- Why, after all the expense in both finances and time, was the original EIS so drastically modified if not simply just to gain approval?
- Why would the lengthening the years of operation with a reduction in the amount of product coal to be produced and reducing profitability be for any other reason than to just gain approval?
- Why would the scrapping of a “world’s best practice coal loader” in favour of an agreement with an opposition company to provide the vital service of preparation and despatch of your product be a good idea? An agreement that exists nowhere else between two competing entities be for any reason than to just gain approval.

The only conclusion that can be logically drawn is that approval is not being sought to allow development of a new mining entity bring prosperity to all involved but simply to gain approval to extract the resource by way of a mining licence.

Once initial approval is obtained any number of variations may be applied for and based on past experience are usually granted.

If the haulage of coal from Rocky Hill to Stratford to be processed is approved then why would the use of the Stratford fuel depot and shared administration facilities also not be feasible?

If the administration and fuel were moved why upgrade Jacks Rd and McKinley’s lane if access were no longer needed.

What reason would exist not to extend the Stratford Mine to the north and Rocky Hill pits to the south along the coal haulage road conveniently located to the east of the coal bearing Craven Coal Measures?

What reason would there be not to push the 100m high eastern end of the Rocky Hill pit further north through the land known as Maslin's dairy to Jack's Road again along the Craven Coal Measures?

The value of the Rocky Hill Project lies not in its ability to be developed into a viable coal mine but as a vehicle to gain initial approval to mine that could be on sold to others.

6:ROCKY HILL MINE COST ANALYSIS (detail)

INCOME	**$'M**	**$'M**	**$'M**
COAL SALES		**1549.60**	
Total production of product coal 13 million tonnes from extraction of 21 million tonnes of ROM coal *based on $120 per tonne FOB Newcastle for prime hard coking coal 12.61mt* *and $93.33 per tonne FOB Newcastle for thermal coal 0.39mt*			
		TOTAL INCOME	**1549.60**
EXPENDITURE			
PRE APPROVAL EXPENSES		**60.00**	
Includes but is not limited to the cost of Licences, land acquisitions, wages (both employees and contractors), EIS preparation costs including consultant fees and government taxes and charges.			
MINE DEVELOPMENT EXPENCES		**30.80**	
Expenses to be incurred during the establishment and construction phase of the mine (Year 1) Includes but it is not limited to the cost of materials, their transport To site, original designs and engineering and contractor costs. Excludes work performed by Rocky Hill employees or machinery *Based on cost comparisons of similar projects, Council engineering* *input, raw material and quarry product cost.*			
Mine Extraction Area	**15.00**		
Mark Out and Fencing of the Mine Extraction Area including key	**1.00**		

boundaries, the removal of existing fencing and the erection of security fencing.	
Construction of Site Offices and Amenity Buildings including the access road, offices, stores buildings, bath house and carparks.	**2.00**
Construction of Water Management Structures	**2.00**
Construction of the Western and Northern Visibility Barriers	**3.00**
Construction of Service Infrastructure including but not limited to power supply, water supply, fuel depot , communications supply, explosive materials storage and explosive magazines, waste management facilities and sewerage treatment facilities.	**3.00**
Construction ROM pad & Breaker Station including machinery, plant, equipment and earthworks.	**3.00**
Construction of the Workshop including the building machinery, plant and equipment associated with the workshop.	**1.00**
Haul Road and Sized Coal Stockpile	**10.80**
Bridge over Waukivory Creek Including design cost and construction costs, contractors and transport of materials to site.	**1.00**
Fairbairns Road Underpass Including design cost and construction costs, contractors and transport of materials to site.	**1.00**
4.4km of 2 Lane Haul Road including loop road Including design and construction of the road as specified in the EIS	**8.80**
Off Site Construction	**5.00**
Engineering design and construction to relevant standards of the following roads and intersections (as outlined in EIS section 2.5.6)	
Jacks Road & Bucketts Way intersection upgrade providing deceleration lanes on approach.	**0.75**
Jacks Road upgrading and widening of pavement along the full length of the road (approximately 2.7km)	**1.50**
Avon River Bridge on Jacks Road to be constructed	**1.50**
Waukivory Road upgrade from Jacks Road to McKinley's Lane including the construction of the McGinley's lane intersection approximately 1.3km	**0.75**
Jacks Road and Waukivory Road Intersection upgrade	**0.25**

Waukivory Road and McKinley's Lane upgrade and 50m of McKinley's Lane to the mine access road	**0.25**

MINE OPERATIONAL EXPENSES — 1313.01

Expenses to be incurred during the operational life of the mine including the construction, operational and rehabilitation phases. This in no way represents a complete list but only those directly listed by GRL in the EIS or those that can be calculated from the information provided in the EIS.

Earth Moving Machinery Costs — 351.70

Earth Moving Machinery as listed by GRL for use in the mine for the **16 year development and extraction period.** — **315.89**

(vehicles to be used and duration of use as outlined in EIS section 2.7.5 and table 2.6)

	$ Value / unit
Drill - Rotary SKF12	500,000.00
Excavator - 40T 345D	600,000.00
Excavator - 120T PC1250	1,000,000.00
Excavator - 200T 994-200	1,500,000.00
Excavator - 350T EX3600	2,000,000.00
Haul Truck - Cat 789Q & Haulmax	5,000,000.00
Scraper - 657G	2,000,000.00
Grader - 14M	400,000.00
Front end Loader - Cat 988	600,000.00
Bulldozer - D10 / D11	1,500,000.00
Bulldozer -Rubber tyred 844RTD	600,000.00
Water Cart - Road Truck & Cat 777 *	5,100,000.00
Bobcat	100,000.00

* the 2 vehicles are treated as 1 unit due to the large cost difference.

Based on information obtained from Hitachi, Komatsu, Liebherr and Wastrac.

	Quantity Required*
Drill - Rotary SKF12	2
Excavator - 70T PC850	1
Excavator - 120T PC1250	1.9375
Excavator - 200T 994-200	1
Excavator - 350T EX3600	1.375
Haul Truck - Cat 789Q & Haulmax	14.5625
Scraper - 657G	2
Grader - 14M	1
Front end Loader - Cat 988	1
Bulldozer - D10 / D11	3.75
Bulldozer -Rubber tyred 844RTD	1
Water Cart - Road Truck & Cat 777	1

Fuel truck	1
Coal Haulage Truck	7.9375

* quantity required is based on: **machinery years rqd / 16 years**
(the rehabilitation phase machinery requirements are not included)

	16 year Machinery Cost $m
Drill - Rotary SKF12	1.00
Excavator - 70T PC850	0.60
Excavator - 120T PC1250	1.94
Excavator - 200T 994-200	1.50
Excavator - 350T EX3600	2.75
Haul Truck - Cat 789Q & Haulmax	72.82
Scraper - 657G	4.00
Grader - 14M	0.40
Front end Loader - Cat 988	0.60
Bulldozer - D10 / D11	5.63
Bulldozer - Rubber tyred 844RTD	0.60
Water Cart - Road Truck & Cat 777	5.10
Fuel Truck	0.20
Coal Haulage Truck	59.53
Total	**156.67**

Advice obtained from Westrac Finance and CBA finance suggests that machinery purchases such as this generally by way of lease, typically over 5 years with 50% residual (current rates 5.8% -6.5%)
The machinery is then traded, new machinery is released and so on for the term of the project.

Interest Payable on $156.67m over 16years at 6% or purchase cost total $150.40m **150.40**

Maintenance of vehicles including but not limited to lubricants and parts for standard servicing, tyres and other components replaced due to wear and components replaced due to breakdown. Includes contract labour but not GRL employee labour **16.00**

Fuel delivered by semi-trailer tankers. **149.49**
(as outlined in EIS Section 2.10.3) 135.9ml

(price of diesel fuel delivered to site $1.10 / litre)

Earth Moving Machinery as listed by GRL for use in the mine for the 3 year rehabilitation period. **35.81**

(vehicles to be used and duration of use as outlined in EIS Section 2.7.5 and Table 2.6)

	$ Value / unit
Excavator - 200T 994-200	1,500,000.00
Excavator - 350T EX3600	2,000,000.00
Haul Truck - Cat 789Q & Haulmax	5,000,000.00

Scraper - 657G	2,000,000.00
Grader - 14M	400,000.00
Bulldozer - D11	1,500,000.00
Bulldozer -Rubber tyred 844RTD	600,000.00
Water Cart - Road Truck & Cat 777 *	5,100,000.00
Bobcat	100,000.00

* the 2 vehicles are treated as 1 unit due to the large cost difference.

Based on information obtained from Hitachi, Komatsu, Liebherr and Wastrac.

	Quantity Required*
Excavator - 200T 994-200	0.67
Excavator - 350T EX3600	2
Haul Truck - Cat 789Q & Haulmax	9.67
Scraper - 657G	2.33
Grader - 14M	1
Bulldozer - D11	3.67
Bulldozer -Rubber tyred 844RTD	1
Water Cart - Road Truck & Cat 777	1
Fuel truck	1

* quantity required is based on: **machinery years rqd / 3 years**
(the rehabilitation phase machinery requirements are not included)

	3 year Machinery Cost $m
Excavator - 200T 994-200	1.01
Excavator - 350T EX3600	4.00
Haul Truck - Cat 789Q & Haulmax	48.35
Scraper - 657G	4.66
Grader - 14M	0.40
Bulldozer - D11	5.51
Bulldozer -Rubber tyred 844RTD	0.60
Water Cart - Road Truck & Cat 777	5.10
Fuel Truck	0.20
Total	**69.83**

Advice obtained from Westrac Finance and CBA finance suggests that machinery purchases such as this generally by way of lease, typically over 5 years with 50% residual (current rates 5.8% -6.5%)
The machinery is then traded, new machinery is released and so on for the term of the project.

Interest Payable on $64.83m over 3years at 6% or purchase cost **12.57**

Maintenance of vehicles including but not limited to lubricants and parts for standard servicing, tyres and other components replaced due to wear and components replaced due to breakdown. Includes contract labour but not GRL employee labour **3.00**

Fuel delivered by semi-trailer tankers. **20.24**
(as outlined in EIS Section 2.10.3) 18.4ml

(price of diesel fuel delivered to site $1.10 / litre)

Electrical Power Cost	**43.50**
Electrical Power includes electricity consumed but not the cost of any infrastructure associated with the supply to the mine. 290,000MW hours over 16 years. (as outlined in EIS section 2.9.1) (cost at $0.15 / KW hour	**43.50**
Wages and Associated Costs	**209.53**
Wages and Associated Costs. 16year extraction period	**185.85**
Wages paid to up to 110 employees during all phases of the mines operation. Payments to contractors are not included. labour force and wages outlined in 2.14.2 of the EIS and 5.3 of the SCSC	**160.88**
Workers Compensation Insurance Premiums based on an average of 150 employees earning in total $17.9m / year *(figures obtained from GIO)*	**6.60**
Superannuation Payments Based on the current figure of 9% of ordinary wages	**15.28**
Provisions for annual, sick and long service leave based on 5weeks wages / employee / year	**3.09**
Wages and Associated Costs. 3year rehabilitation period	**23.68**
Wages paid to between 60 and 70 employees during the rehabilitation phase of operation. Payments to contractors are not included. labour force and wages outlined in 2.14.2 of the EIS and 5.3 of the SCSC	**20.50**
Workers Compensation Insurance Premiums based on an average of 150 employees earning in total $17.9m / year *(figures obtained from GIO)*	**0.84**
Superannuation Payments Based on the current figure of 9% of ordinary wages	**1.95**
Provisions for annual, sick and long service leave based on 5weeks wages / employee / year	**0.39**
Coal Preparation and Transportation Costs	**376.87**
Outlined in section 4.3.1.5 of Part 15 of the SCSC at $28.99 / tonne of product coal. 13mt of product coal to be supplied.	
Other Cost not including labour	**192.89**

Capital Costs		**119.00**	
outlined in 4.3.1.6 of the SCSC			
Environmental Mitigation Costs		**1.59**	
outlined in 4.3.1.8			
Purchase Costs for Land		**11.43**	
outlined in 4.3.1.11			
Local Contributions		**6.50**	
TAXES & ROYALTIES			**306.12**
Amounts as outlined in EIS Section 6.4.3.2			
Local			
Payment of additional Council rates		**7.26**	
State Government		**152.86**	
Royalties	$ 144.00		
Payroll tax	$ 8.86		
Commonwealth Government		**146.00**	
taxation obligations			
		TOTAL EXPENDITURE	**1709.93**
		TOTAL PROFIT / LOSS	**-160.33**

Appendix 4.

REVIEW OF THE

Amended Rocky Hill Coal Project

R.W. Corkery & Co. Pty. Limited

Specialist Consultant Studies Compendium

Development Application No. SSD 5156

Volume 5

Volume 5 Part 12 Historic Heritage Assessment

Richard Lamb and Associates

with reference to

Volume 2 Part 3 Visual Impacts Assessment

Richard Lamb and Associates

Prepared by;

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Contents

SECTION 3

THE VALLEY'S HERITAGE SIGNIFICANCE

SECTION 1

AMENDED ROCKY HILL HISTORIC HERITAGE ASSESSMENT

(The comments provide an overview of the deficiencies in the above document.)

1.1 Understanding the geology of the Gloucester Valley

The *Amended Rocky Hill Coal Project* fails to understand the Gloucester Valley's complex geology, which is a quality that permeates all areas of environmental assessment. The Gloucester Valley requires high level assessment to understand the geological faults, gas migration and hydrogeology matters that underlie all types of extractive industries in the Valley. The geology is among the most complex of all areas yet identified for coal mining and coal seam gas extraction in Australia and was the underlying reason that AGL finally abandoned the Gloucester Gas Project.

As well as providing matters of outstanding environmental concern, the geology is a scientific heritage quality in itself. It is a matter of outstanding scientific interest that goes to all aspects of the Valley's formation, appearance and history.

1.2 The Valley's heritage qualities

Readers are referred to Section 2 for an explanation of the Amended Rocky Hill Historic Heritage Assessment's deficiencies and to Section 3 for a fuller understanding of the Valley's heritage significance

The underlying deficiency in the *Amended Rocky Hill Historic Heritage Assessment* is that it goes to considerable effort to downgrade the Valley's natural and historical heritage significance. The only interpretation that can be placed on this is that the development will have a serious impact on the Valley's heritage qualities and from that on tourist income and the other economic and social benefits that flow from the Valley's heritage qualities.

Issues concerning its geological formation, scenic qualities and historical settlement are repeatedly claimed to be typical of other areas and of no special significance. This claim is flawed because both the Valley's geology and human history are distinctive and underlie its heritage significance. It is also contrary to heritage assessment guidelines, which provide that the existence of other items of similar significance is not reason to downgrade or dismiss an item being assessed.

A brief summary of the Valley's significance follows below.

- The Valley's scenery drew praise from Robert Dawson in his exploration of 1826;
- the Valley's scenery was highly praised in the commemorative publication *The Vale of Gloucester*, Eve Keane, Gloucester Shire Council, 1953;
- the National Trust of Australia (NSW) listed the Vale of Gloucester in 1975;
- the Vale was nominated for entry on the Register of the National Estate in 1976;
- the National Trust of Australia (NSW) revised the listing in 1981;
- provision of the Environment Protection (Scenic) Zone in the Gloucester LEP 2000;
- the National Trust of Australia revised and upgraded the listing 2009;
- the Vale was nominated for entry on the National Heritage List 2010, 2012;
- Publication of *The Stroud-Gloucester Valley: A Heritage Landscape Under Threat*, BGSP Alliance Inc., 2009; revised 2015, 2016.

The Gloucester Valley has a level of heritage significance under all of the assessment criteria used in New South Wales, summarised as follows.

- The valley has a high level of significance under criterion (a) for cultural historical reasons and for natural historical reasons.

- The Valley has historical association significance under criterion (b) because of its association with the Australian Agricultural Company.

- The Valley has a high level of aesthetic significance under criterion (c) for its acclaimed

visual qualities.

- The Valley has social significance under criterion (d) because of its significance to Aboriginal people and its 'sense of place' qualities to the non-indigenous residents.

- The Valley has technical research significance under criterion (e) because of its potential to yield further information about the geological formation of the Stroud-Gloucester Valley and archaeological information about past Aboriginal occupation.

- The Valley has rarity significance under criterion (f) because of its rare geological formation and its ability to visually demonstrate these qualities.

- The Valley has significance under criterion (g) because it is important in demonstrating in a visually graphic manner the characteristics of a complex geological landscape.

1.3 Strategies used to dismiss the Valley's scenic heritage qualities

The assessment is seriously flawed because the *Visual Impacts Assessment* separates visual significance from heritage significance. The assessment instead addresses scenic significance in a separate and complicated study, *Volume 2 Part 3 Visual Impacts Assessment*, which on detailed consideration is intended to isolate scenic significance from the matters for heritage consideration.

Irrespective of the claims made within the *Visual Impacts Assessment,* the proposed development will be highly visible from general viewing points within and adjoining the project area, and from scenic viewing points on both the Mograni Range and Bucketts Range. The findings of the separate scenic assessment should have been integrated into the *Historic Heritage Assessment* as a major component of that assessment. Failure to do so has left the *Historic Heritage Assessment* deficient to a level that seriously undermines both its integrity and its function as a planning document.

1.4 Refusal to acknowledge the landscape's special qualities

The refusal to acknowledge the Valley's special geological, historical and scientific qualities runs throughout the entire *Amended Rocky Hill Historic Heritage Assessment.* Scenic significance is an important element in the Valley's heritage significance and an important contributor to the Valley's tourism industry.

The Historic Heritage Assessment is incorrect when it claims that the landscape *'does not uniquely demonstrate the tangible evidence of the early grazing runs and crop lands established by the AACo. and its current appearance is considered to be only incidentally related to first settlement themes.'* The landscape bears considerable similarity to the original landscape in its setting and in its pastoral use. However, acknowledging the valley's significance does not depend on Criterion (f) alone, the landscape is also significant under the other criteria.

The following quotation from page 12-55, where the Assessment spuriously attempts to dismiss the Valley's significance is an example of the Assessment's unsupported claims.

> *The part of the landscape that would be affected by the proposed amended Project is of a kind that is widespread throughout the northern section of the Valley between Stroud Road and Gloucester/Barrington. It does not uniquely demonstrate the tangible evidence of the early grazing runs and crop lands established by the AACo. and its current appearance is considered to be only incidentally related to first settlement themes. The landscape that would be affected is not rare and although the changes proposed to be made to it are substantial and could be considered a threat to it, if considered in isolation, similar areas are numerous. The site does not exceed the threshold to qualify under criterion (f) as rare or uncommon.*

The errors and assumptions in the above quotation go to the underlying quality and purpose of the *Amended Rocky Hill Historic Heritage Assessment.* It is doubtful if a statement of that type could be more contrived and incorrect. The pertinent issues raised by this brief comment follow.

- **First sentence.** The landscape forms part of the whole and is significant for that reason. However, within that area it is distinct in demonstrating the unique geological qualities of the northern end of the Valley; these qualities are not widespread throughout the Valley.
- **Second sentence.** All landscapes develop over time, the issue is whether the original qualities, functions and setting are still identifiable, and in this instance the answer must be that they are. The phrase '… is considered to be only incidentally related to first settlement themes' lacks detail and is obscure in its meaning.
- **Third sentence.** This is obscure and misleading. The landscape in its total form and qualities is rare and visibly so to the informed observer; similar areas are not numerous if considered in their environmental detail. Even if they do exist, heritage assessment guidelines provide that the existence of other similar examples should not diminish the significance of an item. An important statement in this sentence is the acknowledgement that the changes will be substantial and a threat to the landscape.
- **Fourth sentence.** This claims that the site does not exceed the threshold for criterion (f) but provides no supportive reasons or explanation and does not detail the claimed 'threshold'.

Importantly, the above quotation from page 12-55 honestly acknowledges that *'the changes proposed to be made to it are substantial and could be considered a threat to it'.* The Assessment continues in a confused and contradictory manner when it claims at page 12-57 that;

> *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 the need to return the Site to the highest quality possible and with a landform and use compatible with the existing use and adjacent development pattern is required in either case.*

It is difficult to understand how the views can be considered to have aesthetic significance but could be so readily determined to not be heritage views. The claim that this is 'not of great importance since (because?) the need to return the site to the highest quality possible…' is unclear in its meaning and its intended result.

1.5 Conclusion

The *Amended Rocky Hill Historic Heritage Assessment* submission fails to correctly interpret and apply the relevant assessment criteria. It is clear that the Assessment's sole purpose is to support the proposed development and that a fuller understanding of the Valley's heritage qualities and the application of correct assessment procedures would have resulted in a substantially different document.

The conclusion is that the Amended Rocky Hill Project will be situated in a highly significant part of the Valley, that it will impact on the Valley's heritage significance under all of the assessment criteria and that its impact under some of those criteria will be substantial. It follows from this and the extreme difficulty in modifying the project's impact that development consent should be refused.

SECTION 2

REVIEW OF THE APPLICANT'S

PART 12 HISTORIC HERITAGE ASSESSMENT,

EXECUTIVE SUMMARY, PAGES 12 – 9 TO 12 - 26

With brief preliminary comment concerning the Visual Impacts Assessment

2.1 Preliminary comment – Part 3 Visual Impacts Assessment

This critique considers that the Applicant's Historic Heritage Assessment has been purposefully prepared to reduce and obscure the qualities that bestow the subject landscape with its high level of heritage significance.

The most obvious distortion of the area's heritage significance by the Applicant's Historic Heritage Assessment is the refusal to acknowledge visual significance as a legitimate quality of heritage significance. This has resulted in the assessment of visual impact being removed to a separate document where it is dealt with in a manner that not only fails to acknowledge visual significance but is intended to obscure the impact the proposed development will

have on that significance. The selection of key viewing points and key visual receptors within the subject area has been undertaken expressly to diminish the project's visual impact. The position remains at all times that the visual impact should have been described in the historic heritage assessment even if a separate assessment had been undertaken.

This document has therefore avoided entering into a detailed critique of the Visual Impacts Assessment but relies instead on its absence from the Historic Heritage Assessment and the acknowledgements made in the Historic Heritage Assessment that the visual impacts will be significant.

The following comments provide a brief critique of the assessments made in the Executive Summary provided at the beginning of the Historic Heritage Assessment commencing page 12 – 9. The page numbers, numbered parts and lettered sub parts used in the following review correspond to the numbering in that section.

2.2 Review of the Historic Heritage Assessment

Executive Summary, Pages 12 – 9 to 12 - 26

A point by point review of the Executive Summary of the Historic Heritage Assessment follows, some matters raised are comparatively unimportant but others are of major concern.

Brief comments have been made to address the matters of major concern.

Page 12-9

Points 1. to 4.

No comment is made here – points 1 to 4 are preliminary only.

Point 5.

Point 5 claims the predominant issues are shown to be potential impacts on intangible and cultural values, rather than listed, classified or potential individual items, sites or curtilages.

This is incorrect, there will be impacts on scenic qualities and landscape, and on some supporting buildings.

Point 6.

Point 6, sub-points a. to n. provide a historical overview of the Valley. A number of matters can be raised in relation to claims within this part but in the interests of brevity, comment is restricted to the following sub-points.

Page 12-10

Point 6. k.

Point 6.k claims there is no remaining evidence of the Australian Agricultural Company's occupation of the Valley. This is an empty claim because all landscapes develop progressively, the issue is whether the original landscape can be identified and the answer based on the physical form of the landscape and its current use is a resounding yes. **It is important to understand that the point 6.k claim is central to the Historic Heritage Assessment's dismissal of the heritage significance of the northern end of the valley.**

Point 6. l

Point 6.l claims that later land use themes are identifiable. This critique agrees with that comment but notes two important matters. First, the themes mentioned (dairying, timber and tourism) have contributed to the Valley's historical character and contribute to its heritage significance in their own right. Their impact is consistent with the impact of the AACo's pastoral use and the continuing use of the pastoral lands for grazing purposes is consistent with the Valley's heritage significance.

Point 6.n.

Point 6.n claims mining (along with tourism and cultural development) have played a role in shaping the heritage fabric, but **mining has not played a part**. **This is an incorrect statement intended to justify the proposed mining development.** Mining is and always will be visually intrusive as well as impacting adversely in other ways on the Valley's rural and residential uses. The Valley has managed to accept some mining development because of its scale and placement (though not without some adverse consequences) but the proposed development will have a major adverse impact because of its prominent location in the highly visible and sensitive *Vale of Gloucester*.

Point 7. a. to e.

Point 7 a. to e. attempts to dismiss the Valley's heritage significance by confining significance to identified structures. The Valley has long been recognised as having a high

level of heritage significance for historical, scenic and geological reasons among others, see *Section 3 Assessing the Valley's Heritage Significance* in this critique.

This critique acknowledges that the Valley's heritage significance has not been formally listed but notes that absence of formal listing does not negate an item's heritage significance and that it is the duty of the applicant/developer to identify all heritage items whether listed or not. **The Part 12: *Historic Heritage Assessment* is required to give due weight to these items but fails to do so.** Whether they are formally listed is not the issue, it is a matter of identifying, interpreting and considering the item's heritage significance.

Page 12 - 11

Point 8. a. and b.

Point 8 Non Statutory items acknowledges that the Site is part of the area identified and listed in the Register of the National Trust of Australia (NSW) and in the Register of the National Estate Database as an Indicative Place.

Point 9. a. to c.

Point 9 a. to c. Assessing the Stroud-Gloucester Valley as a Potential Heritage Landscape (see Section 4) attempts to negate the Valley's heritage significance.

a. Sub-point a. separates the area north of Stroud Road from the Stroud area in order to diminish or remove the northern area's historical association significance as part of the AACo settlement. The two areas are part of the one larger valley and their history is integrally connected. The two areas are now in the same local government area, the areas' different local government control has been used in the past to distinguish and separate the areas but that must now cease. The greater area's shared geology, agricultural use, tourism and scenery must now be acknowledged.

b. The claim under sub-point b. is evasive and dismissive. All settlement patterns are similar in seeking desirable features such as arable land, transport access and essential qualities such as water, but settlements differ in the way these requirements are met and the settlement characteristics that result. The comment under b. is intended to obscure and dismiss the factors that have shaped the settlement of the Valley.

c. The purpose of c. is unclear and can only be interpreted as intended to overpower and dismiss the area's heritage significance. The reasons for stating that Gloucester-Barrington

River and Mograni Creek valleys are outside the Gloucester Basin is unclear and would be considered incorrect by any reasonable assessment of the subject area. It can be interpreted only as indicating a lack of clarity on the part of the writer as to the area being assessed, its natural boundaries and its significance within the broader subject area.

Point 10.

Point 10 **a**ttempts to diminish the importance of the National Trust of Australia assessment. The comment under point 10 is clearly incorrect and can be interpreted only as being intended to mislead. The National Trust does use a system that parallels the seven point analysis expected under the NSW Heritage System. The work of the National Trust system was influential in the formation of the NSW Heritage System.

Point 11. a.

The Point 11.a. claims that the BGSPA uses an alternative system of assessment is completely incorrect, the statement prepared by the BGSPA was prepared by a qualified heritage consultant approved by and working professionally within the NSW Heritage Advisors system. The methods used were consistent with the NSW Heritage Manual at all times. It is important to understand that the BGSPA document was not directed solely to NSW heritage assessment procedures but was intentionally of sufficient breadth to be relevant to bodies such as the National Trust, historical societies and other assessment bodies.

The only interpretation that can be placed on the above claim is that the outcomes of the BGSPA assessment are so inconsistent with the project's purpose driven assessment that fabricating means to dismiss the BGSPA assessment is the only option available.

The claim that the State and National levels have not been justified is intentionally misleading. The BGSPA assessment does not set out to justify levels of State or National significance, that is not reasonably the purpose of the BGSPA document but is more reasonably the purpose of further specialist assessment. The BGSPA assessment presents the initial position that such assessment is both justified and necessary, the Richard Lamb assessment fails to either negate or develop that concept in any way whatsoever.

Point 12.

The comment at Point 12 is confused in its direction. It says a Statement of Heritage Significance has been prepared by Richard Lamb and Associates (see Section 4.1.3) '*as required by the Heritage Manual and the DGRs, notwithstanding the Site is not considered to*

be a heritage item, because the impacts of the amended Project would be on values which are not confined to individual sites'.

This statement is confused in its purpose and reveals two major matters that emphasise the lack of integrity of the entire Historic Heritage Assessment. The statement *'notwithstanding the Site is not considered to be a heritage item'* is by any assessment standards incorrect. The site is considered to be a heritage item and has been assessed as such by a number of expert bodies and practitioners. These assessments were not followed to their logical conclusion for the simple reason that there was no system in place to ensure that it was done.

The comment continues at 12.a. *'The SHS acknowledges the scenic significance of the landscape of which the Site is part and does not contest the local cultural values claimed for it by the NTANSW or the BGSPA'*. The intended meaning and purpose of this statement is difficult to grasp. Scenic significance is recognised heritage significance under heritage assessment criteria and the above acknowledgement that it has 'local' significance is sufficient to justify that the site has heritage significance even though 'local' is a substantial understatement.

It is not intended to undertake a detailed assessment of the site's heritage significance at this point. However, it is relevant to note that the geological significance of the valley's intense lateral folding, the historical significance of the Australian Agricultural Company's role in establishing Australia's wool industry and the valley's special scenic qualities attribute it with a high level of heritage significance.

Page 12 - 12

13. Assessment under the criteria

Overview of the assessment

The assessment attempts to isolate the northern end of the Stroud-Gloucester Valley (the mine site and surrounding area) from the Stroud-Booral end and from the valley generally.

The Historic Heritage Assessment then proceeds with assessment of the Valley's heritage significance in a manner that is clearly intended to support the proposed development. The official explanations of the heritage criteria have been added by the writer for reference.

Criterion (a) Historical significance

' An item is important in the course, or pattern, of NSW's cultural or natural history (State significance) OR An item is important in the course, or pattern, of the area's cultural or natural history (local significance).'

This critique considers that the Part 12 Historic Heritage Assessment does not adequately assess the Valley's significance under Criterion a. The Assessment provides some concession to the Valley's heritage significance by acknowledging the matters raised in the initial BGAP Alliance submission;

- the contribution of large scale rural companies such as the AACo;
- the importance of the settings of the two company towns of Booral and Stroud;
- the influence of the AACo in the first settlement period to approximately 1860.

It acknowledges the 'moderate' 'local' significance under Criterion (a) because it demonstrates the influence of historical themes and development after first settlement.

This critique agrees with the general substance of the Part 12 Historic Heritage Assessment except in regard to the significance of the AACo and large scale pastoral development to the history of New South Wales and Australia generally. This critique considers that the significance under Criterion (a) should be described as 'high' when due consideration is given to all aspects of the AACo's operations. This critique further considers that the terms 'moderate' and 'local' are used by the Assessment to downgrade the Valley's significance.

Criterion (b) Historical association significance

An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (State significance; OR An item has strong or special association with the life or works of a person, or group of persons, of importance in the cultural or natural history of the local area (local significance).

The Part 12 Historic Heritage Assessment addresses the Valley's significance under four subheadings. By an initial reading this appears to adequately address the Valley's significance but further consideration shows that, consistent with the Assessment's general direction, it fails to properly acknowledge the Valley's historical significance.

This critique generally accepts the comments made under a. to c. although the AACo's Gloucester Cottage was not acknowledged under point a., which attempts to limit the AACo's built relationship to the Booral-Stroud area. However, the Assessment appears to be

confused and lack understanding of the development of rural landscapes in its comments under Criterion (b), point d.

It is unreasonable to expect the Valley's landscape to bear close visual similarity to its initial AACo landscape. Such similarity would involve the presence of remaining stumps, ringbarked trees, assorted debris, improvised structures and lack of transport facilities.

A rural landscape can be considered only in its developed form; it is this in relation to its original form and its subsequent development that determines its significance. While it is acknowledged that modern development exists in much of the Valley, the wide grazing valley set between the lateral boundary hills and crags that were formed by the Valley's intense lateral folding is still readily identifiable as the pioneer AACo landscape.

This critique considers that the Valley still evidences its special association with the settlement, life and work of the Australian Agricultural Company.

Criterion (c) Aesthetic significance

An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (State significance); OR An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in the local area (local significance).

The Part 12 Historic Heritage Assessment substantially follows the 2013 BGSP Alliance submission in acknowledging;

a. The Gloucester Basin has moderate to high aesthetic quality as a result of the distinctive geological formation and the scenic rural valley floor.

b. The Gloucester Bucketts have high aesthetic significance and landmark qualities, are an important tourist quality and have been a major inspiration for artistic achievement.

c. The southern section between Booral and Stroud is of high local aesthetic significance.

This critique can draw some differences with the Executive Summary at Criterion (c) in that the aesthetic values at the northern end of the valley are clearly of high significance and should not be read down by assessing them as being of 'moderate to high' value. This critique also considers that the aesthetic values of landscape and built areas at the southern end of the valley is of higher than local significance.

However, even allowing for the values to be understated to an extent, the Historic Heritage Assessment Executive Summary attributes the Valley and the subject site with a high level of aesthetic significance. This is inconsistent with the direction and conclusions of the document generally and is difficult to reconcile with the document. It gives the impression that different parts of the document have been prepared by different practitioners working to different standards and different assessment criteria.

Page 12 - 13

Criterion (d) Social significance

An item has strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons (State significance) Or An item has strong or special association with a particular community or cultural group in the area for social, cultural or spiritual reasons (local significance).

The Part 12 Historic Heritage Assessment makes no comments of substance under this Criterion except for the brief comment under this point that the Valley has significance to *'the social group identified by the BGSPA at the local level'.* However, a balanced assessment under this criterion requires consideration of whether there is a 'special association with community or cultural group'. The purpose and meaning of the 'social group identified by the BGSPA at the local level' is unclear; no attempt has been made by the BGSPA to claim any special significance to its members under this criterion.

So what does this statement mean and what is its purpose? Had the Assessment genuinely intended to consider significance under this criterion it would have acknowledged the area's past and present significance to Aboriginal people, residents and groups. It is noted that Part 11 considers Aboriginal Cultural Assessment but this critique considers that an assessment of the area's past and present significance to Aboriginal people and groups, as distinct from an archaeological assessment, is required under this criterion, even if in summary and with reference to the specialist assessment.

Criterion (e) Technical/Research significance

An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (State significance) OR An item has potential to yield information that will contribute to

an understanding of the area's cultural or natural history (local significance).

The Part 12 Historic Heritage Assessment acknowledges that the Valley is of high significance geologically but its attempt to restrict that significance to the local level is puzzling. While it is possible for a geological quality or feature to be considered significant at the local level only, major geological features will be of broader significance. The geology of the Gloucester Syncline is of high geological significance, a quality that underlies its scientific significance.

Criterion (f) Rarity

An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (State significance); OR An item possesses uncommon, rare or endangered aspects of the area's cultural or natural history (local significance).

The comment that 'The Valley is of little significance on Criterion (h) as it provides little evidence of the early landscape' is unclear and seems confused although the reference to 'Criterion (h)'is assumed to be a misprint only.

The further comment that subsequent changes have created a common pastoral landscape appearance that is not rare or endangered and that similar landscapes are numerous is not supported on consideration of all factors. The complex, folded geology and scenic qualities are rare when due regard is given to all of their qualities. While it is acknowledged that substantial change would be required to erode this quality, coal mining projects are of the scale that inflicts that level of impact.

Criterion (g) Representativeness

An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments; (State significance)

OR An item is important in demonstrating the principal characteristics of a class of the area's cultural or natural places; or cultural or natural environments (local significance).

The Historic Heritage Assessment notes at a. that the valley is of high local significance for its ability to demonstrate in the villages of Booral and Stroud a class of early colonial places granted to an agricultural company for private exploitation. This should more reasonably be of State significance because of the importance of the AACo and its agricultural/pastoral activity in NSW. The Historic Heritage Assessment notes at b. Stroud's high significance at State level.

The deficiency in the Historic Heritage Assessment is its failure to note the significance of the entire valley under Criterion (g). The northern section of the Valley has significance historically in its own right and as part of the greater valley. In the latter regard it creates an unnatural process to remove the northern section from the valley for the purpose of denying its significance under Criterion (g).

The northern end of the Valley is important in demonstrating the principle geological characteristics of a folded valley with subsequent volcanic action. This high level of natural significance under criterion (g) provides the outstanding visual setting for the Valley's significance under the other criteria to be fully appreciated. The natural-geological setting of the Gloucester Bucketts and the Mograni Range at the northern end of the Valley form outstanding and rare visual qualities for the Gloucester township and surrounding rural lands. The Historic Heritage Assessment's failure to acknowledge this significance at local, State and possibly National level is a major shortcoming.

14. Statement of Heritage Impact, commencing page 12-13.

This section commences by claiming that a Statement of Heritage Impact was prepared using the NSW Heritage Manual guidelines and that a summary of the Statement follows. However, that summary demonstrates the selective, biased and obstructive qualities of the Historic Heritage Assessment. The Assessment findings are addressed immediately below.

a. The Assessment states that the 'amended project would not make any physical change to identified heritage items, sites, curtilages or views of or between heritage items' is unfounded and borders on the absurd. In this regard it has been shown that the Assessment not only fails to acknowledge the Valley's scenic, heritage, geological, historical and social qualities but attempts to obscure these qualities as means of obscuring the project's impact.

The acknowledgement on page 12-55, 4th paragraph that '…**the changes proposed to be made to it [the landscape] are substantial and could be considered a threat to it…'** provide clear evidence of the impact of the proposed development. It underscores the reasons for the applicant's distorted heritage assessment and the applicant's perceived need to remove scenic impact from the matters to be considered.

b. This section acknowledges that the development will have impacts on the quality of the landscape 'for a period of 16-20 years'. This is a lengthy period in itself but considering all the circumstances is a gross understatement considering the nature of the project and long term impact inflicted by such projects elsewhere. **It is most unlikely that the site could ever**

be returned to its present form having regard to the history of such projects and the site rehabilitation methods used,

c. This section is again directed to dismissing the Valley's highly significant landscape and visual qualities by concentration on buildings in Booral-Stroud, rather than addressing the visual issues of the subject site.

d. This section again concentrates on dismissing the site's setting, scenic significance and heritage significance by the repeated claims that the site has no significant relationship to the AACo and that its current appearance is 'only incidental' to first settlement themes. This is at best nonsense and simply cannot be supported despite the attempt to do so in the main body of the Assessment.

e. The statement under this point displays a gross lack of understanding about heritage significance and the recommended assessment procedures. The statement is fundamentally flawed and should be dismissed on two major grounds.

It commences by acknowledging 'that the changes to be made to it are substantial and could be considered a threat to it' and that the site does not exceed the threshold to qualify under criterion (f) as rare or uncommon. It should be borne in mind that the site does not have to meet the required threshold under every criterion applicable to NSW heritage assessment, it is required to meet the required threshold under only one criterion.

In this regard the project site could be attributed with heritage significance under criterion (a), criterion (b), criterion (c), criterion (e) and possibly also criterion (d).

f. The claim that the site is separated from the Booral Stroud area physically and visually and that the ability of Booral and Stroud to demonstrate the historical significance of the Valley will not be diminished cannot be supported on the evidence. At first consideration the valley should be considered in its entirety, not viewed selectively so that an argued lesser impact on other parts of the Valley cannot be used to diminish the impact on the subject area. Visually the Valley is one continuous landscape, the distinction between the north and south flowing sections is barely discernable to even the astute observer. **The Valley should be considered as the integral landscape that it is.**

Despite this, the principal matter for consideration is the impact of the proposed development on the heritage significance of its location and the highly scenic and significant northern section of the Valley.

g. The claim *that 'The site can be interpreted with regard to post-first settlement historical themes but the effects of these on the landscape are generic..'* is so vague as to be meaningless. If its purpose is to disregard some areas of significance because other areas of significance exist, whether similar or not, it is contrary to heritage assessment guidelines and should be dismissed as being the evasive statement that it is.

h. The statement *'It has been acknowledged that the scenic quality and character of the landscape and character of the area is of importance both in a general sense and to tourism, the interests of which includes heritage sites and places'* must be interpreted as acknowledging the Valley's scenic – heritage qualities. This is inconsistent with the purpose of the Historic Heritage Assessment which is to deny the Valley's scenic heritage qualities as a matter to be considered. (As noted the scenic qualities of the landscape have heritage significance under criteria (c) and (g) and in a less direct manner under the other criteria.)

i. The statement that the quality of the landscape in which the site is situated is acknowledged in Appendix 3 as having moderate to high scenic quality and high sensitivity to the views affected by the amended project cannot be reconciled with the purposes and general argument of the Historic Heritage Assessment**. The situation created by this inconsistency is impossible to reconcile.**

j. The comments in this section again acknowledge the aesthetic significance of the setting and the long standing appreciation of the scenic qualities. Again, this statement cannot be reconciled with the conclusions presented in the Historic Heritage Assessment.

k. The comments that there will be impacts on the aesthetic values *'part of the landscape in the general vicinity of, but not of the same view compositions as the Gloucester Bucketts or views from the Gloucester township'* is incorrect. The scenic impacts created by the proposed development will be highly visible in the general viewing corridors from general viewing points in both the immediate area and the broader area.

l. The claim made under this point is confused and goes to the deficiency of the Historic Heritage Assessment. The Assessment considers that the scenic significance of the setting cannot be denied and that the project will have a significant adverse impact on that significance. These two conclusions are undeniable, whether considered by casual

observation or by professional assessment; the issue that therefore confronts this pro-mining assessment is that the conclusions must be overridden if the project is to be justified. **The Historic Heritage Assessment attempts this by refusing to acknowledge that the area's and the setting's scenic significance is an important element of its heritage significance.**

m. The function and purpose of the Historic Heritage Assessment is well illustrated by the comment under this point; *'In effect, the only impacts that could be interpreted as heritage impacts, because there are no tangible items affected, are on the scenic quality and character, i.e. visual impacts'.*

This is not true in its underlying premise that no heritage structures are affected but the issue raised in this critique is that the Historic Heritage Assessment again attempts to dismiss the

area's recognised scenic significance because dismissing that significance is a fundamental requirement of the Assessment's purpose.

n. The purpose of the above approach becomes apparent at this point by the claim that *'The proposed mitigation and management measures for heritage impacts are therefore the same as those proposed for the control and management of visual impacts, since* (because?) *the issues coincide.'*

This is confused. The Historic Heritage Assessment acknowledges the scenic significance but fails to attach the required weight to that significance and denies there are individual items of significance in the subject area. The issues do not 'coincide' and this can be considered to serve only one purpose; to dismiss the considerable adverse impacts that the mine will have on the Valley's visual heritage qualities and therefore on its heritage significance.

Issues of visual impact will differ according to the setting, the distance involved, the surrounding visual qualities, the nature and height of the viewing point and many other considerations. For example, screening of one type or another may be suitable for localised close proximity visual control but may provide little or no benefit for overall viewing of major works and major scenic impacts over broader viewing areas.

o. The comment under o. continues in the same misleading manner when it claims '*The mitigations measures and contingency management procedures are described in detail in **Appendix 3**. It is considered that these are appropriate conservation policies for impact*

mitigation, since the management of visual impacts and minimisation of impacts on heritage values are essentially the same in this case'.

Appendix 3 does not satisfactorily address these matters.

SECTION 3

THE VALLEY'S HERITAGE SIGNIFICANCE

(Overview assessment by Garry Smith for Groundswell Gloucester)

3.1 The subject area and *The Vale of Gloucester*

The pro-mining interests have at various times attempted to create confusion regarding the terms in use; the Stroud-Gloucester Valley, the Vale of Gloucester, The Valley, the Gloucester Syncline and the Gloucester Trough being the main terms used.

For the purposes of this critique the Stroud-Gloucester Valley is noted as being the term for the entire geological formation extending from near Booral in the south to near Barrington in the north. It includes the Gloucester township and the proposed Rocky Hill coal mine site. The term 'The Valley' is used in this critique to describe the northern section of the Stroud-Gloucester Valley, which is the subject area for the Amended Rocky Hill Coal Project and corresponds to the area historically known as *The Vale of Gloucester*. The several claims that the areas do not exactly correspond is of no consequences because any possible differences relate only to the northern extremity, which is situated outside the area being considered.

The scenic and geological qualities of the Vale of Gloucester drew praise from the time of its first European exploration and continue to draw praise today. The Vale has been described in

glowing terms because of its scenic and heritage qualities and although there have been initiatives to have this significance acknowledged at State and Federal level, the nominations and assessments were not taken to their logical conclusion.

3.2 The Vale's recognised heritage significance

The Vale's scenery drew comment on its first sighting by Robert Dawson in his exploration of November 1826. Dawson's description of the setting for the town of Gloucester is still clearly recognisable today.

> It was with some impatience that I approached the high and rocky peaks which were elevated above the forest, like monuments in the wilderness, and which formed so remarkable a picture in this part of the colony. … The country as we advanced became gradually more even and fertile, till at length we became upon a beautiful and rich flat of considerable extent…

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.

The following list provides an overview of the Valley's heritage assessments to date.

- 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;
- the nomination to the Register of the National Estate 1976;
- the National Trust of Australia (NSW) revised listing 1981;
- provision of the Environment Protection (Scenic) Zone in the Gloucester LEP 2000;
- the National Trust of Australia revised listing 2009;
- nomination to the National Heritage List 2010, 2012;
- Publication of *The Stroud-Gloucester Valley: A Heritage Landscape Under Threat*, BGSP Alliance Inc., 2009; revised 2015, 2016.

3.3 Summary of the Valley's heritage significance under the NSW Heritage Office criteria.

It is important to note that the Amended Rocky Hill Coal Project assessment attempts to split the Stroud-Gloucester into the northern and southern sections so that the site area can be separated from greater valley and be read down in regard to its significance. This critique notes that the Stroud-Gloucester Valley should be considered in its entirety if a full understanding of its heritage significance is to be gained but also notes that the northern end has a high level of significance in its own right for historical, geological and scenic reasons.

The following summary is directed principally to the northern end of the Stroud-Gloucester Valley (referred to as the Valley) in order to address the proposed Rocky Hill mine but

makes reference to the entire valley as is appropriate. The term 'item' should therefore be read as meaning the northern end of the valley, including the proposed mine in its setting and those parts of the valley that are within the visual-social-spatial scope of the mine and its setting. This procedure is consistent with heritage landscape assessment practice. The following brief summary of heritage significance draws on established and accepted heritage assessments.

The following assessments are intended to provide only brief overviews of the area's complex significance. It is important to note that significance under only one criterion is required to meet heritage assessment guidelines.

Criterion (a) Historical significance

An item is important in the course, or pattern, of NSW's cultural or natural history (State significance) OR An item is important in the course, or paten, of the area's cultural or natural history (local significance).'

The Valley has a high level of historical significance relating to its role in the formation of an initial settlement by the Australian Agricultural Company and, although the Gloucester venture was unsuccessful, in the formation of the Australian pastoral industry. The Valley is of outstanding significance geologically in relation to its formation by intense lateral folding and subsequent volcanic action, and is bordered by the geologically significant Gloucester Bucketts and Mograni Range. The Gloucester Bucketts have special significance to the Aboriginal population for cultural and spiritual reasons and to the subsequent European settlement for aesthetic and geological reasons.

Criterion (b) Historical association significance

An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (State significance; OR An item has strong or special association with the life or works of a person, or group of persons, of importance in the cultural or natural history of the local area (local significance).

The Valley has special association with the Australian Agricultural Company and from that, with the beginnings of the Australian pastoral industry.

Criterion (c) Aesthetic significance

An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (State significance); OR An item is important in

demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in the local area (local significance).

The Stroud-Gloucester Valley is acknowledged for its visual qualities, these qualities underpin the Valley's development, its present tourism qualities, its new-settlement appeal and its economic base. A number of views throughout the Stroud-Gloucester Valley have landmark significance but this quality is nowhere better exemplified than by the highly scenic northern end of the valley set between the Gloucester Bucketts and the Mograni Range. It is doubtful if any town in Australia has a more picturesque setting and more dramatic backdrop.

Criterion (d) Social significance

An item has strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons (State significance) Or An item has strong or special association with a particular community or cultural group in the area for social, cultural or spiritual reasons (local significance).

As noted under criterion (a) the Gloucester Bucketts and surrounding parts of the Valley have social significance to the valley's Aboriginal people for ancestral-spiritual reasons and to the non-indigenous population for aesthetic 'identity of place' reasons. This significance should not be seen as limited to the geological formation itself but to the Bucketts and the valley in their total setting, and specifically including the setting.

Criterion (e) Technical research significance

An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (State significance) OR An item has potential to yield information that will contribute to an understanding of the area's cultural or natural history (local significance).

The subject site and area within the northern end of the Valley has the potential to yield further scientific information about the geological formation of the Stroud-Gloucester Valley and the Scone Plate/Eastern Myall Block as well as archaeological information about past Aboriginal occupation.

Criterion (f) Rarity

An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (State significance); OR An item possesses uncommon, rare or endangered aspects of the area's cultural or natural history (local significance).

The Stroud-Gloucester Valley is a rare geological formation both in its geological complexity and in its ability to visually demonstrate these geological qualities. The repeated rhetoric used by the Part 12 Historic Heritage Assessment to derogate the Valley's geological significance forms an underlying and serious deficiency in the Assessment.

Criterion (g) Representativeness

An item is important in demonstrating the principal characteristics of a class of NSW's
- cultural or natural places; or
- cultural or natural environments
(State significance): OR

An item is important in demonstrating the principal characteristics of a class of the area's
- cultural or natural places; or
- cultural or natural environments (local significance).

The Stroud-Gloucester Valley in its entirety and particularly in the northern end of the Valley (including the proposed site) demonstrates in a visually graphic manner the geological

characteristics of a complex landscape formed by intensive lateral folding and volcanic action. Despite the unjustified dismissive claims made by the proponents in the Part 12 Historic Heritage Assessment, the Valley's settlement, function and development are readily demonstrated by it physical features and current form. This area of significance can be more fully described when its significance under the other criteria is fully acknowledged instead of being read down or denied to satisfy high impact mining development.

3.4 Conclusion

The conclusion is that the assessment under the NSW heritage assessment criteria shows that the Amended Rocky Hill Project will have an adverse impact on the heritage qualities of the entire Stroud-Gloucester Valley and a severe impact on the highly significant and highly scenic northern end of the Valley.

This impact will occur over all heritage assessment criteria but will be particularly severe on criterion (a) historic significance and criterion (c) aesthetic significance. By comparison with other similar developments it can be seen that the proposed mitigation measures will fall substantially short of satisfactorily mitigating that impact.

Appendix 5

Groundswell Gloucester Submission Working Group

The following people reviewed the Application documentation, contracted consultants and/or wrote contributions to this submission;

- **Anthony Berecry –** geologist: Exploration, Mine Planning, overburden testing and geophysical analysis specifically for coal seams of the Stratford to Rocky Hill area.
- **Michael Bowman** – Forbesdale resident for 11 years; Owner Bucketts Building Supplies & Services
- **Thomas Davey**
- **Ray Dawes –** BSC. Dip Ed, Newcastle University
- **Graham Gardner** – BTown Planning (UNSW) – Local government planner for 30 years
- **Phillip Greenwood** BA (Geomorphology), MSc (Environmental Science) – Resource Analyst & Industry Strategist
- **Graeme Healy** – BEc (Sydney) –Business Strategist
- **Jeff Kite** – BE (Civil), GDip Nat Res, MIEAust, CPEng (Retired) –Worked in Water Resources/ Environmental Management for WA Govt for 25 years
- **Julie Lyford –** Gloucester resident 30 years**,** ex-Mayor Gloucester Shire Council, Chair Groundswell Gloucester
- **David Marston** – BSc Agric and Master Nat Res; 40years experience in agriculture and natural resource management with specialisation in soil and water management
- **Gerald McCalden** – Post Grad Degrees in Geography and Computer Science. Deputy Director of HVRF. Retired to Gloucester just as the Stratford mine commenced
- **Dianne Montague**
- **Steve Robinson** MB. BSC., FRANZCP (Psychiatrist) –Based at Gloucester Medical Centre for 10 years
- **Chris Russell**
- **John Watts**