



ANVIL HILL PROJECT

environmental assessment

Response to Submissions PART C

Anvil Hill Project Environmental Assessment Response to Submissions Part C

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Centennial Hunter Pty Limited

| | | |
|---------------------------|------------------|---------------|
| Project Director: | Barbara Crossley | |
| Project Manager: | Barbara Crossley | |
| Report No. 2330/R05/Final | Date: | December 2006 |



2/20 The Boulevard
PO Box 838
Toronto NSW 2283

Ph: 02 4950 5322
Fax: 02 4950 5737
Email: mail@umwelt.com.au
Website: www.umwelt.com.au

TABLE OF CONTENTS

| | | |
|------------|--|------------|
| 1.0 | Introduction | 1.1 |
| 1.1 | Summary of Issues Raised in Community Submissions..... | 1.1 |
| 1.1.1 | Support for the Project..... | 1.3 |
| 1.2 | Report Structure | 1.5 |
| 2.0 | Consultation | 2.1 |
| 2.1 | Consultation Process..... | 2.1 |
| 2.1.1 | Muswellbrook Shire Council | 2.1 |
| 2.1.2 | Community Submissions | 2.1 |
| 2.2 | Sandy Hollow Consultation | 2.4 |
| 2.2.1 | Community Submissions | 2.4 |
| 3.0 | Water Resources | 3.1 |
| 3.1 | Department of Natural Resources..... | 3.1 |
| 3.2 | Community Submissions | 3.7 |
| 4.0 | Aboriginal and European Heritage | 4.1 |
| 4.1 | Aboriginal Cultural Heritage | 4.1 |
| 4.1.1 | Department of Environment and Conservation | 4.1 |
| 4.1.2 | Community Submissions | 4.4 |
| 4.2 | European Heritage..... | 4.7 |
| 4.2.1 | Heritage Council of NSW..... | 4.7 |
| 4.2.2 | Community Submissions | 4.8 |
| 5.0 | Land Disturbance and Mine Rehabilitation..... | 5.1 |
| 5.1 | Mine Subsidence Board..... | 5.1 |
| 5.2 | Department of Primary Industries..... | 5.1 |
| 5.3 | Department of Lands..... | 5.4 |
| 5.4 | Community Submissions | 5.5 |
| 5.4.1 | Land Disturbance | 5.6 |
| 5.4.2 | Rehabilitation | 5.6 |
| 6.0 | Visual Amenity..... | 6.1 |
| 6.1 | Muswellbrook Shire Council | 6.1 |
| 6.2 | Community Submissions | 6.1 |
| 6.2.1 | Views into the Mine Site | 6.1 |
| 6.2.2 | Night Lighting and the Night Sky | 6.3 |
| 6.2.3 | Submissions in Support in relation to Visual Impacts | 6.4 |

| | | |
|-------------|--|-------------|
| 7.0 | Traffic and Transport | 7.1 |
| 7.1 | Muswellbrook Shire Council | 7.1 |
| 7.2 | Community Submissions | 7.2 |
| 7.2.1 | Alternative Transport Routes..... | 7.2 |
| 7.2.2 | Wybong Road..... | 7.2 |
| 7.2.3 | Golden Highway | 7.3 |
| 7.2.4 | Mangoola Road | 7.3 |
| 7.2.5 | Other Roads | 7.4 |
| 7.2.6 | Road Infrastructure..... | 7.4 |
| 7.2.7 | Road Safety..... | 7.4 |
| 7.2.8 | Other General Road Issues..... | 7.5 |
| 7.2.9 | Rail..... | 7.7 |
| 8.0 | Socio-Economic | 8.1 |
| 8.1 | Muswellbrook Shire Council | 8.1 |
| 8.2 | Community Submissions | 8.2 |
| 8.2.1 | Community Displacement and Relocation | 8.2 |
| 8.2.2 | Property Devaluation..... | 8.6 |
| 8.2.3 | Impacts on the Sandy Hollow Community..... | 8.8 |
| 8.2.4 | Impacts on the Denman Community | 8.9 |
| 8.2.5 | Impacts on the Castlerock Locality..... | 8.9 |
| 8.2.6 | Impacts on General Community | 8.9 |
| 8.2.7 | Impacts on Community Health | 8.10 |
| 8.2.8 | Impacts on Agriculture and other Business..... | 8.10 |
| 8.2.9 | Employment..... | 8.14 |
| 9.0 | Other Environmental and Compliance Issues | 9.1 |
| 9.1 | Muswellbrook Shire Council | 9.1 |
| 9.2 | Community Submissions | 9.1 |
| 9.2.1 | Spontaneous Combustion | 9.1 |
| 9.2.2 | Soils | 9.2 |
| 9.2.3 | General Environmental Impacts | 9.3 |
| 9.2.4 | Assessment Methodology | 9.4 |
| 9.2.5 | Assessment of Cumulative Impacts | 9.5 |
| 9.2.6 | Legislation and Compliance | 9.6 |
| 10.0 | Conclusion..... | 10.1 |

1.0 Introduction

This document has been prepared in response to a request from the Director-General in accordance with section 75H(6) of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act) that Centennial Hunter Pty Limited (Centennial) prepare a response to the issues raised during the public exhibition period for the Anvil Hill Project (Project). Part A of Centennial's Response to Submissions was lodged with the Department of Planning (DoP) on 31 October 2006 and specifically addressed greenhouse, climate change and ESD issues. Part B was lodged with DoP on 17 November 2006, focussing on the issues of ecology, air quality (apart from greenhouse emissions), noise and blasting. This report is Part C of Centennial's Response to Submissions and addresses the remaining issue themes raised by government agencies and the community.

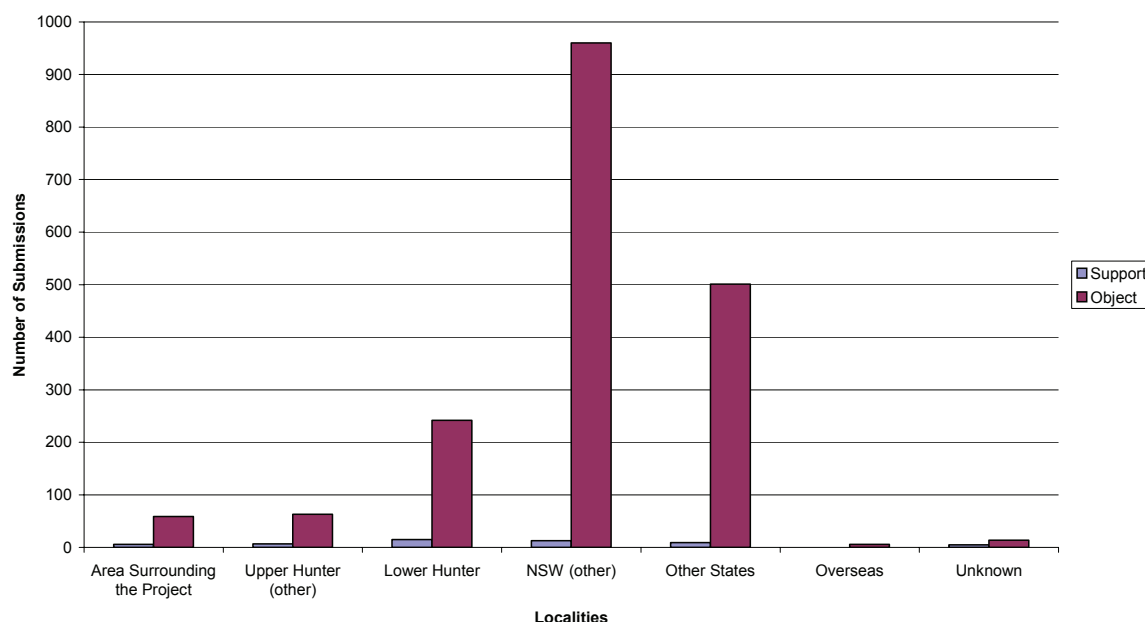
1.1 Summary of Issues Raised in Community Submissions

A total of 1900 submissions were received from members of the community during the exhibition period. Of these, 1845 objected and 55 supported the proposed project. Four types of pro formas made up 1400 of the submissions objecting to the project, with the remaining 445 objections comprising individual submissions. **Table 1.1** and **Graph 1.1** provide a summary of the residential locations of people providing submissions for and against the project.

Table 1.1 – Localities

| | Support | Object | Total |
|---|-----------|-------------|-------------|
| Local Area Surrounding the Project | 6 | 59 | 65 |
| Upper Hunter (other) | 7 | 63 | 70 |
| Lower Hunter | 15 | 242 | 257 |
| NSW (other) | 13 | 960 | 973 |
| Other States | 9 | 501 | 510 |
| Overseas | 0 | 6 | 6 |
| Unknown | 5 | 14 | 19 |
| Total | 55 | 1845 | 1900 |

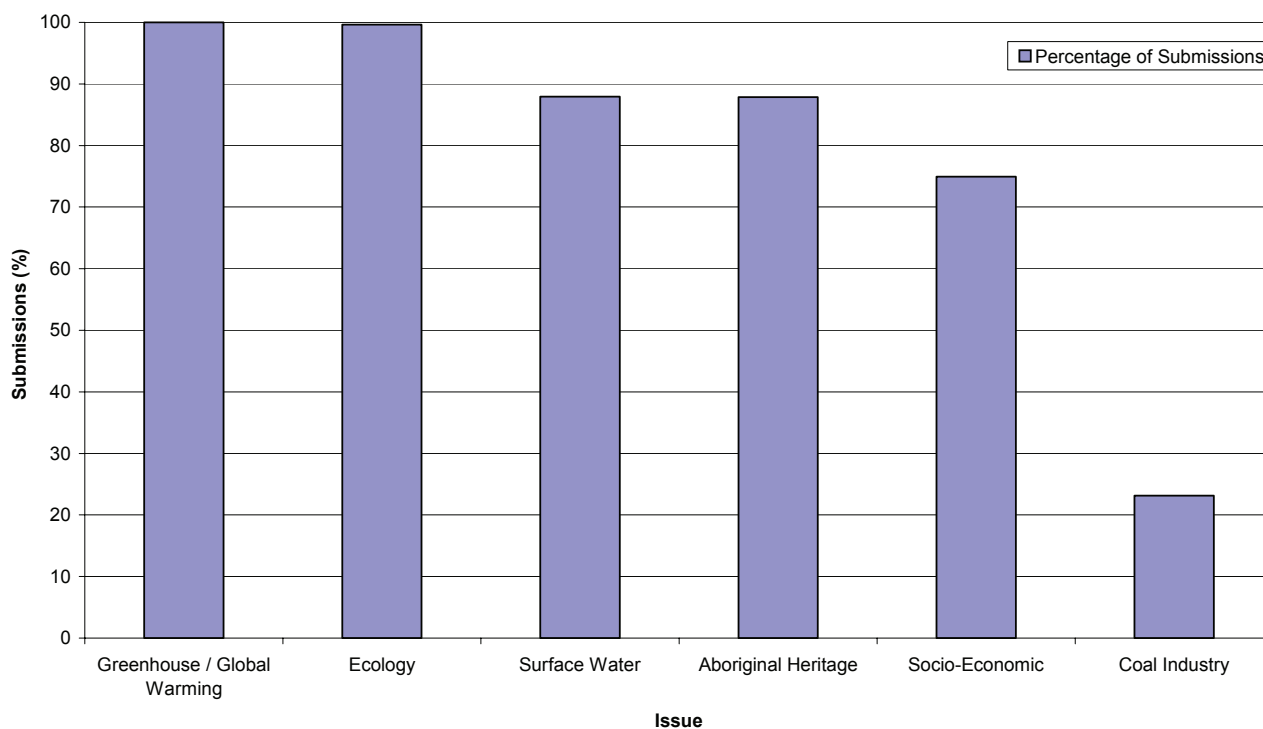
Graph 1.1 - Locality of Submissions of Objection and Support



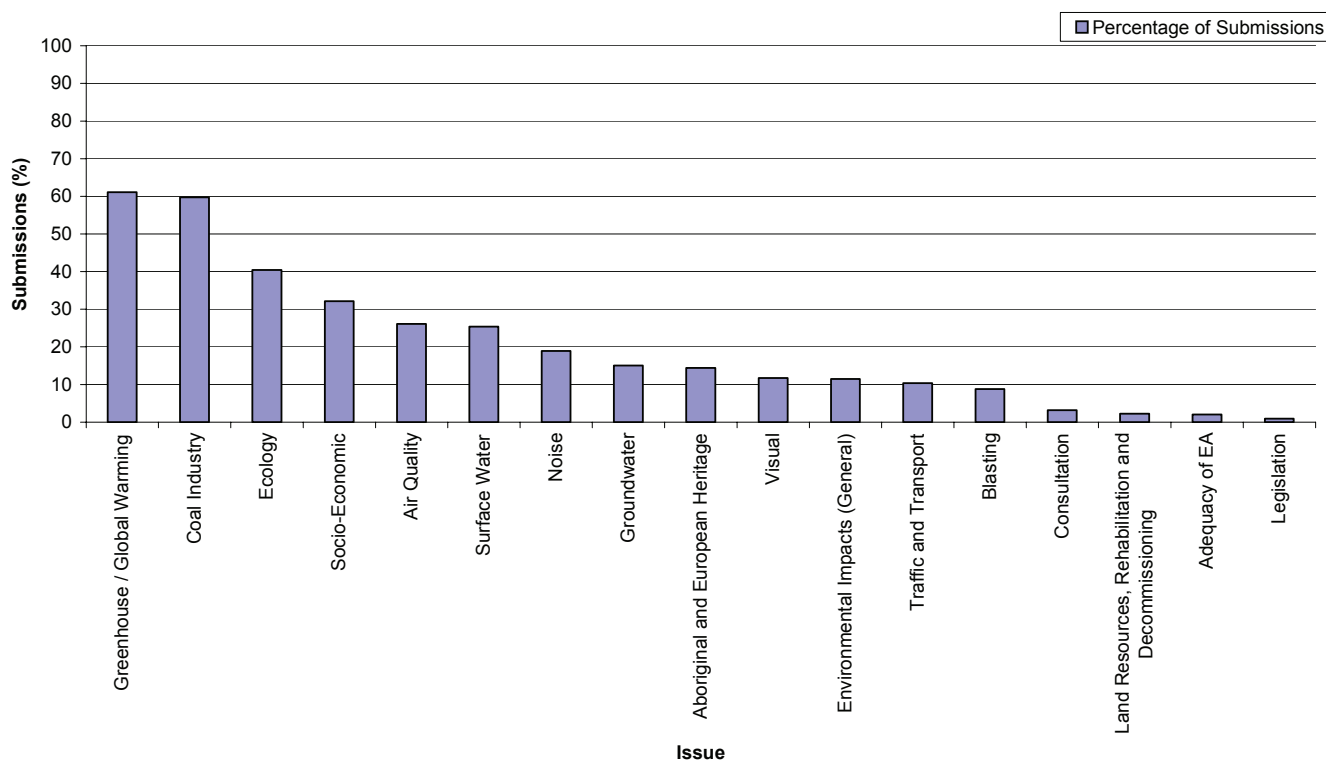
It can be seen from this data that the majority of objections were received from regions of New South Wales outside of the Hunter region and from other states of Australia.

The frequency of issues included in the 1400 form letters is shown on **Graph 1.2**, whilst the frequency of issues raised in the individual submissions is shown on **Graph 1.3**. There was a much greater diversity of issues raised in the individual submissions.

Graph 1.2 - Issues Raised in Pro Forma Submissions



Graph 1.3 - Issues Raised in Individual Submissions



A total of 79 submissions were from local stakeholders located within and in proximity to the Project Area, who had participated in the ongoing consultation program for the EA. Of these local stakeholders, 69 objected to the project, whilst 10 supported the project.

Analysis of the issues raised by locality (refer to **Table 1.2**) indicates that the majority of submissions from the local area related more specifically to direct off-site impacts such as air quality, noise, local socio-economic issues, and surface water. This trend was broadly similar for submissions from other parts of the Upper Hunter. In contrast, submissions from the Lower Hunter, throughout NSW, other States and overseas, were mainly form letters and were primarily objections based most commonly on the grounds of greenhouse/global warming, flora/fauna, cultural heritage, socio-economic impacts, surface water, and general objection to the coal industry.

Table 1.2 - Summary of issues by Locality

| | Area Surrounding the Project | Upper Hunter (other) | Lower Hunter | NSW (other) | Other states | Overseas | Unknown |
|--|-------------------------------------|-----------------------------|---------------------|--------------------|---------------------|-----------------|----------------|
| Adequacy of EA | 3 | 4 | 2 | 0 | 0 | 0 | 0 |
| Air Quality | 48 | 41 | 12 | 15 | 3 | 0 | 0 |
| Blasting | 14 | 25 | 0 | 0 | 0 | 0 | 0 |
| Coal Industry | 9 | 18 | 98 | 392 | 71 | 0 | 6 |
| Consultation | 7 | 3 | 2 | 2 | 0 | 0 | 0 |
| Environmental Impacts – General | 9 | 13 | 6 | 22 | 1 | 0 | 0 |
| Flora and Fauna | 18 | 30 | 205 | 822 | 485 | 6 | 9 |
| Greenhouse / Global Warming | 20 | 23 | 220 | 896 | 497 | 6 | 10 |
| Groundwater | 20 | 20 | 16 | 12 | 1 | 0 | 1 |
| Heritage | 7 | 12 | 143 | 644 | 478 | 6 | 4 |
| Land Resources, Rehabilitation and Decommissioning | 4 | 2 | 2 | 2 | 0 | 0 | 0 |
| Legislation | 2 | 1 | 1 | 0 | 0 | 0 | 0 |
| Noise | 43 | 29 | 6 | 5 | 1 | 0 | 0 |
| Socio-Economic | 43 | 42 | 128 | 548 | 425 | 6 | 3 |
| Surface Water | 31 | 25 | 151 | 648 | 479 | 6 | 4 |
| Traffic and Transport | 21 | 22 | 0 | 2 | 1 | 0 | 0 |
| Visual | 17 | 17 | 5 | 11 | 1 | 0 | 1 |

1.1.1 Support for the Project

As noted previously, there were a number of submissions that provided support for the Project. The reasons given for supporting the project were primarily in relation to the economic benefits associated with the Project, the role of Australian coal within the global and domestic marketplace, the ability of Centennial to operate the Project in an environmentally responsible manner, the social benefits associated with the Project, the quality of the EA and the adequacy of the proposed measures to offset impacts associated with the Project. Some of the key themes raised in support of the project are outlined below:

- *We depend on coal industry as the engine room of our economy and support the development of the mining industry providing all conditions of consent are adhered to.*
- *Mining developments have contributed greatly to Muswellbrook and the surrounding area.*
- *Many people in the region depend directly or indirectly on mining.*
- *The supply of thermal and coking coal underpins every facet of our society, being the main fuel source for electricity generation and core building supplies of steel and concrete.*
- *Urgent changes are required in our use of energy. However there will still be a requirement to produce energy from coal for many decades as the amount of renewable energy available will never be able to meet requirements.*
- *Australian black coal is less damaging to the environment than other world coals. If not guaranteed Australian black coal, such as from Anvil Hill, other nations will use less environmentally friendly brown coals. It would be irresponsible to stop this project and permit less environmentally friendly coals available in other parts of the world to take their place*
- *Centennial Coal is very conscious of its environmental obligations*
- *Centennial Coal will run the project in a responsible and diligent manner, and we may be able to retain an emerging Australian company that will equally serve the workers, environment, shareholders and wider community*
- *Centennial has consulted with community throughout the process - opportunity has been available to everyone with an interest. There has been exhaustive consultation with all stakeholders*
- *Communities in the Upper Hunter Valley have suffered from the effects of drought and poor agriculture prices and have generally missed the benefits of the growth of the coal industry lower in the valley.*
- *The mine will provide considerable economic benefit to NSW, Australia and the local community. NSW will benefit from coal royalties and more employment. Australia will benefit from taxation revenue. The local community will benefit from employment at high wage rates which will have a flow on effect to service industries. There will also be economic benefits for the State government by way of royalties.*
- *The upfront Environmental Assessment process has been an excellent example of transparent approach with community consultation, and strategies to offset impacts.*
- *Satisfied that adequate measures are proposed to be implemented through the Environmental Assessment to achieve an acceptable balance between the economic benefits for the region and the environmental considerations of preserving the rural amenity.*
- *Significant biodiversity offsets are proposed*

- *Believe the development can be managed to minimise potential environmental impact.*
- *There will be long-term environmental benefits.*

In addition to individual submissions received in support of the Project, it should be noted that Muswellbrook Shire Council, as the elected representatives of the broader Muswellbrook community supports the Project, subject to certain suggested project approval conditions.

1.2 Report Structure

As outlined in **Section 1.1**, there were a range of issues raised in the public submissions in relation to matters not addressed in Part A or Part B response to submissions. These issues are addressed in the following sections of this response. For each primary issue, the theme of the matters raised is noted in bold, followed by a response in normal type. Issues raised by government agencies are addressed in each section, followed by those raised in the community submissions.

2.0 Consultation

2.1 Consultation Process

2.1.1 Muswellbrook Shire Council

Muswellbrook Shire Council (MSC) noted that a Community Consultative Committee should be formed for the duration of Project

As outlined below, a Community Consultative Committee (CCC) was formed by the Minister for Primary Industries to provide a mechanism for community engagement throughout the exploration phase and during development of EA.

The current approach in development consents for similar major projects has been to require the formation of a CCC to operate throughout the life of the Project. As outlined in Section 6.0 of the EA (p6.12), Centennial is committed to the establishment of a Community Consultative Committee (CCC), within three months of project approval, in consultation with DoP and Council. It is proposed that a CCC would be in place for the duration of the Project and would function in accordance with relevant DoP guidelines.

2.1.2 Community Submissions

A number of local community submissions raised general concern regarding the EA consultation process, including the following themes:

- **Lack of community consultation and failure to listen to people's concerns.**
- **Newsletters don't really benefit the community. "Consultation notes" are 'useless' including pretty photos of the environment taken long before disturbance.**
- **The community consultation process has been flawed**
- **There has been insufficient public awareness of this proposal and its impact.**
- **Centennial Coal has little regard to residents of the area and did not engage the community nor provide sufficient information.**
- **Centennial preferred to discuss matters individually with landholders**

In response, we note that there was extensive consultation with the local community over a two year consultation program, as part of the environmental assessment process. A range of consultative and assessment mechanisms were used to engage the community in relation to the Project, including:

- over 100 individual landholder meetings. Interviews with landholders specifically focused on providing the context of the Project proposal and on identifying the landholders' issues relating to the Project;
- many community presentations to regional and local environmental groups, professional and trade associations, community organisations, and other industry groups;

- consultation with education, health, accommodation and community service organisations to understand service provisions;
- conduct of a broader community survey involving a telephone survey of 400 randomly selected households in the Muswellbrook Shire to gauge the views of the wider community on the Project;
- Community Information Days were held in June 2006 at Wybong Hall and the Centennial Muswellbrook office;
- three Community Information Sheets (CIS) were circulated to over 200 stakeholders at key stages of EA preparation;
- Anvil Hill Project newsletters continue to be circulated to local landholders and key stakeholders;
- Community Consultative Committee (CCC) – information on the outcomes of the technical studies was provided by Centennial and its consultants, and feedback was received by Centennial from the Committee and members of the gallery;
- consultation with eighteen Aboriginal stakeholder groups during the Aboriginal Heritage Assessment;
- other general consultation including numerous letters, telephone conversations, and personal discussions with many community stakeholders throughout the assessment process;
- participation in other forums including Project information booths at the Muswellbrook Show and the Upper Hunter Wine and Food Affair at Denman.

Feedback from this consultation process was considered in identifying the key issues that were addressed in the EA.

Other more specific issues raised by the local community in relation to the consultation process, are addressed below.

Centennial occasionally treated the land as their own before any formal agreements were made.

Any aspect of the EA that necessitated access to private property was undertaken in accordance with property agreements reached between the individual landholder and Centennial. Additional phone contact was also undertaken to establish permission to access relevant private properties for this assessment and prior to any access. Centennial respects the privacy and rights of all landholders. A very few individual complaints were received about non-adherence to agreed procedures and the specific issues were addressed.

There has been disinterest by Centennial Coal in the results of community consultations and environmental assessment

The outcome of the extensive community consultation process was an integral component in the identification of the key environmental and community issues associated with the Project and specifically assessed in the EA. Section 4.2 of the EA outlines the key environmental and community issues addressed by the EA.

Community consultation and feedback was the driver for the Centennial land acquisition process. As concerns were raised, Centennial shaped its program to try to achieve the best outcome for all stakeholders.

The proponent hid behind the CCC instead of being open with the community

As outlined above and in Section 4.1.2 of the EA (p4.2), Centennial employed a wide range of mechanisms as part of the intensive community consultative process undertaken throughout the preparation of the EA.

As indicated above, the CCC was only one of the mechanisms used to engage with the community. The CCC was formed by the Minister for Primary Industries and Centennial participated in this forum in the manner requested by the independent Chairperson, nominated by the Minister.

The CCC is a farce as there was no minutes sent to the government and for quite a few meetings no records kept of who attended. Meeting protocols constantly changed at the discretion of Centennial Coal and the Chairman. The community was left confused and disillusioned as to the CCC's workings and the community's ability to input.

The CCC was established by the Minister for Primary Industries. An independent Chairperson was nominated by the Minister. The Chairperson ensured that minutes were taken by a non-committee member, draft minutes were distributed to Committee members prior to the next meeting, discussed at the following meeting amended as agreed by the Committee members, ratified by the Chairperson and distributed to Committee members and any other person who had requested the Chairman add their name and address to the circulation list. The CCC was run to the format prescribed by the Chairperson. Members of the community were invited to attend as part of a public gallery and were able to ask questions during the meeting, particularly during information sessions, and at the completion of the committee's business. This process was managed by the Chairperson.

Many participants voiced their appreciation of the CCC process, particularly during the extensive feedback sessions provided on the various EA technical studies.

Community consultation meetings were held at 5.15 pm, making it difficult for people to attend.

The next meeting dates and times were set and agreed to by the Committee at the completion of each meeting.

The Environmental Assessment documentation was not available in paper copy. Had to travel 60 km round trips to read the document in library time. No access to computer or broadband.

Paper copies of the EA were available to view at Denman and Muswellbrook Libraries and Muswellbrook Shire Council Administration Centre. Paper copies were supplied to all members of the CCC. Paper copies were supplied to MSC to be available for public distribution and were re-stocked a minimum of three times during the exhibition process. After the exhibition period, and as of 21 November 2006, MSC advised there were 12 surplus copies of the EA available at its offices.

The timeframe within which to view the Environmental Assessment Documentation and reply was too short. The timing of Panel of Experts gives the community little time to prepare to present to panel.

This is a matter for the Department of Planning, not the Applicant, however it is noted that the public exhibition period is defined within the *Environmental Planning and Assessment Regulation 2000*. In relation to projects to which Part 3A of the Environmental Planning and Assessment Act applies the regulations require that the Project be placed on public exhibition for a minimum 30 day period. The Project was on public exhibition from 25 August 2006 to the 6 October 2006, a period of 42 days, which is considerably more than the requirements of the Regulations.

Independent Hearing and Assessment Panel (IHAP) proceedings were determined by the Department of Planning (DoP) in accordance with current policy in relation to the IHAP process.

In accordance with the regulations, an advertisement to notify the public of the commencement of the public exhibition period and the IHAP process was widely circulated by DoP within a number of newspapers including the Newcastle Herald and the Muswellbrook Chronicle.

2.2 Sandy Hollow Consultation

2.2.1 Community Submissions

Sandy Hollow residents and Progress Association were not included in the consultation process.

Sandy Hollow is closer to the mine than Denman – the public school was not included in the consultation process; and local businesses were not consulted unless they approached Centennial Coal themselves.

Centennial Coal publicly stated that they forgot to include Sandy Hollow in consultation

Sandy Hollow is located approximately 10 kilometres to the west of the Project Area. The extensive impact assessment process indicated that the Sandy Hollow area would not be significantly impacted by the Project and is located well outside the area of affectation associated with the Project.

Nevertheless, the potential socio-economic impacts on Sandy Hollow were considered in the EA.

Under Section 3.2.2 of the Socio-Economic Assessment Sandy Hollow was clearly identified as being a significant locality within the Muswellbrook LGA "...Denman and **Sandy Hollow** are the two other significant areas of settlement among a number of small outlying rural communities" (p.22).

The SIA process involved community consultation with a range of stakeholders including:

- 16 Landholders residing within the proposed project area;
- 96 Landholders residing in close proximity to the project site, within 5 kilometres of the mine but outside of the proposed project area;
- community and environmental groups with an interest in the proposal;
- as well as residents within the broader Wybong area and Muswellbrook Shire (400 households).

Importantly, the attitudes of the general Muswellbrook Shire (LGA) were assessed through a telephone survey of 400 randomly selected households. As the households were randomly selected Sandy Hollow residents had equal opportunity for involvement.

Furthermore, Section 3.4 of the report documented socio-economic characteristics of the broader Muswellbrook LGA (by considering ABS census data) which includes all of the localities within the Shire boundaries. This section also considered census data relating to the locality of Wybong more specifically. This was undertaken because the Anvil Hill project area is located within the locality of Wybong specifically. No other localities were included in such detail; instead assessment was focused on the LGA level.

Section 6 of the report considered the impact of the Project's workforce (construction and operation) on the population in the Hunter region. This involved a focus on the main centres of Muswellbrook, Denman, Scone, Aberdeen, and Singleton, as these centres are most likely to be impacted by population increases related to the project. The main centres have greater access to services and are likely to attract the Anvil Hill residential workforce. However in this section other towns across the region were also considered collectively (see Tables 6.1 and 6.2, page 56). Although Sandy Hollow was not mentioned explicitly, this consideration included the Sandy Hollow locality.

Unfortunately Sandy Hollow School was omitted from Table 6.5.

Specific concerns were raised about increased road traffic and issues associated with road safety. These issues were detailed in Section 4.2.1 which considered issues raised by landholders within the Wybong locality and broader LGA.

3.0 Water Resources

3.1 Department of Natural Resources

Since the Department of Natural Resources' (DNR) letter to the Department of Planning of 27 September 2006, Centennial has met with relevant officers of DNR on two occasions. One of these meetings occurred on site, giving those officers the further opportunity to appreciate the site specific water issues. The other meeting occurred at DNR's Newcastle office and principally concerned the regulatory basis on which the water management system for the Anvil Hill Project would operate, as well as the impact on downstream water users.

Following that discussion, Centennial understands that earlier concerns have been resolved in relation to water licensing and the manner in which the water management system and Environmental Assessment address the objectives of the *Water Management Act 2000* and the Hunter Regulated River Water Sharing Plan 2003 (HRRWSP) and Wybong Creek Water Sharing Plan 2003 (WCWSP).

This response reiterates the regulatory compliance of the water management system discussed with DNR.

1. Operation in accordance with *Water Management Act 2000*, *Water Act 1912*, Wybong Creek Water Sharing Plan (WCWSP) and Hunter Regulated River Water Sharing Plan (HRRWSP)

As discussed in the EA, the proposed development will be undertaken in accordance with the requirements of the *Water Management Act 2000* and associated regulation, *Water Act 1912*, Wybong Creek Water Sharing Plan (WCWSP) and Hunter Regulated River Water Sharing Plan (HRRWSP). Water utilised by the proposed mine will include:

- runoff collected on site, including runoff from the mine's dirty water system. This water will be collected and pumped to the dirty water compartment of Main Dam from where it will be used exclusively for dust suppression purposes in accordance with exemptions provided under clause 18(1)(c) of the Water Management Regulation 2003;
- runoff collected in accordance with Harvestable Rights entitlements under the provisions of the *Water Management Act 2000*. Based on a Centennial landholding of 4785 hectares and the DNR maximum harvestable right dam calculator figure for the area of 0.07 megalitres per hectare per year, the proposed development could harvest (and utilise for any purpose) a total volume of up to 335 ML per year under Harvestable Rights. It is intended that this water will principally be used in the coal preparation plant;
- groundwater inflows into the mine from the fractured rock aquifer that will be intersected by the mine. This water is not part of the water source the subject of the WCWSP, and is not subject to the licensing provisions of the *Water Management Act 2000*. A groundwater licence under Part 5 of the *Water Act 1912* will be sought for this saline groundwater. This groundwater will be pumped to the saline water compartment of Main Dam and will principally be used in the coal preparation plant;
- Water pumped from water sources outside the Wybong Catchment, such as the Hunter River system. This water will, when required, be extracted pursuant to existing entitlements or allocation acquired commercially by Centennial. This

externally sourced water will be used as make up water on site and may be used for any purpose.

2. Impact on downstream flows and impact on downstream users not supported with documentation in EA.

As stated in Section 2.4 of Appendix 7 of the EA, DNR records indicate that there are 10 licensed groundwater extraction points and 13 licensed surface water extraction points on Wybong Creek. In addition, there are downstream properties which front Wybong Creek and therefore have basic landholder rights to extract water for stock and domestic purposes. Surface and groundwater bore licence locations are shown on Figure 2.6 of Appendix 7 of the EA.

As discussed in Section 4.4 of Appendix 7 of the EA, modelling indicates that the proposed development will reduce average annual runoff to the Wybong system by less than 1.3% per year over the life of the project. Surface flows in Big Flat Creek are intermittent with substantial flows typically being of short duration following rainfall events that are sufficient to generate surface runoff. As a result, the potential for the proposed development to change water availability for downstream users in the Wybong Creek system is negligible. Wybong Creek, even though it has a significantly larger catchment than Big Flat Creek, also ceases to flow regularly and can have negligible base flow for prolonged periods. As a result, use of surface flows for agricultural purposes in this area is opportunistic.

As set out in Section 4.0 of Appendix 7.0 of the EA, potential changes to downstream flows are assessed further as part of the surface water assessment. This has been undertaken through the use of a one dimensional hydrodynamic XP-Storm model of the Wybong Creek catchment. The model network used is shown on Figure 4.1 and 4.2 of the EA. To look at potential downstream impacts, modelling was undertaken of flows and flow durations for several locations on Wybong Creek downstream of its confluence with Big Flat Creek.

Modelled flow hydrographs for the 1 in 1, 1 in 20 and 1 in 100 Year Average Recurrence Interval (ARI) flow events for the existing catchment and for the existing catchment with the proposed mine development at Year 10 and Year 21 are provided in Appendix C of Appendix 7 of the EA. Modelling undertaken considered storms of 9 hour and 12 hour durations with the 12 hour storm being found to be the critical storm duration in terms of generating peak flows.

The results of this modelling for location W2 on Wybong Creek which is approximately 1 kilometre downstream of the Big Flat Creek confluence are shown graphically in Appendix C of Appendix 7 on:

- Figure 1 (1 in 100 Year ARI 12 hour storm)
- Figure 8 (1 in 100 Year ARI 9 hour storm)
- Figure 15 (1 in 20 Year ARI 12 hour storm)
- Figure 22 (1 in 20 Year ARI 9 hour storm)
- Figure 29 (1 in 1 Year ARI 12 hour storm)
- Figure 36 (1 in 1 Year ARI 9 hour storm).

The results of this modelling can be summarised as follows:

- During a 1 in 100 year ARI event (Figures 1 and 8 of Appendix 7 of the EA) there will be a small (<3%) reduction in peak discharge. Peak discharge for the 1 in 100 year ARI event is estimated to be approximately 1400 m³/s. Modelling indicates that the

time to peak discharge from the start of the storm, duration of flow and flow volume below peak discharge will be effectively the same for the existing Wybong Creek catchment and the catchment as modified by the proposed development at Year 10 and Year 21.

- As shown on Figures 15 and 22 (refer to Appendix 7 of the EA), modelling indicates that during a 1 in 20 year ARI event there will be a negligible reduction in peak discharge with peak discharge estimated to be approximately 1000 m³/s. The time to peak discharge, duration of flow and flow volume below peak discharge being effectively the same for the existing Wybong Creek catchment and the catchment as modified by the proposed development at Year 10 and Year 21.
- During a 1 in 1 year ARI event (Figures 29 and 36, EA Appendix 7) there will be no discernable reduction in peak discharge with peak discharge estimated to be approximately 240 m³/s. Modelling indicates that during a 1 in 1 year ARI event, the time to peak discharge duration of flow and flow volume below peak discharge will be effectively the same for the existing Wybong Creek catchment and the catchment as modified by the proposed development at Year 10 and Year 21.

These model results indicate that for flow events ranging from the 1 in 1 year ARI to the 1 in 100 year ARI, the proposed development will not significantly impact on downstream flows or the availability of surface water to downstream users. Modelling indicates that the only change is a predicted small (3%) reduction in peak flows 1 in 100 year flows with no change to flow duration. Modelling also indicates that the change for more frequent flows such as the 1 in 1 year ARI event is negligible with peak runoff from Year 21 landform being slightly higher than that of the existing landform.

The predicted small to negligible reduction in peak flows is considered unlikely to adversely impact on downstream users as the ability to harvest or utilise the total flow at these times is extremely low. By way of example if each of the 13 downstream surface water licences in Wybong Creek had the capacity to pump 1000 L/s (which is a very high pumping capacity), the maximum amount of water harvested would be 13 m³/s which is only approximately 5% of the predicted 1 in 1 year ARI flow.

In regard to potential impacts on availability of groundwater for licensed groundwater bores associated with the Wybong Creek alluvium, as stated in Appendix 8 of the EA, groundwater modelling undertaken by Mackie Environmental Research indicates that the proposed mine development will, over the life of the mine, depressurise regional groundwater. This is predicted to cause a drawdown in the conglomerate fractured rock aquifer as shown on Figure E4 of Appendix 8 of the EA. Modelling indicates that this may result in groundwater movement from an area of up to about 1.5 kilometres from Main Pit, with the general direction of movement towards Main Pit.

This groundwater movement may induce leakage from Wybong Creek alluvium for a distance of up to 1.5 kilometres from Main Pit. The maximum rate of leakage from alluvium is predicted by Mackie Environmental Research (Appendix 8 of the EA) to be approximately 0.015 to 0.030 ML/day over a 160 hectare area. Assuming 30% porosity of the alluvium, this maximum leakage rate is the equivalent to a drop in groundwater level in this 160 hectare area of approximately 0.03 to 0.06 mm/day.

If no recharge of the alluvial system from Wybong Creek occurred for a full year (i.e. there was no runoff in the catchment) the maximum predicted leakage rate would equate to a drop in groundwater level over the year of approximately 11 to 22 mm. This loss is negligible and is equivalent to less than 0.01 millimetres of runoff from the upstream catchment.

Groundwater modelling indicates the predicted leakage rate will reduce to approximately zero as the water levels in the Main Pit final void fill to final level following the completion of mining.

As set out above, groundwater modelling indicates that the proposed mine development will not have a significant impact on groundwater levels in the Wybong Creek alluvium downstream of the site and consequently will have a negligible impact on the ability of those holding groundwater licences to pump groundwater.

3. Salinity concentration in Big Flat Creek and Wybong Creek acknowledged but no mitigation measures or compensation to downstream users;

As stated in Section 2.2.3 of Appendix 7 of the EA, approximately 41% of Big Flat Creek catchment will drain to the proposed minewater management system. As discussed in Section 4.2.2 of Appendix 7 of the EA, monitoring indicates that Big Flat Creek which occupies approximately 6% of Wybong Creek catchment is contributing up to 30% of the salt load in the Wybong Creek system.

This salt is generated by significant areas of salt scalds that exist in sections of Big Flat Creek catchment upstream of the proposed development site. During inspection of downstream sections of Anvil Creek in October 2006, areas of crystallised salt on the bed of the creek were identified indicating that the Anvil Creek system (that is proposed to be mined) also contributes salt to Wybong Creek catchment. As shown in Figures D3 and D4 of Appendix D of Appendix 8 of the EA, groundwater salinity and conductivity levels in Clarks Gully and Anvil Creek alluviums are high indicating high salt loads in the groundwater in these areas.

The proposed water management system includes a collection and reuse system for any saline water that flows into the mine void from the surrounding area. As a result, saline water that is currently being discharged from the Anvil Creek and Clarks Gully catchments will not be discharged from the site to Big Flat Creek or the Wybong River system. Collection and reuse of this saline water will result in a net reduction in salt entering the Big Flat Creek system. As discussed above the proposed minewater management system will occupy approximately 41% of Big Flat Creek catchment and as a result, has the potential to capture a substantial salt load that would have otherwise naturally discharged to Big Flat Creek.

Reduction of surface runoff into Big Flat Creek as a result of the proposed development also has the potential to reduce the amount of salt exported from Big Flat Creek catchment to Wybong Creek through reduced flow capacity and hence reduced capacity to transport the salt load.

As stated in Section 4.4 of the EA, modelling indicates that the proposed development will reduce annual runoff to the Wybong Creek system by less than 1.3%. If there was no corresponding reduction in salt load from the Big Flat Creek system, this reduction in runoff would have the potential to cause a minor increase in salt concentrations in flows in Wybong Creek. This potential increase in salt concentrations will be offset by the reduction in salt load that will result from salt that will be captured by the mine water management system.

By way of example if 30% of the salt load in the Wybong Creek system is generated by 6% of the catchment area (i.e. Big Flat Creek), removal of saline runoff from approximately 130 hectares or approximately 2.6% of the Big Flat Creek catchment would offset the identified potential increases in salt concentrations in Wybong Creek

system. As discussed the proposed mine water management system at full development will occupy approximately 41% of Big Flat Creek catchment indicating that reductions in salt load and salt concentration could occur.

Under the EA commitment to the Wybong Uplands Land Management Strategy, Centennial proposes to target dryland salinity in the upland section of Big Flat Creek. Strategies such as the establishment of trees in this area will also assist in reducing salt loads generated from the catchment.

Taking these matters into consideration, it is concluded that the development of the proposed mine is unlikely to significantly increase salt loads or salt concentrations in Wybong Creek and has the potential to substantially reduce salt loads.

4. Proponent not assessed statutory requirements of WCWSP downstream of mine site;

As discussed in response to Point 1 above, water usage at the proposed development will be in accordance with the requirements of the *Water Management Act 2000* and *Water Management Regulation* which provide exemptions for dust suppression and Harvestable Rights usage. These exemptions are not affected by the WCWSP. In addition, groundwater from the fractured rock aquifer will be utilised in accordance with the provisions of Part 5 of *Water Act 1912* which also does not form part of the WCWSP.

The proposed development does not rely on licensed extraction from Wybong Creek Water Source. As a result, the remaining statutory provisions of WCWSP are not applicable to the proposed development.

5. Centennial Coal Response of 8 August. EA should have reflected these commitments;

DNR in its submission of 27 September 2006 quotes part of the Centennial letter of 8 September 2006. The context of this quotation from Centennial's letter of 8 September is important to understanding the commitments made.

In its letter of 8 September 2006 Centennial states that it believes that the water sources proposed to be utilised for the development as set out in the EA are available for use. This is discussed further in response to Point 1 above.

To clarify this, attention is drawn to the following extract from the Centennial letter of 8 September 2006:

Should it be that the assertions of DNR are correct (this is not Centennial's position at this time) Anvil Hill will be able to secure and manage its water requirements within the principles and by the methods assessed in the EA. This would be done generally as follows:

- All surface water would be diverted around the site or collected, treated for sediment control if required and allowed to run off site, removing any need for A WAL for that water;
- Water required for the operation of Anvil Hill would be sourced from ground water inflow and existing or to be acquired WALs on the Hunter River;
- The existing water management systems will allow for the management of any additional water needed to be sourced from the Hunter River should this become necessary, without material change to the proposed mine water management infrastructure with a minor change to the dam size.

Centennial understands that DNR now agrees the water management system proposed for the Anvil Hill Project complies with the applicable legislative regime.

6. DNR requires appropriate conditions be imposed in regard to:

- **Swamp Oak Riparian Forest on Big Flat Creek – mine will abut community and need either set back or monitoring and response mechanisms. Mitigation measures proposed include construction of grout curtain along Big Flat Creek if required and re-instatement of Anvil Creek.**

As discussed in Section 5.3 of Appendix 8 of the EA, assessment undertaken by Mackie Environmental Research, hydraulic testing of the alluvium between Big Flat Creek, Anvil Creek and Clarks Gully indicates that the material has low hydraulic conductivity and that if required, a barrier cut-off wall at the locations shown on Figure 13 of Appendix 8 of the EA could be constructed to minimise groundwater drainage from Big Flat Creek alluvium.

It is proposed that ecological monitoring will be undertaken within Swamp Oak Riparian Forest along Big Flat Creek on at least an annual basis to enable the identification of any detrimental impacts on the community. The Ecological Management Plan (EMP) will document the specific approach required for the monitoring. The EMP will also establish a positive feedback mechanism, which will inform Centennial of what works will be required to mitigate any detrimental impacts, and will also ensure that the results of monitoring will be used to modify the way in which future monitoring is conducted.

The Swamp Oak Riparian Forest along Big Flat Creek occurs within the Conservation Area of the Proposed Offset Area. As part of the biodiversity offset package, cleared areas will be managed to encourage natural regeneration and, where necessary, revegetation will be undertaken, to improve the extent and viability of this community.

- **Rough Barked Apple Woodland along Big Flat Creek downstream of Anvil Creek/Clarks Gully;**

It is proposed that ecological monitoring will be undertaken within Rough-barked Apple Woodland on at least an annual basis to enable the identification of any detrimental impacts on the community. The EMP will document the specific approach required for the monitoring. The EMP will also establish a positive feedback mechanism, which will inform Centennial of what works will be required to mitigate any detrimental impacts, and will also ensure that the results of monitoring will be used to modify the way in which future monitoring is conducted.

The Rough-barked Apple Woodland to be retained occurs within the Conservation Area of the Proposed Offset Area. As part of the biodiversity offset package, cleared areas will be managed to encourage natural regeneration and, where necessary, revegetation will be undertaken, to improve the extent and viability of this community.

- **Forest Red Gum Riparian Woodland along Anvil Creek and Clarks Gully lost through mining**

It is proposed that ecological monitoring will be undertaken within the vegetation that is established on the reinstated Anvil Creek. The rehabilitation plan will aim to revegetate a community that is similar to the existing Forest Red Gum Riparian Woodland. The monitoring will be undertaken on at least an annual basis, and will focus on the establishment success of the plantings, the diversity of the community

and the level of weed infestation. The EMP will document the specific approach required for the monitoring. The EMP will also establish a positive feedback mechanism, which will inform Centennial of what works will be required to improve the establishment success of the revegetation, and will also ensure that the results of monitoring will be used to modify the way in which future monitoring is conducted.

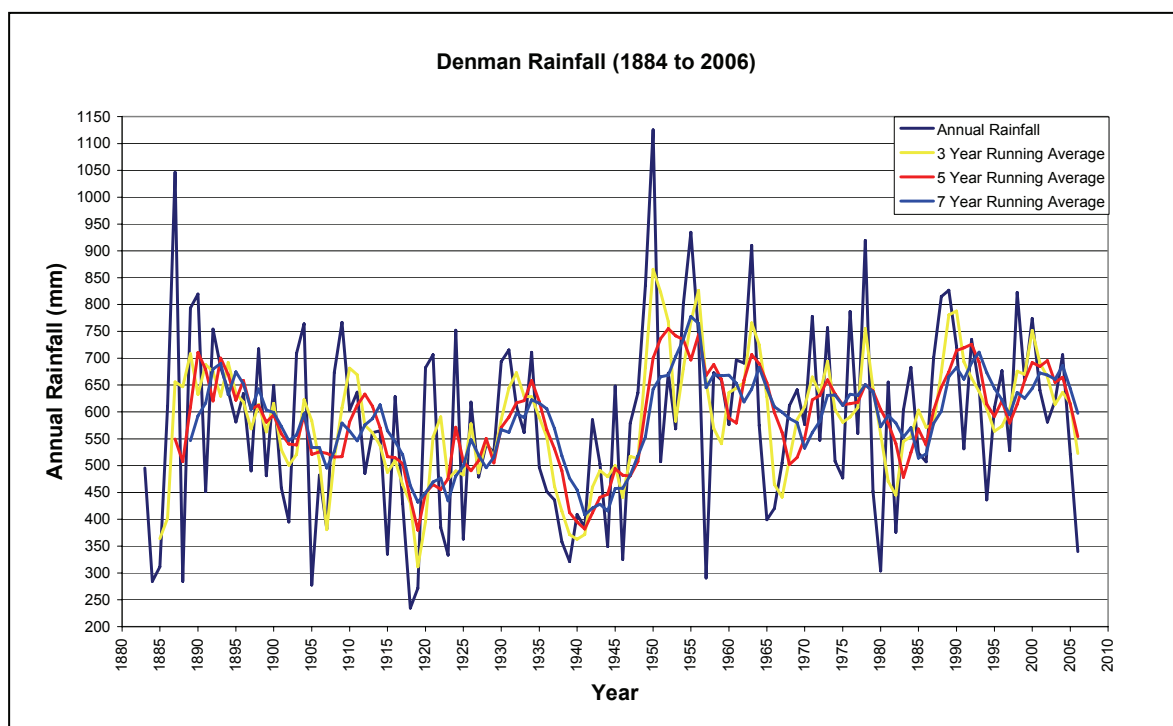
3.2 Community Submissions

The following sections address the other surface water issues raised in the submissions on the Anvil Hill Project EA.

1. Scarcity of water at present, and potential impacts of climate change resulting in it being hotter and dryer. Farms cannot function without water.

The surface water assessment provided in Appendix 7 of the EA takes into account long term rainfall records recorded in the surrounding area dating back to 1884. As part of the surface water assessment, variations in mine water balance were explored using 112 years (1 January 1884 to March 2006) of Denman (Bureau of Meteorology Station 61016) daily rainfall data. This rainfall data set has been subsequently extended to 10 November 2006 to enable this year's rainfall to be compared to historic rainfall records.

Annual Rainfall for the period 1884 to 2006 along with running 3, 5 and 7 year averages are shown on the following Figure.



The driest year on record over this period was 1918 when 234 mm of rainfall was recorded compared to 304 mm recorded in 1880 and 340 mm recorded in 2006 (up until 10 November 2006). There were 12 occasions between 1884 and 2006 when annual rainfall was less than 340 mm which has been recorded to date for 2006. The most recent drier annual period was 1980 when 304 mm of rain was received for the year.

The driest three year period over the 110 years of rainfall record was 1917 to 1919 when an average 312 mm per year was recorded compared to the most recent three year period up to 1982 when an average of 445 mm per year was recorded and the three year period up to 2006 when an average of 523 mm per year was recorded.

The driest five year period over the 110 years of rainfall record was 1915 to 1919 when an average 380 mm per year was recorded. The second driest five year period over the 110 years of rainfall record was 1937 to 1941 when an average 382 mm per year was recorded. These compare to the five year period up to 1983 when an average of 478 mm per year was recorded and the five year period up to 2006 when an average of 554 mm per year was recorded.

The driest seven year period over the 110 years of rainfall record was 1935 to 1941 when an average 408 mm per year was recorded compared to the seven year period up to 1985 when an average of 514 mm per year was recorded and the seven year period up to 2006 when an average of 598 mm per year was recorded.

It is apparent from these considerations that, based on Denman daily rainfall information, droughts of similar or greater magnitude have occurred in the area on at least 12 occasions in the past 110 years, indicating that similar scarcities of water have been experienced in the past. This also indicates that the current prolonged dry period is within the natural bounds of what has been previously experienced.

The impact of these prolonged dry periods on water availability for the mine has been taken into consideration in development of the mine water management system. Predicted variations in mine water balance as a result of climatic fluctuations are shown on Graph 3.7 of Appendix 7 of the EA. Using this analysis, it was determined that the mine would need approximately a 2000 ML storage capacity and access to an external supply of water of approximately 400 ML/year to enable the mine to operate during prolonged and extreme dry periods. As stated in the EA, it is intended that external water would be sourced through the purchase of existing licences that allow access to water from the Hunter River system.

2. Ability of Wybong Creek to consistently supply 1200 ML/year.

The proposed development is not seeking a licence to pump water from Wybong Creek and no water will be pumped from Wybong Creek to meet water needs of the mine. As discussed in the EA, water used in the mine will consist of:

- runoff collected on the mine, including in the mine's dirty water system, for dust suppression purposes;
- runoff collected in accordance with harvestable rights;
- groundwater inflows into the mine from the fractured rock aquifer that will be intersected by the mine;
- make up water pumped from Sandy Creek, the Hunter River system and/or groundwater bores adjacent to the Hunter River system, under existing water licences acquired by Centennial on commercial terms.

The proposed use of water from each of these sources is consistent with the provisions of the *Water Management Act 2000*, *Water Act 1912*, Water Sharing Plan for the Hunter Regulated River Water Source and the Wybong Creek Water Sharing Plan.

As set out in the EA, long term modelling indicates that with the provision of approximately 2000 ML of storage capacity, water make from the above sources will be sufficient to supply the water needs of the mine.

As set out in Section 3.4.4 of Appendix 7 of the EA, modelling indicates that development of the mine will result in approximately a 0.8% reduction in runoff into the Wybong Creek system at Year 2 of operation, a 1.3% reduction in runoff at year 5 and a 0.7% reduction at Year 10. By Year 15, as substantive areas of the mine are rehabilitated, modelling indicates that the mine will result in negligible reduction in runoff to the Wybong Creek system.

Under the *Water Management Act 2000*, land holders are, under Harvestable Rights, entitled to harvest 10% of average regional runoff from their land holdings. This water is typically harvested in farm dams which form part of the existing water management system used on properties in the area. If Harvestable Rights associated with the project area and related land are taken into consideration, the reduction in runoff to the Wybong Creek system as a result of the proposed development reduces from 1.3% in Year 5 to approximately 0.7%.

As stated, no water for the mine will be drawn from Wybong Creek. Construction and operation of the mine is predicted to cause a minor reduction in runoff (approximately 1%) to the Wybong Creek system over the first 15 years, after which time modelling predicts that no reduction in runoff will occur.

- 3. Provision of water for mining versus long standing residential, tourism and agricultural uses (such as agriculture, Lucerne production, animal husbandry, vineyards, horse studs) and potential for increased water costs due to increased demand from mine. This could price long term users out of the market. Need to import more expensive hay/Lucerne may impact on viability of farms.**

The open trading of water is consistent with the State policy on which the *Water Management Act 2000* is based and is also consistent with the Intergovernmental Agreement on a National Water Initiative to which New South Wales is a party.

Even so, the influence of the Anvil Hill Project's water demands on even the local regional availability of water for agriculture will be immaterial for a range reasons depending on the relevant water source, as discussed below:

a) Wybong Creek Water Source

As stated above, the mine will not rely on the extraction of water under water access licences for the Wybong Creek Water Source. It is not proposed that any entitlement for water under the Water Sharing Plan for Wybong Creek Water Source 2003 be reduced or redirected from an agricultural use to use at the mine.

There is therefore no reduction in the total water entitlement available for use for irrigation in the Wybong Creek Water Source.

The Anvil Hill Project will capture rainwater run off within the Wybong Creek catchment in accordance with the harvestable rights exercisable by any landholder. Also in the Wybong Creek catchment, the Anvil Hill Project will capture run off from the mine site, including dirty water from disturbed areas, for on site dust suppression purposes.

Even this harvestable rights and dust suppression water, captured by the mine in accordance with the *Water Management Act 2000*, will not have a material impact on the

water available for allocation to agricultural uses, due to the limited volume (described in response to issue 2 above) and the natural water quality constraints of the catchment from which the water will be captured.

For water to be able to be used for agricultural purposes, the water needs to have suitable water quality including relatively low salinity levels.

As an indication, ANZECC (1992) recommends the following desirable upper limits in regard to salinity levels (mg/L) for a range of agricultural uses:

- Beef cattle and horses - 4000 mg/L (6100 μ S/cm);
- Dairy cattle – 3000 mg/L (4600 μ S/cm);
- Poultry - 2000 mg/L (3000 μ S/cm).

In addition, ANZECC (2000) *National Water Quality Management Strategy* recommends the following upper limit conductivities for crop irrigation water:

- Lucerne – 1500 to 2000 μ S/cm;
- Grapes – 1500 μ S/cm.

Due to high salinities (conductivity) of water in Big Flat Creek in particular and the lower reaches of Anvil Creek as set out in **Table 2.3** of Appendix 7 of the EA, water from this section of the Wybong Creek is not suitable for most agricultural uses, with the water in Big Flat Creek typically being too saline for stock consumption and far too saline for grape and lucerne production.

b) Groundwater

Similarly to the Anvil Creek surface water source, analysis undertaken by Mackie Environmental Research (Appendix 8 of EA) indicates that groundwater that will flow into the mine from the surrounding fractured rock aquifer is predicted to have a typical conductivity of approximately 5000 μ S/cm, making it also too saline to be used to irrigate grapes or lucerne and marginal in terms of stock water.

c) Hunter Regulated River Water Source

The water management system for the mine has been designed to maximise the use of the lower quality water from within the mine site and minimise the amount of water that needs to be imported to the site from higher quality sources such as the Hunter River.

No new entitlements will be issued in respect of the Anvil Hill Project. Any entitlement to extract water from the Hunter Regulated River water source would need to be acquired by Centennial on the open market.

As set out in Table 2.1 of Appendix 7 of the EA, analysis of long term rainfall records indicates that average annual rainfall for Denman for the period 1884 to 2004 is approximately 585 mm/year. As discussed in Section 3.4.3 of Appendix 7 of the EA, modelling indicates that provided in excess of 500 mm/year of rainfall is received, the mine is predicted to have water in excess of dust suppression and coal processing needs for all mine year scenarios modelled (i.e. Years 2, 5, 10, 15 and 20). Under these conditions modelling indicates that it will not be necessary to import water to the site from the Hunter River system, with sufficient water being generated on site.

Centennial is likely to need to use the allocations it holds in the Hunter Regulated River for mining purposes only under prolonged dry conditions. Modelling using the 110 years of Denman rainfall data indicates that to facilitate operation of the mine during such prolonged dry periods, approximately 400 ML/year of make up water will need to be sourced from the Hunter River system.

Assuming Lucerne requires 6 to 8 ML/ha/year, importation of 400 ML/year of water to the mine is the equivalent of the water demand of approximately 50 to 65 hectares of Lucerne which is only a small proportion of the total area sown to Lucerne in the Hunter valley.

The economic return and employment generated by the proposed mine mean that the revenue generated by use of 400 ML of water for mining purposes would be far greater than that generated by the production of 50 to 65 hectares of Lucerne.

In a prolonged dry period Centennial would need to either obtain 400 units of water allocation, or hold sufficient units of entitlement so that it was allocated sufficient water for that year. In the current water year, the available water determination for high security units to ML at present is 79% and for general security units is 8%. At present the Hunter Regulated River has a total of 21,999 units of high security water licences and 128,294 units of low security water licences. On this basis, even if Centennial elected to obtain units rather than purchase allocations on the open market, to make available 400 ML of water the Project would need to acquire approximately 500 units of high security water which represents approximately 2.3% of the total high security licences, or approximately 4% of low security licences. Neither of these options represent a significant component of the total water access licence market.

4. Will devalue alluvial flats on the Wybong Creek system that produce Lucerne.

This issue comes from concern that properties adjacent to Wybong Creek downstream of the proposed mine will lose groundwater through depression and drawdown as a result of mining and that this will impact on the quality and quantity of water available to irrigate Lucerne flats.

As stated in Appendix 8 of the EA, groundwater modelling undertaken by Mackie Environmental Research indicates that the proposed mine development will depressurise regional groundwater which is predicted to cause a drawdown in the conglomerate as shown on Figure E4 of Appendix 8 of the EA. Modelling indicates that this may result in groundwater movement from an area of up to about 1.5 kilometres from Main Pit, draining towards Main Pit.

This groundwater movement may induce leakage from Wybong Creek alluvium in this area with the maximum rate of leakage from alluvium predicted to be approximately 0.015 to 0.030 ML/day over a 160 hectare area. Assuming 30% porosity of the alluvium, this maximum leakage rate is the equivalent to a drop in groundwater level of approximately 0.03 to 0.06 mm/day.

If no recharge of the alluvial system from Wybong Creek occurred for a full year (i.e. there was no runoff in the catchment) the maximum predicted leakage rate would equate to a drop in groundwater level over the year of approximately 11 to 22 mm. This loss is negligible and would be offset by inflows to the Wybong Creek alluvium from the upstream catchment.

Groundwater modelling indicates the predicted leakage rate will reduce to approximately zero as the water levels in the Main Pit final void fill to final level following the completion of mining.

As set out above, groundwater modelling indicates that the proposed mine development will not have a significant impact on groundwater levels in the Wybong Creek alluvium downstream of the site and will have a negligible impact on the ability to produce Lucerne from alluvial flats in this area.

5. The Project will entirely remove Anvil Creek and Clarks Gully, disturb Sandy Creek and mine to within 50 metres of Big Flat Creek.

The proposed development will not impact on the Big Flat Creek channel system with the proposed mining area being in excess of 50 metres from the creek. Analysis of Big Flat Creek alluvium and groundwater modelling undertaken by Mackie Environmental Research indicates that development of the proposed open cut will not adversely impact on groundwater levels in the alluvium, with negligible inflow from Big Flat Creek alluviums to the mine predicted. As a consequence, the proposed mining development is not expected to impact on Big Flat Creek or groundwater availability to riparian vegetation along the creek system.

As discussed in the EA, the proposed development will involve the removal of Clarks Gully in the first one to two years of operation and the subsequent progressive removal of Anvil Creek from approximately Year 7 to approximately Year 20.

As discussed in the EA it is not proposed to reinstate Clarks Gully but instead, as part of the initial development (see Figure 3.1 of Appendix 7 of the EA), a major diversion drain will be constructed along the approximate alignment of the 500 KV powerline easement. This will be used to convey clean runoff that previously drained to Clarks Gully around the mine void and proposed emplacement areas to the Big Flat Creek system. This diversion drain will be maintained in a stable vegetated condition. As shown on Figure 3.2 of Appendix 7 of the EA, rehabilitation of emplacement areas will commence on either side of this diversion drain with the vegetated drain becoming an integral part of the final landform. Where possible, riparian vegetation will be planted along this diversion drain. This planting will need to be undertaken in accordance with constraints posed by the power line easement.

As mining progresses, it is proposed to progressively re-establish a drainage line along the approximate current Anvil Creek with re-establishment of the creek system commencing in approximately Year 15 and continuing for the remaining life of the mine. The approximate location of the Anvil Creek drainage line in the final landform is shown on Figure 3.6 of the EA.

As discussed in Section 3.4.4 of the EA native vegetation will be planted along the drainage path which will be over emplaced material. At present it is proposed to construct this as a broad vegetated drainage line to minimise the potential for the underlying emplaced material to scour or erode and to facilitate reshaping as settlement of the underlying material occurs. The potential also exists to construct the drainage line with in-stream ecological features such as pools and pool riffle sequences.

As shown on Figure 3.1 of Appendix 7 of the EA, disturbance to Sandy Creek will be limited to the establishment of one crossing over the creek to facilitate construction and operation of the rail loop. As discussed in Section 4.1.3 of Appendix 7 of the EA, the culvert will be designed and constructed to convey the 1 in 100 year Average Recurrence Interval flow in Sandy Creek. In addition, the development will have a negligible impact

on the overall surface hydrology of Sandy Creek catchment. As a result, potential impacts to the creek system will be limited to disturbance that occurs during the construction phase. It is considered that these impacts can be readily mitigated using standard construction and sediment and erosion control techniques.

6. Cumulative Impact on Sandy Creek from proposal and Mt Pleasant.

As stated in Section 2.2.5 of Appendix 7 of the EA, Sandy Creek is approximately 37 kilometres long and has a catchment area of approximately 14,500 hectares. In total, approximately 1095 hectares of the catchment lies within the Project Area. Works to be undertaken in Sandy Creek catchment are:

- Construction of 2 kilometres of haul road. This will not require any out of catchment diversion of flows and is not expected to have an impact on flows in Sandy Creek Catchment or water quality in Sandy Creek.
- Construction of a 20 hectare tailings dam that will be constructed as a turkeys nest dam and will have upslope runoff diverted around it. Life of the tailings dam is approximately 10 years, after which time it will be rehabilitated to be part of the Sandy Creek Catchment. This will effectively remove 20 hectares from Sandy Creek Catchment for approximately 10 years. These works are not expected to have a significant impact on flows in Sandy Creek Catchment or water quality in Sandy Creek.
- Construction of the rail loop, culvert over Sandy Creek and conveyor link to the coal preparation plant. The extent of these works is shown on Figure 4.6 of Appendix 7 of the EA and will involve disturbance of approximately 16 to 20 hectares of Sandy Creek catchment. Water quality control measures will be implemented to service this area. These works are not expected to have a significant impact on flows in Sandy Creek catchment or water quality in Sandy Creek.
- Open cut mining as part of South Pit of approximately 75 hectares of Sandy Creek catchment. The majority of this disturbance will occur after Year 10 by which time it is proposed that the tailings dam will no longer be in use. Surface runoff from this area will be directed to the mine water management system and will be removed from Sandy Creek catchment. As a result, this will not impact on water quality in Sandy Creek but will effectively remove runoff from approximately 75 hectares of the catchment. As mining progresses, the surface of the mining area will be shaped so that it drains to Sandy Creek catchment and will be rehabilitated. Once a stable vegetative cover is achieved, runoff from the rehabilitated surface will be directed to Sandy Creek catchment.

The proposed development will result in the temporary diversion of runoff from up to 75 hectares of Sandy Creek catchment to the mine water management system. This represents approximately 0.5% of the total Sandy Creek catchment area and as a consequence will cause a very minor reduction in flows in the Sandy Creek system.

A range of sediment and erosion and water quality controls will be incorporated into the proposed works within Sandy Creek catchment and as a result there will be minimal impacts on water quality.

Taking these matters into consideration, potential for the proposed development to significantly contribute to cumulative impacts on the Sandy Creek system is very low.

7. Topography impacts in terms of rainfall runoff into dams and gullies. Dependence on tank water.

This issue was raised in regard to Property ID ST030 which is located within Sandy Creek catchment approximately 1.3 kilometres west of where the proposed rail loop crosses Sandy Creek and approximately 1.3 kilometres south of the southern most extremity of South Pit.

Analysis of topographic information shown on Figure 3.4 shows that the proposed mining in South Pit that extends into the Sandy Creek catchment will not affect the upstream catchment of tributaries or drainage lines that are located on Property ID ST030. As a result it is concluded that the proposed project will not impact on rainfall runoff into dams and gullies on the property.

8. Downstream impacts on water quality in terms of salt loads and sediment.

The proposed water management system for the project has been designed in accordance with best management practice for sediment and erosion controls to ensure that sediment impacts on the downstream system are minimised. As discussed in Section 3.2 of Appendix 7 of the EA, sediment and erosion control measures for the project have been designed in accordance with 'Managing Urban Stormwater Soils and Construction' (the Blue Book) and will include a pumping system to enable sediment laden runoff from the project area to be stored in Main Dam. This effectively will significantly enhance the sediment trapping capacity of the system. In addition, flocculation equipment will be installed on Sediment Dams 2 and 5 to enable runoff to be treated prior to it being discharged to Big Flat Creek system. All of these measures will ensure that the proposal doesn't adversely impact on downstream water quality.

The proposed water management system also includes a collection and reuse system for saline waters that will flow into the mine void from the surrounding fractured rock aquifer and coal seams. As a result, saline water will not be discharged from the site to Big Flat Creek. Any discharge to the Hunter River system will be licensed in accordance with the requirements of the Hunter River Salinity Trading Scheme.

These control measures will result in a minor net reduction in salt entering the Big Flat Creek system through the capture of salt from the mine site that would have otherwise naturally discharged to Big Flat Creek from Anvil Creek and to a lesser extent Clarks Gully.

As discussed in Section 4.2.2 of Appendix 7 of the EA, monitoring indicates that Big Flat Creek which occupies approximately 6% of Wybong Creek catchment is contributing up to 30% of the salt load in the system. Reduction of surface runoff into Big Flat Creek has the potential to reduce the amount of salt exported from the catchment to Wybong Creek.

Centennial also proposes as part of the mine development to plant trees in the uplands section of Big Flat Creek catchment in areas where salt scalding is apparent. Establishment of the trees will also assist in reducing salt loads generated from the catchment.

9. Impact on long term groundwater levels.

As discussed in response to Issue 4 above, the proposed development has negligible potential to significantly impact on groundwater levels in the Wybong Creek alluvium.

The development will reduce groundwater levels in the coal seams that are being mined and adjacent conglomerates that make up the fractured rock aquifer, with these impacts potentially extending from 500 to 1500 metres from the mine. As discussed in Section 4.4. of Appendix 8 of the EA, groundwater in the fractured rock aquifer has typically high salinity with conductivities ranging from 117 $\mu\text{S}/\text{cm}$ to 23955 $\mu\text{S}/\text{cm}$ with an average of approximately 8425 $\mu\text{S}/\text{cm}$. In addition, yields from the fractured rock aquifer are low. As a result, groundwater from the fractured rock aquifer is typically not suitable for agricultural use due to high salinity levels and low yield.

Consequently, analysis indicates that the mine will not have a significant impact on groundwater levels or availability for agricultural use.

10. Impacts on Wybong, Goulburn and Hunter River systems. Development will impact on large part of Wybong Creek catchment which is one of most stressed in Hunter Catchment and will be further stressed by mine. Proposal goes against government policy designed to reduce impacts and undertake stream improvements.

The proposed development will not draw water from Wybong Creek and will occupy less than 3% of Wybong Creek catchment. Modelling indicates that the development will reduce annual runoff into the Wybong Creek system by typically 1% or less. The reduction in surface runoff to the Wybong Creek system is predicted to be negligible by approximately Year 15 of operation as the sections of the project area become rehabilitated and allowed to free drain to Big Flat Creek.

As discussed, runoff from Big Flat Creek is highly saline, contributing up to 30% of the total salt load in the Wybong Creek system. During the first 15 years of mine operation, reductions in surface runoff to the system will reduce the potential for salt export from Big Flat Creek catchment. The proposed tree planting in the upland sections of the catchment will assist in reducing the amount of salt that is mobilised from the catchment during runoff events. Establishment of trees in these saline effected areas will have a net positive impact on the health of the Big Flat Creek system.

Wybong Creek occupies a small component of the Goulburn River and Hunter River systems and hence reductions in flow in these systems as a result of decreased runoff to the Wybong system will be negligible.

Any water extracted from the Hunter River for the mine will be obtained through the purchase of existing water licences and therefore will not increase the water demand from this system.

11. Water modelling based on Wybong having continuous flow which is not the case as it frequently stops flowing.

The water balance modelling undertaken for the project is not based on the assumption that there are continuous flows in the Wybong system. Modelling and water balance assumptions set out in Appendix 7 of the EA are based on 110 years of rainfall data which includes extended periods that have been considerably drier than the current conditions.

12. Current level of allocation at 8% making further allocation to the mine intolerable.

External water for the project will be acquired through the purchase of existing Hunter River water licences and will not require further or new water allocations. As a result, the proposed development will not increase water demand from the Hunter River system

beyond that already allocated. The mine will abide by the same water licensing provisions as apply to all other licence holders in the area.

13. Mine to extract 1.4 GL per year from Hunter River.

As set out in Section 3.4.3 of Appendix 7 of the EA, water balance modelling indicates that on average water collected within the mine water management system will be sufficient to meet dust suppression and operation needs of the mine. Modelling also indicates that with the proposed mine water management system in place, that during the driest period on record, the mine would need to import in the order of 400 ML/year (i.e. 0.4 GL/year) to meet on-site needs. This modelling has been undertaken using 110 years of rainfall data that includes periods that have been significantly drier than present.

14. Massive impact on natural flows in the Hunter River catchment is a key threatening process under the TSC Act.

As set out in Section 4.4 of Appendix 7 of the EA, the proposed development during its first 15 years will result in less than a 1.3% reduction in runoff into the Wybong Creek system, after which time it is predicted that the development will not reduce runoff into the system. Wybong Creek has a catchment area of 800 km² (80,000 hectares). This represents approximately 12% of that of the Goulburn River which has a catchment area of approximately 6810 km² and 3.6% of that of the Hunter River which has a catchment area of approximately 22,000 km².

Taking the relative catchment areas into account, the reduction in runoff into the Goulburn River and Hunter River systems or impact on natural flows will not be 'massive' with runoff volumes into the Goulburn system being reduced by less than 0.15% and into the Hunter system by less than 0.05%.

Water use at the proposed project will be in accordance with the provisions of the *Water Act 1912*, the *Water Management Act 2000*, Wybong Creek Water Sharing Plan and Water Sharing Plan for the Hunter Regulated River Water Source which have all been adopted by the NSW Government and are in accordance with State water policy.

15. Water quality in Sandy Creek due to coal handling plant.

The coal handling plant is to be located in Anvil Creek catchment with runoff from the plant being directed to Main Dam which will have a storage capacity of approximately 2000 ML. The only components of the proposed development that are located in Sandy Creek catchment are:

- Tailings Dam which will effectively be a turkeys nest dam and not generate discharges to the catchment until it is rehabilitated;
- Coal conveyor which will drain to the rail loop water management system;
- Rail loop and coal loading infrastructure. Runoff from these facilities will be directed to series of water quality control structures including silt fences and sedimentation dams before discharging off site.

Detail sediment and erosion control plans will be developed for the site and implemented to ensure that the proposed development does not adversely impact on Sandy Creek. With appropriate water quality control measures in place as is proposed, the proposed development has negligible potential to have an adverse impact on water quality in Sandy Creek.

4.0 Aboriginal and European Heritage

4.1 Aboriginal Cultural Heritage

4.1.1 Department of Environment and Conservation

DEC notes that the geotechnical report prepared by RCA Australia states that there are multiple blast related impacts that could occur to rock structures as a result of mining activities, ranging from potential cosmetic or minor damage to rock shelter sites in the vicinity of the mine (all sites vulnerable) to major damage potential (nine sites vulnerable) including potential for toppling of 'Anvil Rock' or change in appearance of 'The Book'....

As stated in the Executive Summary and Section 6 of the *Archaeological Assessment, Anvil Hill Project (Umwelt 2006)*, sixteen rock shelter sites with potential archaeological deposit and surface evidence of Aboriginal occupation were identified during the survey program. Neither Anvil Rock nor The Book are rock structures included in this assessment as Aboriginal heritage sites. None of the eighteen registered Aboriginal stakeholder groups provided any comment at any time regarding these sites having Aboriginal significance. These two items are considered important places to the non-Aboriginal community of Wybong (refer to the *Historical Heritage Assessment, Anvil Hill Project (Umwelt 2006a)* for an assessment of their significance). Mitigation measures have been proposed in the EA to stabilise Anvil Rock during proposed blasting. A monitoring program has also been proposed to identify mitigation requirements for the potential impacts from blasting for both Anvil Rock and The Book formation.

DEC considers that there would need to be a significant adjustment to the proposed blast criterion, or the work area modified to provide an appropriate buffer distance, to prevent damage to rock structures. A project approval should be subject to Centennial committing to meet such requirements.

Centennial recognises that potential impact from blasting must be managed for rock shelters of significant Aboriginal cultural heritage value. Therefore, Centennial is committed to refining its blast design and implementing the management measures outlined in *Umwelt 2006*, Section 9, to mitigate and manage these impacts. This commitment was further reinforced in the Part B Response to Submissions. Specifically, as stated in *Umwelt (2006)* Section 9.1.3:

Preliminary results of the RCA Australia assessment indicate the need to refine and manage the blasting regime to protect the structural integrity of the rock shelter sites in the Wallaby Rocks, Western Rocks and Limb of Addy plateaus. Centennial has committed to refine and manage the blasting regime so as not to significantly increase the risk of instability or affect the structural integrity of the rock shelter sites in the Wallaby Rocks, Western Rocks and Limb of Addy Hill plateaus. Centennial has committed to achieve this outcome, which may potentially involve an ongoing monitoring program and review of blast design. Blasting, however, may result in the following impacts to rock shelters on Anvil Hill:

- damage to the rock shelters and their deposits; and
- potential lack of access by Aboriginal people to many of the rock shelter sites during stages of the life of the mine due to the plateau and rock shelters becoming unstable and dangerous during and after blasting.

Consequently, there may be some loss of Aboriginal and archaeological significance of the rock shelters and the plateau archaeological terrain unit as it relates to Anvil Hill.

A monitoring program was also proposed in *Umwelt (2006)* in Section 9.1.4 to ensure that this commitment is achieved and to further refine blasting if necessary by:

Monitoring of the cliffline boulders and rock shelters on Wallaby Rocks, Limb of Addy Hill and Western Rocks by a suitably qualified geotechnical consultant, is also appropriate to ensure that blasting is not causing any adverse effects.

However, it was recognised that blasting design could not be decreased to a level that would ensure no indirect impacts to the rock shelters (CGO1 CG08, CG09, and CG10) on Anvil Hill or Anvil Hill itself. Mitigation of these indirect impacts was recommended as part of the *Umwelt (2006)* report in Section 9.1.4. These recommendations were:

- reinforcement of the roof of the rock shelters with stainless steel bolts to anchor rock in place; and/or
- the removal of loose rock that cannot be stabilised for safety purposes.

In view of the Aboriginal and archaeological significance of the rock shelter sites on Anvil Hill and Anvil Hill in general, it is considered appropriate that Centennial undertake the mitigation procedures outlined above. These are considered appropriate mitigation measures provided they are undertaken in consultation with the DEC and the Aboriginal stakeholder groups and in line with the advice of a geotechnical consultant; and with the provision that there are no significant impacts to the rock shelters of equal and/or higher significance within Wallaby Rocks, Limb of Addy Hill and Western Rocks.

Monitoring of the cliffline boulders and rock shelters on Anvil Hill by a suitably qualified geotechnical consultant to ensure that the mitigation measures implemented are managing the effects of blasting adequately, is another mitigation measure appropriate for this area.

Blasting Impacts

The creation of the “offset areas” in order to protect the Aboriginal cultural sites and landscape features at Anvil Hill, Wallaby Rocks, Limb of Addy Hill and Western Rocks has been put forward by Centennial as a strategy to mitigate the impacts of the mine on the Aboriginal cultural heritage of the area. If damage is likely to occur to sites within these “offset areas” as a result of mine-related activities, then the adequacy of the existing offsets as a mitigation measure must be questioned.

It is accepted that damage to the rock shelters by the indirect impact of blasting (without further mitigation or management) threatens the adequacy of the plateaus as offset areas. For this reason, Centennial has committed to refining its blasting design to ensure that no further damage is predicted at Wallaby Rocks, Limb of Addy Hill and Western Rocks than that predicted to occur naturally as part of the ongoing weathering of these areas (such as minor rock fall, sloughing of weathered rock crusts and cosmetic damage). Ongoing monitoring of the rock shelters is proposed to ensure that Centennial can continually refine its blasting design, if required.

Monitoring and mitigation measures such as rock bolting have been recommended for Anvil Hill's rock shelters to protect the shelters, as blasting is likely to impact their structural integrity.

It should be noted that damage is currently occurring within the Anvil Hill rock shelter sites due to impacts by feral and domestic animals such as sheep, goats and dogs which occupy the shelters, disturbing Potential Archaeological Deposits (PAD), increasing the loss of PAD

from the shelters by moving it out of the shelter and down the adjacent slope, increasing weathering of the walls, breaking artefacts and changing the natural pH of the shelter deposits due to the addition of urine and faeces. The proposed conservation management of these areas will provide an opportunity to minimise these existing impacts that would otherwise go unchecked.

As noted above, DEC considers there is a need for the applicant to review options to mitigate the risk of blasting impacts at the rock shelter sites and landscape features within the proposed “offset areas”. It is noted that Centennial has considered physical mitigation measures to reduce the possible damage caused by blasting on Anvil Hill rock shelter sites, such as reinforcement of the rock shelter roofs with rock bolts/rock anchors to anchor the rock in place, and/or the removal of loose rock that cannot be stabilised. However, it is unknown what the long-term impacts of blasting and these mitigation measures could have upon the affected sites. Rock bolting is a relatively new technology, and its effectiveness over a period of 50, 100 or 200 years is not known.

Given the cultural significance of these sites, DEC recommends that mining activities should be undertaken in a manner which does not cause damage to Aboriginal cultural sites and landscape features in proposed “offset areas”, in particular rock shelter sites and the rock structures known as Anvil Rock and The Book.

It is agreed that rock bolting / rock anchors and their effectiveness over a period of 50, 100 or 200 years is not known. Rock bolting/rock anchors are, however, proposed for those rock shelters on Anvil Hill that already have cracks/joints that are part of the natural process of roof fall. In this situation rock bolting/anchors can be predicted to hold the roof up for a longer period than would have occurred naturally. These mitigation measures will be determined by a geotechnical consultant and in consultation with the proposed Management Committee for Aboriginal cultural heritage (to be set up under the Aboriginal Cultural Heritage Management Plan if the project proceeds). The rock bolting / rock anchor measure is one of the few known techniques which will support the rock shelter roof/walls and is known to have been effective to date.

It is not possible for the proposed mine to undertake mining activities surrounding Anvil Hill without having some indirect impact on this area.

Monitoring Blasting Impacts

While DEC concurs with the need for monitoring, it is not clear what action will be undertaken if geotechnical monitoring reveals that blasting is causing adverse effects. Also, the geotechnical report does not advise on the potential for blast-related impact to show up after the blasting event.

If geotechnical monitoring reveals that blasting is causing adverse effects, Centennial has committed to modify its blast design to protect the structural integrity of the rock shelters at Limb of Addy Hill, Western Rocks and Wallaby Rocks.

At Anvil Hill, Centennial has committed to implementing protective mitigation measures such as rock bolting in consultation with an Aboriginal Heritage Management Committee which will consist of representatives of the eighteen registered stakeholder groups.

As part of the Aboriginal Cultural Heritage Management Plan, there will be a baseline geotechnical study which will record in more detail the morphology of each of the rock shelter sites (including a photographic record). As mining is proposed to start in the Anvil Hill area, any rock shelters on Anvil Hill requiring mitigation measures will be identified and the

appropriate mitigation measure put in place prior to blasting. Monitoring of the Anvil Hill rock shelters will then be undertaken after initial blasting (under the revised blasting design) to assess the impact on the rock shelters with comparison to the baseline study. Monitoring will be undertaken of the rock shelters on Anvil Hill after each series of blasts until Centennial can predict with accuracy the level of blasting that can be safely achieved with no impact to the rock shelter sites. In this way the blasting design can be refined up to a point where Centennial can predict with accuracy the level of blasting possible prior to mining progressing to being in proximity to Wallaby Rocks, Limb of Addy Hill and Western Rocks. Monitoring of the rock shelters in these areas will be undertaken after the initial blasting in the Anvil Hill area.

Furthermore, it is not clear whether the possible effects of blasting upon the structural integrity of the rock shelters and landscape features within the offset areas has been adequately explained to the Aboriginal stakeholders for the Project, and whether the proposed mitigation measures have been discussed and approved by stakeholders.

As stated in Section 3 of Umwelt (2006) all Aboriginal stakeholder groups were provided with a draft of the Aboriginal archaeological assessment report which stated the potential blasting impacts for rock shelters and the proposed mitigation measures for blasting outlined in Section 9. These impacts and mitigation measures were also explained in detail in a presentation to the Aboriginal stakeholder groups in Denman on 11 May 2006 at which Claire Everett of DEC was present. Groups also had the opportunity to visit Wallaby Rock's rock shelters on the day of the meeting. Follow up telephone contact during May and June 2006 also included discussions with the groups regarding any questions they may have or further explanation of issues surrounding the Anvil Hill Project.

All Aboriginal stakeholder group comments are provided in Appendix 8 of Umwelt (2006). These comments also relate to their review of these mitigation measures and offset areas.

Consistent with the above, DEC supports the implementation of rigorous geotechnical monitoring of blasting and vibration impacts on culturally significant sites. DEC recommends that if damage is observed, blasting should cease until the impacts area assessed, operations reviewed and appropriate management requirements by the applicant, with written approval by the DEC, in consultation with Aboriginal stakeholders.

Centennial has committed to rigorous geotechnical monitoring of blasting and vibration impacts on culturally significant sites. If damage is observed, Centennial has committed to modifying and refining its blasting design and to developing appropriate management requirements in consultation with the Aboriginal stakeholders, a qualified archaeologist and the DEC. The frequency of monitoring will be developed and defined in the Aboriginal Cultural Heritage Management Plan which will be prepared in consultation with DEC and to the satisfaction of DoP.

4.1.2 Community Submissions

A number of general concerns were raised in community submissions regarding potential Aboriginal heritage impacts. These included:

Concern raised regarding the extent of consultation with the Aboriginal community and whether cultural values were appropriately considered.

Aboriginal consultation for the Anvil Hill Project was undertaken in compliance with the DEC's *Interim Community Consultation Requirements for Applicants* 2004 and included all Aboriginal stakeholder groups that registered an interest in consultation for the Project. The

program of consultation was prepared in consultation with DEC and approved by DEC (20 December 2004 - refer to Section 1.5 of the Aboriginal Archaeological Assessment in Appendix 13 of the EA). The consultation program was later approved in writing by the Aboriginal stakeholder groups (refer to Appendix 7 of Appendix 13 of the EA) and Umwelt carried out the consultation program in the agreed manner.

The Aboriginal consultation program commenced on 28 January 2005 and continued until June 2006 and is described in considerable detail in Section 3 of Appendix 13 of the EA. Within the detailed report, Appendices 3, 4, 5, 6, 7 and 8 provide further information in relation to the process undertaken to provide the Aboriginal stakeholder groups with the opportunity to make comment on the Aboriginal cultural heritage values / importance / spiritual / non-physical significance of the general Anvil Hill area and in relation to the sites located within the Anvil Hill survey area. This opportunity was provided prior to the survey of the area, during the survey of the area and at the completion of the survey at the draft report stage. The Aboriginal stakeholder groups were also given the opportunity to comment on the Aboriginal cultural significance of the sites located within the Anvil Hill survey area during the survey. Comments in relation to Aboriginal significance of sites were provided by 6 of the 14 groups participating. These comments related to 40 of the 173 sites located. Despite enquiries made by the archaeologists during site recording, the other groups provided no feedback (please refer to Table 8.6 within Appendix 13 of the EA).

It had been noted during earlier projects that many of the Aboriginal groups involved had difficulty with providing written comment. Therefore, offers were made throughout the consultation process for Umwelt archaeologists to come to the group's office or to visit people's homes to record verbal comments. At the initial meeting with all the groups (1 March 2005) it was made clear that there were both male and female Umwelt employees involved in the project whom they could speak with in relation to any gender specific matters. There were no gender specific issues raised during the course of the survey or throughout the consultation process.

The draft Aboriginal Archaeological Assessment report was prepared taking into account the information provided by the groups up to that time. A meeting was held on 11 May 2006 to discuss the findings of the archaeological assessment. Mary-Jean Sutton (Senior Archaeologist) and Jan Wilson (Manager Cultural Heritage) provided a detailed presentation on the results of the survey on the day. At the start of this meeting it was reinforced that information about the importance to Aboriginal people of the Anvil Hill Project area or the sites it contains must be provided by the Aboriginal people involved in the project. The groups were repeatedly requested to provide comments on the significance of the sites within the Proposed Disturbance Area and within the Potential Offset Areas. A pro forma was provided to help the representatives to provide comments and also let them know they could write a letter of comment.

A copy of the pro forma provided to the groups at that meeting is included in Appendix 8 of the detailed report. The pro forma requests feedback on the cultural significance of the Anvil Hill area (such as mythological sites or stories) as well as in relation to the landscape (terrain units) and the sites. A full table with all the sites listed was provided to every group along with a full description of the sites (refer to Appendix 11 of the detailed report) to allow the groups to supply comments on a site by site basis. The pro forma also requested feedback in relation to the destruction of sites in the Proposed Disturbance Area and in relation to the management of sites in the Potential Offset Areas. The groups were specifically asked if they agreed if the management strategy outlined in Section 10 of the draft report was appropriate from an Aboriginal cultural heritage perspective. The pro forma also requested they supply any other information they thought necessary in relation to the Aboriginal cultural heritage values of the Anvil Hill area and informed the groups that we would be happy to discuss any further matters they raised.

The comments provided by the groups are summarised in Sections 8.1 and 9.4 of the detailed report and are provided in full in Appendix 8 of the report. There was a general lack of feedback in relation to the questions asked about the significance of the general Anvil Hill area (mythology, stories, etc).

The small amount of feedback in relation to site significance is seen to relate to two matters. The first is a general agreement with the archaeological significance assessment. It has been Umwelt's experience that the Aboriginal stakeholders will make specific comments if they think the assessment of significance is incorrect, but will limit their comments if in agreement. The second is that as all sites are seen as having Aboriginal cultural significance by the Aboriginal stakeholder groups, the concept of dividing them up into low, moderate and high significance is not seen as appropriate and therefore, not seen as worthy of comment.

As noted at the start of this response, Aboriginal consultation was undertaken in compliance with the DEC's *Interim Community Consultation Requirements for Applicants* (2004) and thus was inclusive of all Aboriginal stakeholder groups that registered an interest in consultation for the Project. It is not possible or appropriate for a "proponent" or their consultant to make decisions as to who are the correct Aboriginal people to consult. This is a matter that the Aboriginal community must decide and is a matter of much contention in the Hunter Valley at present. Umwelt undertakes all consultation on an all inclusive basis in compliance with the DEC's *Interim Community Consultation Requirements for Applicants* (2004).

The mine will destroy important Aboriginal sites and artefacts and an area rich in Aboriginal Heritage.

The mine will destroy important sites and artefacts of the Wonarua Aboriginal people.

The establishment of the mine in such a significant area of Aboriginal history would demonstrate a blatant disregard for the cultural traditions of Indigenous Australians.

The company has no right to mine Wanarua land.

Concerns raised about the impact of the mine on rock shelter sites.

As noted above, a comprehensive Aboriginal archaeology assessment was prepared in consultation with the local Aboriginal community. Eighteen Aboriginal community groups, representing the Wonnarua people, participated in this extensive consultation process. Many of these participants were also involved in the lengthy fieldwork program that surveyed the Proposed Disturbance Area and Proposed Offsets Area, and all were consulted regarding the proposed mine impacts and proposed management approach. The majority of the local Aboriginal community representatives did not object to the proposal and concurred with the proposed management of cultural heritage.

Concerns raised about lack of access to Anvil Rock.

Anvil Rock is currently located on private land and there is no public access route to this location. Centennial is committed to providing no less accessibility to the Anvil Rock area post-mining than currently exists. Access during operation of the mine is unlikely to be practicable, unless requested for a specific purpose, organised well in advance of such access, and depending on the status of mining operations.

4.2 European Heritage

4.2.1 Heritage Council of NSW

The Heritage Council of NSW notes that the recommendations made in Sections 5.0 and 6.0 of the Historical Heritage Assessment (Appendix 14 of the EA) are generally supported with the exception of the following:

- **The ‘surface collection of artefacts’ at the historic sites is not considered likely to yield information of great benefit and is considered unnecessary. There is no suggested analysis or management suggested for the artefacts to be collected, indicating that the reason for recommending such work is unclear.**

An interest in the artefacts found at historic sites identified as part of the Historical Heritage Assessment for the Anvil Hill Project was expressed by Linda MacIntosh, Secretary of the Muswellbrook Local and Family History Society. Mrs MacIntosh expressed (during consultation for the historical heritage assessment) a desire to obtain the artefacts for exhibition in the Muswellbrook Local and Family History Society Museum. There is also stated community interest in the local history of the Wybong area. Any collection of artefacts and the analysis and management of these materials would add to the compilation of a community history for the Wybong area and aid as a mitigation measure to offset the impacts of the proposed mine.

- **The recommended full Conservation Management Plan (CMP) for “Castle Hill” may not be necessary. Whilst monitoring of the impacts of vibration and some stabilisation may be required it is considered by the Heritage Council that such matters could be addressed through the preparation of a Conservation Management Strategy rather than a full CMP.**

It is agreed that a Conservation Management Strategy and the monitoring of impacts of vibration and stabilisation will be sufficient (rather than the preparation of a full Conservation Management Plan) for Castle Hill.

- **It is not clear to the Heritage Council why the relocation of two weatherboard houses (Bundabulla and Yarrowongah) has been recommended. The reason stated in Section 5.3.3 is the ‘level of interest in houses of weatherboard construction’. If relocation is intended as a mitigation measure then the need for the measure should relate to the assessed significance of the buildings and the future use/location proposed for them**

It is agreed that the relocation of the two weatherboard houses (Bundabulla and Yarrowongah) is not necessary. This recommendation arose in response to a request by the Muswellbrook Shire Council which felt it was an appropriate mitigation measure. Full archival recordings to the NSW Heritage Office’s standard of local heritage significance, however, will be carried out prior to the destruction of these two structures.

The Heritage Council of New South Wales recommended the following conditions of consent, should the Anvil Hill Project be approved:

1. Some heritage offset works to enhance the conservation of items outside the Proposed Disturbance Area should be undertaken. Such works should include a dilapidation survey and future monitoring for items potentially affected by future blasting. A Conservation Management Strategy should be prepared to guide future works including any necessary stabilisation works at the “Castle Hill” property.

2. Historic sites, items/ruins and buildings within the Proposed Disturbance area should be recorded prior to removal. Recording should be in accordance with the guidelines of the Heritage Council of NSW. An archival record (including photographs) should be lodged in an appropriate local library or repository.
3. Further historic research, including oral history and Land Title research should be undertaken for properties which will be affected by the works. The results of that research should be incorporated into the archival reports.

The intent of these conditions is consistent with the management actions proposed in the EA and Centennial will consider these recommended conditions in updating the draft Statement of Commitments.

4.2.2 Community Submissions

Submitter has personal association with heritage sites 1-5, 13, 15, 16 and 18. The proposed mine will deny the right of descendants of original settlers to reconnect with their heritage and pursue their right to dwell on the property.

Many old homes date back to the first settlers and should be preserved or relocated.

The preparation of detailed archival recordings and further oral history in collaboration with the local community is proposed to mitigate these impacts.

It is understood that the Hogan family wishes to provide some clarification of the oral history provided in the historical heritage report. This family, together with other long standing members of the local community, will be consulted in detail during preparation of the oral history, and draft oral history documents will be provided for verification to ensure there is no misinterpretation of the information provided.

5.0 Land Disturbance and Mine Rehabilitation

5.1 Mine Subsidence Board

The Mine Subsidence Board made the following comments in relation to the Anvil Hill Project:

1. **Prediction of maximum subsidence, strains, tilts, and curvatures on all proposed infrastructure from any future underground mining.**
2. **All proposed infrastructure will need to be designed to cater for any proposed subsidence design parameters.**
3. **Measures which might be employed to mitigate the effects of mine subsidence on infrastructure from future underground mining.**
4. **Mine Subsidence Board requirements on proposed infrastructure from future underground mining proposals.**
5. **Identification of coal resource potential under and around proposed infrastructure prior to construction commencing.**

Centennial is not seeking approval for any underground mining as part of its Project Application. Therefore the subsidence related matters are not relevant to this Application.

The proposed infrastructure is located in the south-eastern portion of the Project Area, within an area that has no potential for open cut coal extraction and for which there are no plans for underground coal mining. However, as the Project is located in a declared Mine Subsidence District, the relevant application will be made to the Mine Subsidence Board prior to infrastructure construction.

5.2 Department of Primary Industries

The proponent should appoint a suitably qualified and experienced, onsite, full time Environmental Manager for the duration of the Project to oversee the environmental performance of the Project

Centennial will appoint a suitably qualified and experienced person on a full-time on-site basis to oversee the environmental performance of the Project.

Appointment of a suitably qualified Rehabilitation Specialist responsible for the planning and implementation of the mine's rehabilitation, land use management improvement and offset establishment programs

Centennial is committed to employing all relevant personnel or contractors to support the role of the Environmental Manager throughout the duration of the Project. Given the comprehensive rehabilitation strategy for the Project as outlined in Section 5.1.3 of the EA (p5.9), Centennial will consider the appointment of necessary support for detailed planning and implementation.

The Post Mining Landform should be further developed in consultation with the DPI throughout the life of the Project via the MOP

Final Void design should be further refined in consultation with DPI throughout the life of the project via the MOP

Rehabilitation completion criteria should be developed to the satisfaction of the DPI prior to the commencement of any surface disturbance activities as part of the MOP

As outlined in Section 5.1.3.2 of the EA (p5.10) the conceptual final landform has been designed to maintain consistency with the local area and will predominantly consist of an undulating landform reflecting the dominant features of the existing environment. The conceptual final landform will also complement Anvil Hill, the most prominent topographical feature within the Project Area, through the establishment of ridgelines leading to this feature.

Two final voids are planned to remain in place at the completion of mining, located at the south-western end of the proposed mining area associated with the Main and Southern Pit workings. The final voids are designed to capture groundwater inflow from the Main Pit and South Pit overburden emplacement areas and allow for the evaporation of accumulated water.

Further detailed planning of the conceptual final landform will be undertaken in consultation with the DPI through the development of the MOP for the Project, in accordance with the Department's requirements.

Conceptual mine closure criteria have been developed within the EA (refer to Section 5.1.7 p5.22 of the EA) which will be refined in consultation with relevant agencies, including DPI, prior to and during the Project.

In addition as specified in Section 6.8 of the EA (p6.8) Centennial has committed to the development of a detailed mine closure plan at least three years prior to the anticipated mine closure in consultation with relevant agencies. This plan will specifically address the major aspects of conceptual decommissioning and define future care and maintenance requirements for the site and ongoing monitoring and management.

The Mine Closure Plan will:

- define the objectives and criteria for mine closure;
- investigate options for the future use of the site, including any final void/s;
- describe the measures that would be implemented to minimise or manage the ongoing environmental effects of the Project; and
- describe how the performance of these measures would be monitored over time.

The proponent should establish a Rehabilitation Research and Development Committee within 2 months of obtaining project approval.

Rehabilitation techniques and methods should be developed in accordance with the recommendations of the Rehabilitation, Research and Development Committee and in consultation with the DPI.

As outlined above, a conceptual rehabilitation strategy has been developed for the Project. The rehabilitation strategy outlined in Section 5.1.3 of the EA (p5.9) includes specific consideration of the post mining landform, post mining land use, specific rehabilitation techniques and the undertaking of specific studies and trials. The rehabilitation strategy will form the basis of further development of the rehabilitation and management of the post mining landscape. Centennial will liaise in a timely manner with relevant government agencies and other stakeholders regarding the ongoing rehabilitation program.

Consideration of measures to retain future sustainable grazing options for rehabilitated and adjoining undisturbed lands in the North East of the site, not just in the nominated Agricultural offset areas in the South East

As outlined in Section 5.1.4 of the EA (p5.20) Centennial has developed a comprehensive offsets package as part of the Project. The proposed offsets strategy has been designed to offset the ecological and Aboriginal cultural heritage impacts of the Project. It will assist in the protection of a diverse range of threatened flora and fauna and significant Aboriginal archaeological sites, and provide improved connectivity between existing woodland remnants. Development of the offsets strategy has been undertaken in consultation with DoP and DEC (November 2005, May 2006) and with relevant Aboriginal stakeholder groups (March 2005, May 2006).

As outlined in Section 5.1.4.3 of the EA (p5.19) the Sustainable Agriculture Areas located to the South East of the Proposed Disturbance Area have been specifically targeted for this land use due to higher agricultural land capability of this area. As outlined in Section 5.1.1.3 of the EA (p5.3) the areas to the north east of the Project Area predominantly consist of Class VI land, which represents areas of lower productive grazing lands, with some pockets of Class II land located over 1 kilometre to the north-east of the Project Area. In addition, the areas to the north east of the Project Area have been identified as potentially significant local and regional vegetation linkages.

Strategies, such as the Wybong Uplands Land Management Strategy will allow for the targeting of sustainable land management across the broader Wybong area.

DPI would welcome the opportunity to be involved on the Steering Committee for the development of Wybong Uplands Land Management Strategy (WULMS)

A more integrated, planned approach is required for the sustainable management of purchased farmland buffer areas and retention of productivity in the long term

Wybong Uplands Land Management Strategy (WULMS) will target sustainable land management across the broader landscape of the Wybong area.

The aim of the Strategy is long term sustainable land management within the Wybong area. Actions to achieve this aim may include dryland salinity mitigation, drought proof farming, sustainable agriculture, demonstration farms, riparian zone management, and ecological corridors. Centennial will commit to funding for the Strategy of \$100,000 per year for five years. The Strategy provides scope for Centennial to encourage sustainable agricultural land management within broad areas of the Wybong area.

The WULMS will be further developed in consultation with relevant agencies and other stakeholders including the DPI.

Any increases in groundwater infiltration above the modelled predictions may have an adverse impact on the local fish population. The Proponent should develop a

remediation plan to overcome any groundwater loss if seepage is greater than that modelled.

As outlined in Section 7.0 of Appendix 4 of the EA an aquatic ecological survey was undertaken within the local surface water system including Anvil Creek, Clarks Gully, Big Flat Creek, Wybong Creek and Sandy Creek. During the survey there were three aquatic vertebrate species identified, including the identification of the introduced mosquito fish (*Gambusia holbrooki*) in low flow refuge pools in Big Flat Creek.

Aside from the impact on the shallow alluvium aquifer associated with the mining of Anvil Creek, some minimal groundwater inflow from the Big Flat Creek alluvium is predicted to occur (refer to Section 5.3.2.2 of the EA (p5.36)). The majority of groundwater inflow into mining areas will be limited by the construction of a barrier cut off wall to separate mining areas and the proposed mining areas. In addition Centennial will be undertaking continued regular monitoring of a range of groundwater parameters including daily monitoring of water table height, over the life of the Project.

This ongoing monitoring will inform the calibration of groundwater inflow predictions and the subsequent management actions should groundwater inflow rates exceed the modelled rates.

DPI Fisheries have a “no nett loss” policy in relation to stream length. Consequently the channel length of Anvil Creek and Clarks Gully should be of the equivalent length in the final rehabilitation design.

As outlined in the Section 5.2.4.3 of the EA (p5.30) the Project will result in the removal of Anvil Creek from approximately Year 10, with sections of the drainage line being re-established from approximately Year 16 onwards. As part of progressive rehabilitation it is proposed to shape the final landform to provide a free-draining broad vegetated drainage line along the approximate current alignment of Anvil Creek. This drainage line will be designed and constructed to provide a stable vegetated channel that is capable of conveying flows from the final landform to Big Flat Creek system. Native trees and shrubs will be planted along the drainage line alignment to enhance the long term stability of the drainage system and to provide suitable habitat for native fauna. It would also be possible to re-establish in-channel habitat in the final landform such as pools and riffles, similar to that existing in the current Anvil Creek system.

The project will result in the removal of Clarks Gully effectively from Year 1. Over the life of the Project, new drainage lines will be established to convey runoff from the Clarks Gully area to Big Flat Creek. These drainage lines will be designed and constructed to provide a stable vegetated channel that is capable of conveying flows to Big Flat Creek.

5.3 Department of Lands

The development and infrastructure of the mine will destroy the surface and subsurface environment of Crown land.

Under the *Crown Land Acts 1989* Part 11, Crown land management must encourage multiple use of land and the Department believes that the project will limit the ability of the public to use the Crown land currently under review.

There are approximately 348 hectares of Crown land located within the Project Area (which itself covers a total of 3763 ha). Of this, there are approximately 164 hectares located within the Proposed Disturbance Area and this land will be directly impacted by the Project (refer to

Figure 1.3, p1.6 of the EA). The majority of the Crown land located within the Proposed Disturbance Area (147 hectares) is Crown Roads. As outlined in Section 1.2.2 of the EA, Centennial is currently in the process of seeking approval from the Department of Lands for the transfer of Crown land reserves and the closure of Crown roads within the Project Area.

The proposal may also detrimentally affect the conservation of a large parcel of Crown land (5279 hectares) known as “Manobalai Crown Land”, west of Wybong Creek and the project area, through diffuse airborne toxins and particulates (refer to Figure 2). It should be noted that Manobalai Crown Land adjoining the project area is the subject of undetermined Aboriginal Land Claims.

The comprehensive air quality impact assessment undertaken as part of the EA indicates that the extent of significant air quality impacts associated with the Project do not extend to the Manobalai Crown Reserve located to the west of the Project Area. The extent of worst case air quality impacts associated the Project are depicted in Figure 5.21 (p5.57 of the EA).

A major concern of the Department of Lands is the potential impact of the proposed Project on land that forms a significant part of the Upper Hunter conservation corridor and the Manobalai Crown Reserves. The proposal will place an open cut coal mine over Crown land that includes Crown reserves, tenured parcels and Crown Roads (refer to Figure 1).

The land forms an important link between Manobalai Nature Reserve (north-west DEC/National Parks), Anvil Hill (east), Wallaby Hills (west, within Crown Land), Limb of Addy Hill (south), Myambat Commonwealth land (south) and Wollemi National Park (10 kilometres to south). These highly valued conservation zones are integrated within the Upper Hunter conservation corridor of steep escarpments, fertile valley floors and dense vegetation at the edge of the Muswellbrook LGA.

The potential impacts of the Project on regional ecological contours were specifically addressed within the EA and the Part B response to public submissions.

The existing and potential corridor function of the Study Area was considered in Section 9.5.4 of the Ecological Assessment (Volume 4, Appendix 9a of the Environmental Assessment) which provides a detailed account of the Conceptual Corridor Strategy proposed as part of this Project. This section contains a discussion on existing corridors, the design criteria used in the development of the conceptual corridor strategy, and discusses the relative merits and challenges of eight conceptual corridor options. These options involve both internal and external options of varying width. Apart from the extensive offset areas and internal corridors, an EA commitment was made to establish one external corridor to the north and one to the west. This approach was specifically taken to maintain and enhance the corridor function of the Study Area.

The Department of Lands submission raised a number of other issues relating to ecological impacts and these have been addressed in Part B of the response to submissions.

5.4 Community Submissions

Many community submissions raised concerns regarding the potential ecological impacts associated with proposed land disturbance within the Project Area and these issues have been addressed in the Part B response to submissions. Similarly, impacts on water resources as a result of land disturbance are addressed in **Section 3.0** of this document.

This section deals only with those aspects of land disturbance that have not been addressed in these previous sections.

5.4.1 Land Disturbance

Concern regarding the disturbance and possible destruction of Anvil Rock

As outlined in Section 5.1.4 of the EA (p5.17), the Proposed Offset Areas will conserve all the rock shelter sites within Wallaby Rocks, Limb of Addy Hill, Western Rocks and Anvil Hill. Anvil Hill rock shelter sites (including Anvil Rock), however, may be affected by the indirect impacts of blasting. This impact will be mitigated and management strategies for the rock shelters on Anvil Hill are discussed in Appendix 13 of the EA with key aspects outlined below. More detail on the management and monitoring process is outlined in **Section 4.0** of this document.

5.4.2 Rehabilitation

Rehabilitation should be to equal in diversity and density to what existed pre-mining

A Rehabilitation Strategy should be prepared

The proposed rehabilitation strategy of the post mining landscape is discussed in Section 5.1.3 of the EA (p5.9). The primary objective of mine rehabilitation will be to create a stable final landform with acceptable post-mining land use capability. Rehabilitation of the overburden emplacement areas and backfilled pits will be conducted progressively over the life of the mine, as an integral component of mining operations.

In recognition of the importance of vegetation corridors to regional biodiversity, the rehabilitation strategy has been designed to link rehabilitation areas to the proposed offset areas and existing remnant vegetation.

The proposed offsets strategy has been designed to offset the ecological and Aboriginal cultural heritage impacts of the Project. It will assist in the protection of a diverse range of threatened flora and fauna and significant Aboriginal archaeological sites, and provide improved connectivity between existing woodland remnants

Table 5.1 summarises the net increase in treed vegetation that will be achieved by the implementation of the rehabilitation and offset strategies. As indicated, these strategies will increase the total existing treed vegetation area by approximately 1286 hectares in the medium to long term.

Table 5.1 – Effect of the Rehabilitation and Offset Strategy on Treed Areas

| | Area Disturbed by the Project (Ha) | Area of Existing Vegetation Immediately Protected (Ha) | Area of Vegetation to be Established (Ha) | Total Area of Vegetation at end of Project (Ha) | Net Change in Treed Vegetation Area (Ha) |
|-------------------------------|------------------------------------|--|---|---|--|
| Proposed Disturbance Area | 1304 | 0 | 2074 | 2074 | +770 |
| Conservation Areas | 0 | 869 | 178 | 1047 | +178 |
| Habitat Enhancement Areas | 0 | 165 | 293 | 458 | +293 |
| Sustainable Agriculture Areas | 0 | 3 | 45 | 48 | +45 |
| Total | 1304 | 1037 | 2590 | 3654 | +1286 |

As noted in the EA, Centennial is committed to detailed rehabilitation planning as part of the integrated Ecological Management Plan. An integral component of the ongoing Mining Rehabilitation and Environmental Management Planning (MREMP) process administered by the DPI, under the requirements of the Mining Act, will be the review of detailed rehabilitation planning and progress on an annual basis.

6.0 Visual Amenity

6.1 Muswellbrook Shire Council

The provision of a suitable vegetated bund wall along the Wybong Road in front of the proposed four pit areas for screening purposes.

A detailed visual assessment has been undertaken and is discussed in Section 5.9 and Appendix 15 of the EA. The detailed visual assessment identified surrounding areas where views of the Project may be possible and described proposed mitigation measures.

Overall, the design of the Project in terms of the location of infrastructure areas and pit layouts takes advantage of the shielding provided by the existing topography in order to minimise visual impacts where possible. For instance, the realignment of the Northern Pit boundary to be set back approximately 250 metres to 350 metres from Wybong Road decreased the prominence of the proposed mining area and also increased the area where screening can be maintained and enhanced by existing native vegetation.

Views into the Project Area from Wybong Road will be effectively screened by the existing and enhanced vegetation within the 350 to 450 metre offset of the Northern Pit boundary and Wybong Road. Construction of a visual bund within this area would effectively create a disturbance corridor that is not necessary for screening views from Wybong Road. The area suggested by Council to be included as a visual bund is part of the Big Flat Creek corridor area that is proposed to be managed for conservation of ecological and cultural heritage values. Construction of a visual bund in this area would significantly impact on these values, with no substantial benefit in terms of minimising visual impacts.

Due to the elevated location of a number of residences to the north west of the Project Area, a vegetated bund wall would not provide an effective screen of the mining and overburden emplacement areas associated with Northern and Main Pits. Rather, Centennial has committed to rehabilitation of the outer face of shaped overburden dumps as soon as practicable, and the following visual mitigation measures to reduce potential visual impacts on the surrounding area:

- Final bulk earthworks and shaping of the overburden emplacement areas associated with Main, Northern and Southern Pits will be designed to ensure:
 - minimisation of straight edges and use of curved faces, where possible, to greater create relief along the faces of the Northern and Main Pit overburden emplacement areas and vary ridge heights when viewed from Wybong Road; and
 - the shape and line of the base of each overburden emplacement area that is located parallel to the 500 kV line will reduce visual convergence when viewed from Wybong Road.

6.2 Community Submissions

6.2.1 Views into the Mine Site

A number of local landholders raised specific concern regarding visual impacts from their properties. Some examples of these are noted below:

There is a clear line of sight to the mine site less than 3 km from their home.

Look straight down onto Wallaby Rocks. The fact that Centennial Coal says we would not be impacted is false. Have asked at public meetings for the company to explain why we will not be impacted, with no response. Do not want to look at spoil heaps and dust clouds.

These submissions were received from local landholders located to the north west of the Project Area. As outlined in Section 10.1 the detailed visual assessment (refer to Section 5.9 and Appendix 15 of the EA) has acknowledged the visual impacts on a number of residences located to the north and west of the Project Area.

Due to their elevated locations, a number of residences to the North West have views into the Project Area, in particular the progression of Main and Northern Pits and associated overburden emplacement areas, over the life of the Project. In addition, views of the CPP, infrastructure areas and coal stockpile areas will also be possible from the northern most residences close to Wybong Hall Road.

Unfortunately, it is not possible to develop an open cut coal mine of this scale without causing some level of visual impact. Due to the similar influence of topography in relation to both noise and visual impacts, a large portion of the local residences that are predicted to have high visual impacts are also significantly noise affected and consequently are subject to Centennial's offer to purchase their property.

What safeguards will be put in place to restrict the visual intrusion on property?

In order to minimise visual impacts associated with the Project, Centennial has committed to mitigation strategies outlined below (refer to Section 5.9.5 of EA).

Vegetative Screenings

- Vegetative screens will be planted along the lower sections of Mangoola Road from Roxburgh Road to the new rail loop intersection and along the ridge extending west from Limb of Addy Hill.
- Final revegetation of disturbed areas will consider the reduction of visual impacts.

Earthworks and Final Landforms

- Final bulk earthworks and shaping of the overburden emplacement areas associated with Main, Northern and Southern Pits will be designed to ensure:
 - minimisation of straight edges and use of curved faces, where possible, to greater create relief along the faces of the Northern and Main Pit overburden emplacement areas and vary ridge heights when viewed from Wybong Road; and
 - the shape and line of the base of each overburden emplacement area that is located parallel to the 500 kV line will reduce visual convergence when viewed from Wybong Road.

Infrastructure

- The link road from the CPP to the Tailings Dam will be relocated to avoid the knoll 500 metres east of the product stockpile. This will ensure existing vegetation on the knoll shields views of the CPP and stockpile from VP 2.
- The colour of building roofs and walls will be selected to differentiate elements and reduce visual mass.

- The spur on the north-east edge of Anvil Hill at RL 220 will be recreated as part of the overburden emplacement areas to assist screening of the CPP from Years 10 to 20 when viewed from the north around VP 10.
- The north, east and south sides of the workshop and CPP will be clad.
- All floodlights in the open cut area will be shielded to the maximum extent practicable.
- Workshop doors will be orientated south or south-west, where possible, to reduce light spill.
- Where safe to do so, trucks on access roads will make use of portable visual edge markers to increase drivers' visibility of road edges when driving with dipped headlamps.

Operational Measures

- At night, work will be restricted to lower levels on the overburden emplacement areas to reduce noise impacts which will also reduce potential direct lighting effects from random elements such as truck headlights and flashing beacons.

Valuer General lists views as a capital asset - properties with views are valued higher than those without visual amenity

For some time, Centennial has had available an offer to purchase any property within its Coal Tenements Area at rural market value. Further to this, following studies predicting that some properties would have significant noise and dust impacts above the relevant criteria if the project proceeds, Centennial has offered the owners of such properties an option to sell arrangement. As mentioned previously, a large portion of the residences that are predicted to have high visual impacts are also within this noise and dust zone and therefore subject to the option to sell arrangement. Centennial believes this arrangement properly accounts for the potential impact situation and provides an improved degree of certainty for the landholder and Centennial during the assessment of the Project Application. This offer includes a contribution towards the cost of the landholder taking independent legal advice.

All reasonable attempts will be made by Centennial to reach a negotiated agreement with affected land owners regarding compensation and/or acquisition. Should negotiations fail to reach agreement, Centennial will participate in any processes to seek resolution as deemed necessary by DoP.

6.2.2 Night Lighting and the Night Sky

Issues raised in relation to night lighting included the following:

Concern over loss of the night sky and the ability to look at stars

In the Siding Spring Observatory Dark Skies Region any upward light affects the observatory's view of the stars. Submission suggests a condition saying that no lights are to shine above the horizontal. There are effective, well-designed lights available to satisfy this requirement.

Concern over night lighting impacts from increased traffic and sky glow from the mine itself

Concern over lighting impact on horses

The detailed visual assessment included specific consideration of the potential night lighting impacts on the existing night time landscape (refer to Section 5.9 and Appendix 15 of the EA).

Visually prominent features of the Project in the night landscape will be the use of lighting for infrastructure areas including the CPP, lights associated with mobile plant travelling along the haul roads and overburden emplacement areas, and lighting associated with active mining operations within the mining areas.

The degree of night lighting impacts is dependent on the location of receivers in the surrounding area.

As indicated in Section 5.9 (p5.84) the night lighting impacts associated with the Project have been assessed as being predominantly moderate to high. Higher levels of impact will be experienced at locations to the east (VP 2 – VP 4) and north-west of the Project Area (VP 9 – VP 11). The greater extent of impacts within areas to the east of the Project Area is associated with the increased visibility of surface infrastructure from these areas. Elevated lighting impacts within areas to the north-west of the Project Area are associated with increased potential for views in these areas, largely as result of the higher elevation.

In general lighting will be kept to the minimum required for operational needs and safety. All permanent lights will have shields and all lighting will be directed down onto working areas to ensure that fugitive light emissions are limited.

In response to the identified night lighting impacts, Centennial has committed to the following mitigation measures:

- At night, work will be restricted to lower levels on the overburden emplacement areas to reduce noise impacts which will also reduce potential direct lighting effects from random elements such as truck headlights and flashing beacons.
- All floodlights in the open cut area will be shielded to the maximum extent practicable.
- Workshop doors will be orientated south or south-west, where possible, to reduce light spill.
- Where safe to do so, trucks on access roads will make use of portable visual edge markers to increase drivers' visibility of road edges when driving with dipped headlamps.
- Vegetative screens will be planted along the lower sections of Mangoola Road from Roxburgh Road to the new rail loop intersection and along the ridge extending west from Limb of Addy Hill.

6.2.3 Submissions in Support in relation to Visual Impacts

A number of supportive comments in relation to the visual aspects of the Project were evident within the public submissions, including:

The proposed mine will be less visible than many others in region. It is well away from Denman and Sandy Hollow.

Agree with intention to utilise the existing creek to screen the mine from the roadway.

7.0 Traffic and Transport

7.1 Muswellbrook Shire Council

- **Suitable arrangements for the closure of part or all of Mangoola Road to prevent the use of that road by employees and contractors**

The Project does not propose to close or restrict access for non project related traffic. Project related traffic, including employee movements, will use the extension of the Bengalla Link Road to access the Project Area via Wybong Road. There is no proposed access via Mangoola Road and Roxburgh Road, minimising any potential impacts on the integrity and safety of these roads.

This proposed transport route was determined in consultation Muswellbrook Shire Council and is consistent with the Council's Western Road Strategy. The proposed transport route is depicted on Figure 2 of Appendix 16 of the EA.

- **Suitable arrangements to upgrade the Reedy Creek/Golden Highway intersection**

All Project related traffic will be restricted to access to the site via Bengalla Link Road and Wybong Road. As such there will be no impact on Reedy Creek Road and no requirement arising from the Project for the upgrade of the Reedy Creek Road and Golden Highway intersection.

- **Suitable arrangements for the completion of the Bengalla Link Road with Roxburgh and Wybong Roads**

The proposed transport route is dependent on the completion of the Bengalla Link Road with Roxburgh and Wybong Roads. It is acknowledged that the construction of the Bengalla Link Road was a requirement specified within the conditions of development consents for the Bengalla and Mt Pleasant Mines. The relevant conditions of consent did not specify a timeframe for the completion of the Bengalla Link Road, but Council has based its local road planning on the assumption that this Link Road will be established.

- **Deliveries and heavy vehicle access to be undertaken only during daylight hours**

The majority of deliveries and heavy vehicle access will be undertaken during day shift, however, it is not practical or necessary to restrict such access to daylight hours only.

- **Consideration of an alternate access from the Denman Road to the southern section of the mine area**

Centennial has investigated a number of alternative transport options to access the Project Area, including potential southern access options from Mangoola Road, or directly from the Golden Highway. Substantial road and intersection upgrades and/or further land acquisition would be required for a safe, serviceable transport route to be established from the south.

Centennial initiated discussions regarding plans for completion of the Bengalla Link Road with the operators of the Bengalla Mine and the Mt Pleasant Project. A clear timeframe has not yet been established.

As the Bengalla Link Road is the only route proposed in this project application, in the event that the Bengalla Link Road was not available in a suitable timeframe, Centennial would need to seek approval for an alternative route. If this was necessary it would be done in

consultation with Council and involve appropriate environmental assessment and consultation.

7.2 Community Submissions

7.2.1 Alternative Transport Routes

A southern entrance to the site should be built from the Denman direction. This link road could come directly off the Golden Highway or perhaps off Mangoola Rd after the first railway crossing, coming from Denman. This road could then connect with, and run alongside the rail loop

Proposal should consider upgrading the access along Mangoola Road from the Golden Highway and entering the mine site near the rail loop.

Suggestion that a thorough study of road transport options be carried out and presented for public comment before approval is granted

See above

Suggested condition of consent by an individual: Before any mine construction work commences the proponent will upgrade (to an acceptable standard) the Bengalla Link Road and the affected sections of Wybong Road.

This issue has been dealt with in detail in the EA and above. Centennial will continue to assess the availability of the Bengalla Link Road and the need for an alternative access route.

7.2.2 Wybong Road

The Environmental Assessment undertakes to widen Wybong Road, however, there is no undertaking to upgrade drainage, sub-base and pavement to a suitable standard.

Wybong Road needs to be upgraded.

Wybong Road is a rural road unsuitable for modern heavy vehicle traffic.

The intersection of Wybong and Roxburgh Roads is dangerous

Roads will deteriorate further as a result of the proposed mine. Current roads are not capable of carrying extra traffic.

Current transport infrastructure is inadequate. Upgrading of roads was not addressed in the Environmental Assessment.

The detailed traffic impact assessment undertaken for the Project (refer to Section 5.10 and Appendix 16 of the EA) focussed on the assessment of Project related traffic generation along the primary road transport route in relation to condition and safety of the relevant roads and main intersections.

As a key outcome of this assessment, Centennial has committed to funding the reasonable upgrade of Wybong Road, from the intersection with Bengalla Link Road to the proposed mine access road. Centennial proposes the upgrade to be to a sealed carriageway minimum 6.5 metres wide, road marked centreline to relevant standards, enhancement of safety and advisory signage, and upgrade of sections to ensure safe operation of school bus zones and

stops. Centennial commits to working with Muswellbrook Shire Council to ensure the upgrade is designed to meet the standards recommended in the detailed traffic assessment in Appendix 16 of the EA.

7.2.3 Golden Highway

The impacts of the proposed mine transport requirements on the Golden Highway has not been assessed.

There are already safety issues on Golden Highway outside Sandy Hollow School. The proposed mine will worsen this situation.

The proposed mine will create a potential for accidents at the rail/road intersection on Golden Highway.

The nominated transport route does not include the Golden Highway. As such the detailed traffic impact assessment undertaken for the Project (refer to Appendix 16 of the EA) focussed on the assessment of Project related traffic generation along the proposed transport route in relation to condition and safety of the relevant roads and main intersections.

There is difficulty accessing and leaving Pine Ridge ROW at intersection with Golden Highway

Pine Ridge ROW adjoins the Golden Highway approximately 2.7 km north of Denman. As stated above the majority of Project related traffic will be generated along the New England Highway, Thomas Mitchell Drive, Denman Road, Bengalla Link Road and Wybong Road. As such, there is no indication that the Project will impact on the Pine Ridge ROW intersection with the Golden Highway.

The rail/road intersection of the Golden Highway west of Denman is unmanned. Increased rail traffic will mean this road will be closed to road traffic more often.

The Project will not result in additional rail traffic on the Golden Highway level crossing, which is located to the south-west of the Project rail loop. All coal from the Project is planned to be railed to the north-east from the Project rail loop.

7.2.4 Mangoola Road

The loss of Mangoola Road will increase travel times for residents and public transport

Local roads may be cut off or redirected

The Project does not propose to close or restrict access for non project related traffic. As outlined in the Section 5.10.2 of the EA (p5.92), the restriction of Project related traffic, including employee movements, to the nominated transport route will ensure that no Project related traffic will use Mangoola Road and Roxburgh Road, minimising any potential impacts on the integrity and safety of these roads.

If mine employees are not allowed to travel to the mine directly from Sandy Hollow via Wybong Road, Sandy Hollow will not be attractive to move to.

The traffic impacts and selected routes have been based on traffic and employee demographic data from existing upper Hunter Valley mines (Coakes Consulting 1999).

7.2.5 Other Roads

Bengalla Link Road has no approved construction plan or start date.

The nominated transport route is dependent on the completion of the Bengalla Link Road with Roxburgh and Wybong Roads. The actions taken by Centennial and alternatives considered and/or available for further consideration have been noted above.

The road crossing across the Kayuga Bridge over the Hunter River is unsuitable.

The proposed transport route will restrict Project related traffic to the New England Highway, Thomas Mitchell Drive, Denman Road, Bengalla Link Road and Wybong Road. As such it is not proposed that the Kayuga Bridge be used by traffic related to the construction and operation of the Project.

This is consistent with the advice of Muswellbrook Shire Council as outlined in Appendix 16 of the EA, that Wybong Road east of Roxburgh Road should be considered as non existent in assessing traffic impact associated with the Project. MSC advised that in accordance with the Western Road Strategy, this section of Wybong Road will be removed from service at some stage.

7.2.6 Road Infrastructure

Roads will deteriorate further as a result of the proposed mine. Current roads are not capable of carrying extra traffic.

Current transport infrastructure is inadequate. Upgrading of roads was not addressed in the Environmental Assessment.

As outlined in Section 9.3.4 and noted above, Centennial has committed to a relevant upgrade of Wybong Road in association with MSC, from the intersection with Bengalla Link Road to the proposed access road to the Project.

7.2.7 Road Safety

The proposed mine will create more traffic which will increase safety issues for children riding bicycles or horses on the road. The extra traffic will also cause increased dangers on school bus routes. There has been no consideration of the impacts of increased traffic on school bus routes or child safety.

The increased traffic from the project will make the pleasure of walking, horse and bicycle riding along the roadside dangerous.

Children catching the school bus will be unsafe because of extra traffic on the road.

There will be an increased risk of accidents generally because of the increased traffic which the mine would generate.

The detailed traffic impact assessment undertaken for the Project (refer to Section 5.10 and Appendix 16 of the EA) focussed on the assessment of Project related traffic generation along the primary road transport route in relation to condition and safety of the relevant roads and main intersections.

A key outcome of the assessment was the identification of a range of salient road safety issues to be addressed as part of the Project (refer to Section 4.3 of Appendix 16 of the EA).

As stated above, Centennial has committed to the upgrade of Wybong Road between the intersection with the Bengalla Link Road and the proposed mine access road.

There was only one site along Wybong Road subject to activity by vulnerable road users, which was a school bus pick up / set down operation near the intersection with Castlerock Road. Further traffic management planning for sensitive areas will be undertaken at the detailed design stage of the Project.

There are safety issues associated with three poorly signed Mangoola Road rail crossings.

As detailed above, traffic studies and consequent restrictions will ensure that the Project has no significant impact on Mangoola Road.

The proposed mine entrance is not safe as it is close to two dangerous corners.

Following modelling of projected traffic flows for the proposed Wybong Road and Mine Access Road intersection, it is proposed to construct this intersection to a Type B rural layout with a left turn auxiliary lane from Wybong Road into the proposed access road (refer to Section 5.10 and Appendix 16 of the EA).

The proposed location of the mine access road has been selected to provide adequate Intersection Sight Distance (SISD) to provide for the safe operation of the proposed intersection. Modelling of the performance of this proposed intersection layout for projected peak traffic movements indicated that the proposed intersection geometry will manage potential traffic impacts and have minimal impact on Wybong Road.

7.2.8 Other General Road Issues

It will be impossible to police travel routes for employees.

As outlined in Section 5.10.4 of the EA (p5.95), in order to effectively manage any impacts from Project related road traffic, Centennial has committed to the restriction of all Project related traffic, including employee movements, to the use of the extension of the Bengalla Link Road to Wybong Road to minimise impacts on Mangoola and Roxburgh Roads.

This will be achieved through appropriate mechanisms, such as employee contract conditions and regular road audits, to enable the enforcement of the restriction of project related traffic to the nominated primary access route.

There will be an increase in heavy vehicles.

The detailed traffic impact assessment undertaken for the Project (refer to Section 5.10 and Appendix 16 of the EA) estimates there will be an average of 10 heavy vehicles per day associated with the operational phases of the Project. The modelling assumes a "worst case" scenario by incorporating approximately half of the heavy vehicle arrivals to coincide with the day shift change. However, it is considered more likely that heavy vehicle movements will be more evenly distributed over the day.

Heavy vehicle movements are associated with ongoing service and delivery aspects of the Project, with all coal being transported off site by rail (refer to Section 2.5 of the EA).

The traffic assessment also included the modelling of traffic flow of the major intersections along the primary road transport route, which included the nominated heavy vehicle movements. Given the primary access route to the Project Area for Project related traffic, the critical intersection is the Denman Road and Bengalla Link Road intersection. The

detailed traffic assessment modelled traffic impacts on this intersection based on the existing traffic flows, inbound and outbound morning and evening peak movements and the cumulative impact of the corresponding peak movements of the approved Mt Pleasant Project. The modelling indicated that the intersection performed satisfactorily within the existing infrastructure for all ten modelled scenarios.

The performance of intersections was assessed and demonstrates that Project related traffic at the Denman Road and New England Highway, and Denman Road and Jerrys Plains Road intersections will not impact on the physical condition and safety of the existing intersections. An evaluation of the Denman Road and Thomas Mitchell Drive, and the future Wybong Road and Bengalla Link Road intersections also indicated satisfactory performance for projected Project related traffic.

Timber covered culverts are subject to decay and subsidence

As noted above, Centennial has undertaken to engage with MSC on an upgrade of the relevant section of Wybong Road. No other road quality impacts have been noted arising from the traffic assessment undertaken for the project. Any specific issues arising during detailed planning will be addressed.

Noise and lights from increased traffic is unacceptable.

The detailed noise assessment undertaken for the Project included an assessment of road traffic noise associated with both the operational and construction phases of the Project (refer to Section 5.6.4 p5.66 and Appendix 12 of the EA). The assessment was undertaken in accordance with the *Environmental Criteria for Road Traffic Noise* (ECRTN) (EPA, 1999).

It is proposed to operate with two 12 hour shifts, with changeovers at 7.30 am and 7.30 pm. The peak traffic flows are predicted to occur at shift changeover times of 7.00 am – 8.00 am and 7.00 pm – 8.00 pm.

The calculated noise levels show there are four private residences on Wybong Road and one mine owned residence on Bengalla Link Road at which the ECRTN criterion of 55 dBA is marginally exceeded (by up to 1.5 dBA) for the period 7.00 am - 8.00 am. In terms of impacts at residences, there would be a noticeable change in the acoustic environment for that hour. During the period 7.00 pm – 8.00 pm, the calculated noise levels at all residences meet the ECRTN criteria.

Based on overall traffic volumes, the highest traffic noise levels at residences during the construction period would be expected to be 2-3 dBA higher than the highest current hourly day time operational traffic noise levels. This would mean that at seven private residences on Wybong Road (146, 168, 246, 249, 251, 96A, 96B) and at two mine owned residences on Bengalla Link Road (203F, 203G) the daytime criterion for construction traffic noise would be exceeded by up to 4.5 dBA. However, construction traffic is likely to be at a peak for only 2-3 months during the 12 month construction period and any impacts at residences can be considered short term.

Road traffic noise impacts were also assessed on a cumulative basis with consideration of the approved Mt Pleasant Mine (refer to Section 5.6.6.2 p5.70 and Appendix 12 of the EA). Results indicate that the future traffic noise levels at residences on Wybong Road are generally the same as when the Anvil Hill Project was considered in isolation. Noise levels on Bengalla Link Road increase by up to 3.5 dBA, however higher existing noise levels mean that some residences have an ECRTN allowance criteria. Consequently, there is one mine owned residence (203F) at which it is predicted the day time criterion will be exceeded by up to 0.5 dBA.

7.2.9 Rail

The Environmental Assessment does not comment on impact of loading coal trains from the rail loop

Both the noise and air quality impacts assessments included an assessment of train loading and movements along the proposed rail loop throughout operational phases of the Project. Refer to Sections 5.5 and 5.6, and Appendices 10 and 12 of the EA.

Extra coal train movements are not properly addressed in Environmental Assessment.

Section 5.10.3 of the EA provides an assessment of the impacts of the additional train movements along both the Muswellbrook to Ulan rail line and the Main Northern Rail line. This included the assessment of potential cumulative impacts, which specifically assessed potential project related impacts in relation to all existing and approved train movements along the rail line.

Potential cumulative noise impacts due to train movements along the Muswellbrook to Ulan rail line have also been assessed and are included in Section 5.6.5.1 and Appendix 12 of the EA.

Concern over the cumulative impact from increased trains on the Anvil Hill & Ulan rail lines

Section 5.10.3.3 of the EA (p5.93) provides a specific assessment of the potential cumulative impacts of the Project on the existing rail network from Project related rail movements on the Muswellbrook to Ulan Rail Line. The assessment of potential cumulative noise impacts from train movements along the Muswellbrook to Ulan Rail line have also been assessed and are included in Section 5.6.5 and Appendix 12.

The Project proposes to increase average train movements by up to eight per day and peak train movements by up to ten per day. The proposed Project related train movements represent an increase of approximately 20% of the existing and approved average and peak rail movements along the Muswellbrook to Ulan rail line.

The potential for increases in rail movements along the Muswellbrook to Ulan rail line has been acknowledged in the *Hunter Valley Corridor Capacity Improvement Strategy* (ARTC 2005). This strategy provides a five year plan for the improvement of rail movements within the Hunter Valley, which includes a number of specific measures to increase the capacity of the Muswellbrook to Ulan rail line. The proposed improvements to the line aim to increase the capacity of the rail line to accommodate the existing, approved and proposed train movements along the line.

Train movements on the Sandy Hollow Line from Anvil Hill have been miscalculated (Wilpinjong has 20 train movements per day, although Anvil Hill has estimated only 2 train movements per day when they have comparable outputs)

The existing, approved and proposed train movements along the Muswellbrook to Ulan rail line in terms of average and peak daily movements are provided in **Table 7.1** and **Table 7.2** (p5.94 of EA).

Table 7.1 – Average Daily Movements Muswellbrook to Ulan Rail line

| Operation | Existing / Approved Movements (avg/day)* | | Proposed (Avg/day) | | Total Movements / Operation |
|-----------------------------|--|----------------|--------------------|----------|-----------------------------|
| | | | Day | Night | |
| Cobar Ore Freight | 3 ^a | 1 ^a | | | 4 |
| Ulan Coal | 8 ^a | 4 ^a | | | 12 |
| Bengalla Mine | 4 ^b | 2 ^b | | | 6 |
| Wilpinjong Coal Project | 6 ^c | 2 ^c | | | 8 |
| Mt Pleasant Mine | 4 ^d | 2 ^d | | | 6 |
| Anvil Hill Project | | | 6 | 2 | 8 |
| Total Rail Movements | 25 | 11 | 6 | 2 | 44 |

Table 7.2 - Peak Daily Movements Muswellbrook to Ulan Rail line

| Operation | Existing / Approved Movements (peak/day)* | | Proposed (Peak/day) | | Total Movements / Operation |
|-----------------------------|---|----------------|---------------------|----------|-----------------------------|
| | | | Day | Night | |
| Cobar Ore Freight | 5 ^a | 1 ^a | | | 6 |
| Ulan Coal | 8 ^a | 4 ^a | | | 12 |
| Bengalla Mine | 4 ^b | 2 ^b | | | 6 |
| Wilpinjong Coal Project | 8 ^c | 4 ^c | | | 12 |
| Mt Pleasant Mine | 4 ^d | 2 ^d | | | 6 |
| Wheat Freight | 2 ^e | 0 | | | 2 |
| Anvil Hill Project | | | 6 | 4 | 10 |
| Total Rail Movements | 31 | 13 | 6 | 4 | 54 |

* A movement is defined as a pass by along the rail line - that is, a train needs to go out and back from the operation along the rail line - 1 train = 2 movements

a Source from Richard Heggie & Associates 2005, Wilpinjong Coal Project Construction, Operation and Transportation Noise Impact and Blasting Assessment

b Source from Envirosciences 1993, Bengalla Coal Mine Environmental Impact Statement Volume 1

c Source from Richard Heggie & Associates 2005, Wilpinjong Coal Project Construction, Operation and Transportation Noise Impact and Blasting Assessment

d Source from ERM Mitchell McCotter 1997, Mt Pleasant Mine Environmental Impact Statement Volume 1

e Source from ARTC (J Tyne pers comm. 13 April 2006) is based on semi regular movements of 2-3 trains per week

As outlined within **Table 7.2** it is estimated that the Wilpinjong Coal Project will result in up to 12 movements per day during peak production. The Anvil Hill Project is estimated to include up to 10 train movements per day during peak production.

8.0 Socio-Economic

8.1 Muswellbrook Shire Council

The socio economic assessment lists commitments under a Community Enhancement Program (Table 7.1). How does this relate to the Community Enhancement Plan (CEP) developed by Council which is relevant to this development?

Centennial sought to discuss community contributions with Muswellbrook Shire Council early in the project consultation program. At that time, Council made it clear that it intended to determine its position on the project prior to entering into any discussions regarding community contributions. Centennial understood that Council intended to review the EA in detail to determine its position and Centennial assisted with this process by providing a presentation on the final draft EA prior to its submission.

However, as part of the socio economic assessment (Appendix 3 of the EA), Coakes Consulting undertook an assessment of community need in the local Wybong and broader Muswellbrook community, for consideration in the EA. This needs assessment involved consultation with approximately 60 service providers and community groups. The consultation identified priority areas of community need and opportunities for potential community contributions and partnerships across the broad areas listed below.

- Opportunities for employment
- Health of local businesses and the local economy
- Roads
- Public transport
- Health services and facilities
- Recreation services and facilities
- Arts and cultural activities
- Educational and school services and facilities
- Environmental management
- Other community services and facilities.

To complete the socio-economic assessment including appropriate management measures (as required by the DGRs), and as a response to the priorities and suggestions raised through the community needs assessment, Centennial committed to contributing 1 cent per tonne of saleable product to support community projects. It is envisaged that if the Anvil Hill project is approved, the evaluation of community projects and distribution of funds will be undertaken with community input, based on principles of partnership and mutual benefit.

In addition, Centennial has considered community feedback, in committing to the areas of community infrastructure, environmental management and local education and training. The EA commitment also included contribution to the Wybong Uplands Land Management Strategy (\$100,000 per year for 5 years), an Education and Training Strategy (\$200,000 per year for 3 years), and community infrastructure (\$500,000, particularly focused on Denman

and Wybong). These strategies will be further scoped and developed in partnership with community representatives and key stakeholders.

Council's CEP (amended June 2006) identifies a number of key issues related to development pressures in the Shire. These are listed below with Centennial's response to each issue:

- Employment opportunities – the CEP identifies mine workforce commuting to the area as a matter requiring address. Centennial has consulted Council on this issue throughout the EA preparation. Council and Centennial have signed a Memorandum of Understanding ("MoU") regarding local employment. The MoU is designed to maximise the skills, employment potential and employment of residents in the Shire.
- Potential population decline – as part of the above MoU, there is a commitment that Centennial will aim for all employees to live within one hour's normal drive from the mine site.
- Community enhancement program – there are a number of major and minor projects listed. The major projects include recreation area and improvements in Denman and works for the Denman Main Street. Centennial has committed to ongoing contribution for community projects and to \$500,000 for community infrastructure at Denman and Wybong.

Centennial is undertaking further discussion with Council regarding the need or otherwise for a varied or further contribution in relation to Section 94 contributions and Council's Community Enhancement Program.

8.2 Community Submissions

8.2.1 Community Displacement and Relocation

Many submissions received from the local community raised specific concerns in relation to the impacts associated with community displacement and relocation through the acquisition of properties by Centennial. The key themes associated with these submissions related to the potential impacts on the social fabric of the local community, the anxiety associated with perceived uncertainty of relocation, the costs associated with relocation and a sentiment of not wishing to vacate the area. An example of these comments included:

- **The proposal will destroy the social fabric of the Wybong community and displace its residents. This is clearly unacceptable.**
- **The Wybong community is being divided by the proposed mine; families and neighbours are fighting.**
- **If the mine proceeds it will impact on the lifestyle of local residents, including producing questions relating to certainty and potential relocation.**
- **There are significant social and psychological impacts on people who see their homes and gardens converted to a coal mine.**
- **... "established a property over the last 15 years from a rundown, derelict dairy farm to a productive, lucerne and cattle finishing property. Children have established strong friendships. It would be extremely difficult to move and replace the existing lifestyle"**

- **Land has been in the family for 100 years and do not wish to move.**
- **Concerned by such a major change to local community. Relocation of the Mangoola population to other farming areas will have impacts on land prices and farm availability making re-establishment very expensive.**
- **Attendance at the local church (unspecified) has already dropped with people being bought out. The community could lose the church service altogether.**
- **The sentimental value of 'home' with many memories and happy times cannot easily be transferred to another place.**

The impact on lifestyle and the potential for lifestyle change was a key issue raised by stakeholders as part of the social impact assessment outlined in Appendix 3 of the EA. In response to the key findings of the social impact assessment in relation to the potential impacts associated with population displacement, Centennial has a range of management commitments including:

- Offers since 2003 to purchase properties within the then Exploration Licence Area at market value. In making this offer, Centennial recognised both the concern raised by local community about potentially not being able to sell due to a proposed mine in the area and the need for the Company to acquire land if the project were to proceed;
- Offers since 2004 to enter agreements to purchase properties identified as within the proposed disturbance area at a price which recognised that approval for a mining use of the land was being sought;
- Offers since 2006 to enter agreements to purchase properties identified as potentially significantly impacted if the project gained approval, at a price which recognised the potential impact situation;
- Acceptance that approval of the project should include a suitable land purchase condition for those properties noted to be potentially significantly impacted at some time during the life of the project;
- All reasonable attempts will be made by Centennial to reach an amicable agreement with affected land owners regarding compensation and/or acquisition. Should negotiations fail to reach agreement, Centennial will readily participate in appropriate processes deemed necessary by DOP;
- Commitment by the Company to work with residents located within the area that is moderately affected by noise (38-40 dBA) to conduct appropriate noise monitoring to confirm noise levels, at representative locations, and to undertake reasonable and feasible residence specific measures to reduce noise impacts at these locations, such as installation of double glazed windows or provision of air conditioning (refer to Section 5.6.7 of the EA);
- As indicated at the IHAP, if any of the residences in the moderately affected zone are shown by monitoring to be significantly impacted (>40 dBA), then those residences will be afforded the acquisition rights as may be included in any consent conditions for significantly affected residences.

Centennial believes these arrangements properly account for the project proposal and potential impact situation and provide an improved degree of certainty for the landholder and Centennial during the assessment of the Project Application and operation of the mine, if

approved. The offer to provide mitigation, potentially including compensation, for those affected landowners who do not wish to sell their property, may enable more people to remain in the local community. Similarly, the monitoring and mitigation process for moderately noise affected landowners may also encourage more current and long term residents to stay in the area.

Nevertheless, it is recognised that the acquisition of numerous private properties by Centennial within the Wybong area could alter the dynamics of the rural community in this area. The project commitments for Centennial owned land outside the Disturbance area include native vegetation corridors, continued rural-residential utilisation and continued agricultural use where appropriate (including vineyards and lucerne production), in order to provide for ongoing, responsible land management, and to assist to maintain the rural character and dynamics of the area.

The Environmental Assessment fails to deal with the issue of people who do not wish to be bought out by Centennial Coal, but who just want to stay where they are but cannot live with the impacts.

The EA detailed that Centennial is committed to purchasing or reaching agreement with as many of the potentially significantly affected private landholders as possible prior to commencement of the project. The potential significant impacts considered are noise (40 dBA contour Figure 5.23 main text EA), blasting (overpressure and vibration limits as shown on Figure 5.25 main text EA) and dust (PM10, TSP contours and dust deposition contours shown on Figure 5.21 main text EA). Since the exhibition of the EA, Centennial has continued to seek and reach property purchase agreements with landowners. These have considered individual landowner needs and included options to stay on at the property.

The EA provided a detailed environmental, social and economic assessment of the impacts and benefits of the Project, which can be taken into consideration in determination of the Project Application.

The sense of place and the social fabric of the community will be destroyed if the mine proceeds.

The proponent must ensure that the unique community services do not disappear and take all and any means necessary to assist these important community assets.

The potential impacts of the project on the sense of community and place within the Wybong Area were specifically addressed by the social impact assessment within Appendix 3 of the EA.

It was evident, through consultation with local residents and landholders, that a strong sense of community exists in the Wybong area and concerns were raised as to how this would be affected by the project.

To address the issue of sense of community and place, Centennial has committed to work with the local Wybong community on important community projects. These include:

- Documentation of the history of the area in consultation with local landholders;
- Community contribution to the value of \$500,000 directed towards community infrastructure needs and particularly noted the Denman and Wybong communities.

As noted above, it has been acknowledged that the acquisition of numerous private properties by Centennial within the Wybong area could alter the dynamics of the rural community in this area. It is expected that the majority of the residences acquired by

Centennial, outside the project area, will be leased and that this will assist to maintain the rural character and dynamics of the area. Centennial has worked with the Wybong Hall Committee to create an information brochure for the Wybong Hall. This brochure is distributed to all Centennial tenants to encourage involvement in the Wybong community. Centennial has also donated land to the Wybong Hall Association in keeping with an arrangement made prior to Centennial purchasing a property adjacent to the Hall.

Approximately 75 families will be moved, meaning that more people would be moved by the mine than would be employed by it.

Based on average current family size of 3 people per dwelling, more than 700 people would be impacted directly or indirectly by the project.

Over 700 people will be displaced by the mine

As outlined within the EA, 84 residences were identified as being significantly impacted by the project. As outlined in Section 5.11.4.4 of the EA Centennial has offered the owners of such properties an option to sell agreement should the project be approved. Centennial has purchased properties or reached agreement with further residents since the EA was produced. At 9 December 2006, there are 41 such privately owned properties with dwellings (having 45 residences in total) for which written agreement has not been entered into with the landholders. Negotiations have been concluded with a further nine of these landholders and documents are in preparation to ratify those additional agreements. This process is expected to continue to provide for agreement to be reached between Centennial and many of the remaining owners of potentially significantly impacted properties.

In 2001 the average persons per private dwelling within the Muswellbrook LGA was 2.7 (refer to Appendix 3 of the EA). Based on this trend there are potentially 227 persons that may be displaced by the Project.

As outlined in Section 2.0 of the EA it is estimated that project will employ a peak construction workforce of 200 employees and an operational workforce of up to 240 employees at peak production. Furthermore the Project is estimated to directly and indirectly result in the employment of approximately 121 to 143 people during construction phase and an additional 343 to 449 people during the operational phases of the project within the region on an annual average basis.

As noted above, Centennial has made a number of commitments and actions to reduce the impact on the community from the land purchases by Centennial.

Concerned that Centennial Coal will rent properties and that the community will be full of uncaring, renting tenants. Believe that people who rent do not embrace an appropriate community spirit. New people moving in are not inclined to participate in community activities.

There are insecurity issues associated with tenancy of Centennial houses.

Concerned about Centennial renting properties - renters don't embrace the community spirit. Hopes Centennial will be very careful in selection of tenants.

Several months ago, Centennial encouraged the Wybong Hall Committee to produce an information sheet of the Wybong area. This sheet is handed to all new tenants of Company houses by the property manager, to encourage participation in the local community.

8.2.2 Property Devaluation

A number of public submissions received highlighted issues associated with potentially negative impacts of the Project on private property values within the area surrounding the Project Area including:

The approval of the mine will devalue property in the area.

Unacceptable that Centennial Coal will consider purchase of properties at market value because properties have been devalued by the mine proposal.

Inability to sell property

Centennial's upfront commitment to buy properties at market value has been on the basis that the assessed property value is not diminished by the presence of Centennial's mining tenements, project application or project activities. This approach is common for such mining industry purchases and is usually reflected in project approval land purchase conditions. Centennial also adopts this approach in its offers to enter put/call options and/or purchase those properties that have been indicated in the EA as potentially significantly impacted.

Proceeds from the proposed sale of a farm will be person's superannuation - being down wind of mine will do little to enhance its value

The property subject of this submission is located approximately 2 km south east of the Project Area. The detailed air quality assessment (refer to Section 5.5 (p5.51) and Appendix 10) does not identify this property as being significantly affected by the Project.

In addition the comprehensive noise impact assessment (refer to Section 5.6 (p5.61) and Appendix 12 of the EA) predicts that the property is moderately affected by potential noise impacts associated with the Project.

As noted above, for those residences that are moderately affected, Centennial proposes to conduct regular noise monitoring to confirm noise levels at locations representative of those residences, and in consultation with the landholder to undertake reasonable and feasible residence specific measures to reduce noise impacts at these locations, such as installation of double glazed windows or air conditioning. Should monitoring indicate that the residence is significantly impacted the option of acquisition by Centennial in accordance with the terms of the expected land purchase condition of approval will be available to the property owner.

Centennial Coal has failed to offer adequate compensation to landholders.

Centennial should benchmark the status quo (noise/dust/traffic/surface and groundwater) and guarantee to maintain the current property assets or to provide compensation if this is unable to occur.

Compensation for landholders must include the loss of property and infrastructure; loss of connection to the property; inability to fulfil life plans in connection to the property and the relocation of all goods and chattels to new location. Compensation should also be payable for the need to relocate outside the district, including loss of high income employment and high property prices.

Time and effort put into properties cannot be measured or adequately compensated

The proposed coal mine will adversely affect the future viability of businesses, particularly those which have to relocate.

Due to the long process of any mine approval, the original offers made may become obsolete due to inflationary pressures. A consent condition should be enacted to cover the rights of small business people such as myself in this regard.

Compensation discussions with local landholders have not been handled very well. Uncertainty may compromise our business viability in the near future.

As outlined previously, Centennial is committed to purchasing as many potentially Significantly Affected private properties as possible, or reaching agreement with as many of these landholders as possible, prior to commencement of the project. In relation to valuation of the property in the acquisition process, Centennial will be bound by any Government requirement should consent be granted. Current government policy (as expressed in recent conditions of consent) requires the acquisition and compensation process to be undertaken in accordance with the following:

1. The Proponent shall make a binding written offer to the landowner based on:
 - (a) the current market value of the landowner's interest in the property at, as if the property was unaffected by the project the subject of the project application, having regard to the:
 - existing and permissible use of the land, in accordance with the applicable planning instruments; and
 - presence of improvements on the property and/or any approved building or structure which has been physically commenced at the date of the landowner's written request, and is due to be completed subsequent to that date, but excluding any improvements that have resulted from the implementation of condition 6 of schedule 3;
 - (b) the reasonable costs associated with:
 - relocation;
 - obtaining legal advice and expert advice for determining the acquisition price of the land, and the terms upon which it is required; and
 - (c) reasonable compensation for any disturbance caused by the land acquisition process.

However, if at the end of this period, the Proponent and landowner cannot agree on the acquisition price of the land, and/or the terms upon which the land is to be acquired, then either party may refer the matter to the Director-General for resolution.

Upon receiving such a request, the Director-General shall request the President of the NSW Division of the Australian Property Institute to appoint a qualified independent valuer or Fellow of the Institute, to consider submissions from both parties, and determine a fair and reasonable acquisition price for the land, and/or terms upon which the land is to be acquired.

Within 14 days of receiving the independent valuer's determination, the Proponent shall make a written offer to purchase the land at a price not less than the independent valuer's determination.

If the landowner refuses to accept this offer within 6 months of the date of the Proponent's offer, the Proponent's obligations to acquire the land shall cease, unless otherwise agreed by the Director-General.

2. The Proponent shall bear the costs of any valuation or survey assessment requested by the independent valuer, or the Director-General and the costs of determination referred above.
3. If the Proponent and landowner agree that only part of the land shall be acquired, then the Proponent shall pay all reasonable costs associated with obtaining Council approval for any plan of subdivision, and registration of the plan at the Office of the Registrar-General.

To date, Centennial has approached landholders in good faith with the expectation that any agreement should satisfactorily reflect a land purchase condition of approval similar to that quoted above. Individual landholders' situations have been a specific consideration in purchase and option agreement negotiations. Over forty agreements have been finalised since the EA was lodged and a number are in the process of formal exchange.

Two separate properties should be considered as one in the event that either is affected by the mine with respect to compensation

For the purposes of the EA, a property is defined as contiguous parcels of land owned by the same person or entity. The identification of private properties in this manner has formed the basis of the detailed assessments undertaken as part of the EA preparation and the prediction of potential impacts associated with the Project.

In a small number of cases, Centennial has been asked to consider non-contiguous properties in which one of the properties is outside the area noted as potentially significantly impacted. Centennial has, and will continue to, consider the special circumstances of individual landholders and where reasonably justifiable, seek to provide agreements satisfactory to the needs of those individuals.

It is admirable that Centennial Coal has been purchasing properties prior to approval. Considers people in the mining area are lucky because their properties will be purchased by Centennial Coal. People in impact area will also have an opportunity to sell for a decent price. Properties in this area are just as impacted but are not being approached with purchase options.

Residents situated in the 'impact area' will also have an opportunity to sell for a decent price whilst those residences situated outside the 'impact area' are just as impacted but are not being approached with purchase options.

The outer boundary of significant impact tends to be defined by noise impact and a further zone of moderate noise impact has been delineated. For dwellings within that moderately affected zone, Centennial proposes to conduct regular noise monitoring to confirm noise levels at locations representative of those residences, and in consultation with the landholder to undertake reasonable and feasible residence specific measures to reduce noise impacts at these locations, such as installation of double glazed windows or air conditioning. Should monitoring indicate that the residence is significantly impacted the option of acquisition by Centennial will be available to the property owner in accordance with the terms of the expected land purchase condition of approval.

8.2.3 Impacts on the Sandy Hollow Community

Sandy Hollow should be included in Community Enhancement Program. Sandy Hollow is currently being disadvantaged because it will not benefit economically from the proposed mine.

Sandy Hollow is located approximately 10 kilometres to the west of the Project Area and is within the Muswellbrook Local Government Area.

Some elements of the Community Enhancement Program set out in the EA are proposed to be implemented through a consultative process and to focus on the local and regional community. There is opportunity for Sandy Hollow community to be involved in this process.

8.2.4 Impacts on the Denman Community

The proposed Community Enhancement Program contribution (\$500,000) towards community infrastructure in Denman and Wybong is considered to be inadequate. There is currently a need for new sporting and recreational facilities in Denman in excess of the contribution proposed. Similar projects such as Mt Arthur North have provided in excess of \$2.5 million.

As outlined in Section 5.11.4 of the EA, Centennial has committed to provide opportunities for the community to benefit from the Project based on an assessment of community need in the local Wybong and broader Muswellbrook community, through consultation with MSC as well as approximately 60 service providers and the extensive consultation that has been engaged in with local landowners and community members. The consultation identified priority areas of community need and opportunities for potential community contributions and partnerships across a broad range of community sectors. The value of the commitment by Centennial is \$1.6 million in the first 5 years and in addition approximately \$1.2 million over the life of the Project (1 cent per saleable tonne).

Part of this commitment is the upfront contribution to the value of \$500,000, directed towards the Denman and Wybong communities.

As noted above, the level and allocation of funds provided by Centennial is subject to further discussion with Muswellbrook Shire Council and DoP.

8.2.5 Impacts on the Castlerock Locality

Impacts of the mine on the Castlerock locality have been largely ignored.

Castlerock is located approximately 15 kilometres to the north-east of the Project Area. The extensive impact assessment process indicated that the Castlerock area will not be significantly impacted by the Project and is located approximately 14 kilometres outside the potentially significantly impacted area associated with the Project.

8.2.6 Impacts on General Community

The socio-economic assessment does not address the needs relating to education and childcare for children aged 0-4 years in Muswellbrook LGA which would result from an additional 34 children.

The social impact assessment included in Appendix 3 of the EA undertook a specific assessment of the potential impacts associated with population influx into the Muswellbrook area as a result of the Project.

Table 8.1 outlines the current childcare/pre-school facilities in the Muswellbrook LGA. It should be noted that some facilities provide a range of services being pre-school, long day-care, infants etc and capacities vary within each service. Discussions with service providers shows a substantial capacity in the township of Muswellbrook due to new facilities being established and capacity within other existing facilities to expand enrolments to meet demand.

An additional 29 children in the 0-4 age bracket are predicted to reside in the Muswellbrook township. The Denman facility is a non-profit community organisation which currently operates at capacity; however it has plans in place to expand to meet current demand. An additional 5 children in the 0-4 age bracket are predicted to reside in Denman.

Table 8.1 - Pre-School Childcare Capacity within Muswellbrook LGA

| | 2006 Enrolments | Current Capacity | Spare Capacity |
|---|--------------------------------|---------------------------------------|---|
| Muswellbrook Multi-care Childcare Centre | 30 per day | Full | 10 (In 2007) |
| Kate's Kindy – New Facility | 0 (New) | 75 | 75 |
| Muswellbrook Pre-school | Around 70 | 60 for 5 days plus 20 extra on 2 days | Yes. Capacity to expand with demand. |
| ABC Learning Centres Pty Ltd Muswellbrook | Around 80 | Approx. 70% | 3-5 pre-school 4-5 pre-kindy |
| Denman Children's Centre (Pre-school and Kindy) | Around 120 (39 per day max) | Full. | No. Current expansion plans subject to funding. |
| TOTAL | | | Approx. 95 |

Note: Enrolments and capacities vary from day to day, and within different services provided for children 0-4.

8.2.7 Impacts on Community Health

The proposed mine will place an increased strain on health system.

District hospitals are over capacity and there has been no constructive solution proposed to facilitate the impact of an additional 381 people.

The social impact assessment undertaken as part of the preparation of the EA specifically addressed the potential impacts of the project on health care services within the Muswellbrook Shire (refer to Appendix 3 of EA). In relation to health services it is evident from the assessment that the influx of population associated with the Project may potentially place pressure on health services within the area.

The development proposal has highlighted demographic changes which may result from the Project implementation and can be considered by the relevant government authorities in planning and supplying the services for which they are responsible.

The coal industry is shedding jobs. This will negatively affect the health of communities around the mine.

As outlined in Section 2.0 of the EA it is estimated that project will employ a peak construction workforce of 200 employees and an operational workforce of up to 240 employees at peak production. Furthermore the Project is estimated to directly and indirectly result in the employment of approximately 121 to 143 people during construction phase and an additional 343 to 449 people during the operational phases of the project within the region on an annual average basis.

8.2.8 Impacts on Agriculture and other Business

The life of most mines is very short compared to longstanding agricultural enterprises in the Hunter Valley, including horse breeders, Lucerne hay growers and dairy farmers, many of whom have been in operation for generations. The expansion of coal mines, including the proposed Anvil Hill mine, threatens the viability of these businesses and the families that they support to remain in the area. Therefore, the

continuing expansion of coal mines in the area is having significant social consequences in local communities.

There are no substantial horse breeding businesses in the area significantly affected by the Project. The potential off-site impacts associated with Project on agriculture in the area were addressed in the Part B response to community submissions. The relevant aspects of this response are detailed below.

Noise Impacts on Horses

This issue was not specifically addressed in the noise assessment. However, studies such as Bell, Jnl Acoust Soc Am, 51(2) 758 ("Animal Response to Sonic Booms") indicate that the threshold for perceptible noise impacts on animals is significantly higher than the threshold of annoyance for humans, and hence if residential amenity criteria are met, impacts on horses can be considered minimal.

Dust impact on pasture for grazing animals

The air quality impact of the Project was assessed by comparing estimates of dust concentrations and deposition levels with DEC air quality criteria. The air quality criteria have been set for the protection of human health and to minimise nuisance impacts. The air quality criteria would also be expected to protect the health and amenity of other mammals.

Andrews and Sriskandarajah (1992) conducted two research trials to investigate the effects of coal mine dust on dairy farms in the Hunter Valley. The results of their study suggested that coal mine dust, at levels much higher than would be experienced in practice, had no effect on the production of dairy cows. Also, the amount of soil ingested by dairy animals for typical grazing behaviour far outweighs the quantity of dust ingested by consumption of deposited dust on the pasture.

Dust impact on horse health

The air quality impact of the Project was assessed by comparing estimates of dust concentrations and deposition levels with DEC air quality criteria. The air quality criteria have been set for the protection of human health and to minimise nuisance impacts. The air quality criteria would also be expected to protect the health and amenity of other mammals, including horses. Horses and other mammals are kept and raced in Sydney and other cities where PM₁₀ concentrations will be similar and in many cases higher than will be experienced outside the area that the EA has identified as impacted by the mine. For example the DEC's Action for Air publication shows that the annual average PM₁₀ concentration over all the monitoring sites in the Sydney region was in the range 18 to 29 µg/m³ (DEC, 1998) for the period 1988 to 1996. Horse racing and stabling are successfully conducted in the Sydney environment.

Concerned about the displacement of existing vineyards. The wine and tourism industries need a critical mass to survive and the removal of some of our more prominent vineyards impacts on the viability of the industry as a whole and the credibility of this area as a serious wine region. There are also several more vineyards/wineries that are just out of the area of affectation that will also be impacted.

If vines are neglected due to the adverse impact caused by the proposed mine this is likely to cause disease which can spread to other vines in the area.

As outlined in Section 5.1.2 (p5.5) of the EA and depicted in Figure 5.4 (p5.7) of the EA, there are no vineyard operations located within the Project Area. In addition there are no

vineyards located within the area of affectation associated with significant air quality impact. There are number of vineyard operations that are located within or partially within the area of significant noise affectation associated with the Project.

The potential impact of air quality on vineyard operations was addressed in detail in Section 4.2 of the Part B response to community submissions. Relevant aspects are included below to address this concern regarding the impact of the Project on the vineyard industry.

A recent study title "Airborne Particulates and vegetation: Review of Physical Interactions" (Doley, 2006) examined the physical effects of dust on vegetation. The study noted that the effects may be associated with a "reduction in light reaching the photosynthesis apparatus of the leave" and an increase in leaf temperature. A relevant conclusion from the study suggested that there is no discernible affect on the most sensitive plant functions with dust loads of less than 8 g/m² on the leaf surface during growth.

Air quality impacts of the Anvil Hill Project were assessed against a dust fallout criteria of 4 g/m²/month. All vineyards in the area are located outside the zone where deposition levels of more than 4 g/m²/month are predicted due to proposed mining operations. Thus, the impact of dust emissions on vineyards is considered to be negligible.

As outlined in Section 5.2, it is anticipated that the majority of land acquired by Centennial will continue to be leased for rural purposes, in order to provide for ongoing, responsible land management, and to assist to maintain the rural character and dynamics of the area.

The Anvil Hill mine will cover an area of approximately 20,000 Ha and will result in the significant loss of agricultural land and a reduction in the agricultural diversity of the area. Many longstanding, sustainable agricultural enterprises will be displaced by this mine, impacting the existing communities and families that have in some cases been in operation for generations.

The proposal will result in the loss of agricultural land and reduction in agricultural diversity of the area.

The proposed coal mine is incompatible with agriculture based activities in the Wybong area

The Proposed Disturbance Area covers an area of approximately 2238 hectares and represents the proposed footprint for the Project. All land within this boundary may be directly impacted or disturbed in some way due to activities associated with the operations, such as mining, infrastructure or construction, at some time during the 21 year project life. Approximately 2175 hectares of land within the Proposed Disturbance Area has been classified as Class VI land capability, that being generally suited for grazing land with intensive management measures.

As outlined in Section 5.1.2.1 of the EA (p5.8) grazing land within and surrounding the Project Area is primarily utilised for pastoral grazing on unimproved pastures on areas of low to medium slope. This land has been largely cleared of vegetation, apart from isolated woodland fragments, is generally not of high agricultural value and is subject to low intensity grazing.

Highly productive agricultural land is located on the Hunter River alluvials, in the southern portion of the project area. This area will be traversed by the proposed rail loop and as outlined in Section 5.1 is planned to be managed for Sustainable Agriculture, to enhance and protect the agricultural productivity of this area.

As outlined previously Centennial acknowledges that the acquisition of numerous private properties within the Wybong area could alter the dynamics of the rural community in this area. It is anticipated that the majority of land acquired by Centennial will continue to be utilised for rural-residential purposes, in order to provide for ongoing, responsible land management, and to assist to maintain the rural character and dynamics of the area.

The proposed coal mine will increase soil salinity which, in turn, will adversely impact on vine and grape growth. This will result in a loss of income to vignerons and will impact on the Upper Hunter wine growing area as well as the community generally due to the associated lack of multiplier effects.

The Project will not result in significant adverse impacts on soil salinity within the local area. One of the major ways in which mining operations can potentially impact on salinity is through runoff from disturbed areas.

The detailed surface water assessment (refer to Section 5.2 (p5.23) and Appendix 7 of the EA) which has developed a comprehensive water management system to manage runoff from the Project area during and beyond the life of the Project.

The water management system is also proposed to include a series of sediment and pollution control dams that are used to capture, contain and re-circulate surface runoff from disturbed areas within the mining area. These pollution control dams will be utilised as part of the saline water and dirty water management systems.

In addition the final void areas have been designed to capture surface runoff from rehabilitated areas of the site. The final voids have been sized in order to capture all runoff from the rehabilitated surface and to act as a large evaporative sink that will ensure that there is no overflow of saline water into surrounding catchments.

Centennial is also committed to contributing to broader catchment management with the objective of improving water quality in the local area. In this regard, Centennial plans to conduct tree planting and other land management activities in association with relevant stakeholders, in order to address specific existing issues such as dryland salinity in Big Flat Creek catchment.

The Environmental Assessment does not discuss the effect of the proposed mine on tourism. There is no mention of offsetting the impacts of the mine on tourism and tourism operators

Furthering one industry for the short term will destroy several others for the longer term, including tourism and the associated viticultural industry.

This is a pristine area that should be used for tourism rather than mining.

Centennial Coal should make contributions to compensate the local tourism industry.

As outlined in Section 5.1.2.6 (p5.8) of the EA three tourist operations are located along the Golden Highway and Rosemount Road, 4 to 7 kilometres to the south of the Project Area. Each operation offers small scale tourist accommodation in the form of a number of separate cottages and/or cabins (up to five). The identified tourism operations are located 2 to 5 kilometres from the identified area of significant impact associated with the Project. As such these tourist operations have not been identified as being potentially significantly affected by the Project. Issues relating to impacts on the viticultural industry have been addressed above.

8.2.9 Employment

The mining proposal will cause a loss of jobs generally.

Highest unemployment, social problems and health disasters are happening in Muswellbrook

Jobs would be better created in clean and renewable energy industries.

As outlined in Section 2.0 of the EA it is estimated that project will employ a peak construction workforce of 200 employees and an operational workforce of up to 240 employees at peak production. Furthermore the Project is estimated to directly and indirectly result in the employment of approximately 121 to 143 people during construction phase and an additional 343 to 449 people during the operational phases of the project within the region on an annual average basis.

As noted elsewhere, Centennial has entered a Memorandum of Understanding with Muswellbrook Shire Council to underscore the Company's commitment to facilitating local employment and training.

9.0 Other Environmental and Compliance Issues

9.1 Muswellbrook Shire Council

Identification of on site emergency response procedures and the capability of external emergency services to meet the needs of the operation.

As part of standard OHS planning during detailed operational planning, Centennial will develop site specific emergency response procedures and consider the issue of external emergency services, following project approval and prior to commencement of site work.

The Anvil Hill Project falls within three zones under Council's LEP 1985 – Zones 1(a), 7(d) and 7(L1). Zone 7(d) Environment Protection (Scenic) Zone prohibits the development of open cut mining in this area. How is this matter to be resolved?

The applicability of the Muswellbrook LEP 1985 to the Project is addressed in Section 3.1.1 of the EA. The Muswellbrook LEP is relevant to the permissibility of the Project. Section 75J(3)(b) of the EP&A Act provides that the Minister cannot approve the carrying out of a project that would be wholly prohibited under an environmental planning instrument.

The land proposed to be affected by mining and associated infrastructure is located primarily within zone 1(a) (Rural "A" Zone), with a smaller portion of 7(d) (Environment Protection (Scenic) Zone). Open cut mining is prohibited in zone 7(d). However, the Project is not wholly prohibited by Muswellbrook LEP and it is available to the Minister to grant project approval under section 75J of the EP&A Act

9.2 Community Submissions

9.2.1 Spontaneous Combustion

Inclusion of spontaneous combustion in annual CO2 emissions report unclear

Addressed in Part A Response to Submissions.

The Environmental Assessment states that a policy to deal with spontaneous combustion will be developed but gives no time scale. The risk is high and could be initiated from first exposure of the coal seam.

There is no undertaking to close the mine either temporarily or permanently if spontaneous combustion cannot be controlled.

Suggested condition of consent by an individual: There be a fully resourced action plan in place before mining commences to effectively deal with spontaneous combustion. In the event that spontaneous combustion cannot be controlled mining activity is to be suspended until it can be controlled. In the event of numerous instances of spontaneous combustion not being controlled within 12 hours, the mine be permanently closed.

As indicated in Section 2.1 of the EA (p2.2), preliminary assessment has indicated that the coal resource has a medium high to high propensity for spontaneous combustion. However, the inherent propensity to spontaneously combust is only one factor in a complex chain of conditions that can create spontaneous combustion in coal mines. Many mines with coals that are inherently prone to spontaneous combustion operate safely without incident and others with coals of much lower propensity have major problems (SIMTARS, 2003).

It is recommended by SIMTARS that care be taken where broken coal exists, particularly on overburden, ROM stockpiles and clean coal stockpiles. This includes careful design of the stockpiles, particularly for the aspects of height, compaction, slope angle, separation and the orientation of these stockpiles to the prevailing wind directions(s). In addition, as discussed in Section 2.7 of the EA (p2.11), Centennial will place coarse reject within the overburden emplacement areas to minimise the opportunity for spontaneous combustion from this source.

Further to this, Centennial has committed to the development of a spontaneous combustion management strategy in consultation with the DPI. The management strategy will include coal stockpile and reject emplacement management measures, monitoring potential causes of spontaneous combustion events, and actions that can be implemented in the event of spontaneous combustion.

9.2.2 Soils

Concern over the ability of local soils to be used for tailings pits and dams walls due to high dispersion potential

Rainfall intensity is of prime concern due to the problem of erosion in generally sandy soils of the area

A soil assessment was undertaken as part of the preparation of the EA and is included as Appendix 5.

The soil assessment indicated that the majority of soils within the Proposed Disturbance Area ranged from moderately dispersible to more highly aggregated soils. Subsoil structural integrity was found to be decreasing for a number of soil units (Yellow Solodics and Brown Clays). Due to poor structure and water holding capacity, the subsurface horizons of Deep Sands soil unit were considered unsuitable for re-use on site.

Centennial will undertake detailed geotechnical analysis prior to the construction of any dams associated with the Project to ensure that sufficient stability will be achieved. If necessary, clay lining or other approaches such as application of gypsum during construction will be used to ensure appropriate geotechnical stability is achieved.

Impact on geological stability of adjacent slopes and escarpments

As outlined in Section 1.1.3 (p1.3) of the EA the Proposed Disturbance Area covers an area of approximately 2238 hectares and represents the proposed footprint for the Project. All land within this boundary may be directly impacted or disturbed in some way due to activities associated with the operations, such as mining, infrastructure or construction, at some time during the 21 year project life. There are no escarpment areas within the Proposed Disturbance Area.

As outlined in Section 5.1.4 of the EA (p5.17), the Proposed Offset Areas will conserve all the rock shelter sites within Wallaby Rocks, Limb of Addy Hill, Western Rocks and Anvil Hill. Anvil Hill rock shelter sites (including Anvil Rock), however, may be affected by the impact of blasting vibration. This impact will be mitigated and management strategies for the rock shelters on Anvil Hill are discussed in Appendix 13 of the EA with key aspects outlined below.

The following management options are being investigated to mitigate against the impacts of blasting on Anvil Hill and the Anvil Hill rock shelter sites:

- Detailed design of blasting to take into account the rock shelter locations and control vibration levels as far as reasonably practicable in the open cut mining environment;
- reinforcement of the roof of the rock shelters with stainless steel bolts to anchor rock in place; and/or
- the removal of loose rock that cannot be stabilised for safety purposes.

9.2.3 General Environmental Impacts

The proposed mine will cause more damage to environment when we should be reducing the damage already done

Table 7.1 of the EA (p7.2) provides a broad overview of the environmental and community impacts associated with the Project. In general the impacts associated with the Project have been kept to a minimum through:

- obtaining a detailed understanding of the issues and impacts by extensive scientific evaluation and community consultation;
- a realistic consideration of alternatives;
- proactive and appropriate strategies to avoid, minimise, mitigate, offset or manage;
- the temporary nature of mining in the landscape, but with long-term benefits to future land use and catchment quality; and
- a thorough Statement of Commitments (refer to Section 6.0 of EA).

Furthermore there are a range of benefits associated with the Project including significant economic benefits to the local, regional and NSW economies including significant benefits in terms of business output, household income and job generation. Other benefits include the value of conservation offsets and enhancement and community enhancement proposals that are described in Section 5.0 and summarised in Table 7.2 of the EA (p7.4).

Concerns raised over increase in roadside litter.

All contractors and employees of Centennial will need to complete a site induction which will include environmental management aspects. Responsible disposal of litter is an environmental issue for the induction and for the broader community.

Sites are often used as mining garbage dumps for tyres, oil and other waste which leaches into the waterways. Incidence of oil spills over 20 litres is rarely admitted so therefore never reported to the EPA.

Standard waste management practices for mining operations include measures for safe disposal of tyres, oils and other waste. Waste management is also regulated by DEC under the Protection of the Environment Operations licence requirements. If the Mine is approved, it is anticipated that these matters will be closely regulated by the DEC and DPI, as is the case with other mining operations.

Centennial will maintain a waste management program on site.

A baseline must be established for water so impacts on the groundwater can be monitored

A comprehensive assessment of potential groundwater impacts associated with the Project has been undertaken (refer to Section 5.3 of the EA). In accordance with the DGRs for the Project the groundwater assessment includes detailed modelling of potential groundwater impacts and mitigation measures to protect the supply of water to landowners and the environment in the region.

The assessment included the extensive characterisation of the existing groundwater system. Groundwater levels were initially measured in June 2003 and regular groundwater monitoring of approximately 53 bores has been undertaken on a bi-monthly basis since October 2004.

These bores are routinely analysed for a range of parameters including groundwater level, pH, and Electrical Conductivity (EC). Further analyses (including salts, heavy metals, and major ions) have been undertaken from a selection of bores to characterise the groundwater resource in the area. In addition, data loggers have been installed at ten sites which record water table level every eight hours.

The proposed environmental monitoring program is totally inadequate to be able to assess the development within a regional context, and to link with other regional air quality monitoring programs. This requires a program of regional monitoring by an independent authority and ongoing management

As outlined in Section 5.5.7 of the EA, Centennial has committed to the implementation of a detailed Air Quality Monitoring Program. The Air Quality Monitoring Program will include a combination of high volume samplers and dust deposition gauges to monitor the dust emissions of the Project. The monitoring program will incorporate mechanisms for responding to dust related complaints and reporting the results to relevant stakeholders.

The proposed air quality monitoring program is based on the existing extensive air quality monitoring network, including an array of dust deposition and HVAS gauges, maintained by Centennial since March 2002. The data collected from the monitoring network is consistent with that collected throughout the region and as such would be compatible with any future monitoring of regional air quality.

9.2.4 Assessment Methodology**A resilience model for assessment purposes should have been prepared**

Dust, noise and other monitors don't give the true impact of a development. Significant environmental studies need to be undertaken before starting these developments - a lot more than required by law, including forests, global warming, carbon emissions and many more.

The Environmental Assessment is deceptive and the words used are intended to pacify authorities and delude locals.

The EA was prepared in accordance with the Director General's Environmental Assessment Requirements (DGRs) issued under Section 75H of the EP&A Act. A checklist of where each of the DGRs has been addressed by the EA is included in Section 8.0 of the EA with the DGRs reproduced in full in Appendix 2.

The identification of the key issues for assessment in the DGRs necessitated the detailed assessments undertaken as part of the EA. All assessments were undertaken in accordance

with relevant government guidelines and, in many cases, in accordance with detailed and extensive consultation with relevant authorities.

The DG formed the opinion, notified to Centennial by letter dated 23 August 2006, that the EA lodged by the Centennial "adequately addressed" the DGRs for the Project as required by Section 75H(2) of the EP&A Act.

9.2.5 Assessment of Cumulative Impacts

A number of public submissions raised specific issues in relation to the assessment of cumulative impacts associated with the Project and other relevant operations within the region. Specific issues raised included:

Concerns raised over the cumulative impacts of coal mining in the Upper Hunter, including such other mines as Bengalla and Mt Arthur.

The Environmental Assessment has only considered impacts from a site specific perspective.

The cumulative impacts of coal mining in this area have not been adequately considered. In particular, greenhouse, biodiversity and water quality impacts are not appropriately considered. These must be considered at the national, regional and catchment scales respectively. Would like to see further investigation into the cumulative impacts of any additional mining developments in the Upper Hunter with consideration given to the social, environmental and economic impacts on existing communities.

The Environmental Assessment does not adequately consider the regional significance/context of the proposal. Issues of regional scale such as visual impacts, night lighting effects on biodiversity, environmental monitoring, and threatened species and biodiversity considerations have not been taken into account at the appropriate scale to allow for meaningful decision-making

The Environmental Assessment does not adequately cover the short and long term damage to local environment, health (human and animal), water resources, quality of life for people living within 20 km, and the blossoming tourism industry in the area.

The assessment of potential cumulative impacts associated with Project and other relevant mining operation within the surrounding areas was a key consideration in the preparation of the EA. Specifically the EA provided detailed cumulative assessments in relation to:

- Surface Water (section 5.2.5 of EA);
- Groundwater (section 5.3.2.6 of EA);
- Flora and Fauna Assessment (section 5.4 of EA)
- Air Quality (section 5.5.5 of EA);
- Noise Assessment (section 5.6.6 of EA); and
- Traffic and Transport (section 5.10 of EA).

Where relevant to the Project, the EA assessed potential impacts in relation to the regional setting of the Project. This was specifically undertaken for the Heritage Assessment (section

5.8 of EA), Visual Assessment (section 5.9 of EA), Flora and Fauna Assessment (section 5.4 of EA) and the Socio-economic assessment (section 5.11 of EA).

An aspect of DGRs issued for the Project is the assessment of cumulative aspects associated with the Project. The DG formed the opinion, notified to Centennial by letter dated 23 August 2006, that the EA lodged by the Centennial "adequately addressed" the DGRs for the Project as required by Section 75H(2) of the EPA Act.

9.2.6 Legislation and Compliance

Any consent conditions must be enforceable by law

The Project is classified as a Major Project to which Part 3A of the EP&A Act applies. Section 75J of the EP&A Act provides for the Minister to grant development consent for projects under Part 3A of the EP&A subject to relevant conditions of consent as determined by the Minister. In the event that this Project is approved, the Department of Planning will have an ongoing role in assessing compliance with the development consent conditions.

Past inability of local councils and NSW Planning to regulate impacts of mines on the residents

The current regulatory framework for the regulation of mining operations in NSW provides a comprehensive approach to the management of the potential environment and community impacts from mining operations. This includes development consent conditions enforceable under the EP&A Act; the Mining Rehabilitation and Environmental Management Plan (MREMP) process enforceable under the Mining Act, and the Environment Protection Licence (EPL) enforceable under the Protection of the Environment Operations Act.

Centennial will be required to prepare an Annual Environmental Management Report (AEMR) to report on environmental performance, including compliance with regulatory requirements. This AEMR will be reviewed by relevant government agencies and made publicly available.

In addition, consistent with recent consent requirements, Centennial has committed to commissioning and paying the full cost of an Independent Environmental Audit of the Project two years after commencement of development, and every three years thereafter.

As noted above, Centennial is required to obtain an Environmental Protection Licence (EPL) for the project. The EPL requires an annual return to be prepared in relation to the performance of the scheduled activity in relation to the specific conditions of the EPL. This provides an additional mechanism for DEC to regulate the Project.

Notwithstanding the requirements of the current regulatory framework the comprehensive environmental monitoring program to be developed for the Project will include appropriate mechanisms for responding to impacts associated with the Project (refer to **Section 5.0** of the EA).

10.0 Conclusion

As noted in **Section 1.0**, the majority of submissions (60%) and particularly those from outside the local area, raised objection to the coal industry expanding in the Hunter Valley and Australia, generally. Many of these objections related to greenhouse and climate change issues, which have been addressed in the Part A Response to Submissions. Other issues included:

- **Coal will be sold to countries which advocate little or no environmental responsibility.**
- **By funding projects such as Anvil Hill mine we compromise our ability to develop a substantial renewables market place and find a solution to our limited and highly dangerous reliance on coal.**
- **Coal supplies should be left in the ground until technologies for using coal cleanly can be developed. It is unethical to increase export of coal when clean coal technology is still in the experimental stage. There should be no further expansion of coal-fired power station energy production in the interim.**
- **Coal is a limited resource which makes it invaluable. If we mine it now it will be gone for the future. A decision to mine this coal can be made later as it is not required now.**
- **Opening of new mines and port facilities leaves Newcastle very exposed to the inevitable downturn in the coal industry when prices drop and mines close. Social disruption caused by unemployment has severe adverse effects on health and well being of communities.**
- **The Hunter regional economy is far too dependent on coal.**
- **Anvil Hill and NCIG will entrench the dependency of our regional economies upon coal.**
- **Centennial's case is short-term profit driven irrespective of long term environmental and social outcomes.**

These issues relate to matters of government policy. The NSW government resolved to make available the coal resource for exploration, feasibility analysis, and assessment for development by the issue of an exploration licence and subsequently an assessment lease for the project area. Centennial has commissioned extensive background environmental studies, and detailed assessment in conjunction with detailed project planning in order to understand and minimise environment and community impacts associated with the project. Comprehensive environmental management, mitigation and monitoring have been proposed in addition to an extensive offset package in relation to residual impacts.

The location of a large coal reserve in a relatively closely settled rural area means that the proposed open cut coal mine will significantly affect a number of private residences and landholdings. Centennial recognised these potential impacts early in the project, and has stood in the market place to buy properties both within the proposed mining area, and surrounding significantly area, for some time. On completion of detailed dust and noise modelling, there was further information on which to define potential impacts which allowed Centennial to more pro-actively seek to reach agreement with potentially significantly affected property owners. As a consequence, Centennial has acquired or reached agreement for acquisition of a substantial number of properties.

The EA, IHAP and Response to Submissions have addressed environment and community issues relevant to this project. Implementation of the EA commitments, and the anticipated detailed conditions associated with any project approval, with adequate resources and effective environmental management will enable the impacts on the environment and community to be appropriately minimised. Development of the Anvil Hill Project will provide the following local, regional and state benefits:

Regional Economy – Operational Phase

- \$212M to \$224M in annual direct and indirect regional output or business turnover;
- \$115M to \$121M in annual direct and indirect regional value added;
- \$25M to \$28M in annual household income; and
- 343 to 449 direct and indirect jobs.

NSW Economy – Operational Phase

- \$275M to \$324M in annual direct and indirect regional output or business turnover;
- \$133M to \$158M in annual direct and indirect regional value added;
- \$33M to \$43M in annual household income; and
- 531 to 809 direct and indirect jobs.

The Economic Assessment also considers the economic cost of the impact to the environment. It concludes that for the Project to be questionable on economic efficiency (net community welfare) grounds, the residual environmental cost would need to exceed \$480M. In other words, to forego the opportunities presented by the Project and to avoid any residual environmental impact, there must be a community willingness to pay an equivalent of:

- \$85,000 per household in the Muswellbrook LGA;
- \$27,000 per household in the Muswellbrook, Singleton and Scone region; or
- \$190 per household in NSW.

Other benefits include the value of conservation offsets and enhancement and community enhancement proposals that are described in Section 5.0 of the EA and summarised below.

Offset and Enhancement Proposals

| Issue of Concern | Contribution | Detail |
|------------------------------------|--|--|
| <i>Conservation Offsets</i> | | |
| Biodiversity and ecological values | Long term protection of 1078 hectares of Conservation Area | Conservation of area of existing biodiversity value. |
| Aboriginal cultural values | Long term protection of 98 sites, including 16 culturally significant rockshelters in proposed Conservation Area | Conservation of area of existing high cultural heritage value. |

| Issue of Concern | Contribution | Detail |
|--|--|--|
| <i>Habitat Enhancement</i> | | |
| Biodiversity and ecological values | 629 hectares of Habitat Enhancement Area | Further regeneration and revegetation in addition to Conservation Area to enhance existing values |
| Sustainable agricultural opportunities | 217 hectares of Sustainable Agriculture | Specific management of prime land for sustainable agriculture, including components of habitat enhancement |
| <i>Community Enhancement</i> | | |
| Community Projects | 1 cent per Saleable Tonne of coal produced | For ongoing community projects, to be distributed with community input |
| Local Environmental Management | \$100,000 per annum for 5 years | External to the mine site environmental management - Wybong Uplands Land Management Strategy |
| Education and Training | \$200,000 per annum for 3 years | Sponsorship of TAFE courses, apprenticeships, traineeships |
| Community Infrastructure | \$500,000 | Focus on Denman and Wybong, suggest sporting and recreation facilities |