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# Anvil Hill Project Watch Association

ABN 88 261 039 244

January 30, 2007

Referrals Section (EPBC Act)  
Approvals and Wildlife Division  
Department of the Environment and Heritage  
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**Regards: Referral of development proposal under the EPBC Act.  
Centennial Hunter Pty Limited/Mining/near Muswellbrook/NSW/Anvil Hill  
Project coal mine. Reference Number: 2007/3228**

Dear Sir or Madam:

The members of the Anvil Hill Project Watch Association thank you for the opportunity to comment on this development and for the extension in time to submit our comments.

In addition to the comments already emailed to you on the evening of 25<sup>th</sup> January 2007, we wish to add the following;

The Anvil Hill mine proposal clearly falls within the definition of an ‘action’ for the purposes of the EPBC Act.

The Minister should, in considering significant impacts, consider all downstream/indirect impacts, as explained in the Nathan Dam case. That is, as the Full Federal Court stated: *‘that "all adverse impacts" includes each consequence which can reasonably be imputed as within the contemplation of the proponent of the action, whether those consequences are within the control of the proponent or not.’*

‘We note that in *Brown v Forestry Tasmania (No 4)* [2006] FCA 1729, the Federal Court has interpreted the meaning of the term ‘significant impact’ broadly as it applies to the EPBC Act. The Court held that:

- An action under the EPBC Act may have a significant impact on a matter of national environmental significance (MNES) because of its cumulative impacts.

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*Protecting and Preserving the Wybong Environment  
and the Community*

- For example, in considering the impacts of particular forestry operations on the wedge tailed eagle, the present and likely future forestry operations would have a significant impact on the eagle notwithstanding the presence of other (natural and unnatural) impacts which may be even more significant. This is because the particular forestry operations formed part of a well established cumulative impact of native forest harvesting on the eagle.
- The term 'protect' in relation to the EPBC Act means not only to maintain threatened species' population levels, but also to restore populations to levels at which they cease to be threatened.
- In that context, a loss of habitat, while small when compared to other causes, can likewise be seen as a significant impact.

***Endangered ecological community: White Box – Yellow Box – Blakely's Red Gum grassy woodlands and derived native grasslands (Box-Gum Grassy Woodlands and Derived Grasslands)***

Box-Gum Grassy Woodlands and Derived Grasslands is listed as critically endangered under the EPBC Act. The Environmental Assessment identifies that this community potentially occurs on the site, represented as Forest Red Gum Riparian Woodland. About 51 ha of Forest Red Gum Riparian Woodland would be cleared as a result of the proposal.

The referral and Environmental Assessment has taken the wrong approach to determining whether Box-Gum Grassy Woodlands and Derived Grasslands occurs on the project site. The approach taken was to compare the vegetation communities on the project site with MU 11 Upper Hunter White Box – Ironbark Grassy Woodland (Peake, 2006), which is stated as being indicative of the endangered ecological community. This approach is wrong. The vegetation communities at the project site must be compared with the description of the Box-Gum Grassy Woodlands and Derived Grasslands provided in the advice to the Minister from the Threatened Species Scientific Committee as well as the DEH policy statement that relates to the ecological community.

The referral and Environmental Assessment also appear to conflict in relation to defining Box-Gum Grassy Woodlands and Derived Grasslands. After comparing the vegetation communities on the project site with MU 11 Upper Hunter White Box – Ironbark Grassy Woodland, the referral concludes that Box-Gum Grassy Woodlands and Derived Grasslands does not occur at the project site. In making this comparison, the referral states that Forest Red Gum Riparian Woodland is more similar to MU 13 Hunter Floodplain Red Gum Woodland Complex (Peake, 2006) than it is to MU 11. However, the Environmental Assessment states that Forest Red Gum Riparian Woodland is similar to MU 13 Hunter Floodplain Red Gum Woodland Complex of the Hunter Remnant

Vegetation Project, which Peake (2006) indicated met the DEH (2006) criteria for listing as 'critically endangered' (Appendix 9a p 4.14). We assume this 'critically endangered' community refers to the Box-Gum Grassy Woodlands and Derived Grasslands, although this is not clear. The implications of this are that Forest Red Gum Riparian Woodland, which is similar to MU 13, may be defined as Box-Gum Grassy Woodlands and Derived Grasslands.

In any case, in order to properly determine whether an endangered ecological community occurs at the project site, vegetation communities at the site must be compared with the advice from the Threatened Species Scientific Committee and the DEH policy statement, rather than with vegetation communities defined by Peake (2006).

It appears that at least 51 ha of Box-Gum Grassy Woodlands and Derived Grasslands may occur at the project site and may be cleared as a result of the project. The confusion and conflicts in the referral and the Environmental Assessment need to be clarified. We believe that clearing of Box-Gum Grassy Woodlands and Derived Grasslands represents a significant impact under the EPBC Act, given the critically endangered status of the community and all other threats to the community.

### *Climate change*

A supplement to the Environmental Assessment (Response A) has calculated that the project would result in greenhouse gas (GHG) emissions of over 12.4 Mt CO<sub>2</sub>-e per year, or over 248 Mt CO<sub>2</sub>-e over the life of the project. The annual average GHG emissions due to the project (12.4 Mt CO<sub>2</sub>-e) represents about 2.2 percent of Australia's total annual GHG emissions in 2004 from all sources.

The impacts of the project in relation to climate change must be considered in terms of cumulative impacts. There will never be a situation where any one project could be said to make a significant contribution to total atmospheric GHG emissions relative to emissions from existing sources. In addition, it is not possible to link the GHG emissions from any one project to any specific impact on specific matters of national environmental significance. However, each project that causes GHG emissions contributes to total atmospheric GHG emissions and therefore contributes to climate change and impacts on the environment, including impacts on matters of national environmental significance. The impacts of the project should be considered in this way. We note that a recent case in the Federal Court considered cumulative impacts in a forestry context, and held that an action under the EPBC Act may have a significant impact because of its cumulative impacts.

In considering the contribution of the project to climate change, it should be recognized that GHG emissions are additive - any new GHG emissions add to the amount of GHGs already in the atmosphere. For example, CO<sub>2</sub> remains in the atmosphere for between 50-200 years. Consequently, the CO<sub>2</sub> emissions due to the project may contribute to climate change for up to 200 years. It is also important to recognize that coal is a finite resource, which means that approval of this project would cause the release of carbon to the

atmosphere that would otherwise be trapped in the ground in perpetuity, and thereby unable to contribute to climate change.

There is a growing body of evidence to indicate that climate change is already having impacts on MNES, and it is predicted to have further and far greater impacts. This includes in relation to the Great Barrier Reef World Heritage Area (Hoegh-Guldberg, 1999), the Wet Tropics World Heritage Area (Hilbert et al, 2001; Williams et al, 2003), and listed threatened species (Brereton et al, 1995; Westoby and Burgman, 2006). There are many more studies that predict significant impacts on a range of aspects of the Australian environment (eg. Hughes, 2003). The impacts of climate change on matters of national environmental significance are recognized in the National Biodiversity and Climate Change Action Plan 2004-2007.

#### ***Adequacy of the State Assessment Process.***

The NSW State assessment process is not sufficient to assess the significant impacts on MNES. For example, there is no consideration in the NSW assessment process of cumulative or indirect impacts, and the potential significant impacts on MNES have been overlooked.

With respect to the *Gray v Minister for Planning* case, the Land and Environment Court, the Court held that “the Director General failed to take into account the principles of ESD when he decided that the environmental assessment of Centennial was adequate” (at par [126], [135]). Therefore, any implication that the level of environmental assessment was of a particular standard may be questionable.

#### ***Social Carbon Costs of the Project (Stern Review)***

#### **Integrating Stern Review Analyses with Anvil Hill Response to Submissions – Part A.**

##### ***1. Introduction***

A major deficiency of both the Anvil Hill *Environmental Analysis* and its *Response to Submissions – Part A* is the failure to include any consideration of the social costs of carbon dioxide emissions associated with the project. The social costs of carbon (SCC) is an important indicator of the global incremental damage done by emitting greenhouse gases today, and in essence is an estimate of the monetary value of world-wide damage done by anthropogenic carbon dioxide emissions. It is usually estimated as the net present value of climate change impacts over the next 100 years (or longer) of one additional tonne of carbon dioxide emitted to the atmosphere today. It arises from such impacts as increased coastal protection requirements from sea level rise, fluctuating agricultural production from rainfall variations, etc.

The social costs of carbon is an evolving area of economic analysis, and is one of the tools extensively utilised in the *Stern Review of the Economics of Climate Change*, which is the most detailed assessment of the economics of climate change undertaken to date. The *Stern Review Discussion Paper*, released in January 2006, indicated that SCC is a

helpful policy tool, and the final *Stern Review* has gone on to use SCC as an important tool to investigate key climate change economic issues, including equity weightings, discount rates and the risk of irreversible changes. These issues are directly linked with the ESD aspects of intergenerational equity and the precautionary principle integrated within NSW statutes, including the *Environmental Planning & Assessment* legislation under which the Anvil Hill assessment is being undertaken.

The government of the United Kingdom has supported both extensive research and application of the social costs of carbon, initially formalised in a paper jointly released by the UK Treasury and the Department of Environment, Food and Rural Affairs (DEFRA) in January 2002. To date, no comparable government activity has occurred in Australia, so the following analysis utilises information from both the *Stern Review* and the most recent review of the UK Government methodology for SCC analysis, outlined in the publication “*The social costs of carbon review - methodological approaches for using SCC estimates in policy assessment*” released by DEFRA in December 2005 (hereafter referred to as DEFRA, 2005 – the document can be accessed and downloaded at <http://socialcostofcarbon.aeat.com>).

The analysis presented below is for indicative purposes to illustrate the extreme gravity of the SCC omission in the Anvil Hill *Environmental Assessment and Response to Submissions – part A*, which indicates that social and economic factors need to be considered in assessing the project proposal. The following analysis offers great insight into social and economic dimensions, and underscores the urgent need for assessment of the Anvil Hill project proposal to be informed by credible and contemporary analytical tools.

More generally, the analysis highlights the pressing need for NSW to institute a comprehensive assessment regime for all projects with significant climate change implications, if the NSW Government’s target of a 60% (from 1990 levels) reduction in NSW greenhouse emissions by 2050 is to have any credibility. The potential losses to civil society and the NSW community, as well as the wider national and global community, from such immense impacts unequivocally indicate that NSW environmental assessments require detailed and transparent analysis, consideration and disclosure of climate change impacts. Continued neglect of this issue by the NSW Government would constitute gross dereliction of fundamental duties of governance.

## **2. Anvil Hill SCC Analysis**

### *2.1 Guidance values*

The following analysis uses SCC data sourced from the *Stern Review* (page xvi; Box 13.3, page 304) together with guidance values presented on pages xi and 76 of DEFRA 2005. All values have been converted to reflect changes from imperial to metric tonnes, and UK pounds to Australian dollars (the conversions are based on 1 imperial ton = 1.016 metric tonnes and 1 UK pound = 2.47 Australian dollars). All values have been standardised to costs per tonne of carbon dioxide emitted, consistent with the units used

in the *Stern Review*. *Stern Review* SCC values beyond 2010 have been adjusted to reflect the rates of increase over time indicated in DEFRA 2005.

**Table 1 : DEFRA 2005 SCC Guidance Values and Stern Review SCC Values  
Expressed in Australian Units**

Year of Emission	Stern Review (Au\$/tonne CO <sub>2</sub> -e emitted)	Central Guidance value (Au\$/tonne CO <sub>2</sub> -e emitted)	Lower Central Guidance value (Au\$/tonne CO <sub>2</sub> -e emitted)	Upper Central Guidance value (Au\$/tonne CO <sub>2</sub> -e emitted)
2000	110	38	24	151
2010	133*	47	29	185
2020	158*	55	35	240
2030	194*	68	43	250
2040	219*	77	49	281
2050	280*	98	62	343

\* Adjusted Stern Review year 2000 price using same rate of SCC increase over time as DEFRA 2005 central guidance value.

The central guidance value represents the middle of the range of damage values per tonne of carbon emitted, with the lower central and upper central guidance values indicating the likely range of values around the centre of the cost distribution (note that these indices are not equivalent to absolute lower and upper distribution limits). The increasing damage costs per tonne of carbon emissions into the future arise because climate change damages are dependent upon the total stock of carbon in the atmosphere and the rate of economic growth, and reflect the increasing marginal costs of emissions over time.

The current UK Government SCC methodology indicates that the central guidance value is a suitable measure to use for project level assessments such as the current Anvil Hill environmental analysis. However, it is important to note that, in its present state of development, the SCC only deals with a partial subset of the full risk matrix of potential impacts arising from global climate change, and has significant gaps regarding non-market damages, the risk of potential extreme weather, socially contingent effects (such as mass migrations, regional conflict, poverty, famine, etc), as well as the potential for irreversible effects and catastrophic events. The refinement of SCC to include a more comprehensive range of impacts could lead to significant upward revisions in the guidance values, including the central guidance value. It is relevant that the DEFRA SCC website states that *"If anything, there are good reasons to look at a higher bound for this range of uncertainty, given the sensitivity of these estimates to uncertainty about the rate of climate change and other scientific uncertainties"* ([www.defra.gov.uk/environment/climatechange/carboncost/index.htm](http://www.defra.gov.uk/environment/climatechange/carboncost/index.htm), accessed on the 26/10/06).

In this respect, it is notable that the *Stern Review* indicates a SCC value in the order of \$Au110/tonne carbon dioxide (year 2000 prices), which lies in the upper end of the range

between the central guidance value and the upper central guidance value used in DEFRA 2005. The *Stern Review* notes that this value is larger than some earlier reported numbers because the review treats risk explicitly and incorporates recent evidence on the risks, but is well within the range of published estimates. The *Stern Review* also indicates that the SCC value increases into the future.

Therefore, given that current SCC methodology does not include full consideration of the climate change risk matrix, a persuasive case can be made that the upper central value could provide a more reliable estimate of the monetised environmental and social damages arising from carbon emissions from Anvil Hill.

## 2.2 SCC analyses of Anvil Hill emissions

The guidance figures outlined in Table 1 have been integrated with emissions estimates derived from the Anvil Hill *Response to Submissions – Part A* to examine two likely emissions scenarios from the Anvil Hill project, based on the expected total saleable coal and the project maximum saleable coal. For each coal production scenario, 2 sets of emissions estimates are presented, based upon differing assumptions regarding the energy content of the Anvil Hill coal. These two scenarios provide a relevant insight into likely SCC impacts of greenhouse emissions associated saleable coal from the Anvil Hill project.

The first estimate is taken directly from the Anvil Hill *Response to Submissions – Part A*, which assumes an energy content of 23.865 gigajoules per tonne of saleable coal. However, this seems to be an unusually low value for the Anvil Hill coal, and would appear to indicate that the Anvil Hill coal would not be washed prior to its sale and combustion. This is a very significant assumption, as unwashed coal has a lower energy content, and hence lower carbon dioxide emissions per tonne, than washed coal (around 13% in this case). The Australian Greenhouse Office *Factors and Methods Workbook* referenced in the Anvil Hill *Response to Submissions – Part A* indicates a suitable value for unwashed black coal in NSW electricity generation is 23.2 gigajoules/tonne, compared with 27.0 gigajoules/tonne for washed coal.

If the assumption of unwashed coal is verified as underpinning the greenhouse emissions estimates in Anvil Hill *Response to Submissions*, it would be a significant and puzzling error, since the main project report indicates that a coal washery is included with the project (see pages 1.3 and 2.15), and a presentation given by Centennial Coal to the Australian Coal Preparation Society in August 2005 clearly states that “all coal is planned to be washed”.

Therefore, for purposes of comparison and possible greater accuracy, a second set of emissions estimates is included in this SCC analysis, based on the AGO default value for washed black NSW coal of 27 gigajoules/tonne.

**Centennial Coal should provide urgent advice whether the greenhouse emissions analysis in the *Response to Submissions – Part A* assumes unwashed coal, in order to clarify which SCC figure from this analysis is applicable to their project.**

Carbon dioxide emissions associated with combustion of the saleable coal have been added to the direct emissions from the Anvil Hill project, including an estimate for spontaneous combustion and oxidation of coal piles, which was inexplicably omitted from the Anvil Hill *Energy & Greenhouse Assessment*, but has subsequently been acknowledged in the *Response to Submissions – Part A*. In the interests of computational simplicity, emissions have been assumed to be equally distributed over each year of the anticipated 20 year mining life-cycle.

It should be noted that there is a significant additional potential source of combustion emissions neglected in the *Response to Submissions – Part A* analysis. This arises from potential use of non-saleable coal (e.g. wastes and rejects) in local generation activities. In this respect, it is notable that Macquarie Generation, which currently has a contract with Centennial for supply of Anvil Hill coal, already uses coal mine rejects, washdown and washery wastes as fuel, and the nearby Redbank power station is specifically designed to burn coal wastes, although the plant has experienced problems with waste fuels and often uses large amounts of non-waste coal. Combustion of non-saleable Anvil Hill rejects and tailings in existing Hunter Valley generating plants would add substantial, but currently ignored, extra greenhouse emissions to those of the saleable coal component currently considered in the Anvil Hill *Response to Submissions – Part A*.

**Centennial Coal also needs to clarify whether any of the non-saleable coal will be used for generating purposes, and if so, include estimates to account for these extra emissions.**

### *2.3 Anvil Hill SCC analysis – expected total saleable coal*

Table 2 presents results of applying the SCC values in Table 1 to emissions from expected total saleable coal production figures, using results from the Anvil Hill *Response to Submissions- Part A*. Table 3 presents comparable results based on an assumption of 27.0 gigajoules/tonne coal, which may provide a more reliable estimate of climate change impacts from the Anvil Hill project.



**Table 2 : SCC results for expected total saleable coal (@ 23.865 gigajoules/tonne from Anvil Hill**

<i>Years</i>	<i>CO<sub>2</sub>-e Emissions over Specified Years (tonnes)</i>	<i>Resultant Social Costs - Central Estimate (Au\$)</i>	<i>Resultant Social Costs - Lower Central Estimate (Au\$)</i>	<i>Resultant Social Costs - Upper Central Estimate (Au\$)</i>	<i>Resultant Social Costs - Stern Review Estimate (Au\$)</i>
2008-09	25,267,722	960,173,431	606,425,325	3,815,426,001	2,779,449,405
2010-19	126,336,093	5,937,796,371	3,663,746,697	23,372,177,210	13,896,970,230
2020-27	101,068,874	5,558,788,092	3,537,410,604	24,256,529,860	11,117,576,180
<i>Totals</i>	252,672,689	12,456,757,894	7,807,582,626	51,444,133,071	27,793,995,815

Table 2 indicates that, using Centennial Coal’s own emissions estimates, the total carbon dioxide emissions associated with the project amount to 252.672 million tonnes of carbon dioxide, which represents 159% of NSW current (2004) greenhouse emissions, and 393% of NSW targeted greenhouse emissions for 2050. The central value estimate of the social costs of carbon emissions associated with the Anvil Hill project exceed 12 billion (\$12,456,757,894) Australian dollars over the life of the project. The upper central estimate, which could be considered to give a more complete idea of the impacts, puts the social costs of these same emissions at over 51 billion (\$51,444,133,071) Australian dollars. The lower central estimate is well over 7 billion Australian dollars (\$7,807,582,626).

The *Stern Review* based estimate of the cost of this Anvil Hill carbon dioxide emissions scenario is close to 28 billion (\$27,793,995,815) Australian dollars.

**Table 3 : SCC results for expected total saleable coal (@ 27.0 gigajoules/tonne from Anvil Hill**

<i>Years</i>	<i>CO<sub>2</sub>-e Emissions over Specified Years (tonnes)</i>	<i>Resultant Social Costs - Central Estimate (Au\$)</i>	<i>Resultant Social Costs - Lower Central Estimate (Au\$)</i>	<i>Resultant Social Costs - Upper Central Estimate (Au\$)</i>	<i>Resultant Social Costs - Stern Review Estimate (Au\$)</i>
2008-09	28,528,858	1,084,096,604	684,692,592	4,307,857,558	3,138,174,380
2010-19	142,644,290	6,704,281,630	4,136,684,410	26,389,193,650	15,690,871,900
2020-27	114,115,432	6,276,348,760	3,994,040,120	27,387,703,680	12,552,697,520
<i>Totals</i>	285,288,580	14,064,726,994	8,815,417,122	58,084,754,888	31,381,743,800

Table 3 indicates that, using a 27 gigajoule/tonne estimate combined with other data from the Anvil Hill *Response to Submissions – Part A*, the total carbon dioxide emissions associated with the project amount to 285.288 million tonnes of carbon dioxide, which represent 180% of NSW current (2004) greenhouse emissions, and 444% of targeted NSW greenhouse emissions for 2050. The central value estimate of the social costs of carbon emissions associated with the Anvil Hill project exceed 14 billion (\$14,064,726,994) Australian dollars over the life of the project. The upper central estimate, which could be considered to give a more complete idea of the impacts, puts the social costs of these same emissions at over 58 billion (\$58,084,754,888) Australian dollars. The lower central estimate is close to 9 billion Australian dollars (\$8,815,417,122).

The *Stern Review* based estimate of the cost of this Anvil Hill carbon dioxide emissions scenario is over 31 billion (\$31,381,743,800) Australian dollars.

#### 2.4 SCC analysis – maximum saleable coal

Table 4 presents results of applying the SCC values in Table 1 to emissions from expected maximum total saleable coal production figures, using results from the Anvil Hill *Response to Submissions- Part A*. Table 5 presents comparable results based on an assumption of 27.0 gigajoules/tonne coal, which may provide a more reliable estimate of climate change impacts from the Anvil Hill project.

**Table 4 : SCC results for maximum total saleable coal (@ 23.865 gigajoules/tonne from Anvil Hill**

<i>Years</i>	<i>CO<sub>2</sub>-e Emissions over Specified Years (tonnes)</i>	<i>Resultant Social Costs - Central estimate (Au\$)</i>	<i>Resultant Social Costs - Lower Central Estimate (Au\$)</i>	<i>Resultant Social Costs - Upper Central Estimate (Au\$)</i>	<i>Resultant Social Costs - Stern Review Estimate (Au\$)</i>
2008-09	28,310,610	1,075,803,180	679,454,640	4,274,902,110	3,114,,167,100
2010-19	141,553,050	6,652,993,350	4,105,038,450	26,187,314,250	18,826,555,650
2020-27	113,242,440	6,228,334,200	3,963,485,400	27,178,185,600	17,892,305,520
<i>Totals</i>	283,106,100	13,957,130,730	8,068,523,850	57,640,401,960	39,833,028,270

Table 4 indicates that, using Centennial Coal’s own emissions estimates, the maximum total carbon dioxide emissions associated with the project amount to 283.106 million tonnes of carbon dioxide, which represent 178% of NSW current (2004) greenhouse emissions, and 441% of targeted NSW greenhouse emissions for 2050. The central value estimate of the social costs of carbon dioxide emissions associated with the Anvil Hill project are nearly 14 billion (\$13,957,130,730) Australian dollars over the life of the

project. The upper central estimate, which could be considered to give a more complete idea of the impacts, puts the social costs of these same emissions at well over 57 billion (\$57,640,401,960) Australian dollars. The lower central estimate is over 8 billion Australian dollars (\$8,068,523,850).

The *Stern Review* based estimate of the cost of this Anvil Hill carbon dioxide emissions scenario is nearly 40 billion (\$39,833,028,270) Australian dollars.

**Table 5 : SCC results for maximum total saleable coal (@ 27.0 gigajoules/tonne from Anvil Hill**

<i>Years</i>	<i>CO<sub>2</sub>-e Emissions over Specified Years (tonnes)</i>	<i>Resultant Social Costs - Central estimate (Au\$)</i>	<i>Resultant Social Costs - Lower Central Estimate (Au\$)</i>	<i>Resultant Social Costs - Upper Central Estimate (Au\$)</i>	<i>Resultant Social Costs - Stern Review Estimate (Au\$)</i>
2008-09	31,965,108	1,214,674,089	767,162,258	4,826,731,217	3,516,161,836
2010-19	159,825,538	7,511,800,286	4,634,940,602	29,567,724,530	21,256,796,550
2020-27	127,860,430	7,032,323,672	4,475,115,064	30,686,503,300	20,201,948,000
<i>Totals</i>	319,651,076	15,758,798,047	9,877,217,924	65,080,959,047	44,974,906,386

Table 5 indicates that, using the 27 gigajoule/tonne estimate combined with other data from the *Anvil Hill Response to Submissions – Part A*, the maximum total carbon dioxide emissions associated with the project amount to 319.651 million tonnes of carbon dioxide, which represent 201% of NSW’s current (2004) greenhouse emissions, and 497% of targeted NSW greenhouse emissions for 2050. The central value estimate of the social costs of carbon emissions associated with the Anvil Hill project are close to 16 billion (\$15,758,798,047) Australian dollars over the life of the project. The upper central estimate, which could be considered to give a more complete idea of the impacts, puts the social costs of these same emissions at over 65 billion (\$65,080,959,047) Australian dollars. The lower central estimate is close to 10 billion Australian dollars (\$9,877,217,924).

The *Stern Review* based estimate of the cost of this Anvil Hill carbon dioxide emissions scenario is nearly 45 billion (\$44,974,906,386) Australian dollars.

### **3. Conclusion**

Clearly, based on Centennial Coal’s own estimates, the greenhouse emissions and accompanying social costs arising from the Anvil Hill project are significant, non-trivial amounts. The lowest emissions estimate represents 159% of current NSW annual greenhouse emissions, which increases to 178% when maximum production levels are considered. If the

Anvil Hill coal is washed prior to its use, which seems highly probable, the corresponding levels of emissions increase to 178% and 201% of current NSW emissions .

These figures highlight the facile and misleading nature of the *Response to Submissions - Part A*, which portrays these emissions as only a tiny percentage of global emissions. This is a specious and misleading red-herring, because any single project considered on its own will always represent a vanishingly small fraction of global emissions. If every project assessment were informed by this type of simplistic approach, nothing could ever be refused. Application of this type of thinking is a sure-fire way to ensure climate chaos through the “death by 1,000 cuts” syndrome. As clearly articulated in the *Stern Review*, global climate change is a cumulative global problem which requires concerted global action, not the institutionalised “*its not my problem*” type of approach embodied in the Anvil Hill *Response to Submissions*. The *Stern Review* also stresses that actions must commence immediately, and require substantial progress over the next 10-15 years, in order to avert serious impacts.

The global dimensions of climate change mean that environmental assessment and decision-making need to be informed by what a project proposal’s total emissions will be, and how these compare to both current local levels of emissions and the large scale reductions required to effectively address this global problem, as clearly identified in the *Stern Review*. When entities seek to shirk their fair share of responsibility, as exemplified in the Anvil Hill *Response to Submissions*, this obviously increases the reduction tasks required of others, and is a classic example of the “free rider” effect in economics. It is the antithesis of the polluter pays principle enshrined in NSW legislation, and of great relevance to ESD considerations.

It is therefore instructive to examine the Anvil Hill project emissions in terms of the current stated emissions reduction target for NSW (60% on 1990 levels), which approaches the scale of emissions reductions required of developed countries identified in the *Stern Review*. This perspective reveals that, using Centennial Coal’s own emissions figures, the expected total project emissions represent 393% of targeted NSW annual greenhouse emissions in 2050, and rise to 441% when total maximum production levels are considered. If the Anvil Hill coal is washed prior to use, which seems highly probable, the corresponding levels of emissions increase to 444% and 497% of targeted NSW emissions in 2050.

The social cost of carbon estimates associated with the Anvil Hill project emissions based on Centennial Coal’s own data commence at \$Au12.456 billion using central guidance values, and range up to \$Au57.640 billion for upper central estimates with maximum saleable coal. Corresponding *Stern Review* based SCC figures are \$Au27.793 billion for expected saleable coal, and nearly \$Au40 billion for maximum total saleable coal.

If a higher energy content for the Anvil Hill coal is applicable (based on combustion of washed coal product), the projected total emissions represent 180% of current NSW total annual greenhouse emissions, with attendant social costs of carbon rising to over \$Au14 billion using central guidance values, and ranging up to \$Au65.081 billion for upper

central estimates associated with maximum saleable coal. Corresponding *Stern Review* based SCC figures are \$Au31.382 billion for expected saleable coal, and \$Au44.975 billion for maximum total saleable coal.

While a comparison with the claimed economic benefits of the Anvil Hill economic assessment is not straightforward because of differing assumptions and data inputs, it is still instructive to undertake a first order comparison with this caveat borne in mind.

The relative size of the social costs of Anvil Hill carbon can be compared with the purported economic benefits outlined on page ES2 of the Economic Assessment, which indicate benefits of \$42-\$59 million (construction phase) and \$441-\$525 million annually (operational phase), giving a total range of \$9.3-\$11.10 billion (\$9,303,000,000-\$11,084,000,000) dollars over the projected 21 year life of the full project. In comparison, both the lowest central value estimate of SCC for the expected total saleable coal (\$12.456 billion) and the maximum saleable coal (\$13.957 billion) exceed the maximum total claimed benefits for the Anvil Hill project, and these margins substantially increase when a value of 27 gigajoules/tonne is applied to the Anvil Hill coal. All the upper central SCC estimates overwhelmingly exceed the purported total economic benefits of the Anvil Hill mine, commencing at \$51.444 billion (expected total saleable) and ranging up to \$65.081 billion for maximum saleable coal with a 27.0 gigajoules/tonne energy content.

The estimates based on the *Stern Review* data are also substantially higher than the claimed economic benefits, commencing at around \$Au27.793 billion using Centennial Coal's own figures for expected saleable coal and range up to \$44.975 billion for maximum saleable coal with 27 gigajoules/tonne energy content.

This first order analysis indicates that the social costs of carbon emissions are comparable to, and quite possibly significantly larger than, the projected economic benefits of the Anvil Hill project. This result highlights the urgent need for both a detailed climate change analysis of the Anvil Hill project, as well as for NSW environmental assessments to be informed by a comprehensive, robust and transparent methodology for analysing environmental impacts which can effectively characterize significant environmental externalities which NSW and global society can no longer afford to ignore, as disclosed in the *Stern Review*.

The *Stern Review* makes it clear that the costs of inaction over climate change are enormous, and that decisive and urgent action is required now, which will require significant advances in how economics is used to inform public, private and corporate decision-making processes. The current SCC analysis of the Anvil Hill *Response to Submissions* is a simple yet powerful example utilising one of the tools applied in the *Stern Review*, and underscores the pressing need for the NSW Government to bring its environmental assessment practices into the 21<sup>st</sup> century to meet the challenges of a society tackling global climate change.

The *Stern Review* has indicated that, if not addressed, climate change impacts will cost the globe over \$Au9 trillion dollars, greater than effects of the Great Depression and both

January 30, 2007

Page 14

World Wars. It is notable that the *Stern Review* damages estimate does not include the financial cost of the direct impact on human health and the environment from global warming, or the disproportionate costs on poor regions of the world. It also does not include "feedback mechanisms", which may mean that as the concentration of greenhouse gases increases there is a disproportionate rise in warming with each new increment in emissions. The full costs could therefore be much larger. The *Stern Review* emphasises that it is much more effective and much cheaper to tackle climate change now than ignore it till later.

Unless the Australian Government acts decisively to institute significant changes to its environmental assessment processes, the Anvil Hill project could be contributing up to \$Au45 billion dollars toward this impending \$Au9 trillion dollar global disaster, and render any Australian Government mitigation actions on global warming utterly meaningless.

Sincerely



Christine Phelps  
President

For and on behalf of the members,  
Anvil Hill Project Watch Association Inc.