

GSS ENVIRONMENTAL Environmental, Land and Project Management Consultants Rocglen Coal Mine Extension Project Visual Assessment Profile Alignments







 LINE OF SIGHT (LoS) from Site 4 - Surrey

Metres





Rocglen Coal Mine Extension Project Visual Assessment Photographic Viewpoints



Land and F



Purposes only. Finished landform surfaces, which are currently shown in beige / tan for identification purposes, will be rehabilitated and revegetated with pasture and bushland. 2.

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Rocglen Coal Mine Extension Project Visual Assessment Viewpoints (Pre and Post Project) **FIGURE 36**

7.10.2 Potential Impact

The impact of the Rocglen Extension Project on the visual amenity of the local area is considered to be low and acceptable. While the existing topography and remnant vegetation generally contained within road reserves around the Project Site offer natural screening, distant views of the expanded Northern Emplacement Area will be seen from surrounding residences. There is no additional coal handling or significant infrastructure improvements proposed.

The following sub-sections provide an overview of the anticipated visual implications of the Project upon the three closest privately owned residences.

"Roseberry"

While "Roseberry" is a privately owned residence, it is subject to a negotiated agreement between the landholder and Whitehaven. The residence is situated at approximately 270 metres AHD, which is slightly lower than the elevation range of the natural surface levels of the Project Site, and at approximately 1,900 meters from the Western Emplacement Area, 2,000 metres from the coal handling and processing area, and 2,400 metres from the expanded limit of open cut mining.

The current view looking north towards Rocglen from "Roseberry" is obscured by existing tree corridors along roadways, with the Western Emplacement Area partially visible between the existing trees.

The post-mining view of the mine is anticipated to remain essentially the same with the inclusion of obscured views of the expanded Northern Emplacement Area between the existing trees.

"Penryn"

The privately owned "Penryn" residence is located at approximately 315 metres AHD, which is higher than the Project Site. It is located at approximately 4,000 metres from the proposed expanded Northern Emplacement Area, 6,800 metres from the coal handling and processing area, and 4,700 metres from the expanded limit of open cut mining.

The current view looking south from "Penryn" towards Rocglen is dominated by the Vickery State Forest and a line of trees extending from the Vickery State Forest to the east. The Rocglen mine is almost entirely obscured by trees, with only a small portion of the Western Emplacement Area visible above the tree line.

The post-mining view of the mine is anticipated to be dominated by the line of trees extending from the west within the Vickery State Forest with distant views of the expanded Northern Emplacement Area extending slightly above the trees. All other features within the site including the Western Emplacement Area and coal handling and processing area will be obscured by trees, as is currently the case.

"Surrey"

The privately owned "Surrey" residence is situated at approximately 280 metres AHD, which is within the elevation range of the natural surface levels of the Project Site. It is located at approximately 3,400 metres from the Western Emplacement Area, 3,200 metres from the coal handling and processing area, and 3,500 metres from the expanded limit of open cut mining.

The current view looking north-west towards Rocglen is obscured by trees contained within a road reserve. The vegetated areas of the Victory State Forest dominate the background left portion of the view with only small sections of the Western Emplacement Area visible through the trees.

The post-mining view of the mine is anticipated to include distant views of the expanded Northern Emplacement Area extending slightly above the tree line. The remaining features within the site, including the Western Emplacement Area, will be obscured by trees, as is currently the case.

7.10.3 Management

Early re-shaping and revegetation of the external batter slopes of the emplacement area will be undertaken in Years 1 and 2 of the expanded operation to, amongst other things, minimise visual impacts. While the expanded Northern Emplacement will extend above the tree line, the post-mining landform is expected to be consistent with the ridgeline contained within the Victory State Forest and, as such, when fully revegetated, it will not present a significant impact on the visual amenity of the area.

Whitehaven employs various complementary management strategies and mitigation measures to minimise both short-term and long-term visual impacts and these will continue to be implemented for the Rocglen Extension Project. Such initiatives include:

- Whitehaven will continue to adopt a progressive approach to the rehabilitation of disturbed areas within the Project Site to ensure that, where practicable, completed mining and overburden emplacement areas are quickly shaped, topdressed and vegetated. The progressive formation of the post-mining landform and the establishment of a vegetative cover will reduce the amount of disturbed land at any one time and also reduce the visibility of mine-related activities from surrounding properties and roads. Early reshaping and revegetation of the external batter slopes of the emplacement areas is particularly important and has been targeted as a priority. Refer to **Section 5.7.**
- The post-mining landform of the expanded Northern Emplacement Area has been aimed at creating a natural looking knoll that is linked to the adjacent ridge within the Vickery State Forest by a gently sloping saddle. The final design height of this emplacement area has also been planned to be consistent with the height of the adjacent ridge at 340 metres AHD.
- In addition to retaining areas of existing remnant vegetation, it is proposed to restore approximately 206 hectares (58 percent) of the disturbed area within the Project Site as rehabilitated bushland. This large area, which includes the western slopes of the Northern and Western Emplacement Areas, will blend in well with the retained remnant vegetation areas within the Project Site and within the adjacent Vickery State Forest and "Yarrawonga" property.
- Strategically placed bushland tree lots have been integrated into the post-mining landform to break-up the landform and provide visual texture. This will be complimented by the establishment of pasture grass areas that will provide short-term visual impact mitigation prior to the trees becoming established.
- An earthen bund of appropriate height will be established between the realigned Wean Road and the active pit area. This bund will be vegetated immediately following construction. The bund will provide an effective visual screen of the site from Wean Road. In addition to the bund, a strip of bushland will be established to screen the view of the final void and generally improve the visual amenity from Wean Road (see **Figure 21**).
- The requirements of the Australian Standard AS 4282 1997 Control of Obtrusive Effects of Outdoor Lighting will be taken into consideration when placing and directing lights required when working outside of daylight hours. In particular, lighting plant will be positioned and directed away from surrounding residences and aimed downwards to avoid light spill onto adjoining lands and public roads.

7.11 Greenhouse Gas Emissions

An assessment of greenhouse gas emissions associated with the Rocglen Extension Project has been undertaken by PAEHolmes within the *Air Quality Assessment* (2011). The full assessment report is contained within **Appendix P**, with significant findings and recommendations summarised below.

7.11.1 Emission Calculation

Emissions of carbon dioxide (CO_2) and methane (CH_4) will be the most significant greenhouse gases for the Rocglen Extension Project. These gases are formed and released during the combustion of fuels used on-site and from fugitive emissions occurring during the mining process due to the fracturing of coal seams.

Different gases have different greenhouse warming effects (global warming potentials) and emission factors take into account the global warming potentials of the gases created during combustion. The estimated emissions are referred to in terms of CO_2 -equivalent (CO_2 -e) emissions by applying the relevant global warming potential.

The greenhouse gas assessment has been conducted using the *National Greenhouse Accounts (NGA) Factors* published by the Department of Climate Change (as cited in PAEHolmes 2011). This system defines three emission categories:

- **Scope 1** emissions cover direct emissions from sources within the project boundary such as fuel combustion and fugitive methane;
- **Scope 2** emissions cover indirect emissions from the consumption of purchased electricity, steam or heat produced by another organisation; and
- **Scope 3** emissions includes all other indirect emissions that are a consequence of the organisations activities but are not from sources owned or controlled by the organisations, for example, production of diesel fuel, off-site transport of the product.

Project-related greenhouse gas sources included in the assessment are as follows:

- Fuel consumption (diesel) during mining operations Scope 1;
- Release of fugitive methane during mining Scope 1;
- Indirect emissions associated with the production and transport of fuels Scope 3;
- Emissions from coal transportation Scope 3; and
- Emissions from the burning of the product coal Scope 3.

Table 54 provides a summary of the total greenhouse gas emissions associated with the Rocglen Extension Project.

Emission Source	Average Tonnes CO ₂ -e/annum			
Emission Source	Scope 1	Scope 3	Total	
Diesel	17,810	1,358	19,168	
Explosives	480		480	
Fugitive Methane	67,500		67,500	
Coal Transportation		13,067	13,067	
Coal Burning		2,506,991	2,506,991	
Total – Annual	85,789	2,521,415	2,607,205	
Total – Life of Mine	875,703	25,215,512	26,091,215	

Fable 54 –	Summary	of	Greenhouse	Gas	Emissions

PAEHolmes (2011) undertook a comparison with the baseline 1990 Australian emissions, which are reported under the Kyoto Protocol as 547.7 Mt CO_2 -e (DCC 2008, as cited in PAEHolmes 2011). The baseline is used to assign the Australian target under the Kyoto Protocol, which is 108% of the 1990 level. Comparing the average annual Scope 1 emissions from Rocglen, against the 1990 baseline, results in a 0.02% increase from 1990 levels.

The annual greenhouse emissions for NSW in 2007 were 151.6 Mt (DCC 2009, as cited in PAEHolmes 2011). Average annual Scope 1 emissions from Rocglen represent an approximate increase of 0.06%.

PAEHolmes (2011) concludes that there are not likely to be any measurable environmental effects due to the emissions of greenhouse gases from the Rocglen Extension Project.

7.11.2 Management

A *Greenhouse and Energy Efficiency Plan* was prepared by Denis Cooke & Associates in June 2009 in accordance with PA 06_0198. This Plan is designed to promote continuous change and sustainable improvement in energy management and efficiency. It contains energy management and greenhouse principles, estimated energy baseline data and energy savings opportunities.

The *Greenhouse and Energy Efficiency Plan* (Denis Cooke & Associates 2009) will continue to be implemented at Rocglen. The energy savings measures listed in the report provide a "snapshot" of the activities that have and/or currently being investigated. As with all cost reduction activities, this process is continuous and is now embedded within Whitehaven's operating principles and procedures. New opportunities will be identified as technology changes and as older measures are revisited under circumstances where cost-benefit ratios change.

7.12 Traffic and Transport

All coal mined at Rocglen will continue to be transported approximately 30 km by road to the Whitehaven CHPP, as currently approved under PA 06_0198, for selective washing, stockpiling and dispatch by rail to the Port of Newcastle or by road to domestic customers.

In summary, crushed and screened coal will continue to be transported via a purpose built section of road between Rocglen and Hoad Lane, and from Hoad Lane via an established coal haulage route to the CHPP (see **Figure 2**).

The section of the road approved and constructed under PA 06_0198 traverses the "Brentry" property, along the southern edge of Vickery State Forest with a further section of private road constructed across the "Stratford" property to link with Shannon Harbour Road. The transport route then incorporates a length of upgraded Shannon Harbour Road before intersecting with Hoad Lane. The transport route then joins a previously established coal haulage route along Hoad Lane, Blue Vale Road and the Kamilaroi Highway before entering the Whitehaven CHPP. The haul route between Rocglen and the Whitehaven CHPP is fully sealed and well maintained under a contribution plan with Council.

Once reaching the Whitehaven CHPP, the coal is stockpiled for washing or placed directly on the bypass stockpile and then either loaded into trains at the Whitehaven Rail Loading Facility for dispatch to the Port of Newcastle or loaded into trucks for road dispatch to domestic customers. These activities are covered by a separate development consent granted by Council, under the Minister's delegation, in October 2002.

A proportion of the coarse and fine reject material from the Whitehaven CHPP is approved under PA 06_0198 to be backloaded to Rocglen for placement in the mined-out areas of the open cut. This is proposed to continue under the Rocglen Extension Project.

The bulk of the truck fleet consists of 40 tonne capacity B-double trucks and the occasional semi-trailer. An average of 120 loads (4,800 tonnes) of coal is dispatched daily at the maximum production rate of 1.5 Mtpa. This equates to between 17 and 24 movements per hour over a typical operational day, with dispatch of coal permitted under PA 06_0198 between 7.00 am and 9.15 pm Monday to Friday and between 7.00 am and 5.15 pm on Saturdays.

Table 55 presents the average daily vehicle traffic generated by the Rocglen operation approved under PA 06_0198.

Tropoport Activity		Average Daily Vehicle Movements ^{1,2}	
Transport Activity	venicie rype	Heavy Vehicles	Light Vehicles
Coal to CHPP / Reject backloading	B-double, with occasional semi-trailer	240	-
Equipment Supplies	Semi-trailer / rigid truck	8	-
Workforce	Various light	-	42 (48 ³)
Miscellaneous	Various light	-	8
	TOTAL	248	50 (56 ³)

Table 55 – Operational Traffic Movements

1 - assumes 312 days per year of operation.

2 - one round trip equals 2 movements.

3 - bracketed numbers correspond to periods of concurrent open cut and auger mining activities.

Given that the Rocglen Extension Project does not involve any change to the coal production rate, transport fleet or hours of coal haulage, the figures presented in **Table 55** will remain the same. On this basis, and on the basis of the fact the haulage route used between Rocglen and the Whitehaven CHPP will remain as approved under PA 06_0198, the Rocglen Extension Project does not pose any additional annual impacts upon the local road network or traffic volumes, nor does it pose any additional conflict with non-mine related traffic using the haul route.

The Project will result in an extension to the life of the Rocglen operation, which will necessitate ongoing coal transport for a number of years beyond what was originally approved under PA 06_0198. The use of the road network for this extended period will be covered under the arrangements of the existing road maintenance agreement with Gunnedah Shire Council to ensure the subject roads continue to be adequately maintained.

In February 2010, the RTA provided the following written advice (see **Appendix E**) in response to initial consultation regarding the Rocglen Extension Project:

At present road works are about to commence for the Kamilaroi Highway and its junctions with Blue Vale Road and the Coal Loader Road to cater for the impact of the existing approved mines that use this route, as required by the previous conditions of consent.

As it appears that there will be no increase in traffic generation the previous conditions would be adequate for the proposed extension to the mine.

At this time the RTA does not envisage that any further road works will be required on the Kamilaroi Highway for the proposed development.

7.12.1 Management

While the Project does not pose any additional impacts upon the local road network or traffic volumes, it is still necessary to take reasonable and practicable measures to prevent or minimise the potential for conflict. Rocglen already employs a range of complementary traffic management strategies and mitigation measures, and these will continue to be implemented in order to effectively cater for the Rocglen Extension Project. The following safeguards will continue to be employed at Rocglen:

- All transport activities, including the haul route use between Rocglen and the Whitehaven CHPP and the hours of coal haulage, will continue to be undertaken strictly in accordance with that approved under PA 06_0198.
- On school days, Whitehaven will continue to maintain the communication system between the truck drivers and the local school bus driver. The system has been negotiated between Whitehaven and the local bus drivers and involves two-way radio communication to ensure that trucks do not exceed 40 km per hour when travelling in the vicinity of the school bus. The regular communication of a morning and afternoon for the short period when the school buses are operational provides for a high level of safety and minimal disruption to coal transportation.
- Continuing to ensure that all trucks transporting coal from the mine and backloading reject from the Whitehaven CHPP are covered with fitted roll-over tarpaulins.
- Ensuring all trucks transporting coal are well maintained and operating optimally to minimise the potential for breakdowns and emissions (noise and/or air emissions).
- Drivers are required to operate in accordance with a Transport Policy and Code of Conduct, which identify aspects such as travelling speeds, general behaviour, avoidance of exhaust brakes, load coverage, complaints and disciplinary procedures. The Policy and Code apply to all employee and contractor-owned vehicles.
- Maintain routine consultation with residents along the haul route to ensure their satisfaction with all aspects of coal and mine-related transport.

7.13 Waste Management

The Rocglen Extension Project will not generate any new waste materials or additional waste volumes on an annual basis. Additional waste volume will be generated on a life of mine basis given the extended operational mine life, however this volume of waste will continue to be managed in accordance with current approved waste management strategies.

The management of production wastes, comprising overburden from the development of the open cut and coarse and fine reject material from processing of the coal at the Whitehaven CHPP, is outlined in **Section 4.12.1**. The management of non-production wastes generated by Rocglen operations, including general wastes, routine maintenance consumables, waste oils and grease, sewage and hydrocarbon-contaminated water, is outlined in **Section 4.12.2**.

The underpinning waste management strategy will continue to be minimisation and segregation at source. Waste materials produced by the Project will be managed in accordance with the following principles:

- Waste avoidance;
- Waste re-use;
- Waste recycling; and
- Waste removal and disposal.

7.14 Bushfire Hazard

While much of the Project Site comprises land that has been cleared for past agricultural production and/or existing mining activities, remnant areas of mature or regenerating trees do exist. Furthermore, the site is located within a rural environment adjacent to the Vickery State Forest.

To assess the bushfire hazard of the Project Site, R.W. Corkey & Co. (2007) undertook a Type A assessment for bushfire prone areas (NSW RFS 2001) for the original Rocglen development. Despite much of the site comprising cleared agricultural land, the vegetation was categorised as open woodland and the terrain was categorised as predominantly level (0 to 5 degrees) rising to hilly (5 to 10 degrees). Following the assessment guide of NSW RFS (2001), RWC (2007) determined the Project Site as displaying a low-medium hazard rating.

The adjacent Vickery State Forest contains significant areas of dense woodland/forest vegetation over hilly terrain. This would increase the risk of bushfire within the Project Site.

The Rocglen Extension Project does not pose any significant additional or altered activities within the Project Site, and therefore the bushfire hazard is expected to remain unchanged to that assessed by R.W. Corkey & Co. in 2007.

7.14.1 Management

The activities of the Project that may increase the risk of fire and the current controls in place at Rocglen are summarised in **Table 56.**

Activity	Possible Ignition Source	Safeguards
Blasting	Coal dust and ejected shot	 Vegetation cleared away from blast (>20 metres). All coal removed from open cut around blast. Blast design undertaken by qualified personnel. Inspection of blast conducted prior to blast. Blasting Management Plan. Water truck available to douse any smouldering vegetation etc.
Refuelling	Spilt fuel ignited by spark	 Refuelling undertaken within designated fuel bays or within cleared area of the Project Site. Vehicles turned off during refuelling. No smoking policy enforced in designated areas of the Project Site. Fire extinguishers maintained within site vehicles.
Product Stockpiling	Spontaneous combustion	 The coal has a low propensity for spontaneous combustion. Stockpiles are regularly inspected and watered. Stockpile height and volume controlled to limit the duration coal retained in stockpiles.
General Activities	Cigarettes and rubbish such as glass and metal	 No smoking policy enforced in designated areas of the Project Site. Focus on housekeeping maintained by mine management. Water cart available to assist in extinguishing any fire ignited. Site vehicles carry a fire extinguisher.

 Table 56 – Bushfire Hazard – Activities and Controls

Source: RWC (2007)

The safeguards listed in **Table 56** will continue to be implemented by Whitehaven for the duration of the Project. Whitehaven will also regularly liaise with the NSW Forests and NSW Rural Fire Service in relation to the bushfire hazard presented by the Vickery State Forest and to a lesser extent the nearby CCC Zone 2 Kelvin.

7.15 Socio-Economic Considerations

To assess the socio-economic implications of the original Rocglen Coal Mine development, RWC (2007) built on the results of a previous socio-economic study completed by Key Insights and Castlecrest Consulting for a similar scale coal mine development known as East Boggabri Coal Mine in 2005. The key findings and conclusions of RWC (2007) assessment have been used in consideration of the Rocglen Extension Project.

Rocglen is located within a regional and rural setting in central northern NSW which, like many other regional areas, has been in relative decline in socio-economic terms over the past 20 years. Demographic trends over this time in Australia have demonstrated acceleration in the "move to the coast" phenomenon, or to large community centres, placing considerable stress and change on areas in decline. Regional areas are often sensitive to employment loss where the economic support for villages and towns can be relatively single dimensional by being dominated by one to two industries or even employers (RWC 2007).

In recent times, the re-introduction of a viable coal mining industry in the Gunnedah LGA has provided welcome diversification of industry, employment generation and skills provision. Whitehaven has become the leading coal producer in the Gunnedah Basin, directly employing over 250 people and generating significant indirect employment and flow-on benefits. Since Whitehaven entered the area in 1999, Gunnedah has grown and evolved with additional employment opportunities and diversity, increased housing capacity and commercial development.

While the Rocglen Extension Project does not involve any increase to the coal production rate or employment, it is anticipated that the Project will enable open cut mining for approximately 11 years following the issue of Project Approval and the subsequent issue of a new or amended mining lease. This represents an increase to the projected life of the mine, for coal extraction, of up to four years, which, in turn, will secure on-going employment opportunities and socio-economic flow-on benefits over this time.

Social

In addition to the direct and indirect employment opportunities, RWC (2007) identified the following additional positive potential social impacts:

- Reduction of social stress through employment in the mining and related industry. The Rocglen Extension Project will enable the current 35 full-time operators, 14 full-time fitters and 5 full-time staff members to be maintained for up to an additional 4 years. Furthermore, there is flow on employment for truck drivers (coal haulage contract) and additional indirect employment through service and supply from local businesses.
- Training opportunities for local people, including young people and indigenous people, in a growth industry (mining);
- Stimulus to local businesses, particularly in Gunnedah, including motel and hotel trade, cafes and restaurants, mining-related servicing and engineering business, and general surplus spending activity such as gyms, cinema, recreational goods and services, beauty salons, and hair dressers;
- Maintenance of, or increase to, the population to participate in locals clubs, sporting groups, cultural activities, and organisations, therefore contributing to stronger social networks and social capital; and

• More volunteers for community service organisations.

In terms of potentially adverse social impacts, GSSE does not believe that the Rocglen Extension Project poses any notable implications over and above those assessed and approved under PA 06_0198. Potential social issues primarily relate to environmental emissions (air quality, noise, blasting), traffic generation and the temporary cessation of agricultural activities within the Project Site. Each of these issues has been appropriately addressed within the EA, with no significant or limiting factors identified.

Economic

The output of the Rocglen Coal Mine, in terms of direct and indirect employment and flow-on benefits, is anticipated to make a significant contribution to the local and regional economy.

Table 57 presents the annual economic contribution made by Whitehaven in the form of wages, other payments and taxes/royalties for the Rocglen Coal Mine at full operation and production.

Local and Regional Contributions			
Wages	\$9,430,000		
Payments to coal haulage contracting company	\$4,420,000		
Expenditure on other local goods and services	\$6,670,000		
Sub-Total	\$20,520,000		
NSW, Australia and Global Contributions			
Income tax (estimated)	\$1,900,000		
Royalty paid on the coal	\$5,340,000		
Payroll tax to the NSW Government	\$450,000		
Payments to rail-related contracting companies	\$11,880,000		
Payments to other contracting companies and expenditure of other good and services	\$26,270,000		
Sub-Total	\$45,840,000		
Total	\$66,360,000		

Table 57 – Annual Economic Contribution of Rocglen Coal Mine

Source: Whitehaven

Rocglen also indirectly generates employment opportunities through requirement for ancillary services to the mine and general stimulus to the local economy. The average income derived from indirect employment is thought to be less than that of the direct employees of the mine, however anticipated to be, on average, the median household income for the Gunnedah LGA (2006 Census - \$714 per week).

Whitehaven contributed \$153,644 to Council for road maintenance works associated with the coal haulage route over the 2009-2010 period, and also expended \$1.4 million on the Wean Road upgrade completed in 2010.

Whitehaven also provides regular contributions to projects deemed of community value. As an example, Whitehaven has provided for on-going training and employment opportunities for the local Aboriginal community through the establishment of a tree planting initiative. Whitehaven donated land and provided for start-up services such as power and water (to the estimated value of \$30,000) for a joint TAFE / Red Chief LALC project to initiate a native tree nursery and tree-planting service. Community-based and charitable contributions such as these would be continued as part of Whitehaven's on-going commitment to ensuring the economic benefits of the Rocglen Coal Mine are not restricted to the company, employees and various levels of government.

7.15.1 Management

Whitehaven is committed to on-going community consultation and will continue to engage the community in consultation for the purposes of providing information relating to the Project and company operations in general. This will also enable the community to provide feedback to Whitehaven and raise any issues or concerns. It is anticipated that consultation will include the following:

- Circulation of information and newsletters, as required, relating to mining activities (for example, blasting schedule); and
- Continuation of the Rocglen CCC established under PA 06_0198 for the existing Rocglen operation. This CCC comprises representatives from local government and the community, and meets on a quarterly basis.

Further, Whitehaven undertakes to respond to any community complaints within 24 hours of receipt. All complaints will be investigated and the results of the investigation reported to the complainant in a timely manner.