

9.0 JUSTIFICATION AND CONCLUSION

9.1 Environmental Impacts

As detailed in **Section 7.0**, the potential environmental impacts of the Rocglen Extension Project have been identified and assessed. The key issues identified were the subject of comprehensive specialist assessments, which are appended to this EA.

While the information presented within **Section 7.0** and appended to this EA should be read in its entirety, **Table 58** provides a very broad overview of the key outcomes of the environmental assessment.

Table 58 – Broad Overview of Environmental Assessment Issues

Environmental Issue	Overview of Key Findings (following intended management and mitigation)
Air Quality	<ul style="list-style-type: none"> • Modelled predictions indicate acceptable air quality impact at all privately-owned residences throughout the life of the mine. • The 24-hour average PM₁₀ criterion is predicted to be exceeded at “Yarrowonga” during Year 1 by 10 µg/m³, putting the property within the DoP’s acquisition criterion. However “Yarrowonga” is owned by Whitehaven and, as such, the acquisition criterion becomes irrelevant. • Using the 70th percentile approach leads to predicted exceedances of the cumulative 24-hour average PM₁₀ criteria at “Yarrowonga”, “Yarrari”, “Belah” and “Roseberry”. The only one of these residences not currently owned by Whitehaven is “Roseberry” where the exceedance is only predicted for operations in Year 10. Further analysis for “Roseberry” was undertaken to determine how many times this exceedance may occur, with the conclusion being that the mine is predicted to comply with the DoP’s acquisition criterion at “Roseberry”.
Noise	<ul style="list-style-type: none"> • Exceedance of the criterion have been predicted at “Costa Vale”, however this property is now owned by Whitehaven and, as such, is considered project-related. • The most impacted receiver (apart from “Costa Vale”) is “Retreat” to the north of the site. Maximum noise levels estimated from individual sources at “Retreat” are more than 10 dB below the 45 dB(A) sleep disturbance ‘screening’ level and are also no greater than the total LAeq level from the entire mine. • Measured traffic noise levels range from 3 to 9 dB below the 60 dB(A) criterion. The project will not alter the total number of trucks and therefore off-site traffic noise levels are expected to remain compliant.
Blasting and Vibration	<ul style="list-style-type: none"> • Historical blast monitoring results show no exceedances of either the applicable ground vibration or blast overpressure criteria at the nearest residences surrounding the Project Site. On this basis, Spectrum Acoustics (2010) concludes that no significant blasting impacts are expected as a result of the Rocglen Extension Project.
Surface Water	<ul style="list-style-type: none"> • The site has adequate water supply primarily through the rainfall runoff captured in sediment basins, which can be supplemented through the use of bore water when required. • The use of bore water appears highly dependent on the water management practices adopted. Assuming controlled discharge is undertaken to draw down the dirty water dams, the typical bore water usage will be 40 to 50 ML/year and will be within the licensed entitlement of 120 ML/year.

	<ul style="list-style-type: none"> • The number of overflow discharges appears to be also highly dependent on the water management practices adopted. Assuming controlled discharge is undertaken, likely average annual overflow discharges of one day is expected, which will occur under extreme rainfall events (greater than the license threshold of 38.4 mm in 5 days). In practice the mine pit would provide substantial additional on-site storage (temporarily), which would reduce the potential for overflow discharge to occur. • A new <i>Site Water Management Plan</i> will be prepared in accordance with regulatory requirements and conditions of consent. It will be developed in accordance with the <i>Blue Book (Volume 1 and Volume 2E)</i> and will address potential impacts, management strategies and mitigation measures. • Key changes to be integrated into the existing surface water management system are: <ul style="list-style-type: none"> - Additional water management controls to deal with water from the increased disturbance footprint in the northern area of the site; - Additional water management controls to address TSS issues during wet weather discharge; - Relocation of the Mine Water Dam; and - More effective diversion of clean water from off-site catchments to the east. • No additional licensing requirements. However LDP 12 will require relocation to the outlet of the proposed Dam 'B' at the northern boundary of the site to enable discharge into Driggle Draggie Creek.
<p>Groundwater</p>	<ul style="list-style-type: none"> • Apart from the groundwater levels recorded for monitoring bore WB-05, which is likely to be anomalous and affected by nearby pumping, it is apparent that the mine has had very little impact on surrounding groundwater levels over the period mid 2008 to present. • Modelling results indicate high drawdowns in close proximity to the mine site, with relatively low impacts to the east of the faulting. The predicted impacts on the alluvium are also low, however are slightly higher in the alluvium immediately south of the pit in the case that a permeable fault was present to the west of the site. The extent of the impacts on groundwater head are expected to be less than previously predicted by RCA Australia (2007) for areas outside of the area of faulting. • Groundwater flow rates into the pit are generally expected to decrease as mining continues in the northern end of the pit, however are expected to increase as the mining progresses to the south due to the increased area of the pit and because the flow is less restricted by the faulting at the northern end of the pit. The range of possible inflows to the pit, based on the credible range of parameters, ranges from 1,057 to 3,381 m³/day, however it is unlikely that the annual flow rates into the pit will exceed the existing groundwater interference licence of 700 ML/year (1,918m³/day). It is noted that there is some uncertainty in the site conditions, in particular to the south west of the site, and flows greater than 700 ML/year may be possible if adverse conditions occur. Therefore a robust on-going monitoring program and updating of the predictive model are recommended as mining continues. • It is expected that once mining is complete, recharge of groundwater and rainfall infiltration into the pit will result in the formation of a water table within the backfill. It is likely that this will eventually lead to the formation of surface water in the southern part of the pit with the locally deeper final surface level. The inflow to the pit will be offset by evaporation from the area of surface water and therefore it is unlikely that the groundwater levels within the pit will ever fully recover to pre-

	<p>development levels. It is estimated that the final equilibrium water levels may take 20 to 50 years to occur and would also be subject to variations according to climatic conditions.</p> <ul style="list-style-type: none"> • In general, the pore water in the backfilled mine spoil is expected to become less saline over time due to the percolation of rainfall through the spoil pile. The exception to this will be in the area of surface water in the non-backfilled portion of the pit. In this location, the salinity is expected to increase over time as the evaporation leads to reduction in water volume and leaves the dissolved salt behind. The increase in concentration is expected to be generally isolated to the surface water in the locally deep area, with some minor mixing with the adjacent pore water in the mine spoil. It is considered that, although the proposed final void form will, over time, lead to increasing salt concentrations in the localised area of surface water within the final void, this will be of minimal impact outside the final void.
<p>Flora and Fauna (Biodiversity)</p>	<ul style="list-style-type: none"> • No threatened flora species were observed within the Project Site, and it is therefore considered that the Rocglen Extension Project will not have any significant effect on locally occurring threatened flora species. • It is expected that the Project will result in the removal of 5.9 hectares of the White Box Yellow Box Blakely's Red Gum Woodland EEC along Wean Road (note that a large portion of Wean Road occurs within areas covered by the original mine approval) and Jaeger Lane, and 10.9 hectares of derived native grassland of the EEC from the within the Project Site. Habitat critical to the survival of this EEC has not been gazetted within the TSC Act or EPBC Act. Therefore the Project is not likely to impact any habitat critical to this community. The importance of the patch of White Box Yellow Box Blakely's Red Gum Woodland EEC to be removed is considered to be 'medium'. The revised Biodiversity Offset Strategy (ELA 2010) provides a 'maintain or improve' outcome for the removal of this vegetation community. • A small stand (0.14 hectares) of Brigalow trees (<i>Acacia harpophylla</i>) is present within the proposed mine expansion area. The presence of this species is not definitive but is indicative of the EEC "Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions EEC" listed under the TSC Act. This stand is considered not viable due to its small size, lack of recruitment, depauperate condition, isolation and lack of an adequately sized gene pool for continued survival. However, the revised Biodiversity Offset Strategy (ELA 2010) provides a 'maintain or improve' outcome for the removal of this vegetation community. • The Project would be unlikely to significantly affect any threatened, migratory or protected fauna species occurring within the subject site. • As required by the <i>Draft Guidelines for Threatened Species Assessment for Part 3A Applications</i> (DEC/DPI 2005, as cited in RPS 2010a), RPS (2010a) provided the following assessment of Key Thresholds for the Project: <ul style="list-style-type: none"> - It is considered that the information presented within the <i>Flora and Fauna Assessment</i> (RPS 2010a), combined with the revised <i>Biodiversity Offset Strategy</i> (ELA 2010), is likely to result in a maintained, if not an improved, long term outcome for biodiversity within the region. - The threatened species, populations and ecological communities within the Project Site are, or are likely, well represented in the surrounding habitat areas of Vickery State Forest and Kelvin Aboriginal Area. The removal of the relatively small area of habitat for the Project is considered unlikely to reduce the long-term viability of any species, population or EEC. - The threatened species, populations and ecological

	<p>communities within the Project Site are, or are likely, well represented in the surrounding habitat areas of Vickery State Forest and Kelvin Aboriginal Area as well as the wider region. The removal of the relatively small area of habitat for the Project is considered unlikely to accelerate the extinction or place at risk of extinction any species, population or ecological community.</p> <ul style="list-style-type: none"> - There is no declared "Critical Habitat" within the Rocglen Coal Mine locality, and as such the Project will not adversely affect any such habitat. • Due to the relatively small area of forest and woodland vegetation within the Project Site in comparison to the area of also suitable forest and woodland vegetation in the adjacent Vickery State Forest, it is unlikely that the koala would be significantly affected by the Project. • To address and offset impacts, a revised <i>Biodiversity Offset Strategy</i> has been prepared that meets the offset requirements for an approval under the EP&A Act and the EPBC Act. The BioBanking Methodology was used to 'inform' the 'improve or maintain' assessment and provide a 'quantum' of area required to offset the impacts of the Project. This <i>Strategy</i>, in summary, comprises the retirement of 4,859 credits from the Whitehaven Regional BioBank Site, which is the final stages of registration by the DECCW as a BioBank Site under Part 7A of the TSC Act. It provides an offset (525 hectares) to impact (110.44 hectares comprising 95.44 hectares of impacts for mine extension and the equivalent of 15 hectares of original impacts which now needs a replacement offset) ratio of 4.75:1.
Aboriginal Heritage	<ul style="list-style-type: none"> • Three stone artefacts sites were located by RPS (2010b) within the Project Site, comprising one isolated find and two artefact scatters. If impact to these is unavoidable, a surface salvage will be undertaken in accordance with the existing ACHMP (Whitehaven 2008c). • Two scarred trees are located on the eastern side of the Wean Road reserve. Protective measures designed to prevent damage to these will be enacted upon as per recommendations in Appleton (2007) and the ACHMP (Whitehaven 2008c). Whitehaven has restricted the proposed mine extension in this area and has committed to ensuring that no disturbance to the scarred trees or immediate surrounds will occur as a result of the Project.
European Heritage	<ul style="list-style-type: none"> • The "Glenroc" residence and associated outbuildings are not considered to have any historic significance. No other items of heritage significance were observed.
Visual Amenity	<ul style="list-style-type: none"> • The impact of the Project on the post-mining visual amenity of the local area is considered to be 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.
Greenhouse Gas Emissions	<ul style="list-style-type: none"> • There are not likely to be any measurable environmental effects due to the emissions of greenhouse gases from the Project.
Traffic and Transport	<ul style="list-style-type: none"> • The Project does not involve any change to the coal production rate, transport fleet, hours of coal haulage or coal haulage route used between Rocglen and the Whitehaven CHPP. On this basis, the Project does not pose any additional impacts on an annual basis upon the local road network or traffic volumes, nor does it pose any additional conflict with other road users. It will result in the transport route being utilised for a longer period of time than initially identified, however any associated impacts on the road network will be managed via the existing road maintenance agreement with Council.
Waste Management	<ul style="list-style-type: none"> • The Rocglen Extension Project will not generate any new waste materials or additional waste volumes on an annual basis, and all waste streams will continue to be managed in accordance with current

	<p>approved waste management strategies.</p> <ul style="list-style-type: none"> 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.
Bushfire	<ul style="list-style-type: none"> 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, it is located within a rural environment adjacent to the Vickery State Forest. Following the assessment guide of NSW RFS (2001), the Project Site is considered to have a low-medium bushfire hazard rating, as determined by RWC (2007) for the original proposal in 2007.
Socio-Economic	<ul style="list-style-type: none"> While the Project does not involve any change to the coal production rate or employment, it is anticipated that the Project will enable open cut mining for approximately 11 years. 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.

The potential environmental impacts of the Project have been kept to a minimum through:

- Undertaking preliminary feasibility assessments for several development layout options (both within the Project Site and extending beyond the Project Site) and subsequently selecting a configuration considered optimal in light of mining efficiency, operational, environmental, economic and land ownership considerations;
- Obtaining a detailed understanding of the issues and potential impacts via consultation and assessment to a level of detail commensurate with the scale of the Project, industry standards and the legislative framework under which the Project is permitted;
- The existing proactive strategies employed at Rocglen to avoid, minimise, mitigate, offset or manage potential impacts;
- A commitment to undertake site rehabilitation on a progressive basis;
- The development of appropriate and long-term beneficial post-mining landforms and land uses;
- A commitment to review and update the suite of environmental management plans and monitoring programs already implemented at Rocglen; and
- A thorough Statement of Commitments (see **Section 8.0**).

9.2 Benefits of the Project

The socio-economic assessment in **Section 7.15** outlines a range of positive benefits that will accompany the Project at a local, regional and state level.

While the Rocglen Extension Project does not involve any change 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.

Notable positive socio-economic benefits include, but are not limited to, the following:

- Maintenance of direct employment levels (54 full-time jobs) and indirect employment levels for up to an additional 4 years;

- 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;
- Contribution of close to \$21 million per year of operation to the local and regional economies through wages, payments to contracting companies and expenditure of other local goods and services;
- Contribution of close to \$46 million per year of operation to the NSW, Australian and global economies through income tax, royalties, payroll tax, payments to rail-related contracting companies and expenditure of other goods and services; and
- Community-based and charitable contributions ensuring that the economic benefits of the Rocglen Coal Mine are not restricted to the company, employees and various levels of government.

9.3 Ecologically Sustainable Development

Ecologically Sustainable Development (ESD) has emerged as a primary objective of environmental protection in NSW. ESD is an objective of the EP&A Act under Section 5(a)(vii) and is defined under Section 6(2) of the *Protection of the Environment Administration Act 1991* as:

6(2) For the purposes of subsection (1)(a), ecologically sustainable development requires the effective integration of economic and environmental considerations in decision-making processes. Ecologically sustainable development can be achieved through the implementation of the following principles and programs:

- (a) the precautionary principle—namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation...*
- (b) inter-generational equity—namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,*
- (c) conservation of biological diversity and ecological integrity—namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,*
- (d) improved valuation, pricing and incentive mechanisms—namely, that environmental factors should be included in the valuation of assets and services....*

The overall objectives of ESD are to use, conserve and enhance natural resources. This ensures that ecological processes are maintained facilitating improved quality of life, now and into the future.

Whitehaven has shown a commitment to the principles of ESD and understands that social, economic and environmental objectives are interdependent. Whitehaven also acknowledges that a well designed and effectively managed operation will avoid significant and/or costly environmental impact or degradation. The suite of environmental management plans and monitoring programs are designed to demonstrate environmental due diligence and to implement procedures that provide on-going management and monitoring of the Rocglen operation in-line with the objectives of ESD.

9.3.1 The Precautionary Principle

The Precautionary Principle, in summary, holds that where there are threats of serious or irreversible environmental damage, the lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

A detailed understanding of the issues and potential impacts associated with the Rocglen Extension Project has been obtained via consultation and assessment to a level of detail commensurate with the scale of the Project, industry standards and the legislative framework under which the Project is permitted. Specialist assessments, including the use of engineering and scientific modelling, have been undertaken for the design of the mine expansion and for impacts relating to air quality (including greenhouse gas), noise and vibration, surface water, groundwater, flora and fauna, and Aboriginal heritage. Assessment has also been undertaken for other issues, including visual amenity, traffic and transport, waste management, bushfire hazard and socio-economic considerations. To this end, there has been careful evaluation undertaken in order to avoid, where possible, serious or irreversible damage to the environment.

The various consultation activities that have been undertaken (see **Section 2.3**) and the engagement of suitably qualified and experienced consultants have ensured that the planning, design and assessment phases of the Project have been transparent.

The contents of this EA report (including appendices), combined with the consultation activities, has enabled Whitehaven to understand the potential implications of the Project, and therefore identify the required management strategies, mitigation measures and monitoring activities.

9.3.2 Intergenerational Equity

Intergenerational Equity is centred on the concept that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations. There is a moral obligation to ensure that today's economic progress, which will benefit both current and future generations, is not offset by environmental deterioration.

The primary objective of the Project is to maximise resource recovery and maintain continuity of coal production from the existing Rocglen Coal Mine beyond the currently projected life of mine in an environmentally responsible manner. The management strategies, mitigation measures and monitoring programs discussed in **Section 7.0** and listed in **Section 8.0** have been identified to minimise adverse impact upon the local environmental and surrounding populace. Emphasis has been placed on anticipation and prevention of potential impacts, as opposed to undertaking later remedial action.

These actions and initiatives will assist in ensuring that current and future generations can enjoy equal and equitable access to social, environmental and economic resources through the maintenance of the health, diversity and production of the environment.

9.3.3 Conservation of Biological Diversity and Ecological Integrity

The principle of Conservation of Biological Diversity and Ecological Integrity holds that the conservation of biological diversity and ecological integrity should be a fundamental consideration for development proposals. The potential environmental impacts, including upon ecological communities and habitat values, of the Project and measures to ameliorate these impacts are detailed in this EA. Whitehaven has sought to avoid and minimise potential impacts on ecological values within the Project Site. This has resulted in a focus to minimise disturbance, the development of a revised *Biodiversity Offset Strategy* (see **Section 5.8**) and the development of a Rehabilitation and Decommissioning Strategy (see **Section 5.7**) that will result in approximately 206 hectares (58 percent) of disturbed area within the Project Site restored to rehabilitated woodland.

9.3.4 Improved Valuation, Pricing and Incentive Mechanisms

The principle of Improved Valuation, Pricing and Incentive Mechanisms deems that environmental factors should be included in the valuation of assets and services. The cost associated with using or impacting upon an environmental resource is seen as a cost incurred to protect that resource.

The application of this principle remains in its infancy and, to date, there are few widely accepted methods by which monetary values are attributed to environmental factors. However the Project optimises the valuation and pricing of the coal resources by optimising the use of an existing operation (Rocglen), existing coal handling and preparation facilities (Whitehaven CHPP) and existing transportation facilities to extract, process and transport additional coal resources to existing markets. Furthermore, if the additional 5 Mt of coal is not recovered by Whitehaven as part of the existing Rocglen operation, the likelihood of the resource being extracted in the future is considered low. The high cost of re-establishing within the site, compared to the additional coal quantity, would likely result in that resource being isolated and sterilised.

Whitehaven will accept the full costs associated with the avoidance, minimisation, mitigation, offsetting and management of potential environmental and social impacts.

9.4 Conclusion

Following further drilling and definition of local geological features, as well as additional reviews of the mine plan, Whitehaven proposes to expand operations at the Rocglen Coal Mine in order to maximise resource recovery and allow for improved mine progression. The objectives of the Rocglen Coal Mine Extension Project are to:

- Develop the on-going open cut operations with a focus on:
 - maximising resource recovery and maintaining continuity of coal production from the existing Rocglen Coal Mine beyond the currently projected life of mine;
 - maximising the use of existing infrastructure; and
 - securing on-going employment opportunities and socio-economic flow-on benefits;
- Provide additional out-of-pit emplacement area to accommodate overburden material from the existing operations and proposed pit expansion; and
- Continue to conduct mining at Rocglen in an environmental responsible manner to ensure the potential for adverse impact is minimised.

It is intended that the Rocglen Extension Project will be fully integrated with the remaining operational life of the current approved Rocglen mine, which will enable Whitehaven to operate under a single Project Approval over the life of the Project.

The assessment of the Project has been multi-disciplinary and involved consultation with various government agencies, surrounding landholders and community groups. Emphasis has been placed on anticipation and prevention of potential environmental and social impacts, with management strategies, mitigation measures and monitoring activities identified to kept potential impacts to a minimum.

The socio-economic output of the Rocglen Extension Project, particularly in terms of direct and indirect employment and flow-on benefits, is anticipated to make a significant contribution to Gunnedah and the surrounding region.