



Review of Environmental Assessment

Vickery Coal Project

SSD-5000

Submission

Construction Forestry Mining and Energy

Union (Mining and Energy Division)

Northern District Branch

March 2013

On 17 December 2012 Whitehaven Coal Limited applied to the Minister, Department of Planning seeking approval for the development of an open cut coal mine and associated infrastructure at the Vickery Coal Mine. This Project is sought under Part 3A of the EP&A Act, 1979.

The Director General made the Environmental Assessment publicly available on the 5 March, 2013 at the DP & I Information Centre Sydney, Narrabri and Gunnedah Shire Councils and Nature Conservation Council.

The Union is pleased to take the opportunity to comment on the Vickery Coal Project and related activities Environmental Assessment.

The Mining and Energy Division is a Division of the CFMEU under the Federal Workplace Relations Act 1996, with over 120,000 members, one of the largest in Australia. The Division covers several industries including the coal industry, coal ports, metalliferous mining industries, electrical power generation, oil and gas and the Nation's small coking industry.

The Northern District Branch of the CFMEU Mining and Energy Division, being the branch that on behalf of the organisation which is making the submission is the principal Union representing coal miners in the Northern District coalfields of New South Wales. The Vickery Coal Mine operations is located approximately 15 kilometres south-west of Boggabri and 25 kilometres north of Gunnedah and is wholly within the State's Northern District coalfields.

The Union is familiar with the Vickery coal facility site and has engaged the services of an Environmental Consultant with extensive experience in local government and environmental assessments on coal mining related projects.

After reviewing all the material and taking advice, the Union supports the Vickery Coal Project as proposed.

Project Overview

The Project would involve the development of an open cut coal mine producing up to approximately 4.5 Mtpa of ROM coal for a period of approximately 30 years.

Waste rock generated by the open cut mining would be placed within external emplacements to the west and east of the planned open cut, and within the mined-out voids.

A new Mine Infrastructure Area (MIA) would be constructed to produce sized ROM coal. It would also contain workshops, offices and mine services and facilities.

The sized ROM coal would be transported by haulage trucks to the existing Whitehaven Coal Handling and Preparation Plant and rail load-out facility, which is situated on the outskirts of Gunnedah (approximately 20 kilometres to the south of the Project open cut).

The Project also includes construction of an approximately 2 km long section of private haul road (including an overpass over the Kamilaroi Highway) between Blue Vale Road and the Whitehaven CHPP. This would remove the need for coal trucks to cross the Highway.

Other main activities associated with the development of the Project include:

- Development and operation of an open cut mine within CL 316, AUTH406, Mining Lease 1471, Mining Lease Application 1, 2 and 3.
- Use of convention mining equipment, haul trucks and excavators to remove up to 4.5 Mtpa of ROM coal and approximately 48 million bank cubic metres of waste rock per annum from the planned open cut.
- Use of an on-site crusher for coal crushing and screening of up to 150 000 tonnes of domestic specification coal per annum for direct collection by customers at the Project site.
- Use of an on-site mobile crusher to produce up to approximately 90 000 cubic metres of gravel materials per annum for direct collection by customers at the Project site.
- Construction and use of a water supply bore, and a surface water extraction point on the bank of the Namoi River and associated pump and pipeline systems.
- Construction and use of new dams, sediment basins, channels, dewatering bores and other water management infrastructure required to operate the mine.
- Construction and use of new soil stockpile areas, laydown areas and gravel/borrow areas.
- Construction of a 66 kV, 11kV electricity sub-station and 11 kV electricity transmission line.
- Transport of coarse rejects generated within the Whitehaven CHPP via truck to the Project for emplacement within an in-pit emplacement area.
- Transport of tailings generated within the Whitehaven CHPP via truck to the Project for emplacement within co-disposal storage areas in the open cut and/or disposal in existing off-site licensed facilities.

- Realign of sections of Blue Vale Road, Shannon Harbour Road and Hoad Lane to the east and south of the open cut.
- Realignment of the southern extent of Braymont Road to the south of the open cut.
- Ongoing exploration, monitoring and rehabilitation activities.

Approximately 135 Mt of ROM coal would be mined from the open cut during the life of the Project. Mining operations would be conducted up to 24 hours per day, seven days per week.

Consultation

The proponent details the Project consultation program as being comprehensive and assisted with the identification of issues that are of concern or interest to stakeholders.

Key NSW Government agencies were consulted during the preparation of the EIS, including presentation of various refinements to the Project, key findings of the environmental studies and design considerations for environmental management measures.

Meetings were held with representatives of Narrabri Shire Council and Gunnedah Shire Council during the development of the EIS. Discussions included potential impacts on the road network and potential financial contributions.

Whitehaven lodged a Referral under the Commonwealth Environment Protection and Biodiversity Conservation Act, 1999 in January 2012. In May 2012 the Project was declared to be ‘not a controlled action if undertaken in a particular manner’. The particular measures required to be implemented relate to the management of the threatened flora species Winged Peppercress (*Lepidium monolocoides*) and are specified in the Notice of Determination Decision (EPBC 2012/6263).

A community information day was held in September 2012, and Whitehaven has provided Project updates to the local community through several Project newsletters. In addition, Whitehaven has consulted with local landholders who participated in the Project bore census and landholders in the immediate vicinity of the mine with regard to visual, noise and air-quality assessments and potential property acquisitions.

Aboriginal community consultation was undertaken in accordance with Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010. Numerous registrations of interest were received from Aboriginal stakeholders and these stakeholders were invited to participate in the Project Aboriginal Cultural Heritage Assessment.

Where relevant to the Project, the issues raised by the parties above during the consultation program have been considered according to the proponent in the preparation of the Project EIS.

Groundwater

A Groundwater Assessment for the Project was undertaken by consultants Heritage Computing. The Project groundwater and surface water studies were undertaken in an integrated manner.

The Groundwater Assessment evaluated the potential impacts of the Project on groundwater resources using a regional numerical groundwater model.

The regional numerical groundwater model covered an area of approximately 957 square kilometres. The model area included the Tarrawonga and Rocglen Coal Mines as well as local groundwater extraction from the Upper Namoi Alluvium groundwater system by farmers for agricultural purposes.

The Maules Creek Formation was split into multiple layers in the model generally based on the targeted coal seams and in recognition of vertical hydraulic gradients.

The Project open cut would act as a groundwater sink during operations and post-closure. This would cause a change in groundwater flow direction, generally a reversal of direction due to the direction of excavation. There would also be a change in hydraulic properties over the mine footprint where mine waste rock is used to infill the open cut.

A mine waste rock would have a higher permeability than any natural rock material in the area, there would be associated reductions in localised hydraulic gradients.

As mining progresses the open cut would be expanded to the north-east and east in two working fronts. Approximately half way through the mine life (i.e. Year 15) the mined-out area between the two active open cut areas would start to be filled with overburden. This would create a 'saddle' of infill at approximately 240m AHD and would ultimately mean two final voids would be left at the end of mining. Groundwater inflows from the waste overburden and the hard rock groundwater system within the coal measures of the Maules Creek Formation are the only direct groundwater sources for pit inflows to both areas of the open cut during operations and post-closure.

The numerical modelling indicates average groundwater inflows from the Maules Creek Formation to the open cut would be approximately 1.2ML/day (ranging from 0.4 to 1.9 ML/day) with a maximum of 1.9 ML/day in the later years of the Project. Following closure of the Project, groundwater inflow to the two mine voids is predicted to equilibrate at approximate 0.8 ML/day in the northern void and 0.6 ML/day in

the southern void. The combined steady inflow of approximately 1.2 ML/day would be sustained primarily by rainfall infiltration through the Western Emplacement.

During operations the quality of the inflow water would be a mixture of the qualities of the waters in source lithologies, primarily coal and coal measures of the Maules Creek Formation, and leachate from rainfall infiltration through the waste emplacements.

The coal and coal measure waters have similar ionic signatures with median EC values of approximately 4 000 $\mu\text{S}/\text{cm}$ and salinities of about 2 400 mg/L. However, given higher rainfall infiltration rates through mine waste rock within the mine footprint, it is possible that the groundwater inflows to the open cut during operations could be freshened by lateral flow from mine waste rock.

The regional numerical groundwater model was used to predict the drawdown effects of the Project on the local groundwater system during operations and post-closure. The modelling included assessment of a Project-only scenario, as well as cumulative scenario (which included nearby Rocglen and Tarrawonga Coal Mines). Both scenarios included ongoing extraction by irrigators from the nearby Upper Namoi Alluvium aquifer.

The predicted drawdown effects for the Project-only scenario for various Model Layers (i.e. 1,2,4,6,8,10 and 12) and Model Years (i.e. 5,10,15,20, 25 and 31). The predicted drawdown effects for the cumulative scenario were also assessed for Model Layers 1 and 2 at the time of the maximum cumulative impact (i.e. last year of approved operations at the Tarrawonga Coal Mine – Model Year 19).

Project-only predicted drawdown contours for Model layers 1 and 8 at the end of the 30 year mine life, represent maximum predicted drawdown effect. The results for Model layer 8 have been included as this layer corresponded to the deepest known existing groundwater bores within the Maules Creek Formation. The drawdown effect of the Project would be entirely contained within the Maules Creek Formation ‘island’ in which the Project is located.

The cumulative predicted drawdown contour for Model Layer 1 in the Model Year 19 indicates the 1 m drawdown contours for the Project and the Rocglen Coal Mine coalesce, but there is no interaction with effects from the Tarrawonga Coal Mine. The predicted 1 m drawdown contour for the Project and Rocglen Coal Mine remains within the Maules Creek Formation and does not impinge on the Upper Namoi Alluvium.

The modelling of the post-closure scenario showed that the water levels in the Maules Creek Formation would slowly recover, however the equilibrium level of the pit lakes that would form in the final voids would still be below the pre-mining water levels. Since the ‘saddle’ between the northern and southern

voids would be in filled with material, there is likely to be relatively good hydraulic connection between the two pit lakes and as a result they are predicted to have similar equilibrium levels (i.e. approx. 170m AHD and 150 m AHD respectively).

These levels are approximately 100m below the pre-mining water table, and hence the post-closure mine voids would act as permanent local groundwater sinks.

Alluvial Groundwater System

Potential impacts of the Project on the Upper Namoi Alluvium groundwater system include:

- Incidental loss through enhanced leakage from the Upper Namoi Alluvium to the underlying Maules Creek Formation; and
- Lateral flow from the Western Emplacement where it overlaps a small embayment of the Upper Namoi Alluvium.

The Groundwater Assessment evaluated the potential for increased leakage from the alluvium to the underlying consolidated sediments of the Maules Creek Formation as mining progressed. This effect would be very localised and would occur in the areas where the open cut is closest to the boundary between the Maules Creek Formation and the Upper Namoi Alluvium. The effect would also be relatively gradual as it would take tens of years for the depressurisation of the Maules Creek Formation to propagate out and underneath the adjoining areas of the Upper Namoi Alluvium.

The modelling indicated that the Project would result in a permanent leakage of approximately 0.15 ML/day (55 ML/annum) in the area of the Upper Namoi Alluvium to the south of the open cut, and approximately 0.11 ML/day (41 ML/annum) in the area to the immediate north. The magnitude of this predicted loss is such that it would not cause a measurable drawdown effect in the Upper Namoi Alluvium surrounding the Project.

The vertical losses from the Upper Namoi Alluvium are predicted to be partially offset by increased lateral flow to bordering alluvium from the mine site during mining and from the Eastern and Western Emplacements during recovery. However the later flow rates are likely to be no more than about 0.01 ML/day (4ML/annum) in the area to the north of the open cut and the same in the area to the south. The quality of this lateral flow is likely to be at least equal, if not better than the saline water that naturally occurs in the groundwater systems to the immediate south and north of the open cut. The modelling predicts an increased salt transfer of less than 10tpa in each area, which is much smaller than the beneficial vertical mass transfers of about 100 tpa to the north of the open cut and about 500 tpa to the south of the open cut.

Surface Water Resources

The Groundwater Assessment included an evaluation of the potential impacts of the Project on the 4 km long reach of the Namoi River adjacent to the western side of the Project mining area. The evaluation considered the potential loss of base flow due to the depressurisation effect of the open cut, as well as the potential increase in baseflow due to the proposed use of the Blue Vale void (MWSS-1) as mine water surge storage during the Project life.

In summary and assuming a worst case of the total salt load released from the MWSS-1 being captured by the River, the increase in salt load, and hence salinity, would be approximately 0.1% based on median flows.

Driggle Draggie Creek was assessed as having a very constant base flow of approximately 0.2 ML/day. Barbers Lagoon was assessed as receiving about 0.01 ML/day. No change to the amount of base flow entering either of these surface water features, or impact on the water quality is predicted to occur as a result of the Project during operations or post-closure.

Groundwater Dependent Eco Systems

The localised disturbance of open cut mining and the demonstration of inconsequential changes in surface water baseflow, no effects on groundwater dependent ecosystems are anticipated in relation to mining-induced changes to the water system.

Groundwater Users

There is one privately-owned bore within the island of Maules Creek Formation in which the Project is located (SK1). This bore has been drilled to a depth of between 85 and 87m, which coincides with Model Layer 7. The predicted groundwater impact at this location has been conservatively based on the drawdown contour for Model Layer 8. It is predicted drawdown at SK1 plus the other Project census bores within the adjoining Upper Namoi Alluvium, Bore SK1 is predicted to experience a drawdown of 1 to 5 m.

Drawdown effects of up to 5 m and 10 m are also predicted to occur at Bores WG1 and WL1 respectively, however these bores are located on Whitehaven owned land. Bore WG is unregistered, and consists of a currently disused windmill. Bore WL1 is a registered bore equipped with a pump and storage tank.

The modelled 1m drawdown effect in Model Layer 1 and Model Lay 8 is predicted to not extend beyond the boundary of the Maules Creek Formation. As a result, no privately-owned census bores within the predicted to be materially impacted during mining operations or post-closure. The Project would

therefore not impact the agricultural use of the Upper Namoi Alluvium aquifer for irrigation or other agricultural purposes.

Surface Water

A Surface Water Assessment for the Project was undertaken by Evans & Peck.

Surface Water Flow Regime

The Project would result in changes to flows in local watercourses due to the progressive development of the open cut and associated capture and re-use of drainage from operational disturbance areas and controlled releases from licensed discharge points. Changes to groundwater base flow contributions to Driggle Draggie Creek and the Namoi River were also identified as potential impact of the Project.

Changes in Contributing Catchment

The surface water flow regimes in Driggle Draggie Creek would be affected by progressive changes in catchment area as a result of runoff captured in Project disturbance areas.

The maximum predicted impact over the life of the Project when compared to total catchment of the Namoi River is approximately 0.05%.

Post-closure only the bunded catchment area of the final voids would remain excised from the Namoi River catchment.

The Tarrawonga Coal Project Surface Water Assessment considered the potential cumulative impacts of the Tarrawonga Coal Mine, the Boggabri Coal Mine and the Maules Creek Coal Project in the context of potential reduction in the catchment area of the Namoi River. Based on this estimate, it is considered that the maximum cumulative reduction in contributing catchments to the Namoi River during the life of the Project would be approximately 0.16%. This estimate also includes consideration of the approved Rocglen Coal Mine.

Potential Impacts on Groundwater Baseflow Contributions

It was concluded that a potential reduction in baseflow of approximately 0.015 ML/day for the 4km reach of the Namoi River adjacent to the Project could occur as a result of the Project. However this would be more than offset by the proposed use of the Blue Vale void as mine water surge storage.

No perceptible change to baseflow to Driggle Draggie Creek was predicted. Other watercourses in the vicinity of the Project do not experience baseflow through groundwater discharge.

Namoi River Surface Water Extraction

Water would be extracted from the Namoi River during dry periods when supply from mine storages is insufficient to meet the demand. This water would be extracted using a pump station located to the south-west of the Western Emplacement, and would be pumped to the MIA for storage in the mine water dams.

The proponent holds a number of WAL's for extraction from the Namoi River. As all extraction from the Namoi River would be conducted in accordance with the licensed entitlements issued by the NOW, and in accordance with the rules in the water sharing plan, impacts to the Namoi River water source are not anticipated to be significant.

Ground Water Quality

No measurable changes in the quality of groundwater are predicted to occur as a consequence of mining. As a result, there would be negligible impact on surface water quality in local creeks through baseflow.

Flooding

Consultants Worley Parsons evaluated potential flooding impacts associated with the Project as a component of the Surface Water Assessment. The assessment focussed on two specific areas where potential flooding impacts were identified. The area surrounding the private haul road and Kamilaroi Highway overpass; and the area to the south of the MIA and the southern extent of the open cut.

Private Haul Road and Kamilaroi Highway Overpass

The wider flood plain of the Namoi River passing the site of the private road and Kamilaroi Highway overpass is represented by several parallel branches, namely Deadmans Gully, Namoi River and Landry Lagoon. This area is subject to flooding once the Namoi River breaks its banks.

Under existing conditions, the water depth at the site of the proposed Kamilaroi Highway overpass would be approximately 1 m above the surface of the highway, and approximately 3 m above the Blue Vale Road bridge during a 1% AEP flood. Under this scale of flooding event a continuous flood surface would form between the Namoi River, Deadmans Gully and Landry Lagoon with flood waters transferring between the three. A flood of this magnitude would prevent the Kamilaroi Highway from being used, and would cause widespread inundation and closure of local roads such as Blue Vale Road.

With the proposed overpass in place, the flood modelling indicated that during a 1% AEP flood event a small increase of up to 9 cm in the peak flood level above the Kamilaroi Highway may be experienced at the point where the overpass would cross the highway. The predicted change in flood level at the Blue Vale Road bridge is even smaller, 1cm.

Whitehaven owns several blocks of land in the vicinity of the proposed Kamilaroi Highway overpass including the property immediately upstream on Deadmans Gully, as well as the nearest property on the northern side of the Namoi River.

During a 1% AEP flood event, the proposed Kamilaroi Highway overpass would be expected to increase in the lateral extent of the flood waters by approximately 50 to 60m to the south. Whitehaven owns the land to the south of the Kamilaroi Highway overpass up to the higher ground that the Werris Creek Mungindi Railway is located on.

The increase in peak flood height and lateral flood extent would not result in any impacts to the Werris Creek Mungindi Railway.

No significant change to the lateral extent of flooding along the northern extent of the floodplain is predicted.

Changes to flow velocities as a result of the construction of the proposed Kamilaroi Highway overpass are anticipated to be negligible in the vicinity of the overpass. Increases of up to 0.06 m/s along the Landry Lagoon arm of the flood plain could occur, however this reflects an increase of only 5% above existing flood velocities and therefore not predicted to result in any notable change in flood hazard.

Noise and Blasting

A Noise and Blasting Assessment for the Project was undertaken by consultants Wilkinson Murray.

The Noise and Blasting Assessment included assessment of the following potential impacts:

- On-site operational and construction noise;
- Off-site road traffic noise;
- Rail noise; and
- Blasting

Background Noise Levels

Consultants conducted a background noise survey between 21 November and 20 December 2011. The survey was carried out at three locations representative of the residential receivers surrounding the Project.

RBL's at all monitored locations were determined to be 30 dBA or less during day, evening and night-time periods. In accordance with the INP RBL's of 30 dBA for the day, evening and night periods have been adopted for noise assessment purposes.

Noise Modelling Scenarios

Noise modelling was undertaken for the day, evening and night operating scenarios for Project Years 2, 7, 17 and 26. Those Project years were selected for the following reasons:

- Year 2 – represents initial mining and the south-western most operations during the Project.
- Project Year 7 – represents the emplacement of waste rock at the Eastern and Western Emplacements at their maximum elevations and the first year that ROM coal production is at the maximum rate 4.5 Mtpa;
- Project Year 17 – represents the emplacement of waste rock at the northern most extent of the Western Emplacement and large exposed areas of the pit and overburden.
- Project Year 26 – represents maximum ROM coal and waste rock production rates.

The noise modelling for the Project included the use of pro-active noise management systems. Preliminary noise modelling, incorporating mitigation measures identified the potential for exceedances of the relevant noise criteria at a selection of receivers to the south-west of the Project (receivers 131a and 131b (Dennison), 132 (Lanreef), 133 (Clinton) and 1z (Long Way Round) in Project Years 2 and 7 during adverse weather conditions.

Further noise modelling indicated that relocating the waste emplacement fleet to the northern most extent of the Western Emplacement during evening and night time operations would avoid exceedances of relevant noise criteria at the selection of receivers to the south-west in Project Years 2 and 7, and also, would not result in any increases of the 10th percentile noise levels at other receivers in the Project Area.

On this basis, the pro-active noise management system would be implemented during adverse conditions to manage noise at the selection of receivers to the south-west. When adverse conditions are predicted, mine operators would relocate the waste emplacement fleet operating on the Western Emplacement to the north-west most portion of the Western Emplacement.

Predicted Noise Levels

The operational noise assessment indicates the following:

- During periods of calm meteorological conditions, operational noise from the Project would comply with the 35 dBA $L_{Aeq, 15min}$ criterion at all privately-owned receivers.
- During the daytime, operational noise levels are predicted to exceed the 35 dBA $L_{Aeq, 15 min}$ criterion at receivers 89b, 127a, 127b and 127c. In most instances, Project operational noise levels at receiver locations would be less during the day time than during the evening and night.
- During the night, exceedances of the 35 dBA $L_{Aeq, 15min}$ criterion by between 1 to 2 dBA are predicted for privately-owned receivers 89a and 112 during adverse meteorological conditions.

- During the night, exceedances of the 35 dBA $L_{Aeq, 15min}$ criterion by between 3 to 5 dBA are predicted for privately-owned receivers 127a and 127c during adverse meteorological conditions.
- During the night, exceedances of the 35 dBA $L_{Aeq, 15 min}$ criterion by greater than 5 dBA are predicted for privately-owned receivers 89b (approved dwelling location), and 127b during adverse meteorological conditions.

Whitehaven is intending to enter into noise or purchase agreements with the owners of receivers 89a and b, 127a, 127b and 127c. At this time negotiations are underway with these owners.

According to the proponent the relatively limited number of exceedances indicates, that with the implementation of Project noise mitigation measures, noise from the Project would be managed to maximum extent possible, and no other measures would be of material benefit, including limiting operations to daytime only.

Cumulative noise impacts resulting from the concurrent operation of the Project and the Rocglen, Tarrawonga and Boggabri Coal Mines were assessed against the INP recommended acceptable and recommended maximum amenity criteria.

The assessment indicated that cumulative noise levels from the concurrent operation of the Project, Rocglen and Tarrawonga Coal Mines would comply with the recommended acceptable amenity criterion at all but one privately-owned residence. A marginal 1-2 dBA exceedance of the amenity criterion is predicted at receiver 89b (approved dwelling location). Night-time cumulative noise levels are predicted to comply with the recommended maximum amenity criterion at all residences.

Receiver 89b has been identified as falling within the Project's Noise Affection Zone. Whitehaven is intending to enter into a noise agreement with the owner or receiver 89b (and 89a).

Construction Noise

Assessment of the potential for noise impacts was conducted for the construction of the MIA, realignment of Blue Vale Road, realignment of Braymont Road and the construction of the private haul road and Kamilaroi Highway overpass. Construction activities would generally occur during the daytime only (7am to 6pm).

The construction noise assessment indicated that no receiver would be either 'highly noise affected' or 'noise affected'.

Noise resulting from construction of the MIA and realignment of Blue Vale Road and Braymont would be largely indistinguishable from operation noise emission of the Project. This is conservative as construction activities are expected to be completed by the end of Project Year 1.

Exceedances of the daytime 35dBA $L_{Aeq, 15 \text{ min}}$ operational noise criterion at receivers 89b, 112, 127a, 127b and 127c would occur when a predicted construction noise emissions are added to Year 2 daytime operational noise predictions. Exceedances of the Project-specific noise criteria are predicted at all of these receivers and as such, Whitehaven intends to enter into noise or purchase agreements with the owners of these receivers.

Private Haul Road and Kamilaroi Highway Overpass

Noise levels due to traffic on the private haul road and Kamilaroi Highway Overpass would be generally similar to or less than those from equivalent traffic on the existing highway.

At receivers 223, 224 and 292 predicted noise levels from the private haul road and Kamilaroi Highway overpass would decrease in comparison with the existing Whitehaven haul route as the truck movements would be located further away from these receivers.

At receiver 284, a marginal increase of 1 dBA is predicted in comparison with the existing Whitehaven haul route.

Because the private haul road and Kamilaroi Highway overpass would be owned by Whitehaven and not available for public use, the noise levels have also been compared to the INP intrusiveness criterion of 35 dBA $L_{Aeq, 15 \text{ min}}$.

The predicted noise levels exceed the 35 dBA noise limit at private receivers 223, 224, 284 and 292. When noise associated with non-Project traffic on the Kamilaroi Highway is considered cumulatively with Project haul trucks, the private haul road and Kamilaroi Highway overpass would result in noise levels that are less than or equivalent to noise levels associated with the existing Whitehaven haul route at all private receivers.

No exceedances of the relevant night-time or day INP road noise assessment criteria were predicted at receivers for all assessed traffic scenarios inclusive of the Project.

Public Road Noise

The following key sections of the Blue Vale Road and the Kamilaroi Highway were selected for assessment due to the proximity of private receivers to these roads:

- Blue Vale Road south of Shannon Harbour Road;

- Blue Vale Road north-east of Kamilaroi Highway; and
- Kamilaroi Highway between Blue Vale Road and the Whitehaven CHPP.

The predicted noise levels at the two privately-owned receivers closest to Blue Vale Road along the Project haulage route are within the relevant RNP criteria. As the criteria is predicted to be met at the two closest receivers, then the criteria would be anticipated to be met at all other receivers along the Blue Vale Road section of the Project haulage route.

Until the proposed private haul road and Kamilaroi Highway overpass is constructed, Project related traffic would use the Kamilaroi Highway to access Blue Vale Road from the south. Predicted traffic noise levels at the closest privately owned receiver to the Kamilaroi Highway are anticipated to be within the relevant criteria during this stage of the Project.

Rail Noise

Approximately two laden trains transporting product coal to the Port of Newcastle via the Werris Creek Mungindi Railway are dispatched from the site per day.

There would be no increase in the existing approved number of trains, transporting product coal from the Whitehaven CHPP; the Project would extend its life.

Blasting

No exceedances of vibration criteria are predicted to occur at any privately owned receiver.

No exceedances of the 5% level for air blast overpressure are predicted at any privately owned receiver; however the blast MIC would be reduced at relevant blast locations to ensure compliance at privately owned receiver 127b, unless Whitehaven reaches an agreement with the owner of this property. At this time, Whitehaven have entered into negotiations with the owner of 127b.

Air Quality

An Air Quality and Greenhouse Assessment for the Project were undertaken by PAE Holmes.

No exceedances of the OEH criteria/guidelines were predicted at any privately owned receiver for Project Years 2, 7, 17 and 26 for annual average PM₁₀ concentrations, TSP concentrations or dust dispersion levels.

In addition no exceedances of the OEH annual average criteria for PM₁₀ and TSP concentrations or dust deposition levels were predicted when accounting for background concentrations and levels from existing sources.

One receiver (89b approved dwelling site) is predicted to experience 24 hour average PM₁₀ concentrations above the EPA assessment criterion due to the Project-only. Whitehaven is already intending to enter into a noise or purchase agreement with the owner of receiver 89b due to predicted exceedances of noise criteria associated with the Project.

Potential Cumulative Impacts

Annual Average PM₁₀

No exceedance of the OEH annual average PM₁₀ criterion 30 µg/m³ is predicted at any privately-owned receiver due to the cumulative contributions from the Project, plus the Tarrawonga, Boggabri and Rocglen Coal Mines and background levels.

24 hour Average PM₁₀

The potential cumulative impacts associated with the project would be most influenced by elevated background levels associated with episodic, short-term, non-mining events.

Analysis indicates that the 24 hour PM₁₀ criterion would be expected to be exceeded on two days per year due to background-only sources at receiver locations surrounding the Project.

When background sources are considered cumulatively with the Project, the Project may result in additional exceedances of the 24 hour PM₁₀ criterion on up to:

- Six days per year at the closest privately owned receiver to the north of the Project (89b)
- One day per year at a privately owned receiver (88) to the north of the project; and
- Four days per year at the closest privately-owned receiver (127b) to the south-west of the Project.

Annual Average TSP

No exceedances of the OEH annual average TSP criterion (90 µg/m³) is predicted at any privately-owned residence due to the cumulative contributions from the Project and neighbouring operations.

Greenhouse Gas Emissions

A quantitative assessment of Project greenhouse gas emissions was undertaken by PAE Holmes.

The Project's contribution to projected climate change, and the associated environmental impacts, would be in proportion with its contribution to global greenhouse gas emissions.

The Project may exceed the facility threshold for participation in the carbon pricing mechanisms during the Project, and as such relevant Scope 1 greenhouse gas emissions from the Project would be subject to the carbon pricing mechanism.

The potential for reducing greenhouse gas emissions at the Project is related predominantly to consumption of diesel by plant and equipment. Whitehaven currently employ methods to maximise efficiency of the mining fleet at its existing operations through regular maintenance scheduling, implementation of high efficiency motors, reduction of engine idle times and, where possible, minimising the gradient and length of loaded haul runs for the operating haul trucks.

Ongoing monitoring and management of greenhouse gas emissions and energy consumption at the Project would occur through Whitehaven's participation in the Commonwealth Government's National Greenhouse and Energy Report System.

Flora

A flora assessment has been prepared for the Project as part of the Ecological Assessment by consultants Niche Environment and Heritage.

Native Vegetation/Habitat Clearance

The Project would require the progressive disturbance of approximately 464 ha of scattered remnants of native woodland, semi-cleared woodland and White Cypress re-growth. It would also involve disturbance to approximately 1 284 ha of grassland areas with occasional re-growth trees. The remainder of the Project disturbance area consists of previously disturbed rehabilitation areas (405 ha) and other non-vegetation areas (89 ha) such as farms dams, roads, tracks and existing infrastructure.

Threatened Ecological Communities

Approximately 6 ha of Box-Gum Woodland EEC would be cleared for the Project mining area and private haul road and Kamilaroi Highway overpass. Approximately 1 ha of the Weeping Myall Woodland EEC would be cleared for the Project.

Groundwater Dependent Vegetation

Based on the localised nature of predicted surface water and groundwater impacts, the native vegetation surrounding the Project would not be significantly impacted by changes to the availability of water. This includes groundwater dependent ecosystems associated with the Namoi River.

Threatened Flora Species

A total of 46 Winged Peppercress individuals were recorded within the Project mining area, with a further 420 individuals recorded outside the planned disturbance area in the Canyon Coal Mine site. Targeted surveys in the local area and the Pilliga National Park were also conducted in order to assess the region distribution of the species.

A large population of Winged Peppercress was identified in the Pilliga National Park with an average density of 353 plants per hectare, with an estimated population size of at least 42 450 plants.

Potential impacts on the Winged Peppercress were assessed under the Threatened species assessment guidelines and conclude that the Project is unlikely to significantly impact this species in the locality, subject to Whitehaven implementing the management measures specified in the EPBC Act Notification of Referral Decision.

The Project flora surveys did not record the Finger Panic Grass within the Project area, however the timing of the survey was not considered to be optimal.

An additional threatened flora species, the Silky Swainson-pea, was recorded within the proposed biodiversity offset area; however, this species will not be disturbed by the Project.

Cumulative Impacts

The Project and nearby Rocglen Coal Mine may result in indirect impacts on the flora of the Vickery State Forest. The Rocglen Coal Mine does not have approval to clear within the Vickery State Forest and no clearance of Vickery State Forest is proposed by the Project.

However, the Project may result in some increased edge effects such as weed incursion, noise and dust. In the long-term the Project is likely to improve the connectivity of the Vickery State Forest through the rehabilitation of the Project mine landforms to provide a linking corridor to the Namoi River.

The Ecological Assessment considered the cumulative impact of native woodland vegetation clearing in the 'locality' of the Project as well as the broader Liverpool Plains sub-region.

The locality has been taken to cover the local area within approximately 10 km of the Project mining area. Consultants have estimated that approximately 5 643 ha of native woodland is present within the 'locality'. This includes the Vickery State Forest (1 942 ha), woodland adjacent to Vickery State Forest (381 ha), the Boonalla CCA Zone 3 State Conversation Area (2300 ha) and woodland adjacent and to the north of Boonalla CCA Zone 3 State Conversation Area (1 020 ha). This is likely to be an under-estimate of woodland in the 'locality' given that it does not consider small patches of vegetation, road reserves or scattered paddock trees. Based on these conservative figures, the Project would remove up to 4.8% of native woodland within the 'locality'.

Although the removal of up to 4.8% of the native woodland in the 'locality', and 0.17% increase in the Liverpool Basin CMA sub-region, it is not insubstantial, the woodland to be impacted by the Project is mostly heavily disturbed having been exposed to logging/thinning, firewood collection, track and grazing.

Compared with the adjacent Vickery State Forest, the vegetation and fauna habitat in the Project mining area is of a poorer quality. Given that threatened species that would be affected by the Project are highly mobile it is likely that local populations of these species also use Boonalla Conservation Area and revegetation as part of the compensatory habitat package for the Rocglen Coal Mine is strengthening the link between these areas of remnant vegetation in the locality.

The proposed rehabilitation of a large proportion of the Project mining area (1 360 ha) to native woodland/forest would increase the overall amount of native vegetation in the locality and sub-region in the medium to long-term.

Fauna

A fauna assessment has been prepared to the Project as part of the Ecological Assessment by Niche Environmental and Heritage.

Fauna Habitat Removal and Modification

The Project area would be cleared progressively over the 30 year mine life, but would be accompanied by progressive rehabilitation of woodland/forest and grassland. The aim would be to reinstate cleared habitats over the medium to long-term.

Natural Flow Regimes

The Project is unlikely to adversely change the macro invertebrate or fish community composition of the local area given the ephemeral nature and highly disturbed condition of the creek systems. Similarly, the Project is unlikely to have a significant impact to the aquatic flora and fauna of the Namoi River system, given the limited potential impacts on groundwater and surface water.

Groundwater Dependent Fauna

The groundwater modelling conducted by heritage Computing has concluded that potential drawdown on the Upper Namoi Alluvium groundwater system would be negligible and no material changes to groundwater quality is likely. As a result no significant Project-related impacts to stygofauna in this groundwater system are expected to occur.

Threatened Fauna Species

A total of 31 threatened fauna species have potential to be affected to some degree by the Project, either due to the loss of known or potential habitat and/or direct loss of individuals.

The Project would result in the removal of known habitat for the following species recorded within the Project area:

- Blue-billed duck
- Little Eagle
- Speckled Warbler
- Hooded Robin

- Grey-crowned Babbler
- Diamond firetail
- Yellow-bellied Sheath tail bat
- Beccari's Freetail-bat
- Eastern Bentwing bat
- Large-eared Pied Bat

None of these species are confined to the Project area and the Project is unlikely to cause a net impact on any threatened fauna species over the medium to long-term considering:

- The Project area is a highly disturbed system;
- No clearing within Vickery State Forest is proposed;
- Clearing would be staged over a 30 year period;
- Progressive rehabilitation of the mine landforms would result in re-establishment of woodland/forest; and
- Conservation of the Project biodiversity offset area would include regeneration of 248 ha of derived native grassland and conservation of a total of 1 671 ha over the medium to long-term.

Threatened Ecological Communities

Potential impacts of the Project on the Aquatic Ecological Community in the Natural Drainage system of the Lowland Catchment of the Darling River EEC are limited to impacts associated with:

- The proposed pump station and water supply pipeline on the Namoi River; and
- The proposed private haul road and Kamilaroi Highway overpass.

The pump station would include a submersible pump within the Namoi River. The conceptual designs of the Namoi River pump station. Design features to minimise impacts of the pump station on aquatic ecology. The scale and nature of the predicted changes in flooding are not expected to have any significant impacts on the Aquatic Ecological Community in the Natural Drainage System of the Lowland Catchment of the Darling River EEC.

Cumulative Impacts

The main potential impact of the Project on fauna is considered to be the loss of habitat.

The cumulative impacts of all mining operations and proposals on habitat and fauna without consideration of the proposed mitigation outcomes would likely result in adverse changes to the resident fauna populations, including some threatened fauna species. However, these cumulative impacts are considered to be relatively minor when compared to the past and present disturbance of agricultural practices, particularly, in relation to EEC's where natural communities have become threatened due to clearing of productive land and the remaining remnants are mostly small fragmented occurrences on poor soils and in poor condition.

Biodiversity Offset

The biodiversity offset for the Project comprises approximately 1 671 ha of freehold land that has been purchased by Whitehaven. The offset is situated approximately 35 km to the north-north east of the Project and adjoins Mount Kaputar National Park.

The biodiversity offset area includes similar vegetation communities/fauna habitats and biodiversity values to the Project area, and has substantial areas of Box-Gum Woodland EEC.

A number of management measures to enhance the offset area's flora and fauna values would be detailed in the Biodiversity Offset Strategy Plan to be prepared for the Project.

Whitehaven intends to reach an agreement with the NSW Government so that the biodiversity offset area can be permanently added to adjoining Mount Kaputar National Park.

Road Transport

A Road Transport Assessment for the Project was undertaken by GTA Consultants.

Traffic generated by the Project would include construction traffic, operational traffic, ROM and domestic coal haulage and gravel haulage.

Whitehaven currently holds approvals to transport ROM coal along the Whitehaven haul route at a rate of up to 3.5 Mtpa from the Tarrawonga and Rocglen Coal Mines. This ROM coal haulage can take place between the hours of 7am to 10pm Monday to Friday and 7am to 6pm on Saturdays. If the 3.5 Mtpa is averaged over these approved operating hours it equates to approximately 782 t of ROM coal being transported per haulage hour, or 19 truck deliveries per hour, from the Tarrawonga and Rocglen Coal Mines to the Whitehaven CHPP.

ROM coal transport from the Project to the Whitehaven CHPP via the Whitehaven haul route and the private haul road and Kamilaroi highway overpass is proposed to be undertaken up to 24 hours per day, seven days per week. If the maximum Project ROM coal production rate of 4.5 Mtpa is averaged over the 24 hour trucking period it would equate to 13 truck deliveries per hour.

Noise modelling of Project ROM coal road transport was conducted. No exceedances of the relevant criteria were predicted at receivers for all assessed traffic scenarios, inclusive of Project and non-Project related traffic.

Cumulative Traffic Increases

Whitehaven would construct the private haul road and Kamilaroi highway overpass between Blue Vale Road and the Whitehaven CHPP. This would allow haulage trucks to travel between Blue Vale Rd and the Whitehaven CHPP without the need to travel along, and turn across the Kamilaroi Highway.

The proposed private haul road and Kamilaroi Highway overpass would be constructed prior to the cumulative road haulage of ROM coal along the Whitehaven route.

During construction of the infrastructure there is potential for short-term delays to traffic travelling along Kamilaroi highway and Blue Vale Road. These delays would be due to a temporary decrease in speed limits to ensure safety to the public and construction workforce, and due to temporary road closures while the overpass is constructed.

Mine Infrastructure Area

Light and delivery vehicles would access the MIA via a new access road connecting the existing Shannon Harbour Road with the Blue Vale Road realignment. Coal haulage trucks would have a dedicated MIA access road constructed off the blue Vale Road realignment, to the south of Shannon Harbour Road. This would remove potential interaction between the coal haulage trucks and light vehicles accessing the MIA.

Proposed Road Realignments and New Intersections

The Project open cut would require the realignment of sections of Blue Vale Road, Hoad Lane and Shannon Harbour road, to the east and south of the open cut, to provide for continued public road accessibility around the southern and eastern extents of the project. A small realignment of the southern section of Braymont Road would be required to allow the open cut to reach its full extent.

Two new intersections would be constructed between the MIA Access Road, the coal haulage truck MIA access road and the Blue Vale Road realignment. The intersections would be three way intersections with the Blue Vale Road realignment having right of way. Acceleration and deceleration lanes would be provided for vehicles turning in and out of the MIA.

The new sections of road and intersections would be designed and constructed to the same standard as the exiting sealed roads, in accordance with the RTA's Road Design Guide.

The proposed Blue Vale Road realignment would add an extra 5km of travel distance for vehicles travelling north-south/south-north along blue Vale Road. This would add approximately 3 to 4 minutes of typical travel time.

It is anticipated that this increase in travel time would primarily affect local land owners in the general vicinity of the Project travelling between their properties and either Gunnedah or Boggabri, school buses operating along Hoad Land and Blue Vale Road and the local mining workforce.

ROM Coal Road Transport Route Intersections with Kamilaroi Highway

The Whitehaven haul route intersects with the Kamilaroi highway at the Whitehaven CHPP access road and the intersection with Blue Vale Road. The two intersections with the Kamilaroi Highway being the road priority.

The intersections are both constructed to a good standard, with deceleration and acceleration lanes to accommodate the slower moving coal trucks. The construction of the private haul road and Kamilaroi highway overpass would mean that coal trucks would no longer use these intersections. They would however continue to be used by other traffic entering the Whitehaven CHPP and/or using Blue Vale Road. No upgrades to these intersections are required as a result of the Project.

Visual Amenity

A Visual Assessment for the Project was undertaken by consultants Urbis.

The major aspects of the Project considered to have the potential to impact on the visual landscape include:

- Modification of topographic features including:
- Development of the open cut;
- Development of the external eastern rock emplacements on either side of the open cut;
- Construction of flood and noise control earth bunds;
- Construction of the water diversion drains and storages; and
- Development of the MIA and associated ROM coal handling infrastructure.
- Realignment of sections of Blue Vale Road, Shannon Harbour Road, Hoad Lane and Braymont Road to the east and south of the Project;
- Construction and use of a private haul road and Kamilaroi Highway overpass between Blue Vale Road and the Whitehaven CHPP; and
- Use of lighting during night-time operations.

The external waste rock emplacements would be constructed to a maximum height of 375 m AHD, which would be up to approximately 100m above the existing ground level.

Dwellings

The high visual amenity of the “Mirrabinda No: 2” dwelling coupled with a moderate level of modification means a high level of visual impact is expected. However, with progressive and final rehabilitation the level of visual impact would reduce to low.

The moderate visual sensitivity of the ‘Bungalow Mirrabinda No: 1’ and Mirrabinda No: 3’ dwellings coupled with a moderate to high visual modification levels means a medium to high potential visual impact would be expected. However with progressive and final rehabilitation the level of visual impact would reduce to low.

The moderate visual sensitivity of the ‘Silkdale’ and ‘Clinton’ dwellings coupled with a moderate visual modification level means a moderate visual impact would be expected.

However with progressive and final rehabilitation the level of visual impact would reduce to low and very low.

The moderate visual sensitivity coupled with the low to moderate visual modification level at the 'Brolga' and 'Coulston' (secondary) dwellings means a low to moderate level of visual impact. However again as the mine progressive and rehabilitation works are completed this impact will reduce to from low to very low.

The low visual sensitivity coupled with the low visual modification level at the 'Coulston' (primary) dwelling means a low level of visual impact would be experienced. Once rehabilitation of the waste emplacement has established, the level of visual impact is expected to be very low.

The very low visual sensitivity of the 'Braymont' dwelling coupled with a moderate to high level of modification, would result in a low level of visual impact which would reduce to very low following progressive and final rehabilitation of the Western Emplacement.

There are no privately-owned dwellings within the local setting of the Project (i.e. less than 1km from the planned mine disturbance area).

Night-Lighting

From most locations in the sub-regional and regional setting, direct view to the lighting sources would be obscured from view by vegetation within the landscape and around residences. Significantly the use of the pro-active noise management system would mean that the mine fleet would not operate on the external batters of the Western Emplacement between 6pm to 7am.

The nature and degree of night-lighting for the Project would be similar to the existing night-lighting at the Tarrawonga and Rocglen Coal Mines.

It is considered night lighting produced by the Project would not be visible from Siding Springs Observatory, which is located approximately 115 km to the south-west of the Project.

Aboriginal Heritage

An Aboriginal Cultural Heritage Assessment was undertaken for the Project by Landscape.

Direct Impacts

The Project would result in direct disturbance of 24 known Aboriginal heritage sites and the partial disturbance of eight sites. These sites are located within or partially within the footprint of the proposed open cut, waste emplacements, MIA and the private haul road and the Kamilaroi Highway overpass area and would therefore be subject to direct disturbance by the Project.

There would be no direct impacts to the axe grinding grooves as a result of the Project.

Potential Indirect Impacts

Open artefact scatters and isolated artefacts are not considered to be particularly sensitive to potential indirect impact and the potential indirect impacts on these sites would be limited.

Consultants have undertaken a blasting assessment for the Project and have concluded that blasting impacts to the axe grinding grooves would be negligible.

Mitigation, management and monitoring measures have been developed in consultation with the registered Aboriginal stakeholders and in consideration of the cultural and archaeological significance of the Aboriginal heritage sites to be impacted.

A Heritage Management Plan will be developed in consultation with the Aboriginal community and OEH. The Heritage Management Plan would be developed prior to any works which would harm Aboriginal cultural heritage sites in the Project area.

Non Aboriginal Heritage

A Non-Aboriginal Heritage Assessment for the Project was undertaken by Dr Michael Person of Heritage Management Consultants.

Heritage Management Consultants completed its historical and archival research and review of heritage registers prior to the surveying of the Project area. No items of state or regional non-Aboriginal heritage significance were identified in the vicinity of the Project.

One item identified approximately 2km west of the Project (i.e. Broadwater Homestead Complex) was assessed as being of local significance.

The Broadwater Homestead Complex is of local significance as it contains a number of well-maintained buildings that reflect rural settlement of the local area in the late 19th and early 20th centuries.

The Broadwater Homestead Complex would not be directly impacted by the Project and potential impacts from blasting induced vibration are expected to be negligible.

Project Justification

The Project objective is the development and operation of an open cut mine and associated infrastructure, for a period of approximately 30 years.

At full development, the workforce would be approximately 250 full time on-site operational personnel, plus additional contract personnel. An additional construction workforce of up to approximately 60 people would also be required.

The Project would include the implementation of mitigation measures, and management strategies to minimise potential impacts on the environment and community.

The Socio-Economic Assessment indicates that operation of the Project is likely to result in an average annual stimulus of up to approximately 423 direct and indirect jobs in the local region, and some 2 292 direct and indirect jobs in NSW. The Project would also make contributions to regional and NSW output or business turnover and house income.

The Benefit Cost Analysis indicates that a net benefit of between \$912M and \$1 056M would be forgone if the Project was not implemented.

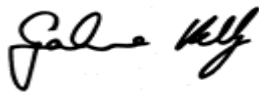
The Project would involve the production of up to 4.5 Mtpa of ROM coal over a mine life of 30 years. The Project would produce a combination of thermal and semi-soft coking coal that would be sold domestically or exported for electricity generation and steel production overseas.

Project coal production would contribute to NSW export income, royalties and State and Commonwealth tax revenue, as well as contributing to manufacturing and electricity supply in countries that purchase Project coal. The Project would also provide a reliable supply of coal for a number of manufacturing and other commercial industries in Australia.

In Summation

Based on the assessment of environmental and socio-economic considerations which has been multi-disciplinary, the Vickery Coal Mine Project is anticipated to pose negligible additional environmental impacts when assessed cumulative with other neighbouring operations.

The Union considers that on balance, the Vickery Coal Project is consistent with the objectives of the EP&A Act, and therefore supports the proponent's application and the consent be granted in the form proposed by the Proponent.

A handwritten signature in black ink, appearing to read 'Grahame Kelly', is positioned above the printed name.

Grahame Kelly

DISTRICT SECRETARY