



APPENDIX E REVISED ENVIRONMENTAL RISK ASSESSMENT

MT ARTHUR COAL CONSOLIDATION PROJECT ENVIRONMENTAL RISK ASSESSMENT

for
Hunter Valley Energy Coal Pty Ltd

Issue	Aspect	Impact	Preliminary Risk Assessment			Proposed Control Measures	Revised Risk Assessment		
			C	L	R		C	L	R
Air Quality	Vegetation clearing, drilling and topsoil stripping	Wind blown dust and machinery exhaust fumes contributing to elevated dust levels	3	C	H	- Disturb only the minimum area necessary for mining. Reshape, topsoil and rehabilitate completed overburden emplacement areas as soon as practicable after the completion of overburden placement. - Maintain coal-handling areas in a moist condition using water carts to minimise wind blown and traffic generated dust. - Maintain water sprays on coal stockpiles to reduce emissions of dust. - All major roads and trafficked areas will be treated with a chemical solution to minimise the generation of dust. - All haul roads will have edges clearly defined with marker posts or equivalent to control their locations, especially when crossing large overburden emplacement areas. - Any obsolete roads will be ripped and re-vegetated.	3	C	H
	Overburden emplacement		3	C	H				
	Uncovering of coal		2	E	H				
	Coal, rejects and overburden haulage		3	C	H				
	Coal processing and transport		3	C	H				
	CHPP operation and stockpiles		3	C	H				

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						• Development of minor roads will be limited and the locations of these will be clearly defined and road well watered. • Access tracks used by topsoil stripping scrapers during their loading and unloading cycle will be watered. Topsoil stripping will not occur in dry dusty conditions. • Long term topsoil stockpiles, not used for over 6 months will be re-vegetated. • Dust aprons on drill rigs will be lowered during drilling. • Drills will be equipped with dust extraction cyclones, or water injection systems. • Water injection or dust suppression sprays will be used when high levels of dust are being generated. • Adequate angular rock stemming will be used at all times. • Automatic sprays, or other dust control mechanisms will be used when tipping raw coal that generates excessive dust quantities. • All spillage of material will be cleaned up to prevent dust.			

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						- Water sprays are/will be fitted at all transfer points. - Dust control measures will continue to be implemented in accordance with the existing Mt Arthur Coal Dust Management Plan. Dust management at Mt Arthur Coal involves the integration of operational procedures, alarming systems and an extensive monitoring network. Additional operational commitments in relation to dust control will be required to be applied to the Project to ensure monitored levels at adjacent private property remain within acceptable criteria.			
	Combustion of diesel fuel	Greenhouse gas emissions	2	E	H	The air quality impact assessment will assess greenhouse gas Scope 1, 2 and 3 emissions in accordance with the Department of Climate Change <i>National Greenhouse Accounts Factors</i> (DCC, 2008). Mt Arthur Coal will continue to manage and minimise Greenhouse Gas emissions where possible, in accordance with the EMS and will also continue to support, through the Coal21 Project and other industry and Government initiatives, the development of clean coal technologies.	2	E	H
	Electricity use		2	E	H				
	Downstream Impacts from the Burning of Coal		2	E	H				

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	Spontaneous combustion	Heating, vegetation scalding, emissions to air, odours	2	B	L	The air quality impact assessment will include a spontaneous combustion impact assessment. Spontaneous combustion will be managed in accordance with the approved Management Plan. Regular monitoring of areas subject to spontaneous combustion will continue to be undertaken.	2	B	L
	Blasting	Greenhouse gas emissions, fume and dust Generation	3	C	H	Appropriate blasting controls will continue to be applied to the Project, such as restricting blast events in sensitive areas and during unfavourable weather conditions to minimise impacts.	2	C	M
Acoustics	Coal, rejects and overburden haulage	Excessive Noise generation	2	C	M	The approved Noise Management Plan will continue to be applied to the Project. Management controls include a range of mine planning, operational and engineering measures, real-time monitoring and alarm systems, which will continue to be applied to the Project.	1	C	M
	Plant and equipment working in-pit and on overburden dumps		2	C	M				
	Train movements on rail loop and spur		2	C	M				
	CHPP operation and stockpiles		2	C	M				
	Coal loading at rail loop		2	C	M				
	Increased traffic movements		1	D	M				

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	Blasting	Overpressure and ground vibration impacts at near neighbours and heritage properties	2	D	H	An acoustical impact assessment (including noise and blasting) has been conducted for the Project by Wilkinson Murray. Blasting will continue to be conducted and managed in accordance with the approved Blasting Management Plan and EMS. Additional mitigation measures will be developed for blasting adjacent sensitive receivers and heritage properties, as required.	1	D	M
Change in landscape	Overburden stockpile dumps	Visual	2	E	H	A Visual Impact Assessment has been completed for the Project by Integral Landscape Architecture and Visual Planning, which will assess the visual impacts of the Project and identify mitigation and management measures, as appropriate. Mt Arthur Coal will maintain the visual bund constructed to screen views of the mining operation from South Muswellbrook. Management plans for lighting and landscaping that specify the control measures to reduce the visibility of the operation off-site will also continue to be applied to the Project.	1	E	H
	Exposed earthworks		2	E	H		1	E	H
	Lighting from mobile and fixed equipment		2	C	M		2	E	H

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Ecology	Vegetation clearing, drilling and topsoil stripping	Loss of biodiversity and disruption to threatened flora and fauna or habitats	2	E	H	- Development of a Compensatory Habitat Area of 717 Ha of Offset Area and 500 Ha regenerated woodland consisting of native endangered ecological communities, including Upper Hunter White Box – Ironbark Woodland, Hunter Floodplain Red Gum Woodland, Central Hunter Bullock Forest Regeneration; and extensive areas of Native Derived Grassland. - Mine rehabilitation areas will be replanted with local native plant species. - Ongoing ecological monitoring to provide feedback about the condition of vegetation at Mt Arthur Coal. - The Tiger Orchid will be translocated to a conservation area; nest boxes will be erected to make up for the loss of nest boxes within extension areas. - Pre-clearance surveys will be conducted within all patches of forest and woodland to be cleared and flora and fauna of conservation significance detected will be translocated into protected habitat.	1	E	H

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Cultural Heritage	Vegetation clearing, drilling and topsoil stripping	Disturbance of Aboriginal artefacts, sites or places of cultural significance	2	E	H	The Aboriginal Archaeology and Cultural Heritage Impact Assessment for the Project has been completed by ENSR Australia in accordance with the <i>Part 3A EP&A Act Guidelines for Cultural Heritage Impact Assessment & Community Consultation</i> (DECC, 2007).	2	C	M
Water Management	Topsoil stripping, haul roads, un-rehabilitated spoil	Dirty water runoff entering local waterways	2	C	M	Mt Arthur Coal will continue to manage surface water in accordance with the approved Water Management Plan which prescribes the system to effectively source, capture, divert, store, monitor, utilise and reticulate water on site.	2	C	M
	Coal Extraction and overburden removal	Additional groundwater inflow into pit	2	C	M	A Groundwater Impact Assessment has been conducted for the Project by Australasian Groundwater and Environmental Consultants utilising the finite-element simulation package (FEFLOW) to identify the impacts of the Project on groundwater (including alluvial aquifers and any surrounding private boreholes). Groundwater will continue to be monitored and is managed at Mt Arthur Coal in accordance with the approved Water Management Plan.	2	C	M
		Drawdown of aquifers on surrounding water users	2	C	M		2	B	L
		Cumulative impacts with surrounding users	2	B	L		1	D	M

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	Increase in production, coal processing and intensification of operations	Additional water demand for dust suppression and coal washing	1	D	M	A surface water assessment has been conducted for the Project by Gilbert & Associates. This will include the preparation of a water balance and identification of water demands and management requirements for the Project. Mt Arthur Coal will continue to manage surface water in accordance with the approved Water Management Plan which prescribes the system to effectively source, capture, divert, store, monitor, utilise and reticulate water on site.	1	C	L
	Water discharges into local waterways	Surface water contamination	1	C	L		1	B	L
		Contaminated water from wash down bays	1	B	L		3	C	H
Mine Rehabilitation	Topsoil Stripping and land preparation	Loss of productive topsoil	3	C	H	A Soils and Land Capability Impact Assessment has been completed for the Project by GSS Environmental. The assessment reviewed the soil types within the proposed mining areas, identify any soil materials with potentially adverse quality (e.g. acid sulphate generating) and identify the suitability of topsoils for use as topdressing material and identified mitigation and management measures for the Project.	3	C	H
		Deterioration of land capability	3	C	H		2	D	H
	Rehabilitation	Erosion	2	D	H	The proposed mine plan for the Project will allow the development of an undulating, free-draining and stable landform generally consistent with the surrounding environment.	1	B	L
		Invasion of weed species	1	B	L		1	B	L
		Invasion of feral animals	1	B	L		2	A	L

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	Final Landform	Acid Rock Drainage	2	A	L	Further planning and detail will be provided in the EA in regard to the revision of biodiversity corridors and final landform. Rehabilitation at Mt Arthur Coal is designed to be compatible with the surrounding landform, stable and able to support final land use(s). To ensure a stable final landform, the majority of overburden emplacement slopes are shaped to 10 degrees or less. Progressive rehabilitation at Mt Arthur Coal will continue to be undertaken in accordance with the approved Landscape and Revegetation Management Plan, focusing on utilising a mixture of improved pasture and grasses and native trees and shrubs. The long-term rehabilitation strategy will be revised for the Project. The development of biodiversity corridors and contributions to the <i>Synoptic Plan for Mine Rehabilitation in the Upper Hunter Valley</i> (DPI, 1999) will be revised for the Project.	2	B	L
		Unstable landform	2	B	L		2	B	L
		Poor drainage	2	B	L		2	C	M
		Erosion	2	C	M		1	C	M

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Traffic and Transport	Increased vehicle movements from employees, deliveries and train loading	Increased traffic movements	1	C	M	A Traffic and Transport Impact Assessment has been completed for the Project by Hansen Bailey in accordance with the RTA's <i>Guide to Traffic Generating Developments</i> (RTA, 2002). The assessment will review the capacity of the affected road network to cater for differing traffic volumes due to the proposed change in traffic flows. Road enhancements and mitigation measures will be identified as required. Noise impacts from traffic have been assessed in the acoustical impact assessment described above.	3	C	H
	Road Resolution	Socio-Economic	3	C	H		1	B	L
Waste	General waste management	Land contamination	1	B	L	Mt Arthur Coal's Total Waste Management (TWM) system provides detailed procedures to ensure the environmentally responsible disposal, tracking and reporting of all waste generated on site. The TWM system will continue to be applied to the Project and will be enhanced as required.	2	C	M
	Rejects management	Water contamination	2	C	M		2	B	L
	Sewage management	Water contamination	2	B	L		2	B	L
Hazardous materials	Storage and Handling	Soil and water contamination	2	B	L	All hazardous materials will continue to be managed in accordance with the ISO14001 EMS. It is not anticipated that large and additional quantities of hazardous materials will be required for the Project.	2	B	L

BHP Billiton HSEC Risk Assessment Tools

Quantitative Risk Assessment Matrix

Likelihood or Frequency	Consequence Severity				
	Low (1)	Minor (2)	Moderate (3)	Major (4)	Critical (5)
E – Almost Certain	High	High	Extreme	Extreme	Extreme
D – Likely	Moderate	High	High	Extreme	Extreme
C – Possible	Low	Moderate	High	Extreme	Extreme
B – Unlikely	Low	Low	Moderate	High	Extreme
A – Rare	Low	Low	Moderate	High	High

Consequence Table

Severity Level	Natural Environment	Social/Cultural Heritage	Community/Govt/ Reputation/Media
1	Limited damage to minimal area of low significance.	Low-level repairable damage to commonplace structures.	Public concern restricted to local complaints.
2	Minor effects on biological or physical environment.	Minor medium-term social impacts on local population. Minor damage to structures/ items of some significance. Mostly repairable.	Minor, adverse local public or media attention and complaints.
3	Moderate, short-term effects but not affecting ecosystem functions.	Ongoing social issues. Permanent damage to items of cultural significance.	Attention from media and/or heightened concern by local community. Criticism by NGOs.
4	Serious medium term environmental effects.	On-going serious social issues. Significant damage to structures/items of cultural significance.	Significant adverse national media/public/NGO attention.
5	Very serious, long term environmental impairment of ecosystem function.	Very serious, widespread social impacts. Irreparable damage to highly valued items.	Serious public or media outcry (international coverage).

Likelihood Table

A - Almost Certain	Occurs 1 or more times a year
B - Likely	Occurs once every 1-10 years
C - Possible	Occurs once every 10-100 years
D - Unlikely	Occurs once every 100-1000 years
E - Rare	Occurs once every 1000-10000 years