APPENDIX E

Revised Environmental Risk Assessment

COALPAC CONSOLIDATION PROJECT
REVISED ENVIRONMENTAL RISK ASSESSMENT

Issue	Aspect	Impact	Preliminary Risk Assessment			Proposed Control Measures	Revised Risk Assessment		
			C	L	R		C	L	R
Subsidence	Coal Extraction associated highwall mining	Subsidence	3	A	6 (H)	Geonet Consulting Group has undertaken an Assessment of Stability and Subsidence for the Project. The report concluded that the total subsidence induced by highwall mining associated with the Project was predicted to be within the relevant criteria and less than 20 mm. In addition, a peer review of the assessment was conducted by Boyd Mining that concurred with the modelling and findings of the Geonet assessment. Coalpac will prepare a detailed MREMP for the Project in consultation with DTIRIS-MR and to the satisfaction of DP&I which will contain specific design reports and scheduling for each area prior to mining and geotechnical assessment of the highwall stability.	3	E	20(L)
Air Quality	Vegetation clearing, drilling and topsoil stripping	Wind blown dust and machinery exhaust fumes contributing to elevated air quality impacts	3	A	6 (H)	An Air Quality Impact Assessment was undertaken for the Project by PAE Holmes in accordance with the *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales* (DEC, 2001) to predict the likely impacts of the Project. Coalpac will continue to implement air quality control measures for existing operations and will develop a comprehensive Air Quality Monitoring Program for the Project. This Air Quality Monitoring Program will provide a framework to manage monitoring, assessment and mitigation of air quality impacts on the local community.	3	D	17(M)
	Overburden emplacement		3	A	6 (H)		3	D	17(M)
	Uncovering of coal		3	A	6 (H)		3	D	17(M)
	ROM coal, rejects and overburden haulage		3	A	6 (H)		3	D	17(M)

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			C	L	R		C	L	R
	Coal processing and stockpiling		3	C	13 (S)	Management techniques for managing air quality impacts of the Project will include utilisation of a real time air quality monitoring system to proactively manage operations, minimising disturbance areas, minimising overburden and ROM coal haulage distances, utilising largest possible haul truck size, water cart deployment, enforce speed limits, extensive dust suppression on haul roads and heavily trafficked areas, progressive rehabilitation and maintenance, managing spontaneous combustion, and efficient dumping and tipping.	3	E	20 (L)
	Construction activities		3	C	13 (S)		3	D	17(M)
	Product coal transport		4	C	18 (M)		4	D	21(L)
	Blasting	Fume and dust Generation	3	C	13 (S)		3	D	17(M)
Greenhouse	Combustion of diesel fuel in equipment	Greenhouse gas emissions	4	C	18 (M)	The Air Quality Impact Assessment was undertaken for the Project by PAE Holmes which included a greenhouse gas assessment. The assessment included the analysis of greenhouse gas Scope 1, 2 and 3 emissions in accordance with the Australian Greenhouse Office's (AGO) *'Factors and Methods Workbook*'. Coalpac will implement all reasonable and feasible measures to minimise greenhouse gas emissions, where possible and will include the ongoing review and improvement of energy efficiencies, minimising haul routes, consideration of alternative fuels where viable, efficient scheduling and minimising double handling and the development and implementation of greenhouse reduction targets.	4	C	18(M)
	Electricity usage		4	C	18 (M)		4	C	18(M)
	Downstream Impacts from combustion of product coal		4	A	10 (S)		4	C	18(M)

Issue	Aspect	Impact	Preliminary Risk Assessment			Proposed Control Measures	Revised Risk Assessment		
			C	L	R		C	L	R
Historical Subsurface Heating	Spontaneous combustion	Subsurface heating from historical areas, vegetation impacts, emissions to air, odours	4	B	14 (S)	An Air Quality Impact Assessment was undertaken for the Project by PAE Holmes which included an assessment of historical heating at Coalpac. The assessment noted that localised areas within the Project Boundary (in the vicinity of the existing Cullen Valley Mine) will continue to be prone to heating resulting in odour and some impact to rehabilitation within this area. Coalpac will retain the Heating Response Plan for Cullen Valley Mine for the Project, with any modifications required to be made in consultation with DTIRIS-MR and to the satisfaction of DP&I.	4	C	18(L)
Noise & Blasting	ROM coal, rejects and overburden haulage	Excessive noise generation	2	C	8 (H)	An Acoustic impact assessment (incorporating the consideration of noise and blasting issues) was completed for the Project by Bridges Acoustics in accordance with the *Industrial Noise Policy* (EPA, 2000). The assessment identified the potential noise impacts of the Project including those associated infrastructure and traffic noise. Cumulative noise impacts with surrounding mining operations and industry were also considered by the assessment. Coalpac will develop and implement an Environmental Monitoring Program which will consider noise monitoring required for the Project. This Monitoring Program will provide a framework to manage the monitoring, assessment and mitigation of noise and blasting impacts on any surrounding private receivers and other sensitive locations.	2	E	16(M)
	Plant and equipment working in-pit and on overburden dumps		2	C	8 (H)		2	E	16(M)
	ICPP and ETCPP operation and coal stockpiling		4	C	18 (M)		4	D	21(L)
	Truck transport of product coal by road and rail		4	B	14 (S)		4	D	21(L)

Issue	Aspect	Impact	Preliminary Risk Assessment			Proposed Control Measures	Revised Risk Assessment		
			C	L	R		C	L	R
	Traffic movements		5	B	19 (M)	Management controls included incorporating noise mitigation measures such as bunds in the mine planning process for key areas, operational and engineering methods for Project equipment and infrastructure and real-time monitoring and response systems. These management measures will be included in a Noise Management Plan to be developed for the Project.	5	D	24(L)
	Blasting	Overpressure and ground vibration impacts at Cullen Bullen township, other near neighbours and heritage sites	3	C	13 (S)	The Acoustic Impact Assessment has confirmed that there is some potential for impacts to sensitive receivers and locations as a result of the Project, including sites of Aboriginal and Non-Aboriginal heritage significance. In order to manage the impacts predicted for the Project, a further geotechnical review of sensitive sites was undertaken by SCT Operations to determine appropriate blast impact criteria and confirm appropriate management and monitoring responses for these locations. These measures will be included in the Noise Management Plan and Environmental Monitoring Program to be developed for the Project, to the satisfaction of DP&I.	3	D	17(M)
Visual	Views to exposed earthworks and equipment	Visual Impacts	4	A	10 (S)	A Visual Impact Assessment was completed for the Project by Integral Landscape Architecture and Visual Planning to assess the potential visual impacts of the Project and identify appropriate mitigation and management measures.	4	C	18(M)
	Overburden emplacement areas		4	A	10 (S)		4	C	18(M)

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			C	L	R		C	L	R
	Lighting effects from mobile and fixed equipment		4	C	18 (M)	Management commitments include retaining existing vegetation and establishing rehabilitated bunds to screen key sensitive areas around the Project Boundary in advance of mining operations, the cladding of infrastructure in natural tones, and implementing measures to direct lighting away from sensitive receptors. Coalpac will implementation of a consolidated Rehabilitation and Landscape Management Plan for the Project that will consider specific impact mitigation strategies for sensitive viewing locations and the management of site lighting impacts.	4	D	21(L)
	Views to mine infrastructure areas		4	C	18 (M)		4	D	21(L)
Water Management	Topsoil stripping, haul roads, overburden emplacement	Mine water runoff entering local waterways	4	B	9 (H)	A Groundwater Impact Assessment was conducted for the Project by Australasian Groundwater and Environmental Consultants to identify the impacts of the Project on groundwater (including aquifers and any surrounding private boreholes). Coalpac will develop a consolidated Site Water Management Plan in consultation with the relevant Government departments and to the satisfaction of DP&I. The Site Water Management Plan will identify a management measures including the location of additional groundwater monitoring bores and the reinstatement of groundwater bores proposed to be disturbed by the Project, regular groundwater monitoring including annual reviewing to identify potential trends or adverse impacts and the implementation of an appropriate method for calculating groundwater seepage rates into open cut mining areas for the Project.	4	D	21(L)
	Coal and sandstone extraction, overburden removal	Additional groundwater inflow into pit	4	C	18 (M)		4	D	21(L)
		Interactions and impacts on groundwater levels in historical underground workings	3	C	13 (S)		3	D	17(M)
		Drawdown of aquifers for surrounding water users	4	C	18 (M)		4	D	21(L)
	Coal processing and extension of operational areas	Additional water demand for dust suppression and coal washing	5	B	19 (M)		5	C	22(L)

Issue	Aspect	Impact	Preliminary Risk Assessment			Proposed Control Measures	Revised Risk Assessment		
			C	L	R		C	L	R
	Water discharges into local waterways	Surface water contamination	3	C	13 (S)	A Surface Water Impact Assessment was conducted for the Project by WRM Water & Environment to assess the consolidation of the two operations for the Project, including the preparation of a water balance for key years and identification of water demands and additional management requirements for the mining operations proposed for the Project. Coalpac will mitigate the potential impacts of the Project on surface water resources through the implementation of an integrated Site Water Management System, to control the flow and storage of water of varying qualities across the site; development of a consolidated Erosion and Sediment Control Plan to manage and reduce potential sediment loads from disturbed areas; and the development of a Surface Water Monitoring Program to ensure that the Site Water Management System is meeting its objective of not creating adverse impacts on receiving waters to the approval of DP&I.	3	E	20(L)
		Contaminated water from wash down bays, water management structures	3	C	13 (S)		3	E	20(L)
Geochemistry	Coal and sandstone processing, overburden and rejects emplacement, soil stockpiling	Potential for acid and saline drainage, metal leaching and spontaneous combustion	3	C	13 (S)	A Geochemical Impact Assessment was prepared by RGS Environmental Pty Ltd for the Project to assess the potential impacts associated with the processing of coal and overburden emplacement. While the assessment determined that it is considered unlikely that reject and tailings materials will adversely impact upon local and regional water quality, Coalpac will implement and range of measures to ensure that these materials are appropriately managed.	3	E	20(L)

Issue	Aspect	Impact	Preliminary Risk Assessment			Proposed Control Measures	Revised Risk Assessment		
			C	L	R		C	L	R
Archaeology & Cultural Heritage	Vegetation clearing, drilling, blasting and topsoil stripping	Disturbance of Aboriginal artefacts, sites or places of cultural heritage significance	3	C	13 (S)	The Aboriginal Archaeology and Cultural Heritage Impact Assessment for the Project was conducted by AECOM in accordance with the *National Parks & Wildlife Act 1974* and in consultation with the Aboriginal Community in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010). Coalpac will develop an Aboriginal Archaeology and Cultural Heritage Management Plan for all sites of heritage significance identified, in consultation with Aboriginal community stakeholders and OEH to the approval of DP&I. The AHMP will be guided by specific policies and procedures to manage Aboriginal archaeological sites within the Project Boundary.	3	D	17(M)
Non Indigenous Heritage	Vegetation clearing, drilling, blasting and topsoil stripping	Disturbance of Non Indigenous Heritage sites	4	B	18 (M)	AECOM has completed a Non-Indigenous Heritage Assessment in accordance with the NSW Heritage Office guidelines for heritage impact studies (NSW Heritage Office, 2001) and the *NSW Heritage Office's NSW Heritage Manual*. Coalpac will develop an Archaeological Management Plan for the Project in consultation with the relevant authorities and to the satisfaction of DP&I. The AMP will include, but not be limited to, a photographic and archival recording of sites predicted to be impacted for the Project, provision of a Statement of Heritage Impact along with archival recording to establish a baseline for the ongoing monitoring of sites with the potential for indirect impacts.	4	D	21(L))

Issue	Aspect	Impact	Preliminary Risk Assessment			Proposed Control Measures	Revised Risk Assessment		
			C	L	R		C	L	R
Ecology	Vegetation clearing, drilling and topsoil stripping	Loss of biodiversity and disturbance to threatened flora and fauna species or communities	3	A	6 (H)	An Ecological Impact Assessment has been completed for the Project in accordance with the DECC *Draft Guidelines for Threatened Species Assessment* (DEC, 2005). The assessment has identified the potential impact of the Project on flora and fauna (including Federally and NSW listed threatened species and vegetation communities). To limit the impact on ecological values a number of management and mitigation measures have been identified and include: • Revisions of the Project mine plan to reduce the potential for adverse impacts to the environment, including specific impacts on Threatened communities (Box Gum Woodland) and flora and fauna species habitat (particularly for the Capertee Stringybark and Clandulla Geebung); • Development of a comprehensive Biodiversity Offset Strategy that compensates impacts caused by the Project, comprising of native vegetation including areas of Box Gum Woodland; • Prepare a Biodiversity Management Plan that will include a flora and fauna monitoring program and management procedures such as an updated Land Disturbance Protocol; • Progressively rehabilitate mined areas, consistent with existing Coalpac operations; and • Protection and enhancement of existing and regeneration habitat areas.	3	D	17(M)
Traffic and Transport	Product coal haulage via public roads	Increased road traffic movements for the	4	C	18 (M)	A Traffic and Transport Impact Assessment was undertaken for the Project by Hyder Consulting in accordance with the RTA's *Guide to Traffic*	4	D	21(L)

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			C	L	R		C	L	R
	Increased vehicle movements from employees, deliveries	Project	5	C	22 (L)	*Generating Developments 2002*. The assessment reviewed the existing status of the road network used for product coal haulage and assessed the capacity of key roads and intersections to safely and efficiently process the proposed truck movements for the Project. Results from the assessment identified that the Project will not have any significant road and rail traffic and transport impacts from those currently approved, generally resulting in a overall decrease in traffic movements. Coalpac will develop a Traffic and Transport Management Plan in consultation with the relevant authorities and to the satisfaction of DP&I.	5	D	24(L)
	Increased train movements from operation of proposed rail loop	Increased road traffic movements for the Project	4	C	21 (L)		5	D	24(L)
Bushfire	Mining within the Ben Bullen State Forest	Loss of habitat, public and private property	3	C	13 (S)	Coalpac manages bushfires and potential bushfire hazards in accordance with the *Rural Fires Act 1999* and regulated by the NSW Rural Fire Service. Fire controls and emergency systems in place for existing operations are implemented in accordance with the *Coal Mine Health and Safety Act 2002* and the approved onsite management plans. Coalpac will review and consolidate its management procedures for the Project in consultation with relevant regulators to the satisfaction of DP&I.	3	D	17(M)
Mine Rehabilitation	Topsoil stripping and land preparation	Loss of productive topsoil	3	C	13 (S)	A Soils and Land Capability Impact Assessment was completed for the Project by Ecobiological to further define the soil landscapes within the Project Boundary. This assessment included mapping of the soil types, land capability and agricultural suitability within the Project Boundary, identification of soil material of adverse quality and the identification of suitable material for topdressing on rehabilitation. Topsoil materials will be placed directly on shaped spoil or stockpiled for later use on rehabilitation.	3	E	20(L)
		Deterioration of land capability	3	C	13 (S)		3	E	20(L)
	Rehabilitation	Erosion	4	C	18 (M)	The mine plan for the Project has been designed to allow the development	4	D	21(L)

Issue	Aspect	Impact	Preliminary Risk Assessment			Proposed Control Measures	Revised Risk Assessment		
			C	L	R		C	L	R
	Management	Invasion of weed species	5	C	22 (L)	of an undulating, free-draining and stable post-landform generally consistent with the surrounding environment. Coalpac will develop a Rehabilitation and Landscape Management Plan for the Project in consultation with the relevant authorities and to the satisfaction to DP&I. This document will include procedures for the annual review of rehabilitation performance over the life of the Project. Rehabilitation planning for the Project will be undertaken progressively to ensure the total area of disturbance at any one time is minimised so as to reduce the potential for wind-blown dust, visual impacts and increased sediment-laden runoff. Rehabilitation will be 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 the final overburden emplacement slopes will generally be shaped to 18 degrees or less. A Mine Closure Plan will be prepared within five years of closure and this document shall reflect contemporary expectations including any changes to the final mine plan, regulatory requirements and guidelines, new rehabilitation technologies and stakeholder expectations.	5	D	24(L)
		Invasion of feral animals	5	C	22 (L)		5	D	24(L)
		Landform stability and sustainability	4	C	18 (M)		4	D	21(L)
		Modified drainage flows	4	D	21 (L)		4	D	21(L)
Waste	Rejects, tailings and sand residues management	Water contamination	4	C	18 (M)	Coalpac will enhance and consolidate its Waste Management System as required for the Project, within the provisions of the *Waste Avoidance and Resource Recovery Act 2001* and the POEO Act to monitor, remove, track and report wastes for the Project to reflect the additional workforce and operational areas.	4	D	21(L)
	Sewage management	Water contamination	4	D	21 (L)		4	E	23(L)

Issue	Aspect	Impact	Preliminary Risk Assessment			Proposed Control Measures	Revised Risk Assessment		
			C	L	R		C	L	R
	General waste management	Land contamination	5	D	24 (L)		5	D	24(L)
Hazardous materials	Storage and Handling	Soil and water contamination	4	D	21 (L)	Hansen Bailey has completed a hazards assessment in accordance with *SEPP 33 – Hazardous and Offensive Development Application Guidelines* (DUAP, 1994), and the *Hazardous Industry Planning Advisory Paper No 6 – Hazard Analysis* (DP&I, 2011). The assessment determined that the Project would not be a potentially hazardous or offensive industry and as such would not require a detailed Preliminary Hazard Analysis to be undertaken. Coalpac will utilise the consolidated EMS and OH&S procedures to manage the risks associated with the transportation and storage of hazardous materials for the Project.	4	D	21(L)
	Transportation	Transport of materials to and within Project Boundary	4	D	21 (L)		4	E	23(L)

COAPLAC CONSOLIDATION PROJECT
Risk Assessment Tools
Matrix for Determining Level of Risk

Rating	Safety	Note: Consequence may consist of a single event or may represent a cumulative impact over a period of 12 months				A - Certain	B - Probable	C - Possible	D - Remote	E - Improbable
		Material Breakdown/ Machinery Breakdown	Business Interruption	Environment	Reputation	Will occur – common or frequent occurrence	Likely to occur	Could occur	Unlikely to occur	Practically impossible to occur
1 - Catastrophic	Multiple Fatalities	> $5.0m	> 3 month	Massive leak/spill	International Impact	1 (E)	3 (E)	5 (H)	7 (H)	11 (S)
2 - Major	Fatality	$1.0m to $5.0m	1 month to 3 months	Major leak/spill	National Impact	2 (E)	4 (E)	8 (H)	12 (S)	16 (M)
3 - Moderate	Serious Bodily Injury	$0.1m to $1.0m	1 week to 1 month	Localised leak/spill	Regional Public Impact	6 (H)	9 (H)	13 (S)	17 (M)	20 (L)
4 - Minor	Lost Time Injury	$10,000 to $0.1m	1 day to 1 week	Minor leak/spill	Some Public Concern	10 (S)	14 (S)	18 (M)	21 (L)	23 (L)
5 - Insignificant	First Aid	Up to $10,000	Up to 1 day	Slight leak/spill	No Public Concern	15 (S)	19 (M)	22 (L)	24 (L)	25 (L)

Risk Matrix Result	Risk Rating		Rating Definitions
1 to 4	1	Extreme Risk	Immediate intervention required from senior management to eliminate or reduce this risk
5 to 9	2	High Risk	Imperative to eliminate or reduce risk to a lower level by the introduction of control measures. Management planning required at senior levels
10 to 15	3	Significant Risk	Corrective action required, senior management attention needed
16 to 19	4	Moderate Risk	Corrective action to be determined, management responsibility must be specified
20 to 25	5	Low Risk	Corrective action where practicable, manage by routine procedures