

Mt Arthur Coal



p r o p o s e d

Mt Arthur

UNDERGROUND PROJECT



Volume 2

Appendices 4-6



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Appendix 4



Environmental Risk Analysis

Appendix 4 - Mt Arthur Underground Project Environmental Risk Analysis

Activity	Aspect	Potential Impact	Preliminary Risk Rating ¹			Impact Assessment Findings & Proposed Controls (EA Section Reference)	Revised Risk Rating		
			C	L	R		C	L	R
CONSTRUCTION PHASE									
Construction of general surface facilities (incl. roads, infrastructure etc) & CHPP upgrade	European Heritage	Disturbance of sites of European heritage significance.	2	C	M	Section 5.4	1	A	L
	Ecology	Loss of native flora and fauna.	2	C	M	Section 5.3	2	B	L
	Cultural Heritage	Disturbance of Aboriginal places or objects.	3	C	H	Section 5.4	3	C	H
	Erosion and Sediment Runoff	Sedimentation of local waterways.	1	A	L	Section 5.5	1	A	L
	Clean Water Management	Contamination of clean water.	1	A	L	Section 5.5	1	A	L
	Dust Generation	Degradation of air quality.	2	B	L	Section 5.7	2	B	L
	Noise Generation	Degradation of noise amenity (cumulative).	2	B	L	Section 5.6	2	B	L
	Visual Amenity	Aesthetics of exposed earthworks and construction works.	1	B	L	Section 5.9	1	B	L
	Land Capability and Agricultural Suitability	Loss/deterioration of land capability and agricultural suitability.	1	A	L	Section 5.10	1	A	L
	Soils	Loss of productive topsoil.	1	B	L	Section 5.5	1	B	L
	Traffic	Supply of materials for construction project resulting in increased traffic.	2	C	M	Section 5.11	2	B	L

¹ Umwelt, 2006, Mt Arthur Coal Underground Project Preliminary Environmental Assessment

Activity	Aspect	Potential Impact	Preliminary Risk Rating ¹			Impact Assessment Findings & Proposed Controls (EA Section Reference)	Revised Risk Rating		
			C	L	R		C	L	R
MINE SURFACE FACILTIES & SERVICES (OFFICE, WORKSHOP, BATHHOUSE, ROADS ETC)									
Operation of surface facilities	Erosion and Sediment Runoff	Sedimentation of local waterways.	1	A	L	Section 5.5	1	A	L
	Clean Water Management	Contamination of clean water.	1	A	L	Section 5.5	1	A	L
	Dirty Water Management	Contamination of clean water.	1	B	L	Section 5.5	1	B	L
	Surface Water Flows	Flooding.	2	C	M	Section 5.5	2	B	L
	Dust Generation	Degradation of air quality.	2	B	L	Section 5.7	2	B	L
	Noise Generation	Degradation of noise amenity (cumulative).	2	B	L	Section 5.6	2	B	L
	Visual Amenity	Aesthetics of mine surface facilities.	1	C	L	Section 5.9	1	A	L
	Energy Use	Emission of greenhouse gas emissions.	3	B	M	Section 5.8	2	B	L
	Water Demand	Water demand for dust suppression etc.	2	C	M	Section 5.5	2	C	M
MINING									
Surface Drilling (including access tracks etc)	European Heritage	Disturbance of sites of European heritage significance.	2	B	L	Section 5.4	1	A	L
	Ecology	Loss of native flora and fauna.	2	C	M	Section 5.3	2	B	L
	Cultural Heritage	Disturbance of Aboriginal places or objects.	3	C	H	Section 5.4	3	B	M
	Erosion and Sediment Runoff	Sedimentation of local waterways.	1	A	L	Section 5.5	1	A	L
	Dust Generation Noise Generation	Degradation of air quality. Degradation of noise amenity (cumulative).	1	B	L	Sections 5.6 & 5.7	1	B	L

Activity	Aspect	Potential Impact	Preliminary Risk Rating ¹			Impact Assessment Findings & Proposed Controls (EA Section Reference)	Revised Risk Rating		
			C	L	R		C	L	R
	Land Use and Agricultural Productivity	Impact on land use, land capability and agricultural suitability.	1	C	L	Section 5.5	1	B	L
Underground Mining	Water Demand	Water demand for mining equipment.	2	C	M	Section 5.5	2	C	M
	Energy Use	Emission of greenhouse gas emissions.	3	B	M	Section 5.8	2	B	L
	Gas Drainage and Venting of Mine Air	Emission of greenhouse gas emissions.	3	B	M	Section 5.8	3	B	M
	Dewatering	Degradation of natural groundwater flow and quality.	3	B	M	Section 5.5	3	B	M
	Mine Closure	Inadequate mine closure leaving post mining liability.	3	B	M	Section 5.10	1	A	L
Subsidence and subsidence remediation works	European Heritage	Disturbance of sites of European heritage significance.	3	C	H	Sections 5.4 & 5.2	2	B	L
	Ecology	Loss of native flora and fauna. Aquatic habitat.	3	C	H	Sections 5.3 & 5.2	3	B	M
	Cultural Heritage	Disturbance of Aboriginal places or objects.	3	C	H	Sections 5.4 & 5.2	3	C	M
	Erosion and Sediment Runoff	Sedimentation of local waterways.	3	B	M	Sections 5.5 & 5.2	2	B	L
	Surface Water Flows	Alteration to natural overland drainage flow. Surface water capture.	3	C	H	Sections 5.5 & 5.2	3	B	M
	Visual Amenity	Aesthetics of exposed earthworks and top soil stockpiles.	1	C	L	Sections 5.9 & 5.2	1	B	L

Activity	Aspect	Potential Impact	Preliminary Risk Rating ¹			Impact Assessment Findings & Proposed Controls (EA Section Reference)	Revised Risk Rating		
			C	L	R		C	L	R
	Land Use and Agricultural Productivity	Short-term impact on land use, land capability and agricultural suitability.	1	C	L	Sections 5.5 & 5.2	1	C	L
	Topography	Alteration to existing topography, potential for land slips in steeper sloped near Mt Ogilvie.	3	C	H	Section 5.2	1	B	L
Ventilation fans and borehole facilities	European Heritage	Disturbance of sites of European heritage significance.	2	B	L	Section 5.4	1	B	L
	Ecology	Loss of native flora and fauna.	2	C	M	Section 5.3	2	B	L
	Cultural Heritage	Disturbance of Aboriginal places or objects.	3	C	H	Section 5.4	3	B	M
	Erosion and Sediment Runoff	Sedimentation of local waterways.	1	A	L	Section 5.5	1	A	L
	Dust Generation	Degradation of air quality.	2	B	L	Section 5.7	1	B	L
	Noise Generation	Degradation of noise amenity (cumulative).	2	C	M	Section 5.6	1	A	L
	Land Use and Agricultural Productivity	Impact on land use, land capability and agricultural suitability.	1	C	L	Section 5.10	1	B	L
COAL HANDLING PREPARATION & PRODUCT COAL TRANSPORT									
ROM Crushing Plant and ROM Conveyors	Noise Generation	Degradation of noise amenity.	2	C	M	Section 5.6	2	B	L
	Dust Generation	Degradation of air quality.	2	C	M	Section 5.7	2	B	L
	Visual	Degradation of visual amenity.	1	A	L	Section 5.9	1	A	L
	Energy Use	Emission of greenhouse gas emissions.	3	B	M	Section 5.8	2	B	L
	Surface Water Management	Contamination of clean water.	2	B	L	Section 5.5	1	B	L

Activity	Aspect	Potential Impact	Preliminary Risk Rating ¹			Impact Assessment Findings & Proposed Controls (EA Section Reference)	Revised Risk Rating		
			C	L	R		C	L	R
	Cultural Heritage	Disturbance of Aboriginal places or objects.	3	B	M	Section 5.4	3	B	M
	European Heritage	Disturbance of European heritage sites.							
	Ecology	Loss of flora and fauna.	3	B	M	Section 5.3	2	B	L
	Spontaneous Combustion	Potential for spontaneous combustion.	1	B	L	Section 5.7	1	B	L
CHPP Operation	Noise Generation	Degradation of noise amenity.	2	C	M	Section 5.6	2	B	L
	Dust Generation	Degradation of air quality.	2	C	M	Section 5.7	2	B	L
	Visual	Degradation of visual amenity.	1	B	L	Section 5.9	1	B	L
	Energy Use	Emission of greenhouse gas emissions.	3	B	M	Section 5.8	2	B	L
	Water Management	Contamination of clean water.	2	B	L	Section 5.5	2	B	L
	Water Demand	Water demand for coal processing.	2	C	M	Section 5.5	2	C	M
	Cultural Heritage	Disturbance of Aboriginal places or objects.	1	A	L	Section 5.4	1	A	L
	European Heritage	Disturbance of European heritage sites.							
	Ecology	Loss of flora and fauna.	1	A	L	Section 5.3	1	A	L
Coarse reject and tailings management and disposal	Noise Generation	Degradation of noise amenity.	2	C	M	Section 5.6	2	B	L
	Dust Generation	Degradation of air quality.	2	C	M	Section 5.7	2	B	L
	Cultural Heritage	Disturbance of Aboriginal places or objects.	1	A	L	Section 5.4	1	A	L
	European Heritage	Disturbance of European heritage sites.							
	Ecology	Loss of flora and fauna.	1	A	L	Section 5.3	1	A	L

Activity	Aspect	Potential Impact	Preliminary Risk Rating ¹			Impact Assessment Findings & Proposed Controls (EA Section Reference)	Revised Risk Rating		
			C	L	R		C	L	R
	Water Management	Contamination of waterways and aquifers.	2	B	L	Section 5.5	1	B	L
Product Coal Loading and Transportation (incl. rail facility and train movements)	Noise Generation	Degradation of noise amenity.	3	C	H	Section 5.6	3	C	H
	Dust Generation	Degradation of air quality.	2	C	M	Section 5.7	2	B	L
	Visual	Degradation of visual amenity.	1	A	L	Section 5.9	1	A	L
	Energy Use	Emission of greenhouse gas emissions.	3	B	M	Section 5.8	2	B	L
	Water Management	Contamination of clean water.	1	A	L	Section 5.5	1	A	L
	Water Demand	Water demand for dust suppression.	1	A	L	Section 5.5	1	A	L
	Cultural Heritage	Disturbance of Aboriginal places or objects.	1	A	L	Section 5.4	1	A	L
	European Heritage	Disturbance of European heritage sites.							
	Ecology	Loss of flora and fauna.	1	A	L	Section 5.3	1	A	L
ANCILLARY ACTIVITIES & ISSUES									
Waste Management	Waste Disposal (Including Sewage)	Pollution/contamination due to incorrect disposal. Inefficient use of resources.	1	A	L	Section 6.0	1	A	L
	Waste Oil and Grease Storage	Soil and/or water contamination from spills or leaks.	2	B	L	Sections 3.0 & 5.5	1	A	L
Materials supply and storage	Oil, Fuel and Grease Supply and Storage	Soil and/or water contamination from spills or leaks.	2	B	L	Sections 3.0 & 5.5	1	A	L
	Dangerous Goods Supply and Storage	Soil and/or water contamination from spills or leaks. Explosion hazard.	2	B	L	Sections 3.0 & 5.5	1	A	L
	Materials Delivery	Increase in traffic.	2	C	M	Section 5.11	1	B	L
Workforce and Amenities	Transport and Access of employees to site	Increase in traffic.	2	C	M	Section 5.11	2	B	L

Activity	Aspect	Potential Impact	Preliminary Risk Rating ¹			Impact Assessment Findings & Proposed Controls (EA Section Reference)	Revised Risk Rating		
			C	L	R		C	L	R
	Increased Local Population	Impact on services/local infrastructure.	3	B	M	Section 5.12	2	B	L

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 function.	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

Likelihood	Description in Context of a Task	Frequency Description	Per Year Equivalent Frequency
A - Rare	Consequence may occur under exceptional circumstances, or could occur elsewhere at similar facilities.	Occurs once every 1000 – 10000 years	Occurs once every 1000-10000 years
B – Unlikely	Consequence may occur at some time.	Occurs once every 100 -1000 years	Occurs once every 100 – 1000 years
C – Possible	Consequence could occur at some time.	Occurs once every 10 -100 years	Occurs once every 10 -100 years
D – Likely	Consequence will probably occur in most circumstances.	Occurs once every 1 – 10 years	Occurs once every 1 – 10 years
E – Almost Certain	Consequence expected to occur in most circumstances.	Occurs more than once every month – year	Occurs 1 – 12 times per year
		Occurs once every week – month	Occurs 12 – 52 times per year
		Occurs more than once per week	Occurs more than 52 times per year