



WILPINJONG COAL PROJECT

MAIN REPORT

Table of Contents



TABLE OF CONTENTS

1	INTRODUCTION	1-1	2	PROJECT DESCRIPTION	2-1
1.1	EXPLORATION HISTORY AND TENDER PROCESS	1-1	2.1	COAL RESOURCE	2-1
1.2	PROJECT OVERVIEW	1-1	2.1.1	Ulan Seam	2-1
1.2.1	Project Summary and Objectives	1-1	2.2	PROJECT GENERAL ARRANGEMENT	2-3
1.2.2	Project Snapshot	1-5	2.3	INITIAL CONSTRUCTION AND OTHER DEVELOPMENT ACTIVITIES	2-3
1.2.3	Mining Tenements and Land Tenure	1-5	2.3.1	Temporary Construction Camp and Temporary Access Road	2-14
1.2.4	Proponent	1-5	2.3.2	Mine Access Road/Closure of Wilpinjong Road and Bungulla Road	2-14
1.3	DEVELOPMENT APPROVAL PROCESS	1-5	2.3.3	Relocation of the Existing 11 kV Electricity Transmission Line	2-15
1.3.1	Permissible Development	1-10	2.3.4	Mine Facilities Area	2-15
1.3.2	State Significant Development	1-10	2.3.5	Coal Handling and Preparation Plant and ROM Coal Handling Areas	2-15
1.3.3	Designated Development	1-10	2.3.6	Project Water Supply Borefield and CHPP Water Supply Storage	2-15
1.3.4	Integrated Development	1-10	2.3.7	Product Coal Stockpiles/Handling Area and Train Loading Infrastructure	2-16
1.3.5	Environmental Planning Instruments	1-11	2.3.8	Rail Spur and Rail Loop	2-16
1.3.6	Other Statutory Approvals	1-15	2.3.9	Realignments of Ulan-Wollar Road	2-16
1.3.7	Environment Protection and Biodiversity Conservation Act, 1999	1-16	2.4	OPEN CUT OPERATIONS	2-16
1.4	DOCUMENT STRUCTURE	1-16	2.4.1	Mine Schedule	2-16
1.5	CONSULTATION REPORT	1-17	2.4.2	Mining Sequence	2-17
1.5.1	Public Consultation	1-18	2.4.3	Mine Fleet	2-20
1.5.2	Aboriginal Groups	1-18	2.4.4	Vegetation Clearance and Topsoil/Subsoil Stripping	2-20
1.5.3	Government Agencies	1-20	2.4.5	Overburden Drilling and Blasting	2-20
1.5.4	Identification and Prioritisation of Issues	1-20	2.4.6	Overburden and Interburden/ Parting Material Removal and Handling	2-21
1.6	ECOLOGICALLY SUSTAINABLE DEVELOPMENT	1-23	2.4.7	Coal Mining and Handling	2-21
1.6.1	Background	1-23	2.4.8	Open Cut Dewatering	2-21
1.6.2	ESD Assessment	1-24	2.4.9	Final Voids	2-22
1.7	PROJECT ALTERNATIVES	1-26	2.5	ROM COAL RECLAIM, HANDLING AND PREPARATION	2-22
1.7.1	Coal Resource Recovery and Production Rate	1-26	2.5.1	Coal Sizing and Screening Circuit	2-22
1.7.2	Mining Method	1-27	2.5.2	Coal Preparation Circuit	2-22
1.7.3	Mine Access Road	1-27	2.6	PRODUCT COAL STOCKPILING, RECLAIM AND TRAIN LOADING	2-25
1.7.4	Transport of Product Coal	1-27	2.7	COAL TRANSPORT	2-25
1.7.5	Waste Rock Management	1-28			
1.7.6	Coarse Reject and Tailings Management	1-28			
1.7.7	Water Supply	1-28			
1.7.8	Final Voids	1-29			
1.7.9	Cumbo Creek Relocation	1-29			
1.7.10	Clearing of Remnant Vegetation in Pit 3	1-29			
1.7.11	Energy Source	1-30			
1.7.12	Enhancement and Conservation Areas	1-30			
1.8	CONSEQUENCES OF NOT PROCEEDING WITH THE PROJECT	1-31			
1.9	PROJECT CONSULTANTS	1-31			

TABLE OF CONTENTS (Continued)

2.8	MINE WASTE ROCK AND CHPP REJECTS/TAILINGS MANAGEMENT	2-26	3.3	GROUNDWATER	3-19
2.8.1	Overburden and Interburden/Parting Materials	2-26	3.3.1	Previous Studies and Site Testwork	3-19
2.8.2	Coarse Rejects	2-26	3.3.2	Local Hydrogeology	3-19
2.8.3	Tailings	2-27	3.3.3	Groundwater Levels and Gradient	3-22
2.9	WATER MANAGEMENT	2-27	3.3.4	Local Groundwater Quality	3-22
2.9.1	Water Management System	2-27	3.3.5	Other Groundwater Users	3-22
2.9.2	Site Water Supply	2-32	3.4	NOISE AND BLASTING	3-22
2.9.3	Project Water Supply Borefield	2-32	3.4.1	Project Background Noise Monitoring	3-24
2.10	INFRASTRUCTURE AND SERVICES	2-32	3.4.2	Road Transport Noise	3-24
2.10.1	Mine Facilities Area	2-32	3.4.3	Rail Traffic Noise	3-24
2.10.2	Internal Access Roads and Haul Roads	2-33	3.4.4	Blasting and Vibration Levels	3-25
2.10.3	Electricity Supply and Distribution	2-33	3.5	AIR QUALITY	3-25
2.10.4	Potable Water	2-33	3.5.1	Dust Deposition	3-26
2.10.5	Communications	2-33	3.5.2	Suspended Particulates	3-26
2.11	MANAGEMENT OF CHEMICALS AND WASTES	2-33	3.5.3	Observations	3-27
2.11.1	Dangerous Goods	2-33	3.6	FLORA	3-27
2.11.2	Liquid and Non-Liquid Wastes	2-34	3.6.1	Regional Setting	3-27
2.11.3	Recyclable and Non-Recyclable Domestic Waste	2-34	3.6.2	Local Setting	3-27
2.11.4	Sewage Treatment and Effluent Disposal	2-35	3.6.3	Flora Survey	3-27
2.12	WORKFORCE	2-35	3.7	FAUNA	3-32
2.12.1	Construction	2-35	3.7.1	Fauna of Goulburn River National Park and Munghorn Gap Nature Reserve	3-32
2.12.2	Operations	2-35	3.7.2	Terrestrial Fauna Surveys	3-32
3	EXISTING ENVIRONMENT	3-1	3.8	AQUATIC ECOSYSTEMS	3-36
3.1	LAND RESOURCES	3-1	3.8.1	Aquatic Ecosystem Survey	3-36
3.1.1	Landforms and Landuse	3-1	3.9	ABORIGINAL HERITAGE	3-40
3.1.2	Meteorology	3-1	3.9.1	Background	3-40
3.1.3	Geology	3-3	3.9.2	Cultural Heritage Assessment	3-41
3.1.4	Soils, Rural Land Capability and Agricultural Suitability	3-6	3.10	NON-ABORIGINAL HERITAGE	3-46
3.1.5	Land Contamination Assessment	3-9	3.10.1	Background	3-46
3.1.6	Visual Character	3-9	3.10.2	Site Survey	3-46
3.1.7	Bushfire Regime	3-11	3.11	TRANSPORT	3-47
3.2	SURFACE WATER	3-11	3.11.1	Road Hierarchy	3-47
3.2.1	Regional Hydrology	3-11	3.11.2	Existing Road and Traffic Conditions	3-49
3.2.2	Local Hydrology	3-13	3.11.3	Traffic Safety	3-49
3.2.3	Surface Water Quality	3-16	3.11.4	Rail System and Capacity	3-50
			3.12	COMMUNITY INFRASTRUCTURE	3-51
			3.12.1	Population Profile	3-51
			3.12.2	Employment Profile	3-51
			3.12.3	Housing and Short-term Accommodation	3-53
			3.12.4	Community Facilities	3-53
			3.13	OVERVIEW OF THE REGIONAL ECONOMY	3-55

TABLE OF CONTENTS (Continued)

4	POTENTIAL IMPACTS AND MITIGATION MEASURES	4-1	4.10	ABORIGINAL CULTURAL HERITAGE	4-63		
	4.1	LAND RESOURCES	4-1	4.10.1	Potential Impacts	4-63	
		4.1.1	Topography and Landscape Features	4-1	4.10.2	Management, Mitigation and Conservation Measures	4-65
		4.1.2	Soils and Erosion Potential	4-3	4.11	NON-ABORIGINAL HERITAGE	4-67
		4.1.3	Landuse and Land Capability	4-4	4.11.1	Potential Impacts	4-67
		4.1.4	Land Contamination Potential	4-5	4.11.2	Mitigation Measures	4-67
		4.1.5	Bushfire Hazard	4-5	4.12	ROAD TRANSPORT	4-67
	4.2	VISUAL	4-6	4.12.1	Potential Impacts	4-67	
		4.2.1	Assessment Methodology	4-6	4.12.2	Traffic Management Measures	4-70
		4.2.2	Visual Landscape Alteration	4-6	4.13	RAIL TRANSPORT	4-71
		4.2.3	Visual Impact Assessment	4-7	4.14	COMMUNITY INFRASTRUCTURE ASSESSMENT	4-71
		4.2.4	Mitigation Measures	4-14	4.14.1	Construction Phase	4-72
	4.3	SURFACE WATER	4-15	4.14.2	Operational Phase	4-72	
		4.3.1	Surface Water Quality	4-15	4.14.3	Potential Cumulative Impacts	4-74
		4.3.2	Surface Water Flows	4-18	4.14.4	Mitigation Measures	4-74
	4.4	GROUNDWATER	4-20	4.15	BENEFIT COST ANALYSIS AND REGIONAL ECONOMIC IMPACT ASSESSMENT	4-74	
		4.4.1	Existing Groundwater Users	4-21	4.15.1	Benefit Cost Analysis	4-75
		4.4.2	Groundwater Inflows to Creeks	4-22	4.15.2	Regional Economic Impact	4-76
		4.4.3	Potential Cumulative Impacts	4-22	4.16	HAZARD AND RISK	4-77
	4.5	ACOUSTICS	4-23	4.16.1	Hazard Identification and Risk Assessment	4-77	
		4.5.1	Construction and Operation Noise Assessment	4-23	4.16.2	Hazard Prevention and Mitigation Measures	4-78
		4.5.2	Noise Mitigation Measures	4-31	5	ENVIRONMENTAL PROTECTION PLAN	5-1
		4.5.3	Recommended Project Noise Limits	4-31	5.1	ENVIRONMENTAL MANAGEMENT AND MONITORING	5-2
		4.5.4	Road Transportation Noise Assessment	4-32	5.1.1	Mining, Rehabilitation and Environmental Management Process	5-3
		4.5.5	Rail Transportation Noise/Vibration Assessment	4-34	5.1.2	Environmental Management Plans	5-4
		4.5.6	Blast Impact Assessment	4-35	5.1.3	Environmental Monitoring	5-10
	4.6	AIR QUALITY	4-37	5.2	REHABILITATION AREAS	5-14	
		4.6.1	Air Quality Criteria	4-38	5.2.1	Principles and Objectives	5-14
		4.6.2	Dust Deposition	4-39	5.2.2	Planning	5-14
		4.6.3	Concentrations of Suspended Particulate Matter	4-44	5.2.3	Erosion and Sediment Control	5-14
		4.6.4	Greenhouse Gas	4-50	5.2.4	Soil Removal, Handling and Replacement	5-14
		4.6.5	Odour and Spontaneous Combustion	4-50	5.2.5	Revegetation	5-15
	4.7	FLORA	4-51	5.2.6	Replacement of Aboriginal Objects	5-17	
		4.7.1	Potential Impacts	4-51	5.2.7	Studies and Trials	5-17
		4.7.2	Mitigation Measures	4-52	5.2.8	Final Landform Design	5-17
	4.8	TERRESTRIAL FAUNA	4-55	5.2.9	Monitoring, Maintenance and Reporting	5-22	
		4.8.1	Potential Impacts	4-55			
		4.8.2	Mitigation Measures	4-57			
	4.9	AQUATIC ECOSYSTEMS	4-59				
		4.9.1	Potential Impacts	4-59			
		4.9.2	Mitigation Measures	4-62			

TABLE OF CONTENTS (Continued)

5.3	REGENERATION AREAS	5-24
5.4	ENHANCEMENT AND CONSERVATION AREAS	5-24
5.5	MINE CLOSURE AND COMPLETION CRITERIA	5-25
5.5.1	Mine Closure Plan	5-26
5.5.2	Completion Criteria	5-26
6	RECONCILIATION OF KEY EIS REQUIREMENTS	6-1
7	REFERENCES	7-1
8	ABBREVIATIONS, ACRONYMS AND GLOSSARY	8-1
8.1	ABBREVIATIONS AND ACRONYMS	8-1
8.2	GLOSSARY	8-4

LIST OF TABLES

Table 1-1	Project Snapshot
Table 1-2	Expected Integrated Approval Requirements
Table 1-3	Summary of Relevant Issues Raised by the Public during Consultation
Table 1-4	Director-General's EIS Requirements – Reference Summary
Table 2-1	Characteristics of the Project Coal Working Sections
Table 2-2	Proposed Mine Schedule
Table 2-3	Proposed Mine Equipment Fleet
Table 2-4	Liquid and Non-Liquid Wastes Generated by the Project
Table 3-1	Bureau of Meteorology Station Locations and Recording Periods
Table 3-2	Meteorological Data Summary
Table 3-3	Summary of Streamflow Statistics for the Goulburn River and Wollar Creek
Table 3-4	Stream Reach Characteristics of Local Watercourses
Table 3-5	Surface Water Quality Ranges – Local Watercourses
Table 3-6	ANZECC (2000) Surface Water Quality Default Trigger Values for the Protection of Aquatic Ecosystems (Physical and Chemical Stressors)
Table 3-7	ANZECC (2000) Surface Water Quality Default Trigger Values for the Protection of Aquatic Ecosystems (Toxicants)
Table 3-8	ANZECC (2000) Livestock Drinking Water Quality Trigger Values
Table 3-9	Summary of Groundwater Quality in the Project Area
Table 3-10	Relative Scale of Various Noise Sources
Table 3-11	Noise Environment for Project Assessment Purposes

LIST OF TABLES (Continued)

Table 3-12	Average Dust Deposition Rates (g/m ² /month)
Table 3-13	Vegetation Communities Identified within the Project Area and Surrounds
Table 3-14	Number of Native Fauna Species Identified
Table 3-15	Threatened Fauna Species Recorded by Project Surveys
Table 3-16	Migratory Species Recorded in the Vicinity of the Project
Table 3-17	Marine Protected Species Recorded in the Vicinity of the Project
Table 3-18	Summary of the Project Aboriginal Heritage Consultation/Survey Programme
Table 3-19	Aboriginal Cultural Heritage Survey Results
Table 3-20	Sites of Local Heritage Significance Identified in the Project Survey
Table 3-21	Annual Average Daily Traffic Flows
Table 3-22	Population of the Local Region 1976 to 2001 and Projections to 2021
Table 3-23	Age of the Population
Table 3-24	Comparative Population Income and Household Indicators Local Region and NSW – 2001
Table 3-25	Employment Distribution by Industry Local Region – 1996 and 2001
Table 3-26	Rate of Unemployment (%) in the Mudgee, Rylstone and Merriwa SLAs and Whole of NSW
Table 3-27	Available Short-term Accommodation in Mudgee – December Quarter 2003 Hotels, Motels and Serviced Apartments
Table 3-28	Contributions to Gross Regional Product, Employment and Output by Industry Sector – Local Region 2001
Table 4-1	Visual Impact Matrix
Table 4-2	Visual Impact Assessment Summary
Table 4-3	Potential Surface Water Quality Impacts
Table 4-4	Potential Maximum Reduction in Wilpinjong Creek and Wollar Creek Annual Average Flow
Table 4-5	Project-Specific Noise Assessment Criteria (dBA)
Table 4-6	Private Dwellings within Noise Management and Affection Zones
Table 4-7	Private Vacant Land within Noise Management and Affection Zones
Table 4-8	Proposed Operating Noise Limits (dBA)
Table 4-9	DEC Criteria for Road Traffic Noise (dBA)
Table 4-10	Wollar Road Estimated Peak L _{Aeq} (1hour) Noise Levels (dBA)
Table 4-11	Railway Guideline Noise Assessment Criteria
Table 4-12	Air Quality Standards/Assessment Criteria for Particulate Matter Concentrations

TABLE OF CONTENTS (Continued)

LIST OF TABLES (Continued)

Table 4-13	Flora Attributes of the Enhancement and Conservation Areas
Table 4-14	Fauna Attributes of the Enhancement and Conservation Areas
Table 4-15	Aboriginal Cultural Heritage Sites in the Project Area
Table 4-16	Predicted Peak Daily Project Traffic Flows – Construction and Operational Phases
Table 4-17	Predicted Peak Period Daily Traffic Flows on the Local Road Network
Table 4-18	Operational Phase Population Effects – Direct and Flow-on Employment Average and Peak Employment Scenarios
Table 4-19	Estimates of Total Operational Phase Housing Impact Allocated to Centres and Rural Areas
Table 5-1	Effect of the Environmental Protection Plan on Woodland Areas
Table 5-2	Project Management Plans
Table 5-3	Overview of the Project Environmental Monitoring Programme
Table 5-4	Soil Resource Management Strategies
Table 5-5	Proposed List of Native Species to be used in Revegetation
Table 5-6	Key Completion Criteria for Project Components
Table 6-1	Section 1 - Reconciliation Summary
Table 6-2	Section 2 - Reconciliation Summary
Table 6-3	Section 3 - Reconciliation Summary
Table 6-4	Section 4 - Reconciliation Summary
Table 6-5	Section 5 - Reconciliation Summary

LIST OF FIGURES

Figure 1-1	Regional Location
Figure 1-2	Project Location
Figure 1-3	Mining Lease Application and Development Application Areas
Figure 1-4	Aerial View of the Project Area and Surrounds
Figure 1-5	Relevant Land Ownership Plan
Figure 1-6	Relevant Land Ownership List
Figure 2-1	Stratigraphy of the Project Area
Figure 2-2	Proposed Development Schedule
Figure 2-3	Project General Arrangement
Figure 2-4	General Arrangement – Year 1
Figure 2-5	General Arrangement – Year 3
Figure 2-6	General Arrangement – Year 7
Figure 2-7	General Arrangement – Year 9
Figure 2-8	General Arrangement – Year 10
Figure 2-9	General Arrangement – Year 13
Figure 2-10	General Arrangement – Year 14
Figure 2-11	General Arrangement – Year 21
Figure 2-12	Conceptual Mining Method (Plan View)

LIST OF FIGURES (Continued)

Figure 2-13	Conceptual Mining Method (Section View)
Figure 2-14	Coal Handling and Preparation Plant, Product Coal Stockpiles/Handling Area and Train Loading Infrastructure
Figure 2-15	Coal Preparation Circuit Flowsheet
Figure 2-16	Project Water Management System
Figure 2-17	Cumbo Creek Relocation Corridor (Typical Section)
Figure 3-1	Local Topography and Baseline Air and Noise Monitoring Sites
Figure 3-2	Wind Roses
Figure 3-3	Project Geology
Figure 3-4	Water Monitoring Sites and Catchment Boundaries
Figure 3-5	Conceptual Hydrogeological South-North Cross Section
Figure 3-6	Flora Sample Sites
Figure 3-7	Vegetation Communities within the Study Area
Figure 3-8	Terrestrial Fauna Sample Sites
Figure 3-9	Approximate Location of Threatened Fauna Species
Figure 3-10	Aboriginal and Non-Aboriginal Heritage Recordings
Figure 3-11	Road Hierarchy and Traffic Count Stations
Figure 4-1	General Arrangement – Post-Mining
Figure 4-2	Visual Simulation Points and Locations of Residences in Close Proximity to the Project
Figure 4-3	Existing View and Visual Simulations – “Hillview” Residence
Figure 4-4	Existing View and Visual Simulations – “Binggarra” Residence
Figure 4-5a	Existing View and Visual Simulation Year 3 – “Wilpin Farm” Residence
Figure 4-5b	Visual Simulations Year 14 and Post-Mining – “Wilpin Farm” Residence
Figure 4-6	Year 3 Operation $L_{Aeq(15minute)}$ Intrusive Noise Contours – Night-time Temperature Inversion
Figure 4-7	Year 9 Operation $L_{Aeq(15minute)}$ Intrusive Noise Contours – Evening Westerly Wind
Figure 4-8	Year 14 Operation $L_{Aeq(15minute)}$ Intrusive Noise Contours – Night-time Easterly Wind
Figure 4-9	Year 21 Operation $L_{Aeq(15minute)}$ Intrusive Noise Contours – Night-time Easterly Wind
Figure 4-10	Year 3 – Predicted Annual Average Dust Deposition ($g/m^2/month$) from the Project
Figure 4-11	Year 9 – Predicted Annual Average Dust Deposition ($g/m^2/month$) from the Project
Figure 4-12	Year 14 – Predicted Annual Average Dust Deposition ($g/m^2/month$) from the Project
Figure 4-13	Year 21 – Predicted Annual Average Dust Deposition ($g/m^2/month$) from the Project

TABLE OF CONTENTS (Continued)

LIST OF FIGURES (Continued)

Figure 4-14 Year 3 – Predicted Annual Average PM₁₀ Concentrations (µg/m³) from the Project

Figure 4-15 Year 9 – Predicted Annual Average PM₁₀ Concentrations (µg/m³) from the Project

Figure 4-16 Year 14 – Predicted Annual Average PM₁₀ Concentrations (µg/m³) from the Project

Figure 4-17 Year 21 – Predicted Annual Average PM₁₀ Concentrations (µg/m³) from the Project

Figure 5-1 Proposed Environmental Monitoring Sites

Figure 5-2 Project Rehabilitation Areas, Regeneration Areas and Enhancement and Conservation Areas

Figure 5-3 Final Landform Photo-simulation

Figure 5-4 Conceptual Cross Section – Rehabilitated Landform

LIST OF ATTACHMENTS

Attachment 1 Director-General's Requirements

LIST OF APPENDICES

Appendix A Surface Water Assessment

Appendix B Groundwater Impact Assessment

Appendix C Assessment of the Acid Forming Potential and Salinity of Overburden, Coal and Coal Washery Waste

Appendix D Construction, Operation and Transportation Noise and Blasting Impact Assessment

Appendix E Air Quality Impact Assessment

Appendix F Aboriginal Cultural Heritage Assessment

Appendix G Non-Aboriginal Heritage Impact Assessment

Appendix HA Flora Assessment

Appendix HB Terrestrial Fauna Assessment

Appendix HC Bat Fauna Assessment

Appendix HD Aquatic Ecosystem Assessment

Appendix HE Eight Part Tests of Significance

Appendix I Economic Assessment

Appendix J Community Infrastructure Assessment

Appendix K Road Transport Assessment

Appendix L Preliminary Hazard Analysis

Appendix M Soils, Rural Land Capability and Agricultural Suitability Assessment

Appendix N Visual Impact Assessment

Appendix O Land Contamination Assessment