



PEMBROKE

Olive Downs Coking Coal Project
Draft Environmental Impact Statement

Table of Contents

TABLE OF CONTENTS

ES	EXECUTIVE SUMMARY	ES-1			
ES1.1	PROJECT PROPONENT	ES-1		2.2.2	Existing Transport Infrastructure 2-24
ES1.2	PROJECT SUMMARY	ES-1		2.2.3	Existing Energy Infrastructure 2-25
ES1.3	PUBLIC CONSULTATION PROCESS	ES-6		2.2.4	Existing Water Infrastructure 2-25
ES1.4	PROJECT DESCRIPTION	ES-6		2.2.5	Business Precincts and Other Existing Public and Private Facilities 2-25
	ES1.4.1 General Arrangement	ES-6		2.2.6	Topography, Landform and Catchments 2-25
	ES1.4.2 Construction	ES-7		2.2.7	Geology, Exploration History and Coal Resource 2-28
	ES1.4.3 Operations	ES-7		2.2.8	Soils and Land Use 2-32
	ES1.4.4 Rehabilitation and Conceptual Post mining Land Use	ES-8		2.2.9	Queensland Agricultural Land Audit 2-33
ES1.5	ENVIRONMENTAL ASSESSMENT	ES-12		2.3	CLIMATE 2-33
	ES1.5.1 Flora and Fauna	ES-12		2.3.1	Rainfall Data and Statistics 2-33
	ES1.5.2 Water Resources	ES-13		2.3.2	Evaporation and Evapotranspiration Data and Statistics 2-35
	ES1.5.3 Water Quality	ES-14		2.3.3	Temperature Data and Statistics 2-35
	ES1.5.4 Flooding and Regulated Structures	ES-15		2.3.4	Humidity Data and Statistics 2-37
	ES1.5.5 Air Quality	ES-15		2.3.5	Bushfire Risk 2-37
	ES1.5.6 Social Values	ES-16		2.3.6	Wind Speed Direction 2-37
	ES1.5.7 Economics	ES-16		2.3.7	Atmospheric Stability 2-37
	ES1.5.8 Transport	ES-17		2.3.8	Consideration of Climate Change Projections for Australia and Queensland 2-37
	ES1.5.9 Noise and Vibration	ES-17		2.4	CONSTRUCTION 2-40
	ES1.5.10 Land	ES-17		2.4.1	Access Roads, Car Parking and Site Security 2-41
	ES1.5.11 Cultural Heritage	ES-18		2.4.2	Mine Infrastructure Areas 2-43
	ES1.5.12 Waste Management	ES-18		2.4.3	Explosives Magazines 2-44
	ES1.5.13 Biosecurity	ES-18		2.4.4	Dry Weather Road Crossing to the Eastern Emplacement 2-44
	ES1.5.14 Hazards and Community Safety	ES-18		2.4.5	CHPP and Associated Infrastructure 2-44
ES1.6	GENERAL ENVIRONMENTAL MANAGEMENT COMMITMENTS AND MODEL CONDITIONS	ES-19		2.4.6	Initial Rejects Storage Facilities and In-line Flocculation Cells 2-45
1	INTRODUCTION	1-1		2.4.7	Rail Loadout Facility and Product Coal Stockpiles 2-45
1.1	PROJECT PROPONENT	1-1		2.4.8	Rail Spur and Rail Loop 2-47
1.2	PROJECT DESCRIPTION	1-2		2.4.9	Water Supply Pipelines and Potable Water Treatment Plants 2-47
1.3	THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS	1-4		2.4.10	66 kV Electricity Transmission Line and Power Supply 2-48
	1.3.1 Coordinated Project Declaration and Terms of Reference	1-4		2.4.11	Internal Roads, Hardstand/Laydown Areas and Other Miscellaneous Infrastructure 2-48
	1.3.2 Objectives of the EIS	1-4		2.4.12	Internal Roads, Hardstand/Laydown Areas and Other Miscellaneous Infrastructure 2-49
	1.3.3 How to Make a Public Submission	1-6		2.4.13	Construction Materials 2-49
1.4	PUBLIC CONSULTATION PROCESS	1-7		2.4.14	Disturbance Areas – Construction 2-49
1.5	PROJECT APPROVALS	1-8		2.4.15	Construction Fleet 2-49
	1.5.1 Relevant Legislation and Scope of Approvals Sought through this EIS Process	1-8		2.5	OPERATIONS 2-50
	1.5.2 Project Approvals Process	1-8		2.5.1	Resource Base and Mine Life Staging 2-50
2	PROJECT DESCRIPTION	2-1			
2.1	PROPOSED DEVELOPMENT	2-1			
	2.1.1 Project Title and Objective	2-1			
	2.1.2 Nature and Scale of the Olive Downs Coking Coal Project	2-1			
	2.1.3 Project Capital Expenditure	2-1			
	2.1.4 Project General Arrangement	2-12			
	2.1.5 Project Location	2-13			
	2.1.6 Workforce	2-19			
	2.1.7 Workforce Accommodation	2-20			
2.2	SITE DESCRIPTION	2-20			
	2.2.1 Tenure	2-20			

2.5.2	Mining Sequence, Methods and Equipment	2-51	3.2.8	Aquatic Ecology Surveys	3-45
2.5.3	Temporary Flood Levees and Permanent Highwall Emplacements	2-53	3.3	OLIVE DOWNS PROJECT MINE SITE AND ACCESS ROAD (EPBC 2017/7867)	3-46
2.5.4	Mining Fleet and Supporting Equipment/ Plant	2-53	3.3.1	Location of the Action	3-46
2.5.5	ROM Coal Handling and Processing	2-54	3.3.2	Description of the Action	3-46
2.5.6	Waste Rock Management	2-57	3.3.3	Current Status of the Action	3-49
2.5.7	Coal Rejects Management	2-58	3.3.4	Consequence of Not Proceeding	3-49
2.5.8	Ongoing Evaluation and Exploration Activities	2-58	3.3.5	Alternatives Considered	3-49
2.5.9	Product Coal Handling and Transport (Rail)	2-58	3.3.6	Relationship to Other Actions	3-51
2.5.10	Hazardous Substances	2-59	3.3.7	Impacts on listed Threatened Species and Ecological Communities	3-51
2.5.11	Disturbance Areas – Operations	2-59	3.3.8	Migratory Species	3-82
2.6	INFRASTRUCTURE REQUIREMENTS	2-59	3.3.9	Impacts on Water Resources	3-97
2.6.1	Transport	2-59	3.3.10	Cumulative Impacts	3-153
2.6.2	Energy	2-61	3.3.11	Impact Avoidance, Mitigation Measures and Management Plans	3-156
2.6.3	Water Supply	2-61	3.3.12	Social and Economic Impacts	3-167
2.6.4	Sewage and Effluent Disposal	2-62	3.3.13	Ecologically Sustainable Development Considerations	3-168
2.6.5	Telecommunications	2-63	3.3.14	Consideration of the Project against the Objects of the Environment Protection and Biodiversity Conservation Act, 1999	3-172
2.6.6	Accommodation and Other Infrastructure	2-63	3.3.15	Conclusion	3-172
2.7	WATER MANAGEMENT	2-63	3.4	OLIVE DOWNS PROJECT WATER PIPELINE (EPBC 2017/7868)	3-173
2.7.1	Water Management Objectives	2-65	3.4.1	Location of the Action	3-173
2.7.2	Up-catchment Diversions	2-65	3.4.2	Description of the Action	3-173
2.7.3	Water Consumption	2-66	3.4.3	Current Status of the Action	3-174
2.7.4	Groundwater Inflows (Open Cut Dewatering)	2-69	3.4.4	Consequence of Not Proceeding	3-174
2.7.5	Sediment Dams	2-69	3.4.5	Alternatives Considered	3-174
2.7.6	Controlled Release Strategy	2-69	3.4.6	Relationship to Other Actions	3-174
2.7.7	Simulated Performance of the Project Water Management System	2-70	3.4.7	Impacts on Listed Threatened Species and Ecological Communities	3-174
2.8	ENVIRONMENTALLY RELEVANT ACTIVITIES AND NOTIFIABLE ACTIVITIES	2-72	3.4.8	Impact Avoidance, Mitigation Measures and Management Plans	3-189
2.9	WASTE MANAGEMENT	2-73	3.4.9	Consideration of the Project against the Objects of the Environment Protection and Biodiversity Conservation Act, 1999	3-198
2.10	PROJECT JUSTIFICATION AND ALTERNATIVES CONSIDERED	2-73	3.4.10	Conclusion	3-198
2.10.1	Need for the Project	2-73	3.5	OLIVE DOWNS PROJECT ELECTRICITY TRANSMISSION LINE (EPBC 2017/7869)	3-199
2.10.2	Consideration of Project Alternatives	2-74	3.5.1	Location of the Action	3-199
2.10.3	Consideration of not Carrying Out the Project	2-76	3.5.2	Description of the Action	3-199
3	ASSESSMENT OF MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE	3-1	3.5.3	Current Status of the Action	3-200
3.1	INTRODUCTION	3-1	3.5.4	Consequence of Not Proceeding	3-200
3.2	BACKGROUND	3-3	3.5.5	Alternatives Considered	3-200
3.2.1	Proponent details	3-3	3.5.6	Relationship to Other Actions	3-200
3.2.2	Consultation Undertaken in relation to the Project	3-3	3.5.7	Impacts on Listed Threatened Species and Ecological Communities	3-200
3.2.3	Commonwealth Requirements	3-4	3.5.8	Impact Avoidance, Mitigation Measures and Management Plans	3-223
3.2.4	Relevant Legislation and Scope of Approvals Sought through the EIS Process	3-19			
3.2.5	Relevant Databases and Legislation	3-19			
3.2.6	Flora Surveys	3-19			
3.2.7	Fauna Surveys	3-28			

3.5.9	Consideration of the Project against the Objects of the Environment Protection and Biodiversity Conservation Act, 1999	3-224	4.4.5	Regulated Structures	4-99
3.5.10	Conclusion	3-224	4.5	AIR QUALITY	4-99
3.6	OLIVE DOWNS PROJECT RAIL SPUR (EPBC 2017/7870)	3-225	4.5.1	Environmental Objectives and Performance Outcomes	4-99
3.6.1	Location of the Action	3-225	4.5.2	Description of Environmental Values	4-100
3.6.2	Description of the Action	3-225	4.5.3	Potential Impacts	4-102
3.6.3	Current Status of the Action	3-226	4.5.4	Mitigation Measures, Management and Monitoring	4-103
3.6.4	Consequence of Not Proceeding	3-226	4.5.5	Greenhouse Gas Emissions	4-105
3.6.5	Alternatives Considered	3-226	4.6	SOCIAL VALUES	4-105
3.6.6	Relationship to Other Actions	3-226	4.6.1	Environmental Objectives and Performance Outcomes	4-106
3.6.7	Impacts on Listed Threatened Species and Ecological Communities	3-226	4.6.2	Description of Environmental Values	4-106
3.6.8	Impact Avoidance, Mitigation Measures and Management Plans	3-244	4.6.3	Potential Impacts	4-113
3.6.9	Consideration of the Project against the Objects of the Environment Protection and Biodiversity Conservation Act, 1999	3-253	4.6.4	Mitigation Measures, Management and Monitoring	4-118
3.6.10	Conclusion	3-253	4.7	ECONOMICS	4-124
3.7	OFFSET STRATEGY RELEVANT TO MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE	3-254	4.7.1	Environmental Objectives and Performance Outcomes	4-124
4	ASSESSMENT OF PROJECT SPECIFIC MATTERS	4-1	4.7.2	Description of Environmental Values	4-124
4.1	FLORA AND FAUNA	4-1	4.7.3	Potential Impacts	4-125
4.1.1	Environmental Objectives and Performance Outcomes	4-1	4.7.4	Mitigation Measures and Management	4-127
4.1.2	Description of Environmental Values	4-2	4.8	TRANSPORT	4-127
4.1.3	Potential Impacts	4-24	4.8.1	Environmental Objectives and Performance Outcomes	4-127
4.1.4	Mitigation Measures, Management and Monitoring	4-37	4.8.2	Road Transport	4-128
4.1.5	Biodiversity Offset Strategy	4-40	4.8.3	Rail Transport	4-134
4.2	WATER QUALITY	4-49	4.8.4	Air Transport	4-135
4.2.1	Environmental Objectives and Performance Outcomes	4-49	4.9	NOISE AND VIBRATION	4-136
4.2.2	Description of Environmental Values	4-49	4.9.1	Environmental Objectives and Performance Outcomes	4-136
4.2.3	Potential Impacts	4-57	4.9.2	Description of Environmental Values	4-137
4.2.4	Mitigation Measures, Management and Monitoring	4-62	4.9.3	Potential Impacts	4-138
4.3	WATER RESOURCE	4-65	4.9.4	Mitigation Measures, Management and Monitoring	4-141
4.3.1	Environmental Objectives	4-65	4.10	LAND	4-141
4.3.2	Description of Environmental Values	4-66	4.10.1	Environmental Objectives and Performance Outcomes	4-142
4.3.3	Potential Impacts	4-75	4.10.2	Description of Environmental Values	4-142
4.3.4	Mitigation Measures, Management and Monitoring	4-82	4.10.3	Potential Impacts	4-149
4.4	FLOODING AND REGULATED STRUCTURES	4-87	4.10.4	Mitigation Measures and Management	4-154
4.4.1	Environmental Objective	4-87	4.11	CULTURAL HERITAGE	4-155
4.4.2	Description of Environmental Values	4-88	4.11.1	Environmental Objectives and Performance Outcomes	4-155
4.4.3	Potential Impacts	4-88	4.11.2	Description of Environmental Values	4-155
4.4.4	Mitigation Measures, Management and Monitoring	4-97	4.11.3	Potential Impacts, Mitigation and Management Measures	4-157
			4.12	HAZARDS AND COMMUNITY SAFETY	4-159

4.12.1	Environmental Objectives and Performance Outcomes	4-160	6.1.2	Consultation and Community	6-14
4.12.2	Description of Environmental Values	4-160	6.1.3	Environmental Management, Mitigation Measures, Monitoring and Auditing	6-14
4.12.3	Hazard Identification and Risk Assessment	4-160	6.1.4	Environmental Reporting	6-23
4.12.4	Hazard Mitigation and Management Measures	4-161	6.2	PROPOSED ENVIRONMENTAL AUTHORITY CONDITIONS	6-24
4.13	BIOSECURITY	4-162	6.2.1	Schedule A – General	6-24
4.13.1	Environmental Objectives and Performance Outcomes	4-162	6.2.2	Schedule B – Air	6-25
4.13.2	Description of Environmental Values	4-162	6.2.3	Schedule C – Waste Management	6-26
4.13.3	Potential Impacts	4-163	6.2.4	Schedule D – Noise	6-26
4.13.4	Mitigation Measures and Management	4-163	6.2.5	Schedule E – Groundwater	6-27
4.14	WASTE MANAGEMENT	4-165	6.2.6	Schedule F – Water	6-28
4.14.1	Environmental Objectives and Performance Outcomes	4-165	6.2.7	Schedule G – Sewage Treatment	6-35
4.14.2	Sources of Waste	4-165	6.2.8	Schedule H – Land and Rehabilitation	6-35
4.14.3	Potential Impacts	4-172	6.2.9	Schedule I – Watercourse Diversions	6-42
4.14.4	Mitigation Measures, Management and Monitoring	4-172	6.2.10	Schedule J – Regulated Structures	6-43
5	REHABILITATION STRATEGY	5-1	7	REFERENCES	7-1
5.1	REHABILITATION REQUIREMENTS	5-2	8	ABBREVIATIONS, ACRONYMS, GLOSSARY AND DEFINITIONS	8-1
5.1.1	Rehabilitation Goal	5-2	8.1	ABBREVIATIONS	8-1
5.1.2	Rehabilitation Domains	5-2	8.2	ACRONYMS	8-2
5.1.3	Rehabilitation Objectives	5-2	8.3	GLOSSARY	8-5
5.1.4	Performance Indicators	5-10	8.4	DEFINITIONS	8-6
5.1.5	Completion Criteria	5-10			
5.2	CONCEPTUAL FINAL LANDFORM DESIGN	5-10		LIST OF TABLES	
5.2.1	Conceptual Post-mining Land Use	5-10	Table ES-1	General Rehabilitation Objectives for the Project	
5.2.2	Waste Rock Emplacements	5-10	Table 1-1	Terms of Reference – Reconciliation Summary	
5.2.3	Final Voids and Permanent Highwall Emplacements	5-17	Table 1-2	Summary of Legislative Considerations	
5.2.4	Geotechnical Stability of Final Landforms	5-18	Table 2-1	Meteorological Summary – Average Rainfall, Evaporation, Temperature and Humidity	
5.2.5	Water Management Infrastructure	5-19	Table 2-2	Adopted Climate Change Impact Predictions	
5.2.6	ILF Cells	5-19	Table 2-3	Approximate Disturbance Areas – Project Construction Components	
5.3	GENERAL REHABILITATION PRACTICES AND MEASURES	5-19	Table 2-4	Indicative Mine Schedule	
5.3.1	Progressive Rehabilitation	5-19	Table 2-5	Indicative List of Hazardous Substances	
5.3.2	Vegetation Clearance Procedures	5-19	Table 2-6	Approximate Disturbance and Rehabilitation Areas – Project Operations	
5.3.3	Topsoil Management	5-20	Table 2-7	Sewage Treatment Effluent Quality	
5.3.4	Erosion and Sediment Control Plan	5-35	Table 2-8	Ripstone Creek Diversion Geometric Characteristics	
5.3.5	Revegetation Program	5-35	Table 2-9	Predicted Average Groundwater Inflows by Stage	
5.3.6	Weed Management	5-36	Table 2-10	Proposed Controlled Release Conditions	
5.3.7	Exploration Areas	5-36	Table 2-11	Indicative Project Water Supply System Performance (Average Annual Water Balance)	
5.3.8	Decommissioning	5-36	Table 2-12	Environmentally Relevant Activities at the Project	
5.4	REHABILITATION MONITORING	5-36			
5.5	REHABILITATION MILESTONES	5-37			
5.6	REHABILITATION AND MINE CLOSURE PLAN	5-37			
6	GENERAL ENVIRONMENTAL PROTECTION COMMITMENTS AND MODEL CONDITIONS	6-1			
6.1	GENERAL ENVIRONMENTAL PROTECTION COMMITMENTS	6-1			
6.1.1	Overview	6-1			

Table 3-1	Terms of Reference Cross Reference Table	Table 3-28	Likelihood of Significant Adverse Impact of the Water Pipeline on the Australian Painted Snipe
Table 3-2	Division 5.2 of the EPBC Regulations Cross Reference Table	Table 3-29	Likelihood of Significant Adverse Impact of the Water Pipeline on the Squatter Pigeon (southern)
Table 3-3	IESC Guideline Cross Reference Table	Table 3-30	Likelihood of Significant Adverse Impact of the Water Pipeline on the Koala
Table 3-4	Ground-truthed Regional Ecosystems	Table 3-31	Likelihood of Significant Adverse Impact of the Water Pipeline on the Greater Glider
Table 3-5	Summary of Terrestrial Fauna Survey Methodology	Table 3-32	Assessments for Other Threatened Species Relevant to the Water Pipeline Area
Table 3-6	Survey Methods and Effort Employed for Potentially Occurring Threatened Fauna Species	Table 3-33	Proposed Avoidance and Mitigation Measures for the Water Pipeline
Table 3-7	Indicative Mine Schedule	Table 3-34	Vegetation and Habitat Clearance Summary – Project ETL
Table 3-8	Vegetation and Habitat Clearance Summary - Mine Site and Access Road	Table 3-35	Likelihood of Significant Adverse Impact of the Project ETL on the Ornamental Snake
Table 3-9	Likelihood of Significant Adverse Impact of the Mine Site and Access Road on the Ornamental Snake	Table 3-36	Likelihood of Significant Adverse Impact of the Project ETL on the Squatter Pigeon (southern)
Table 3-10	Likelihood of Significant Adverse Impact of the Mine Site and Access Road on the Australian Painted Snipe	Table 3-37	Likelihood of Significant Adverse Impact of the Project ETL on the Koala
Table 3-11	Likelihood of Significant Adverse Impact of the Mine Site and Access Road on the Squatter Pigeon (southern)	Table 3-38	Likelihood of Significant Adverse Impact of the Project ETL on the Greater Glider
Table 3-12	Koala Habitat Appraisal	Table 3-39	Assessments for Other Threatened Species Relevant to the Project ETL Area
Table 3-13	Likelihood of Significant Adverse Impact of the Mine Site and Access Road on the Koala	Table 3-40	Proposed Avoidance and Mitigation Measures for the Project ETL
Table 3-14	Likelihood of Significant Adverse Impact of the Mine Site and Access Road on the Greater Glider	Table 3-41	Vegetation and Habitat Clearance Summary – Rail Spur
Table 3-15	Assessments of Other Threatened Species Relevant to the Mine Site and Access Road Area	Table 3-42	Likelihood of Significant Adverse Impact of the Rail Spur and Loop on the Ornamental Snake
Table 3-16	Likelihood of Significant Adverse Impact of the Mine Site and Access Road on the Brigalow TEC	Table 3-43	Likelihood of Significant Adverse Impact of the Rail Spur and Loop on the Australian Painted Snipe
Table 3-17	Draft Water Quality Objectives	Table 3-44	Likelihood of Significant Adverse Impact of the Rail Spur and Loop on the Squatter Pigeon (southern)
Table 3-18	Rainfall Recharge Ranges	Table 3-45	Likelihood of Significant Adverse Impact of the Rail Spur and Loop on the Koala
Table 3-19	Application of Representative Mine Stages to Full Mine Life	Table 3-46	Likelihood of Significant Adverse Impact of the Rail Spur and Loop on the Greater Glider
Table 3-20	Proposed Controlled Release Conditions	Table 3-47	Assessments for Other Threatened Species Relevant to the Rail Spur and Loop Area
Table 3-21	Maximum Captured Catchment Area	Table 3-48	Proposed Avoidance and Mitigation Measures for the Rail Spur and Loop
Table 3-22	Predicted Average Groundwater Inflows by Stage	Table 3-49	Residual Significant Impact on MNES
Table 3-23	Predicted Maximum Drawdown at Privately-owned Property Bores	Table 3-50	Relevant Offset Area Details
Table 3-24	Habitat Clearance Summary	Table 3-51	Ground-truthed Regional Ecosystems within the Stage One Offset Area
Table 3-25	Proposed Avoidance and Mitigation Measures for the Mine Site and Access Road	Table 3-52	Stage One Offset Area Reconciliation
Table 3-26	Vegetation and Habitat Clearance Summary – Water Pipeline		
Table 3-27	Likelihood of Significant Adverse Impact of the Water Pipeline on the Ornamental Snake		

Table 3-53	Reconciliation of the Proposed Offset Strategy against EPBC Act Environmental Offsets Policy	Table 4-29	Local Business and Industry Content Management Strategy Key Action Summary
Table 4-1	Ground-truthed Regional Ecosystems	Table 4-30	Level of Service Criteria
Table 4-2	Impacts to MSES and MNES	Table 4-31	Project Years Assessed
Table 4-3	Likelihood of Significant Adverse Impact on the Common Death Adder	Table 4-32	Predicted Peak Cumulative Traffic Generation
Table 4-4	Likelihood of Significant Adverse Impact on the Short-beaked Echidna	Table 4-33	Project Transport Requirements for Inputs and Outputs
Table 4-5	Likelihood of Significant Adverse Impact on Wetlands and Watercourses	Table 4-34	Estimated Incremental Increase in People using Airports Servicing the Project Locality
Table 4-6	Likelihood of Significant Adverse Impact on Waterways Providing for Fish Passage	Table 4-35	Relative Scale of Various Noise Sources
Table 4-7	Summary of Residual Significant Impacts on MSES	Table 4-36	Noise Limits Adopted for the Project
Table 4-8	Residual Significant Impact on National and State Matters	Table 4-37	Overpressure and Vibration Limits Adopted for the Project
Table 4-9	Relevant Offset Area Details	Table 4-38	Representative Background Noise Levels
Table 4-10a	Ground-truthed Regional Ecosystems Within Stage One Offset Area	Table 4-39	Predicted Operational Noise Levels (Laeq 15min) During Adverse Meteorological Conditions
Table 4-10b	Stage One Offset Area Reconciliation	Table 4-40	Land Suitability – Cropping
Table 4-11	Reconciliation of the Proposed Offset Strategy against EPBC Act Environment Offsets Policy	Table 4-41	Land Suitability – Grazing
Table 4-12	Item 2 Performance Outcomes for Water, Wetlands and Groundwater	Table 4-42	Agricultural Land Classification
Table 4-13	Draft Water Quality Objectives for the Project	Table 4-43	Approximate Distances from Project to Nearby Dwellings
Table 4-14	Maximum Captured Catchment Area	Table 4-44	Area of Project within Properties
Table 4-15	Predicted Average Groundwater Inflows by Stage	Table 4-45	Proposed Post Mining Land Suitability Classes
Table 4-16	Predicted Maximum Drawdown at Privately-owned Property Bores	Table 4-46	Estimated Maximum Wastes Produced by the Project (per annum)
Table 4-17	Proposed Controlled Release Conditions	Table 5-1	General Rehabilitation Objectives for the Project
Table 4-18	Predicted Afflux Changes at Neighbouring/Private Properties	Table 5-2	Preliminary Rehabilitation Requirements
Table 4-19	Goals for Ambient Air Quality	Table 5-3	Backfill Status of Open Cut Pits at Mine Closure
Table 4-20	Estimated Background Air Quality Levels	Table 5-4	Final Void Geometry
Table 4-21	General Project Dust Control Measures	Table 5-6	Indicative Progressive Rehabilitation Schedule
Table 4-22	SIA Considerations Discussed with Stakeholders	Table 5-5	Preliminary Soil Balance
Table 4-23	Summary of Social Baseline Characteristics	Table 6-1	Summary of Management, Monitoring and Reporting Commitments for the Project
Table 4-24	Social Benefits and Impacts Significance Assessment Summary	Table 6-2	Summary of Project Commitments made by Pembroke Throughout the EIS
Table 4-25	Community Stakeholder Engagement Management Strategy Key Action Summary	Table 6-3	General Project Dust Control Measures
Table 4-26	Workforce Management Strategy Key Action Summary		
Table 4-27	Housing and Accommodation Management Strategy Key Action Summary		
Table 4-28	Health and Community Wellbeing Management Strategy Key Action Summary		

LIST OF FIGURES

Figure ES-1	Regional Location	Figure 2-25	Isaac River Crossing – Conceptual Design
Figure ES-2	Project General Arrangement	Figure 2-26	Overland Conveyor – Conceptual Design
Figure ES-3	General Arrangement – Olive Downs South Domain	Figure 2-27	Indicative ROM Coal Handling Schematic
Figure ES-4	General Arrangement – Willunga Domain	Figure 2-28	Indicative Mine Infrastructure Area Layout
Figure ES-5	Conceptual Final Land Use – Olive Downs South Domain	Figure 2-29	Indicative Water Management Schematic
Figure ES-6	Conceptual Final Land Use – Willunga Domain	Figure 2-30	Proposed Ripstone Creek Diversion – Conceptual Design
Figure 1-1	Regional Location	Figure 3-1	EPBC Act Assessment Areas
Figure 1-2	Project General Arrangement	Figure 3-2	Ground-truthed Regional Ecosystems
Figure 1-3	Environmental Impact Assessment and Project Approval Processes	Figure 3-2a	Ground-truthed Regional Ecosystems (a)
Figure 2-1	General Arrangement – Olive Downs South Domain	Figure 3-2b	Ground-truthed Regional Ecosystems (b)
Figure 2-2	General Arrangement – Willunga Domain	Figure 3-2c	Ground-truthed Regional Ecosystems (c)
Figure 2-3	Olive Downs South Domain General Arrangement – Year 2027	Figure 3-2d	Ground-truthed Regional Ecosystems (d)
Figure 2-4	Olive Downs South Domain General Arrangement – Year 2043	Figure 3-2e	Ground-truthed Regional Ecosystems (e)
Figure 2-5	Willunga Domain General Arrangement – Year 2043	Figure 3-3	Threatened Ecological Communities
Figure 2-6	Olive Downs South Domain General Arrangement – Year 2066	Figure 3-4	Broad Fauna Habitat Types
Figure 2-7	Willunga Domain General Arrangement – Year 2066	Figure 3-4a	Broad Fauna Habitat Types (a)
Figure 2-8	Olive Downs South Domain General Arrangement – Year 2085	Figure 3-4b	Broad Fauna Habitat Types (b)
Figure 2-9	Willunga Domain General Arrangement – Year 2085	Figure 3-4c	Broad Fauna Habitat Types (c)
Figure 2-10	Period Progress Plot	Figure 3-4d	Broad Fauna Habitat Types (d)
Figure 2-11	Brigalow Belt North Bioregion	Figure 3-4e	Broad Fauna Habitat Types (e)
Figure 2-12	Isaac Connors Sub-Catchment of the Fitzroy Basin	Figure 3-5a	Threatened Species Records – Birds
Figure 2-13	Groundwater Management Areas of the Fitzroy Basin	Figure 3-5b	Threatened Species Records – Mammals
Figure 2-14	Potential Strategic Cropping Land Trigger Map and Important Agricultural Land Mapping	Figure 3-5c	Threatened Species Records – Reptiles
Figure 2-15	Native Title Determination and Indigenous Land Use Agreement Areas	Figure 3-6a	Threatened Species Habitat Mapping – Australian Painted Snipe & Squatter Pigeon – Mine Site
Figure 2-16	Resource Tenements	Figure 3-6b	Threatened Species Habitat Mapping – Ornamental Snake – Mine Site
Figure 2-17	Land Ownership	Figure 3-6c	Threatened Species Habitat Mapping – Koala and Greater Glider – Mine Site
Figure 2-18	Topography	Figure 3-7	Numerical Groundwater Flow Model Extents
Figure 2-19	Isaac River Catchment	Figure 3-8a	Flood Model Extents – Hydrology
Figure 2-20	Regional Geology – Outcrop Mapping and Faulting	Figure 3-8b	Flood Model Extents – Hydraulic Model
Figure 2-21	Meteorological Stations	Figure 3-9	Topography
Figure 2-22	Long-Term and Average Rainfall Graphs	Figure 3-10	Isaac Connors Sub-Catchment of the Fitzroy Basin
Figure 2-23	Bushfire Hazard Mapping	Figure 3-11	Isaac River Catchment
Figure 2-24	Annual and Seasonal Wind Roses from CALMET Model	Figure 3-12	Groundwater Management Areas of the Fitzroy Basin
		Figure 3-13	General Arrangement – Olive Downs South Domain
		Figure 3-14	Regional Geology – Outcrop Mapping and Faulting
		Figure 3-15	Conceptual Model of the Groundwater Regime (Pre Mining and Post-Mining)
		Figure 3-16	Environmental Values – Water Quality (Isaac River Sub-basin)
		Figure 3-17	Resource Tenements
		Figure 3-18	Water Quality Monitoring – Baseline Data
		Figure 3-19	Surface Water Flow Monitoring Locations

Figure 3-20	Groundwater Monitoring and Investigation Sites	Figure 4-3	Conservation Significant Flora Species
Figure 3-21	Geomorphology Survey Sites	Figure 4-4	Broad Fauna Habitat Types
Figure 3-22	Isaac River Water Quality	Figure 4-5a	Threatened Species Records – Birds
Figure 3-23	Indicative Water Management Schematic	Figure 4-5b	Threatened Species Records – Mammals
Figure 3-24a	Numerical Groundwater Model – Predicted Groundwater Levels Post-Mining Equilibrium (Unconsolidated)	Figure 4-5c	Threatened Species Records – Reptiles
Figure 3-24b	Numerical Groundwater Model – Predicted Groundwater Levels Post-Mining Equilibrium (Vermont Seam)	Figure 4-6	Referrable Wetlands
Figure 3-25a	Developed Case Flood Model Predictions (50% AEP)	Figure 4-7a	Regional Ecosystem Mapping – Stage 1 Offset Area
Figure 3-25b	Developed Case Flood Model Predictions (2% AEP)	Figure 4-7b	Matters of State Environmental Significance – Stage 1 Offset Area
Figure 3-26	Developed Case Flood Model Predictions (2% AEP) – Afflux and Property Ownership	Figure 4-8	Environmental Values – Water Quality (Isaac River Sub-basin)
Figure 3-27a	Base Case Flood Model Predictions (0.1% AEP) – Velocity and Extents	Figure 4-9	Water Quality Monitoring – Baseline Data
Figure 3-27b	Final Landform Flood Model Predictions (0.1% AEP) – Velocity and Extents	Figure 4-10	Isaac River Water Quality
Figure 3-28	Modelled Downstream Water Quality – Isaac River Median Climatic Conditions	Figure 4-11	Modelled Downstream Water Quality – Isaac River Median Climatic Conditions
Figure 3-29a	Olive Downs South Domain – Proposed Monitoring Network	Figure 4-12	Surface Water Flow Monitoring Locations
Figure 3-29b	Willunga Domain – Proposed Monitoring Network	Figure 4-13	Groundwater Monitoring and Investigation Sites
Figure 3-30a	Threatened Species Habitat Mapping – Australian Painted Snipe & Squatter Pigeon – Electricity Transmission Line	Figure 4-14	Geomorphology Sites
Figure 3-30b	Threatened Species Habitat Mapping – Ornamental Snake – Electricity Transmission Line	Figure 4-15	Conceptual Model of the Groundwater Regime (Pre-mining and Post-mining)
Figure 3-30c	Threatened Species Habitat Mapping – Koala and Greater Glider – Electricity Transmission Line	Figure 4-16	Numerical Groundwater Flow Model Extents
Figure 3-31a	Threatened Species Habitat Mapping – Australian Painted Snipe & Squatter Pigeon – Rail Spur and Water Pipeline	Figure 4-17a	Groundwater Model – Maximum Incremental Drawdown Predictions (Unconsolidated)
Figure 3-31b	Threatened Species Habitat Mapping – Ornamental Snake – Rail Spur and Water Pipeline	Figure 4-17b	Groundwater Model – Maximum Incremental Drawdown Predictions (Vermont Seam)
Figure 3-31c	Threatened Species Habitat Mapping – Koala and Greater Glider – Rail Spur and Water Pipeline	Figure 4-18a	Numerical Groundwater Model – Predicted Groundwater Levels Post-mining Equilibrium (Unconsolidated)
Figure 3-32	Indicative Mine Stages for Biodiversity Offset	Figure 4-18b	Numerical Groundwater Model – Predicted Groundwater Levels Post-mining Equilibrium (Vermont Seam)
Figure 3-33	MNES – Potential Offset Property Mapping	Figure 4-19a	Flood Model Extent – Hydrology
Figure 4-1	Ground-truthed Regional Ecosystems	Figure 4-19b	Flood Model Extent – Hydraulic Model
Figure 4-1a	Ground-truthed Regional Ecosystems	Figure 4-20a	Developed Case Flood Model Predictions (50% AEP)
Figure 4-1b	Ground-truthed Regional Ecosystems	Figure 4-20b	Developed Case Flood Model Predictions (2% AEP)
Figure 4-1c	Ground-truthed Regional Ecosystems	Figure 4-21	Developed Case Flood Model Predictions (2% AEP) – Afflux and Property Ownership
Figure 4-1d	Ground-truthed Regional Ecosystems	Figure 4-22a	Base Case Flood Model Predictions (0.1% AEP) – Velocity and Extents
Figure 4-1e	Ground-truthed Regional Ecosystems	Figure 4-22b	Final Landform Flood Model Predictions (0.1% AEP) – Velocity and Extents
Figure 4-2	Threatened Ecological Communities	Figure 4-23	Project Only 24-hour Average PM10 Contours – 2043
		Figure 4-24a	Social Impact Assessment Study Area
		Figure 4-24b	Potentially Affected Communities within SIA Study Area
		Figure 4-25	Mackay, Isaac and Whitsunday Local Government Areas

Figure 4-26	Existing Road Network
Figure 4-27	Noise Contours – Year 2066 Adverse Meteorological Conditions
Figure 4-28	Soils Mapping
Figure 4-29	Contaminated Land Points of Interest
Figure 4-30	Non-indigenous Cultural Heritage Sites
Figure 5-1	Rehabilitation Domains
Figure 5-2	Conceptual Final Landform – Olive Downs South Domain
Figure 5-3	Conceptual Final Landform – Willunga Domain
Figure 5-4a	Conceptual Final Landform Cross Section Backfilled Open Cut
Figure 5-4b	Conceptual Final Landform Cross Section Highwall Emplacement and Final Void
Figure 5-5a	Conceptual Final Land Use – Olive Downs South Domain
Figure 5-5b	Conceptual Final Land Use – Willunga Domain
Figure 5-6	Olive Downs South Domain Progressive Rehabilitation - 2030
Figure 5-7	Olive Downs South Domain Progressive Rehabilitation - 2040
Figure 5-8	Willunga Domain Progressive Rehabilitation - 2040
Figure 5-9	Olive Downs South Domain Progressive Rehabilitation - 2050
Figure 5-10	Willunga Domain Progressive Rehabilitation - 2050
Figure 5-11	Olive Downs South Domain Progressive Rehabilitation - 2060
Figure 5-12	Willunga Domain Progressive Rehabilitation - 2060
Figure 5-13	Olive Downs South Domain Progressive Rehabilitation - 2072
Figure 5-14	Willunga Domain Progressive Rehabilitation - 2072
Figure 5-15	Olive Downs South Domain Progressive Rehabilitation - 2085
Figure 5-16	Willunga Domain Progressive Rehabilitation - 2085
Figure 5-17	Olive Downs South Domain Progressive Rehabilitation - 2098
Figure 5-18	Olive Downs South Domain Progressive Rehabilitation - Post Decommissioning
Figure 5-19	Willunga Domain Progressive Rehabilitation - Post Decommissioning
Figure 6-1	Environmental Monitoring Locations

LIST OF PLATES

Plate 4-1	Fitzroy Developmental Road – Indicative Intersection Form
Plate 4-2	Vermont Park Looking West

LIST OF CHARTS

Chart 2-1	Indicative Production Schedule
Chart 2-2	Estimated Gross and Net Annual CHPP Makeup Water Requirements

LIST OF DIAGRAMS

Diagram 2-1	Indicative Sewage Treatment Flow Diagram
-------------	--

LIST OF ATTACHMENTS

Attachment 1	Olive Downs Coking Coal Project Terms of Reference
Attachment 2	Olive Downs Coking Coal Project Terms of Reference Reconciliation Table
Attachment 3	Regulatory Framework
Attachment 4	Peer Review Letters
Attachment 5	Public Consultation Report

LIST OF APPENDICES

Appendix A	Terrestrial Flora Assessment
Appendix B	Terrestrial Fauna Assessment
Appendix C	Aquatic Ecology Assessment
Appendix D	Groundwater Assessment
Appendix E	Surface Water Assessment
Appendix F	Flood Assessment
Appendix G	Air Quality and Greenhouse Gas Assessment
Appendix H	Social Impact Assessment
Appendix I	Economic Assessment
Appendix J	Road Transport Assessment
Appendix K	Noise and Vibration Assessment
Appendix L	Geochemistry Assessment
Appendix M	Soil and Land Suitability Assessment
Appendix N	Non-Indigenous Cultural Heritage Assessment
Appendix O	Preliminary Risk Assessment