



ATTACHMENT 5

ARROW LNG PLANT

Other Management Plans

CONTENTS

1.	INTRODUCTION	1-1
1.1	Arrow LNG Plant	1-1
1.2	Purpose of the Plan	1-1
1.3	Legislative Context	1-1
2.	SITE DESCRIPTION AND ENVIRONMENTAL VALUES	2-1
2.1	Geology	2-1
2.2	Regional Groundwater Setting	2-1
2.3	Hydrogeology	2-1
2.3.1	Groundwater Recharge	2-1
2.3.2	Groundwater Discharge	2-1
2.3.3	Groundwater Flow	2-1
2.4	Groundwater Quality and Uses	2-1
2.5	Contaminated Land and Acid Sulfate Soil Assessments	2-1
2.5.1	Contaminated Land	2-1
2.5.2	Acid Sulfate Soils	2-1
2.6	Groundwater Values	2-1
3.	POTENTIAL GROUNDWATER IMPACTS	3-1
3.1	Project Activities	3-1
4.	MITIGATION AND MANAGEMENT MEASURES	4-1
4.1	Design	4-1
4.2	Construction and Operation	4-1
4.3	Decommissioning	4-1
5.	GROUNDWATER MONITORING STRATEGY	5-1
5.1	Monitoring Conceptual Timeline	5-1
5.1.1	Preconstruction	5-1
5.1.2	Construction and operation	5-1
5.1.3	Decommissioning	5-1
5.2	Groundwater Baseline Assessment	5-1
5.3	Impact Monitoring	5-1
5.4	Sampling Location Selection and Rationale	5-1
5.5	Drilling, Soil and Rock Sampling and Analysis	5-1
5.5.1	Drilling Techniques	5-1
5.5.2	Sample Handling	5-1
5.6	Monitoring Well Installation	5-1
5.6.1	Bore Construction License	5-1
5.6.2	Water	5-1
5.6.3	Well Screen	5-2
5.6.4	Primary Filter Pack	5-2
5.6.5	Casing	5-2
5.6.6	Headworks	5-2

5.6.7	Annular Sealants	5-2
5.6.8	Maintenance	5-2
5.7	Compliance Targets	5-2
6.	SAMPLING AND ANALYSIS METHODOLOGY	6-1
6.1	Groundwater Sampling Regulations	6-1
6.1.1	Equipment	6-1
6.1.2	Groundwater Gauging	6-1
6.1.3	Purging	6-1
6.1.4	Sampling	6-1
6.1.5	Laboratories	6-1
7.	MONITORING PARAMETERS AND FREQUENCY	7-1
8.	REPORTING	8-1
9.	REFERENCES	9-1

Figures

1	Target locations for monitoring bore installation	5-1
2	Monitoring bore design	5-1

Tables

1.1	Relevant policies, guidelines and legislation	1-1
2.1	Potential sources of contamination and potential contaminants of concern	2-1
3.1	Construction and operation impacts on groundwater	3-1
5.1	Sampling location selection and rationale	5-1
5.2	Groundwater quality guideline criteria	5-2
6.1	Groundwater quality parameter stabilisation limits	6-1
7.1	Field and laboratory parameters and sampling frequency for baseline and impact monitoring	7-1

CONTENTS

1.	INTRODUCTION	1-1
1.1	Arrow LNG Plant	1-1
1.2	Objectives of the Plan	1-1
1.3	Legislative Framework	1-1
2.	EXISTING ENVIRONMENT AND ENVIRONMENTAL VALUES	2-1
2.1	Completed Studies and Assessments	2-1
2.2	Determination of Significance of Shorebird Habitat	2-1
2.3	Status of Shorebird Habitat in Port Curtis and Region	2-1
2.4	Status of shorebird species in Port Curtis and Region	2-1
2.5	Status of shorebird species and habitat adjacent to Arrow LNG Plant Project Area	2-1
3.	THREATS TO SHOREBIRDS AND HABITAT	3-1
3.1	Habitat Loss	3-1
3.2	Habitat Degradation	3-1
3.3	Disturbance	3-1
3.4	Direct Mortality	3-1
4.	POTENTIAL IMPACTS	4-1
4.1	Impacts on Shorebirds	4-1
4.2	Potential Cumulative Impacts	4-1
5.	MITIGATION AND MANAGEMENT MEASURES	5-1
5.1	Proposed Mitigation Measures	5-1
6.	MONITORING MEASURES	6-1
7.	REFERENCES	7-1

Tables

2.1	Criteria for determining important shorebird habitat as defined by DEWHA (2009) and Clemens <i>et al.</i> , (2008)	2-1
2.2	Internationally and nationally significant shorebird counts for Curtis Coast from Western Basin Dredging Project Shorebirds Monitoring Program 2011-2012 (Gladstone Ports Corporation, 2011 and 2012)	2-1
2.3	Migratory shorebird species listed under the EPBC Act potentially occurring in Port Curtis	2-1
2.4	Resident shorebird species potentially occurring in Port Curtis	2-1
5.1	Commitments Update: Shorebirds	5-1

CONTENTS

1.	INTRODUCTION	1-2
1.1	Arrow LNG Plant	1-2
1.2	Purpose of the Plan	1-2
1.3	Legislative Framework	1-2
1.4	Approvals, Licences and Permits	1-2
2.	EXISTING ENVIRONMENT AND ENVIRONMENTAL VALUES	2-1
2.1	Threatened Flora Communities	2-1
2.2	Endangered Regional Ecosystems (RE)	2-1
2.3	Conservation Listed Flora Species	2-1
2.4	Fauna Species	2-1
2.5	Pest Species	2-1
3.	IMPACTS ON FLORA AND FAUNA SPECIES	3-1
3.1	Potential Impacts	3-1
3.1.1	Vegetation Clearance and Ground Disturbance	3-1
3.1.2	Habitat Fragmentation and Impacts on Wildlife Corridors	3-1
3.1.3	Introduced Flora and Fauna	3-1
3.1.4	Hydrology and Pollution	3-1
3.1.5	Direct Disturbance of Fauna	3-1
3.1.6	Altered Fire Regimes	3-1
3.1.7	Trenchfall	3-1
3.2	Potential Cumulative Impacts	3-1
4.	MITIGATION AND MANAGEMENT MEASURES	4-1
4.1	Proposed Mitigation Measures	4-1
5.	OFFSET REQUIREMENTS	5-1
6.	MONITORING MEASURES	6-1
6.1	Pre-clearance Surveys	6-1
6.2	Monitoring and Inspection	6-1
7.	REFERENCES	7-1

Tables

2.1	Environmentally sensitive areas present in the Arrow LNG Plant project area	2-1
3.1	Cumulative clearance of regulated vegetation	3-1
4.1	Commitments update: terrestrial ecology	4-1

CONTENTS

1.	INTRODUCTION	1-1
1.1	Objectives of the Plan	1-1
1.2	Legislative Framework	1-1
1.3	The Function of Wildlife Corridors	1-1
2.	EXISTING ENVIRONMENT	2-1
2.1	Flora	2-1
2.2	Weeds	2-1
2.3	Fauna	2-1
3.	POTENTIAL IMPACTS	3-1
3.1	Direct Impacts	3-1
3.2	Indirect Impacts	3-1
4.	MANAGEMENT MEASURES	4-1
4.1	Standard Management Measures	4-1
4.2	Species-Specific Management Measures	4-1
4.3	Management Roles and Responsibilities	4-1
4.4	Inductions and Training	4-1
5.	MONITORING AND REPORTING MEASURES	5-1
5.1	Inspections, Reviews and Audits	5-1
6.	REFERENCES	6-1

Tables

4.1	Environmental Management Roles and Responsibilities	4-1
5.1	Wildlife Corridor Management Implementation Plan	5-1

