

GLNG Project CSG Fields

Environmental Protocol for Constraints Planning and Field Development

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Revision History

Revision	Date	Description
0	18/5/11	For use
A	21/9/11	Amended to satisfy third party review by Cardno, prior to SEWPaC approval
B	29/11/11	Amended to include Arcadia Valley Project Area Environmental Authority.
C	7/8/13	Draft amendment to allow for mutually beneficial activities in Constraints Class A with DNPRSR approval
D	22/8/13	Amended to allow for mutually beneficial activities in Constraints Class A with DNPRSR approval
E	12/9/13	Amended following SEWPaC review and comments on Revision D

Revision A

The Environmental Protocol for Constraints Planning and Field Development (the Protocol) Revision 0 was submitted to SEWPaC for approval. Following SEWPaC's review (undertaken by Cardno), a number of amendments were required. The *Santos GLNG Project CSG Fields Environmental Protocol for Constraints Planning and Field Development (Protocol) Review* outlines the location, nature and rationale of any changes to the Protocol.

Revision B

The Environmental Protocol for Constraints Planning and Field Development (the Protocol) Revision A was submitted to SEWPaC and approved on 28/09/2011. Following the subsequent receipt of the Arcadia Valley Project Area Environmental Authority, minor amendments were required to the approved Protocol.

Revision C

A draft Environmental Protocol for Constraints Planning and Field Development (the Protocol) was submitted to SEWPaC. The updates allow Santos to conduct specific and mutually beneficial activities in a National Park, provided the Queensland Department of National Parks, Recreation, Sport and Racing have given express written permission for the proposed activities. SEWPaC provided comments on this draft.

Revision D

The Environmental Protocol for Constraints Planning and Field Development (the Protocol) Revision D was submitted to SEWPaC to incorporate the changes within the draft Revision C. This revision includes the additional information requested by SEWPaC following their review of Revision C, including the fauna habitat mapping methodology.

Revision E

Revision E of the Environmental Protocol for Constraints Planning and Field Development (the Protocol) was submitted to SEWPaC to incorporate the changes to Revision D. This revision includes the additional information requested by SEWPaC following their review of Revision D.

Table of Contents:

1	INTRODUCTION	7
2	PURPOSE AND SCOPE	10
	2.1 Purpose	10
	2.2 Scope	10
3	ENVIRONMENTAL HEALTH & SAFETY MANAGEMENT SYSTEM	11
4	LEGAL AND OTHER REQUIREMENTS	11
5	ROLES AND RESPONSIBILITIES	12
	5.1 Project Director - Development	13
	5.2 Project Manager - Development.....	14
	5.3 Development Team.....	14
	5.4 Assessment Team	15
	5.5 Environmental Representative	16
	5.6 Ecologist.....	17
	5.7 Implementation Team	17
	5.8 Santos Management.....	18
6	PLANNING CONSTRAINTS.....	18
	6.1 Nuisance Constraints for Noise and Air Impacts	18
	6.2 Soils Constraints (including Good Quality Agricultural Land and Strategic Cropping Land)	18
	6.3 Exclusion of Petroleum Activities in Riverine Improvement Trust Asset Areas	18
	6.4 The Exclusion of Infrastructure from Flood Areas.....	19
	6.5 Bioregional Corridors	19
	6.6 Other Planning Constraints	19
	6.7 Linear Infrastructure Constraints	20
	6.8 Disturbance Limits	21
	6.8.1 EPBC Fauna Habitat Model.....	23
	6.8.2 Disturbance Limits within Arcadia Project Area.....	25
7	FIELD MANAGEMENT PROCEDURES.....	26
	7.1 Constraints Classes	27
	7.2 Field Management Procedures for Constraints Classes.....	30
	7.2.1 Constraints Class A	30
	7.2.2 Constraints Class B	30
	7.2.3 Constraints Class C	34
	7.2.4 Constraints Class D	36
	7.2.5 Constraints Class E	37
8	INTERNAL APPROVAL PROCESS.....	38
	8.1 STAGE 1: Planning and Approvals	38
	8.1.1 Step 1 – Request for Internal Approval.....	38
	8.1.2 Step 2 – Desktop Evaluation of Petroleum Activities.....	39
	8.1.3 Step 3 – Field Assessment and Verification	41
	8.1.4 Step 4 – Assessment of the Proposed Activity	43
	8.1.5 Step 5 – Approval	44
	8.2 STAGE 2: Field Development and Construction	45
	8.2.1 Step 6 – Implementation of the Authorised Activity	45
	8.3 STAGE 3: Post Construction.....	46
	8.3.1 Step 7 – Monitoring and Internal Reporting	46
	8.3.2 Step 8 – Auditing.....	47
	8.3.3 Step 9 – External Reporting to Regulatory Agencies	48
9	DECOMMISSIONING AND DEMOLITION MANAGEMENT PLAN	49
10	SITE REMEDIATION, REHABILITATION AND RECOVERY MONITORING PLAN	49
11	OTHER DOCUMENTATION.....	51

11.1.1	Internal (Santos personnel access only).....	51
11.1.2	External.....	51
11.2	Environmental Management Plans	51
11.3	Cumulative Impact Assessment Report	52
11.4	Species Management Programs.....	52
11.5	Significant Species Management Plan.....	53
11.6	Pest and Weed Management Program	55
11.7	Fauna Management Plans.....	55
11.8	Soil Management Plans	55
12	APPROVAL AND REVIEW OF THE SANTOS ENVIRONMENTAL PROTOCOL FOR CONSTRAINTS PLANNING AND FIELD DEVELOPMENT FOR THE GLNG CSG FIELDS	56
13	PUBLICATION AND NOTIFICATION.....	57
14	DEFINITIONS	58
	Constraints Mapping.....	87
	Constraints Classes.....	87
	Data Layers	87
	Environmentally Sensitive Areas.....	88
	Regional Ecosystem Mapping	88
	EPBC Act Related Matters.....	88
	EPBC Act listed Ecological Communities	88
	Queensland Directory of Important Wetlands.....	91
	Essential Habitat Mapping	91
	Bioregional Corridors	91
	Previous Survey Work	92
	Fauna Habitat Maps.....	92
	APPENDIX A EPBC ACT CONDITIONS AND THE RELEVANT SECTION OF PROTOCOL WHERE THEY ARE ADDRESSED	
	APPENDIX B CG REPORT CONDITIONS AND THE RELEVANT SECTION OF PROTOCOL WHERE THEY ARE ADDRESSED	
	APPENDIX C FIELD ASSESSMENT MATRIX	
	APPENDIX D LAND DISTURBANCE – SITE SELECTION AND INSPECTION FORM	
	APPENDIX E ECOLOGICAL CONSTRAINTS MAPPING	
	APPENDIX F ENVIRONMENTALLY SENSITIVE AREAS	
	APPENDIX G FIELD SURVEY METHODOLOGY	
	APPENDIX H INTERNAL APPROVAL FLOW CHART	
	APPENDIX I GUIDELINE FOR SITE SCOUTING	
	APPENDIX J FIELD ASSESSMENT FLOW CHART	

List of Tables:

Table 1	Noise Limits at Sensitive Receptors	18
Table 2	Gathering pipeline network corridor widths (right of way)	20
Table 3	Road and co-located infrastructure corridor widths (right of way)	21
Table 4	Disturbance limits for threatened ecological communities, sensitive regional ecosystems and essential habitat	21
Table 5	Protected plant species (<i>Nature Conservation Act 1992</i>) disturbance limit	22
Table 6	Disturbance limits for listed species.....	23
Table 7	Constraints Classes	28
Table 8	EPBC Act listed threatened ecological communities and their equivalent REs ..	89

List of Figures:

Figure 1	CSG Field Development Areas.....	8
Figure 2	Organisation Chart	13
Figure 3	Diagram of State and Commonwealth buffer zones (not to scale) (excludes linear infrastructure)	29

Abbreviations

ARI	Average Recurrence Interval
CG	Coordinator-General
CSG	Coal Seam Gas
DEHP	Department of Environment and Heritage Protection
DNPRSR	Department of National Parks, Recreation, Sport and Racing
EDIDB	Environmental Disturbance Inventory Database
EHS&S	Environment, Health, Safety and Security
EHSMS	Environment, Health and Safety Management System
EIS	Environmental Impact Statement
EM Plan	Environmental Management Plan
EP Act	<i>Environmental Protection Act 1994</i>
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
EPC	Engineering, Procurement and Construction
ESA	Environmentally Sensitive Area
EVNT	Endangered, Vulnerable and Near Threatened
FMP	Field Management Procedures
GIS	Geographic Information System
GLNG	Gladstone Liquefied Natural Gas
HDD	Horizontal Directional Drilling
IA	Indigenous Affairs
LNG	Liquefied Natural Gas
MNES	Matters of National Environmental Significance
NC Act	<i>Nature Conservation Act 1992</i>
PM	Project Manager
P&G Act	<i>Petroleum and Gas Act (Production and Safety) 2004</i>
RE	Regional Ecosystem
RFDA	Reasonable Foreseeable Development Area
RoW	Right of Way
RRRMP	Remediation, Rehabilitation, Recovery and Monitoring Plan
SEIS	Supplementary Environmental Impact Statement
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities
SSMP	Significant Species Management Plan
The Protocol	Environmental Protocol for Constraints Planning and Field Development
US	Upstream
VM Act	<i>Vegetation Management Act 1999</i>

1 Introduction

The Gladstone Liquefied Natural Gas (GLNG) Project Environmental Protocol for Constraints Planning and Field Development (**the Protocol**) has been developed to satisfy the conditions imposed by:

- The Minister under the *Environment Protection and Biodiversity Conservation Act 1999* approval for the Coal Seam Gas (CSG) Fields (referral EPBC No. 2008/4059);
- The Coordinator-Generals' evaluation for an environmental impact statement – Gladstone Liquefied Natural Gas – GLNG Project (the CG Report);
- Relevant Environmental Authorities for Petroleum Activities (EAs); and
- The clearing permit exemption under section 41(1)(a)(ii) of the *Nature Conservation (Protected Plant) Conservation Plan 2000*.

The Protocol outlines the approach Santos as Operator on behalf of the GLNG joint venture will take in identifying, assessing and managing potential impacts to Matters of National Environmental Significance (MNES) and State related matters through the use of Field Management Procedures (FMP).

Santos proposes to develop the GLNG joint venture's CSG resources in the Surat and Bowen Basins (Arcadia, Fairview and Roma CSG Fields) to produce enough feed gas for the first liquefied natural gas (LNG) Train of the GLNG project. The Roma, Fairview and Arcadia Valley fields are known as the Reasonably Foreseeable Development Area (RFDA). The development of the GLNG CSG fields will involve a rolling program of construction, operation, decommissioning and rehabilitation of GLNG CSG infrastructure over a large area over a significant length of time. Planning for field development, including the specific locations of exploration and development wells and associated infrastructure is determined incrementally based on the outcome of ongoing exploration programs. A map of the CSG Fields development area is included in Figure 1.

Santos has been given approval to develop 2,650 production wells within the RFDA. The limits have been factored into the EA's and progress tracked in the Operational Plans and annual returns.

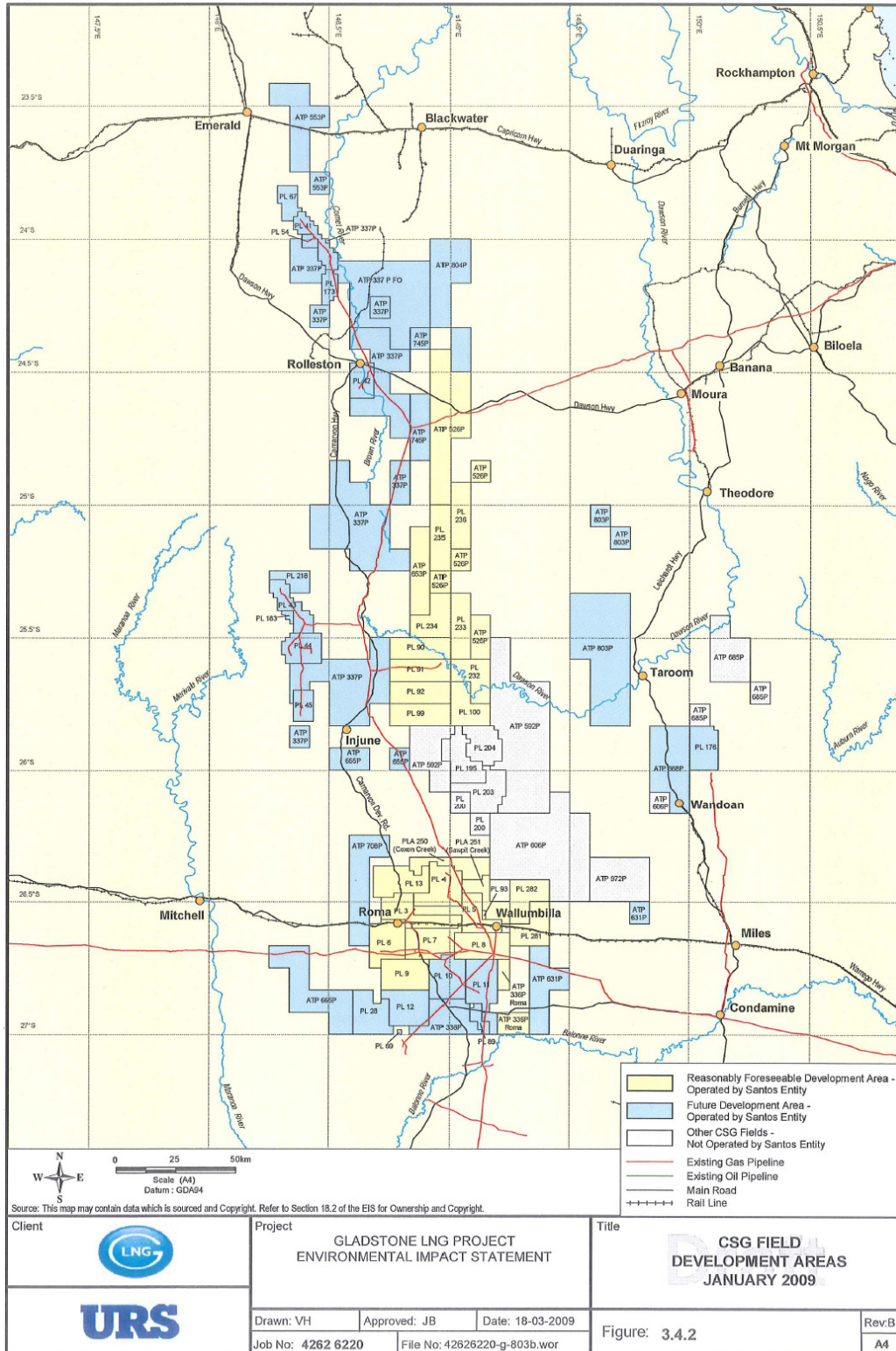


Figure 1 CSG Field Development Areas

Potential impacts to MNES and other State related matters may arise from the clearing of vegetation and potential fauna habitat required for the gas wells, water and gas gathering pipelines, roads, power easements, compression facilities and associated infrastructure (including dams and camps). The clearing will progress incrementally over the life of the GLNG Project with the expansion of the GLNG CSG field infrastructure network. Due to the nature of the activities within the GLNG CSG fields, the precise locations of the wells and associated infrastructure have not been determined at this time.

The Protocol has been developed to enable Santos to systematically identify, assess and manage potential impacts to environmentally sensitive areas, including MNES in accordance with the conditions of the EPBC Approval and other approvals for the GLNG CSG Fields.

The Protocol includes specific FMP that will be implemented for five constraints classes identified (described in Section 7 of the Protocol). The FMP set out:

- The nature of the development which is proposed to be undertaken within each constraints class;
- The process to be undertaken to determine the specific location of the development within each constraints class having regard to the local ecological values of the area; and
- The mitigation measures that will be implemented to minimise the impact of the development on the ecological values of the area.

Santos will adopt specific management principles when planning for and implementing new petroleum activities that may result in land disturbance for the GLNG CSG Fields:

- Avoidance – Avoiding direct and indirect impacts to environmentally sensitive areas, including MNES;
- Minimise – Minimise potential impacts on environmentally sensitive areas, including MNES;
- Mitigate – Implement mitigation and management measures to minimise cumulative adverse impacts on MNES; and
- Remediation and Rehabilitation – Actively remediate and rehabilitate impacted areas to promote and maintain long-term recovery of environmentally sensitive areas, including MNES.

Where impacts are unavoidable and result in a permanent loss of an environmental value, Santos will provide secured environmental offsets for approval in accordance with both Queensland State and Commonwealth government requirements.

2 Purpose and Scope

2.1 Purpose

The purpose of the Protocol is to set out the framework for systematically identifying, assessing and managing potential impacts to environmentally sensitive areas, including MNES associated, with development of the GLNG CSG fields.

The Protocol details the requirements for:

- Obtaining internal Santos approval for any new petroleum activity that may cause significant disturbance to land;
- Ensuring that appropriate planning is undertaken prior to conducting any new petroleum activity associated with the authorised CSG activities;
- Conducting CSG activities in a way that avoids or minimises land disturbance and potential impacts to MNES; and
- Compliance monitoring and reporting requirements to the relevant State and Commonwealth Departments.

The Protocol will ensure that the CSG activities are undertaken to:

- Ensure compliance with all relevant State and Commonwealth statutory approvals;
- Minimise impacts to environmentally sensitive areas including MNES;
- Achieve compliance with Santos environmental policies; and
- Ensure that activities are undertaken in a sustainable manner.

2.2 Scope

The Protocol applies to the life of the project, including the various stages of development (i.e. planning and design, construction, operation, decommissioning and rehabilitation). The Protocol will apply to any new petroleum activity within the Reasonable Foreseeable Development Area (RFDA). The Protocol will apply to all new petroleum activities or modifications to existing operations associated with the GLNG Project. Petroleum activities may include:

- Seismic exploration;
- Borrow pits;
- Well lease sites;
- Compressor stations and associated infrastructure;
- Water treatment facilities and associated infrastructure;
- Accommodation facilities and associated infrastructure – e.g. Permanent and temporary construction campsites;
- Waste Disposal facilities (onsite only);
- Ponds and Dams – For storage and the management of CSG water;
- Water and Gas Pipelines – Reticulated network;
- Petroleum pipeline licenses (PPL) and trunk/flow lines;
- Internal power network; and

- Roads and access tracks.

Operational Plans (OP) have been developed for the CSG Fields, based on the rolling nature of CSG Field development. The purpose of an OP is to provide site and asset specific information regarding the actual and near term foreseeable CSG Fields development. It also documents the nature and extent of activities and disturbances relative to existing landforms, land uses and sensitive environmental settings during the three year period of the plan. The Protocol will be reviewed and updated to reflect inclusions to the OPs, as required.

3 Environmental Health & Safety Management System

Santos will use its company-wide Environment, Health & Safety Management System (EHSMS), which provides a structured framework for effective environmental and safety practice across all Santos activities and operations.

The framework has been developed to ensure compliance with Australian Standard 4801:2000 Occupational Health and Safety Management Systems – Specification with guidance for use, and AS/NZS ISO 14001:1996 Environmental Management Systems – Specification with guidance for use.

The EHSMS documents are maintained in electronic form on Santos' central server (The Well) that is accessible to all employees and contractors.

Management standards have been developed as part of the EHSMS and define the requirements necessary to ensure that environmental, health and safety risk is systematically managed.

Hazard standards detail the controls required to manage the risks of specific hazards to acceptable levels. These apply to all Santos operations. They contain specific requirements for planning and undertaking activities and include checklists and references to internal and external approvals and controls.

The system has been reviewed and information and guidelines pertinent to the Protocol have been included as required.

4 Legal and Other Requirements

As Operator of the GLNG CSG fields (RFD Area) and proponent of the upstream component of the GLNG Project, Santos must comply with all relevant State and Commonwealth approvals, including but not limited to:

- Approval of EPBC No 2008/4059 (22nd October 2010);
- Coordinator-General's evaluation report for an environmental impact statement – Gladstone Liquefied Natural Gas – GLNG Project under Part 4 of the *State Development and Public Works Organisation Act 1971*;
- Relevant Environmental Authorities (Petroleum Activities) for each project area;
- Clearing Permits issued under the *Nature Conservation Act 1992* (NC Act);
- Species Management Programs under NC Act;

- Beneficial Reuse Applications for managing associated water under the *Environmental Protection Regulation 2008*; and
- The Protected plant exemption under section 41(1)(a)(ii) of the *Nature Conservation (Protected Plant) Conservation Plan 2000* (September 2010).

A Compliance Matrix which lists all conditions imposed by Commonwealth and State governments and the relevant section of the Protocol where they are addressed is included as Appendix A and Appendix B respectively.

The Protected plant exemption applies to the taking a protected plant in the course of an activity under a *resource authority* made, granted or given under the *Greenhouse Gas Storage Act 2009* or the or the *Petroleum Act 1923* or the *Petroleum and Gas (Production and Safety) Act 2004* or the *Petroleum (Submerged Lands) Act 1982*. The exemption does not apply within a Forest Reserve or Protected Area prescribed under the NC Act.

5 Roles and Responsibilities

Santos has adopted specific Field Management Procedures to minimise impacts from new petroleum activities on the ecological values within the GLNG CSG fields. These procedures follow a project management model that defines specific roles and responsibilities for each stage of disturbance. For the purposes of the Protocol, these roles and responsibilities are generic in nature to allow for the organisation structure changes and progress of the project. The personnel required for the implementation of the Protocol include:

- Project Director - Development;
- Project Manager - Development;
- Development Team;
- Assessment Team;
- Environmental Representative;
- Ecologist;
- Project Director - Implementation;
- Implementation Team; and
- Santos Management.

The interaction between these personnel is shown in an organisation chart (Figure 2). Within this figure, the terms 'B', 'C', 'D' and 'E' refer to the constraints classes described in section 7.

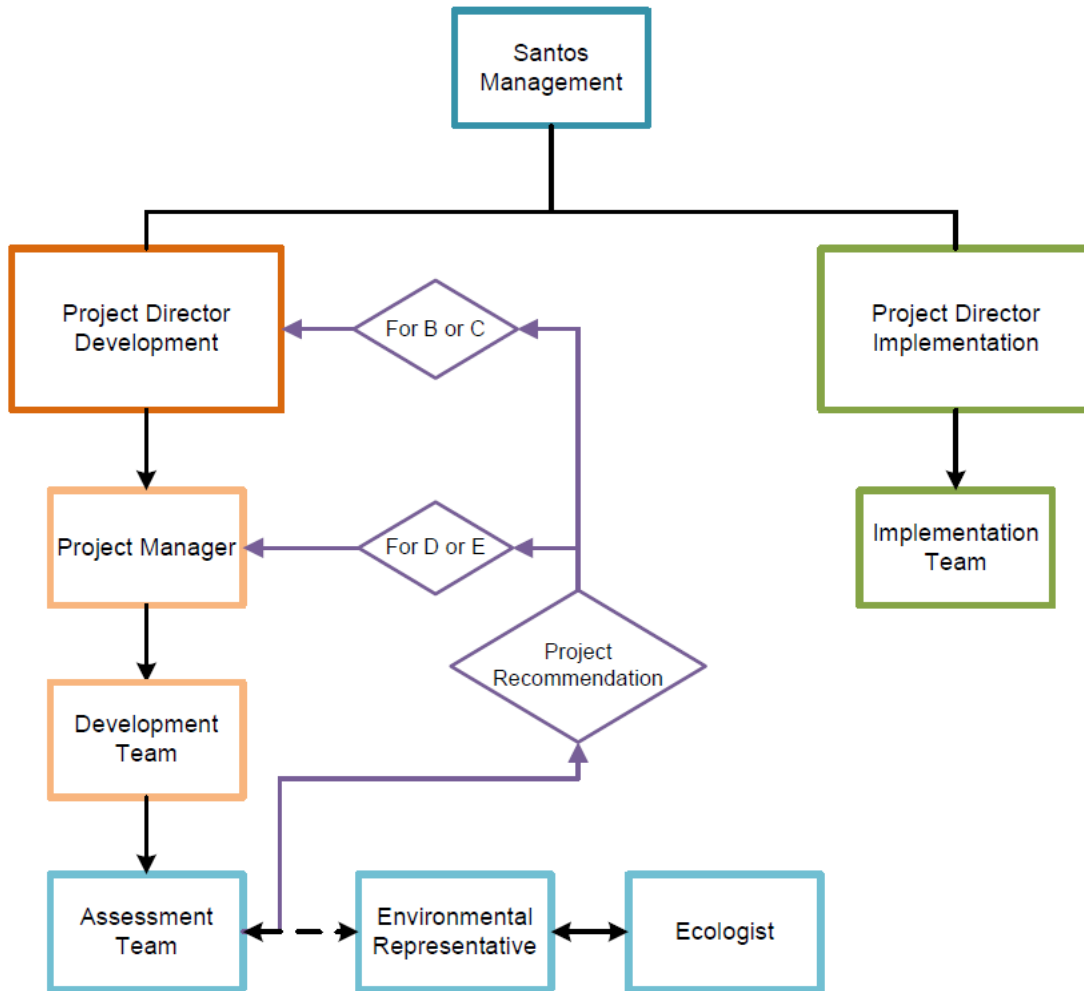


Figure 2 Organisation Chart

5.1 Project Director - Development

The Project Director – Development will ensure that all business interests are adequately addressed, and that decisions that may impact EPBC Act and State related matters are approved at an appropriate level. The Project Director shall also ensure that no unauthorised activities will be undertaken in a Constraints Class A area. Where express written permission from the Queensland Department of National Parks, Recreation, Sport and Racing (DNPRSR) has been granted for a specific and mutually beneficial activity in a National Park, the Project Director is responsible for obtaining the permission and ensuring the activities are conducted in accordance with the approval or agreement.

The Director will ensure that the decision making process adequately takes into account all stakeholders interests and that EPBC Act related matters are given proper consideration in the decision making process. The Director will make the final decision for the site design for the proposed new petroleum activity in Constraints Class B or C areas (described in Section 7 of the Protocol), based on the information provided by the Environment Representative and Assessment Team.

In relation to environmental offsets, the Project Director will need to ensure that appropriate offsets have been obtained and that the proposed area of disturbance is within the required disturbance limits as per the conditions of approval.

Prior to issuing final internal approval, the Project Director will ensure that:

- Relevant employees and contractors have been consulted;
- All necessary internal (e.g. landholder and cultural heritage) approvals have been obtained; and
- Issues have been considered in accordance with the Protocol.

5.2 Project Manager - Development

A Project Manager will be appointed for each new development program. Development programs include any new petroleum activity that may require land disturbance. The relevant Project Manager shall ensure that all internal and statutory requirements are identified and complied with in consultation with the relevant environmental representatives.

The Project Manager will make the final decision for the site design for the proposed new petroleum activity in Constraints Class D or E areas (described in Section 7 of the Protocol), based on the information provided by the Environment Representative and Assessment Team

The Project Manager is responsible for ensuring that:

- Internal environmental approvals are obtained for:
 - Any new land disturbance for new petroleum activities; and
 - Any changes to the area of land disturbed.
- Internal and statutory requirements / approvals are identified;
- The relevant Environmental Representative is consulted to ensure internal and statutory requirements / approvals are current;
- Relevant tenures and environmental authorisations are considered to determine if the proposed activity is permitted and therefore if external approval by the relevant regulatory authority is required;
- employees, contractors and relevant land users (e.g. landholders and Native Title Representative Body/ies) are consulted for a proposed development;
- A scout (i.e. initial site inspection) of each proposed location of new petroleum activity is undertaken;
- Any further documentation required by the relevant authorities is prepared and, where necessary, approved by the regulator prior to construction;
- Initiating the Environmental Approvals Request Form; and
- The receipt of an internal Environmental Approvals Request Form and any attached conditions by completing Section D of the form.

5.3 Development Team

The Development Team is responsible for the planning of any new developments within the GLNG CSG Fields. They will also be responsible for obtaining all approvals associated with the new petroleum activities.

The Development Team will consist of representatives from:

- Early Works;
- Dam Design;
- Reservoir Engineers;
- Production Engineers;
- Geologists; and
- Construction Engineers.

The role of the Development Team will be to design the most appropriate layout of the GLNG CSG infrastructure (for both surface and subsurface facilities) that will optimise the extraction of CSG resources whilst complying with statutory requirements. The relevant Project Manager will ensure that these approvals are coordinated and are in place prior to the activity commencing.

5.4 Assessment Team

To ensure that all business interests are adequately addressed, Santos has established an internal team to assess all new activities, collectively referred to as the Assessment Team. The Assessment Team will include representatives from various business areas, as required, including:

- EPC Contractor;
- QLD Operations – Field;
- QLD Operations – Works Execution;
- Energy Projects;
- QLD US Project Management;
- Public Affairs and Sustainability;
- QLD EHS&S;
- EHS, Sustainability and IA; and
- CSG Drilling and Completions.

The Assessment Team is responsible for:

- Providing technical advice and direction to Santos management and the Development Team on the proposed new activities;
- Reviewing the site design for proposed new petroleum activities in Constraints Class D or E areas (described in Section 7 of the Protocol); and
- Recording the decision making results.

Prior to issuing the preliminary internal approval, the Assessment Team will ensure that:

- Relevant employees and contractors have been consulted;
- All necessary internal (e.g. landholder and cultural heritage) approvals have been gained;
- Issues are considered in accordance with the Protocol.

The Assessment Team will need to ensure that the following matters are addressed and provided to the Director:

- Santos EIS & SEIS commitments made to minimise impacts to EPBC Act related matters;
- Conditions of the Coordinator-General's Approval relating to the GLNG Project;
- Conditions relevant to specific State and Commonwealth Government Permits, Approvals and Licenses relating to the specific activity; and
- Environmental Offsets have been secured for the GLNG Project including relating to the GLNG CSG fields.

The Development Team will contain competent personnel capable of undertaking field scouting. Competent scouting personnel include Santos representatives that have undertaken cultural heritage site identification and have an awareness of environmental considerations.

The Assessment Team will also be responsible for:

- Undertaking internal audits of the petroleum activities to ensure compliance with both internal and external approvals;
- Monitoring against the requirements of the Protocol to satisfy:
 - Conditions of the various Commonwealth and State government approvals; and
 - Internal Santos standards and procedures.

5.5 Environmental Representative

The Environmental Representative is responsible for undertaking a desktop evaluation prior to arranging pre-clearance surveys in those areas where MNES are identified or pre-clearance surveys are required, using the most current available information sources

- Information to be reviewed during the Desktop Evaluation includes:
 - Location map;
 - Site access route;
 - Ecological Constraints Mapping;
 - EPBC Act – Fauna Habitat Mapping;
 - Site photos, aerial photography and other relevant spatial imagery;
 - CSG Environmental Management Plan under the relevant EA;
 - Relevant Statutory Approvals – Conditions of relevant environmental approvals;
 - The *Nature Conservation (Protected Plant) Conservation Plan 2000*; and
 - Other documents specified in the Protocol (e.g. Significant Species Management Plan)
- Determining the level of assessment required based on the review of the above information sources and the Field Assessment Matrix (Appendix C);
- Coordinating ecological survey and implementing recommendations for approval.

- Completing the assessment section of the Environmental Approvals Request Form and including any specific conditions that must be complied with, including the requirement to undertake specific field investigations;
- Assessing the condition, type and ecological value of any vegetation, flora, fauna, threatened ecological communities, etc, in such areas where the activity is proposed to take place;
- Ensuring that no excavation or fill placement is conducted in a way that adversely interferes with the flow of water in a watercourse, wetland, or spring, including works that divert the course of flow of the water or works that impound the water;
- Assessing the potential environmental impact of new activities using the Environmental Approvals Request Form;
- Ensuring the Protocol and its calculation and recording of disturbance is accurate and regularly checked to ensure that there is no disturbance above the prescribed limits; and
- Completing Land Disturbance – Site Selection and Inspection Form (Appendix D) for all new disturbances.

5.6 Ecologist

An ecologist approved by SEWPaC will be required to undertake a field assessment (e.g. pre-clearance surveys) if the desktop analysis has determined that the new petroleum activity is in Constraints Class B or C (described in Section 7 of the Protocol).

A number of ecologists have been approved by SEWPaC for the following activities:

- Site assessments and ecological surveys;
- Preparation and review of species and ecological management plans; and
- Preparation and review of remediation, rehabilitation, recovery and monitoring plans.

The list of approved ecologists is available through the Santos intranet and published on the GLNG website.

5.7 Implementation Team

Following the approval for new petroleum activities, the responsibility for undertaking the proposed works will involve, where relevant, the following business areas:

- Appointed EPC Contractor;
- QLD Operations – Field;
- QLD Operations – Works Execution;
- Energy Projects;
- QLD US Project Management;
- Public Affairs and Sustainability; and
- CSG Drilling and Completions.

The Implementation Team will undertake works in accordance with the approved program and work instructions and in accordance with any statutory State and Commonwealth approval.

5.8 Santos Management

The Management Team, or their nominated representatives, will provide regular reporting to the Commonwealth in accordance with the conditions of the EPBC Approval No. 2008/4059 and to the Coordinator-General in accordance with the conditions of the Coordinator-General's Report.

6 Planning Constraints

The Santos Geographic Information System (GIS) contains a number of mapping layers, and will continue to be built upon, to aid in the desktop review of planning constraints. The following constraints have been identified by the CG Report and will apply to all Constraints Classes described in Section 7.

6.1 Nuisance Constraints for Noise and Air Impacts

The noise constraint layer within the Santos GIS will continue to be built to reflect the sound power levels of equipment selected in the final engineering design of the field. During the final engineering design, the environmental design criteria will include the criteria as established in Part 3 – Environmental Authority Conditions – Model Conditions – Gas Fields, Schedule E, Environmental Nuisance (E7). The criterion as included in Part 3 is presented in Table 1.

Table 1 Noise Limits at Sensitive Receptors

Time Period	Metric	Short Term Noise Event	Medium Term Noise Event	Long Term Noise Event
7:00 am – 6:30 pm	$L_{Aeq, adj, 15 mins}$ Max $L_{pA, 15 mins}$	$L_{ABG} + 10 dBA$ 55 dBA	$L_{ABG} + 8 dBA$ 51 dBA	$L_{ABG} + 5 dBA$ 45 dBA
6:00 pm – 10:00pm	$L_{Aeq, adj, 15 mins}$ Max $L_{pA, 15 mins}$	$L_{ABG} + 10 dBA$ 55 dBA	$L_{ABG} + 8 dBA$ 46 dBA	$L_{ABG} + 5 dBA$ 40 dBA
10:00 pm – 6:00 am	$L_{Aeq, adj, 15 mins}$ Max $L_{pA, 15 mins}$	$L_{ABG} + 10 dBA$ 38 dBA	$L_{ABG} + 3 dBA$ 36 dBA	$L_{ABG} + 3 dBA$ 33 dBA
6:00 am – 7:00 am	$L_{Aeq, adj, 15 mins}$ Max $L_{pA, 15 mins}$	$L_{ABG} + 10 dBA$ 50 dBA	$L_{ABG} + 8 dBA$ 46 dBA	$L_{ABG} + 5 dBA$ 40 dBA

6.2 Soils Constraints (including Good Quality Agricultural Land and Strategic Cropping Land)

Soils constraints are included as a layer in the Santos GIS.

Soil management procedures have been developed and will be implemented for the areas that will be disturbed by the petroleum activity. The soil management procedures will be available to the administering authority upon request.

6.3 Exclusion of Petroleum Activities in Riverine Improvement Trust Asset Areas

No Riverine Improvement Trust Areas are located within the RFDA.

6.4 The Exclusion of Infrastructure from Flood Areas

Prior to the final siting of camps or permanent infrastructure (that are not pipelines or roads) flood impact assessments of the 1:50 ARI will be undertaken. As the RFDA acreage is approximately 690,000 ha it is not practical to undertake flood mapping of the entire acreage.

The objective of the study is to broadly identify flood prone areas and map the extent of flooding in the vicinity of the proposed development site, to ensure protection of future infrastructure. The investigation estimated flood levels for the 50 and 100 years Average Recurrence Interval (ARI) along the waterways location within a 5 km radius of the proposed hub and campsite areas.

The investigation will allow Santos to determine the location of hub and campsite locations to ensure that the Upstream development areas will not be impacted during the 50 and 100 year ARI flood events.

The information from the study will be included into the Santos GIS field development constraint layers.

6.5 Bioregional Corridors

Bioregional corridors have been included into the Santos GIS as a Category C ESA, and thus fall under constraints class C. Any part of a bioregional corridor that is assessed as providing habitat for MNES will be included in constraints class B.

6.6 Other Planning Constraints

If any of the proposed land clearance is within 200 m of any natural significant wetland or 100 m of any natural wetland, lake, spring or high bank of any other watercourse, it must be relocated outside of these buffer zones.

Pipeline, track and road construction works may be undertaken in a watercourse, wetland or spring where there is no reasonable and practicable alternative (i.e trenchless methods) for a maximum period of 10 business days, provided that the works are conducted in accordance with the following order of preference:

- (a) Conducting work in times of no flow; and
- (b) Using all reasonable and practicable measures to reduce impacts in times of flow.

The petroleum activity(ies) or works resulting in significant disturbance to the bed and banks of a watercourse, lake, wetland, or a spring must be no greater than the minimum area necessary for the purpose of the significant disturbance.

Petroleum activities or works resulting in significant disturbance to the bed and banks of a watercourse, lake, wetland, or a spring will be designed and undertaken by a suitably qualified person taking into account the matters listed in "Planning Activities" and "Impact Management" sections of the Department of Environment and Resource Management's *Guideline – Activities in a watercourse, lake or spring associated with mining operations* dated December 2010, as amended from time to time.

Slope is analysed by measuring the fall over the proposed land clearance area. The measuring tool is used over the contours to determine the fall over 100 m. For activities other than pipelines and wells the slope must remain below 10% or relocation is required.

Known constraints, including but not limited to, known declared weed locations and indigenous and non indigenous significant locations will be loaded into the Santos GIS as identified. Information on indigenous and non indigenous significant locations will not be made publicly available.

6.7 Linear Infrastructure Constraints

Linear infrastructure must be either:

- (1) Excluded from the impact risk zone; or
- (2) Where the location of linear infrastructure in the impact risk zone is justified given other constraints and cannot be avoided, only authorise the siting of that infrastructure in that zone where field ecological surveys demonstrate that there will be minimal adverse impact on any MNES, including habitat for any listed species. (the reasons for the decision including justification for the action taken, description of the efforts taken to avoid impact, and explanation why other constraints might justify the adverse impact on MNES will be recorded if an impact or presumed impact occurs to MNES, in accordance with the EPBC approval conditions)

Santos will plan for and decide the extent that proposed linear infrastructure may have an adverse impact on MNES in accordance with the following:

All linear disturbances within environmental Class B for MNES (described in Section 7 of the Protocol) and the impact risk zone will be in accordance with the limits specified in Table 2 and Table 3.

Table 2 Gathering pipeline network corridor widths (right of way)

Pipeline Number (based on 2 pipelines per trench and provision for an access track)	Maximum Width (m) (without power provision)	Maximum Width (m) (with power provision)
2	9.5	19.5
4	14	24
6	18.5	28.5
8	23	33

Note: These widths include 3 m offset from the road and provision of 5 m spacing from the edge of trench to the edge of clearing to allow for stockpiling trenching spoil, topsoil and cleared vegetation. * Based on Santos' documented specifications.

Table 3 Road and co-located infrastructure corridor widths (right of way)

Road Class	Power Provision (m)	Road Width (m)	Road/Pipeline Separation (m)	Pipeline Provision (m)	Maximum Total Corridor Width (m)
C* (single)	10	11	3	6	30

Note: Table 2 relates to formed roads other than tracks. * Based on Santos' classification for roads within the gas fields.

Gas and water trunkline rights of way, water distribution pipeline rights of way and other major linear infrastructure disturbance corridors within environmental constraint class B and the impact risk zone will be:

- Limited to 30 m in width where there are one or two gas and water trunklines, underground 33 kV power lines and fibre optic cables in parallel; and
- Limited to 30 m plus an additional 4 m for every additional gas or water trunkline in parallel with the initial one or two gas or water trunklines, power lines and fibre optic cable.

Where feasible, gas trunklines, pipelines for associated water and other transmission lines must be co-located to reduce total disturbance on MNES and other environmentally sensitive areas. Any area of disturbance referred to in this condition will be subtracted from the disturbance limits specified in Table 4, Table 5 and Table 6.

6.8 Disturbance Limits

The disturbance limits shown in Table 4, Table 5 and Table 6 apply to authorised (by both State and Commonwealth governments) unavoidable adverse impacts on environmentally sensitive areas, including MNES as a result of exploration, development, operation and decommissioning within the RFDA and external to it as a result of all associated gas field activities for the life of the project.

Table 4 Disturbance limits for threatened ecological communities, sensitive regional ecosystems and essential habitat

Ecological Community	EPBC Status	VM Act Status	Disturbance Limit (ha)
Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant) (includes REs 11.4.3 and 11.9.5)	Endangered		19.6
11.4.3 <i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> shrubby open forest on Cainozoic clay plains		Endangered	3.3
11.9.5 <i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest on fine-grained sedimentary rocks		Endangered	16.3
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Regions (EPBC) 11.9.4 Semi-evergreen vine thicket on fine-grained sedimentary rocks ¹	Endangered	Endangered	0.8
Natural Grasslands of the Queensland Central Highlands and the northern	Endangered	Of Concern	5.2

Ecological Community	EPBC Status	VM Act Status	Disturbance Limit (ha)
Fitzroy Basin			
The community of native species dependant on natural discharge of groundwater from the Great Artesian Basin	Endangered		0 (no disturbance authorised)
11.9.4, 11.10.1, 11.10.13 Semi-evergreen vine thicket and open woodland to open forest (<i>Apatophyllum teretifolium</i>)	Endangered	Of Concern / Least Concern / Least Concern	1 (- 0.8 ha of 11.9.4 already accounted for above)
11.10.1 <i>Corymbia citriodora</i> predominates and forms a distinct but discontinuous open-forest to woodland canopy (20 – 30 m high) (<i>Acacia calantha</i>)		Least Concern	2.8
11.3.2 <i>Eucalyptus populnea</i> woodland on alluvial plains		Of Concern	108.9
11.3.17 <i>Eucalyptus populnea</i> woodland with <i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> on alluvial plains		Of Concern	12.6
11.9.7 <i>Eucalyptus populnea</i> , <i>Eremophila mitchellii</i> shrubby woodland on fine-grained sedimentary rocks		Of Concern	1.3

1. Although the Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Regions (EPBC) contain a number of REs within Queensland, only 11.9.4 is located within the RFDA.

2. A total of 1 ha of Semi-evergreen vine thicket and open woodland to open forest is authorised to be cleared, however, if the 0.8 ha limit for 11.9.4 has been reached, then the additional 0.2 ha must not contain this RE.

Table 5 Protected plant species (*Nature Conservation Act 1992*) disturbance limit

Species	NC Act Status	Habitat Type	Disturbance Limit (ha)
<i>Apatophyllum teretifolium</i>	Rare	Semi-evergreen vine thicket and open woodland to open forest	2.8 (-1 ha of vine thicket and open woodland to open forest already accounted for in Table 4 ¹)
<i>Acacia calantha</i>	Rare	<i>Corymbia citriodora</i> predominates and forms a distinct but open forest to woodland canopy (20 – 30 m high)	1 (-2.8 ha of <i>Corymbia citriodora</i> already accounted for in Table 4 ²)

1. A total of 2.8 ha of Semi-evergreen vine thicket and open woodland to open forest is authorised to be cleared that contains *Apatophyllum teretifolium*, however, if the maximum disturbance limit has been reached for the REs 11.9.4, 11.10.1 and 11.10.3, then the additional 1.8 ha must not contain these REs.

2. A total of 2.8 ha of 11.10.1 is allowed to be cleared, however only 1 ha of this is allowed to contain the habitat where *Corymbia citriodora* predominates and forms a distinct but open forest to woodland canopy (20 – 30m high), i.e. *Acacia calantha* habitat.

6.8.1 EPBC Fauna Habitat Model

Santos maintains an active fauna habitat mapping for all EPBC Act significant species located within the GLNG Upstream Project Area. For all EPBC Act significant species with potential to occur within the GLNG Upstream Project Area fauna habitat has been modelled using species based assumptions. This predictive model is based on a suite of GIS base maps and their interactions in relation to the specific requirements of each fauna species identified. These assumptions, as well as existing fauna records, allow the fauna habitat mapping to be split into four distinct categories:

- **Core habitat**- consists of 'essential habitat' in which the species is known and the habitat is recognised under relevant recovery plans or other relevant plans/policies/regulations. Also included within this category are populations that are limited geographically within the region.
- **Essential habitat** - is an area containing resources that are considered essential for the maintenance of populations of the species (eg potential habitat for breeding, roosting, foraging, shelter, for either migratory or non-migratory species). 'Essential habitat' is defined from known records and/or expert advice (including the findings of preclearance surveys).
- **General habitat** - consists of areas or locations that are used by transient individuals or where species have been recorded but there is insufficient information to assess the area as 'essential/core habitat'. 'General habitat' may be defined from known records or habitat that is considered to potential support a species according to expert knowledge of habitat relationships, despite the absence of specimen backed records. 'General habitat' may include areas of suboptimal habitat for species.
- **Unlikely habitat** - areas are those areas that do not contain records of the particular species and contain no habitat values to support the presence or existence of resident or migratory individuals or populations of the species.

Minimisation of impact to significant species habitat will utilise (amongst other things) this predictive habitat modelling and preferentially avoid habitat in accordance with the above hierarchy. For the purposes of calculating disturbances for listed species (Table 6) and determining habitat areas to be mapped as constraints class B (Table 7), Unlikely Habitat has been excluded. Only Core, Essential and General Habitat contribute to the overall species habitat disturbance limits.

Table 6 Disturbance limits for listed species

Species	NC Act and EPBC Act Status	Habitat Type	Disturbance Limit (ha)
<i>Dasyurus hallucatus</i> (Northern Quoll)	EPBC – Endangered NC – Least Concern	Habitat generally encompasses some form of rocky area for denning purposes with surrounding vegetated habitats used for foraging and dispersal. Preferred habitat of rocky hills and escarpments, open forest and open woodland.	100.1

Species	NC Act and EPBC Act Status	Habitat Type	Disturbance Limit (ha)
<i>Chalinolobus dwyeri</i> (Long-eared pied bat, Large pied bat)	Vulnerable	Usually found in proximity to cliff lines and escarpments and sandstone outcrops where shallow caves appear to be used as roosts, although the species is also known to use tree hollows. Known to forage in adjoining woodlands including Brigalow ecological communities.	108.1
<i>Turnix melanogaster</i> (Black-breasted button-quail)	Vulnerable	Drier closed forests, particularly semi-evergreen vine thicket, low microphyll vine forest, <i>araucarian</i> microphyll vine forest and <i>araucarian notophyll</i> vine forest	0.1 (already counted)
<i>Erythrotriorchis radiates</i> (Red goshawk)	Vulnerable	Eucalypt woodland, open forest, gallery rainforest, swamp sclerophyll forest and rainforest margins, usually in association with large tracts of forest. Prefers a mosaic of vegetation types and permanent water.	139.4
<i>Rostratula australis</i> (Australian painted snipe)	Vulnerable	Potentially any wetland and farm dams with suitable vegetation cover, temporary and permanent lakes, swamps and claypans. Favours freshwater swamps and samphire salt marshes.	11.2
<i>Paradelma orientalis</i> (Brigalow scaly-foot)	Vulnerable	Occurs in a wide range of (dry) forest and woodland habitats, including Brigalow woodland, Vine thicket regrowth and rocky habitats on sandstone ridges to flats and gently undulating plains with clay, loam or sand. Not tolerant of clearings. Specific habitat where species found includes remnant Brigalow woodland with sparse tussock grasses on grey cracking clay soils.	205.3
<i>Delma torquata</i> (Collared delma)	Vulnerable	Eucalypt or acacia dominated woodland including Brigalow ecological communities and open forest where it is associated with suitable microhabitats (exposed rocky outcrops or a sparse understorey of tussock grass, shrubs or semi-evergreen vine thickets).	41.6 (already counted)
<i>Geophapa scripta scripta</i> (Squatter pigeon (Southern))	Vulnerable	Grassy woodlands and open forest that are dominated by eucalypts, open grassy pastures in association with cattle grazing marshes, acacia growth and disturbed habitats (i.e. around stockyards, along roads and railways, and around settlements.	199.2

Species	NC Act and EPBC Act Status	Habitat Type	Disturbance Limit (ha)
<i>Denisonia maculate</i> (Ornamental snake)	Vulnerable	Brigalow (<i>Acacia harpophylla</i>) woodland growing on clay cracking clay soils and sandy soils, riverside woodland and open forest growing on natural levees and other riparian habitats. Shelters under fallen timber and in soil cracks. Known from cleared grazing and cropping lands where suitable soils exist.	44.0 (already partially accounted for)
<i>Egernia rugosa</i> (Yakka skink)	Vulnerable	Open dry sclerophyll forest or woodland, Brigalow, shrublands, lancewood forests on sandy and open textured soils. Dense ground cover, cavities in soil-bound root systems of fallen trees and beneath rocks, hollow logs and animal burrows are considered to provide suitable microhabitat for this species.	119.9
<i>Furnia Dunmali</i> (Dunmall's snake)	Vulnerable	Brigalow (<i>Acacia harpophylla</i>) forest and woodland growing on cracking black clay and clay loam soils (usually on heavy clay soils). Also known to occur in eucalypt and <i>Callitris</i> woodland with fallen timber and ground litter.	205.3 (already partially accounted for)
<i>Nyctophilus timoriensis</i> (Easter long-eared bat)	Vulnerable	River red gum forest, semi-arid woodlands, savannahs and open woodlands, often in association with riverine environments in Brigalow Belt of inland Queensland.	275.4

6.8.2 Disturbance Limits within Arcadia Project Area

In addition to the above limits within the Arcadia Valley Project Area (AVPA), for limited petroleum activities undertaken within the primary protection zone of, or within 'Endangered' or 'Of Concern' RE's, State Forests or Timber Reserves, vegetation clearing must not exceed any of the following areas:

- For the life of the project and before any activity commences, if the disturbance relates to an 'Endangered' or 'Of Concern' RE, 10% of the remnant unit of 'Endangered' or 'Of Concern' RE as ground truthed and mapped; and
- Six metres in width of access tracks not associated with water or gas line; or
- For lineal infrastructure, including provision for a utility corridor and access track:
 - 12 metres width for a single water or gas gathering line; or
 - 18 metres width for a trench with one water gathering line and one parallel gas gathering pipeline; or
 - 25 metres width for multiple trenches where there are three parallel gas or water gathering lines; and
 - Seven metres width for any additional trench for a water or gas line.

Where petroleum activities are undertaken within a high value regrowth or remnant vegetation that is other than a Category A, B or C ESA and their associated protection zones, Santos will be able to demonstrate that no reasonable or practicable alternative exists and for lineal infrastructure, that significant disturbance to land does not exceed the following areas:

- 18 metres in width for dual carriage way roads;
- Six metres in width for access tracks not associated with a water or gas line; or
- For pipelines, including provision for a utility corridor and access track:
 - 12 metres width for a single water or gas gathering line; or
 - 18 metres width for a trench with one water gathering line and one parallel gas gathering pipeline; or
 - 25 metres width for multiple trenches where there are three parallel gas or water gathering lines; or
 - Seven metres width for any additional trench for a water or gas line.

7 Field Management Procedures

To minimise impacts on the ecological values within the GLNG CSG fields, Santos has developed specific Field Management Procedures (FMP) that will be implemented for the five constraints classes A to E. The FMP apply to all GLNG CSG field activities within the RFDA. The Constraints Classes are aligned with the State and Commonwealth ranking of importance and protection of ecological communities and listed species for ease of use. A full description of the FMP for each constraints class is provided in Sections 7.2 and Appendix E.

The FMP set out:

- The nature of the development which is proposed to be undertaken within each constraints class;
- The process to be undertaken to determine the specific location of the development within each constraints class having regard to the local ecological values of the area; and
- The mitigation measures that will be implemented to minimise the impact of the development on the ecological values of the area, including MNES, (e.g. selecting a specific site on land of a lower constraints class).

Prior to conducting petroleum activities that involve significant disturbance to land, an assessment will be undertaken of the condition, type and ecological value of any vegetation in such areas where the activity is proposed to take place. The assessment will be undertaken by persons authorised in accordance with this FMP.

Each activity undertaken in environmentally sensitive areas will be subject to stringent conditions to minimise environmental impacts. A summary of ESAs that may be impacted is included in Appendix F. These will depend on the location and the activity being undertaken. A number of management strategies have been formulated with practical prescriptions for on the ground management and confirmation of sensitive environmental values and constraints. These conditions and management strategies are set out in the FMP.

7.1 Constraints Classes

Santos has prepared detailed Ecological Constraints Mapping over the entire RFDA. The Ecological Constraints mapping includes data sets based on five classes of land with graduated levels of ecological sensitivity (or constraints classes). The five classes are:

- **Constraints Class A** – Contains QLD State government listed Category A Environmentally Sensitive Areas (e.g. National Parks) and the communities of native species dependant on natural discharge of groundwater from the Great Artesian Basin. Constraints Class A areas will also include those areas where the disturbance limits for environmentally sensitive areas, including MNES, have been reached;
- **Constraints Class B** – Contains all QLD State government listed Categories B Environmentally Sensitive Area which includes EPBC Act threatened ecological communities, all listed flora species, those listed threatened and migratory fauna species habitats as identified in management plans required under the approved EPBC No. 2008/4059 conditions and parts of bioregional corridors that have been assessed as providing habitat for MNES as defined in the SSMP. Constraints Class B also includes the primary protection zone (DEHP) or impact risk zone (SEWPaC) which is the area within 200 m from the perimeter of Constraints Class B and the secondary protection zone (DEHP) which is the area within a 800 m buffer from the boundary of a primary protection zone of a Category A ESA (Constraints Class A) or 300 m buffer from the boundary of a primary protection zone of a Category B ESA;
- **Constraints Class C** – Contains all QLD State government listed Category C Environmentally Sensitive Areas and bioregional corridors. Also contains the primary protection zone (DEHP) which is an area within 200 m from the perimeter of Constraints Class C and the secondary protection zone which is the area within a 300 m buffer from the boundary of a primary protection zone of a Category C ESA.
- **Constraints Class D** – Contains QLD State government listed "Not of concern" Regional Ecosystems under the VM Act; and
- **Constraints Class E** – Contains QLD State government listed "Non-remnant" vegetation - generally modified habitats such as agricultural lands, grazing lands, residential lands or regrowth vegetation.

Table 7 provides a summary of the Constraints Classes and how the State and Commonwealth requirements align. A diagram of the relationship between the buffer zones is included in Figure 3.

Table 7 Constraints Classes

Constraints Class	QLD State ESAs	EPBC Act - MNES
A	Category A ESAs	The community of native species dependant on natural discharge of groundwater from the Great Artesian Basin
B	All Category B ESAs	Threatened Ecological Communities Listed Flora, Fauna and Migratory Species Listed Threatened and Migratory Fauna species habitats* Bioregional corridors assessed as providing habitat for MNES
	Buffer Zones <ul style="list-style-type: none"> - Primary Protection Zone (of both Category A and B ESAs) - Secondary Protection Zone (of both Category A and B ESAs) 	Buffer Zones <ul style="list-style-type: none"> - Impact Risk Zone - No Impact Zone
C	All Category C ESAs	Bioregional corridors assessed as not providing habitat for MNES.
	Buffer Zones <ul style="list-style-type: none"> - Primary Protection Zone (of Category C ESAs) - Secondary Protection Zone (of Category C ESAs) 	
D	All Remnant Not of Concern Regional Ecosystems	
E	All Non-remnant Vegetation	

* Core Essential and General Habitats as defined and described in Section6.8.1.

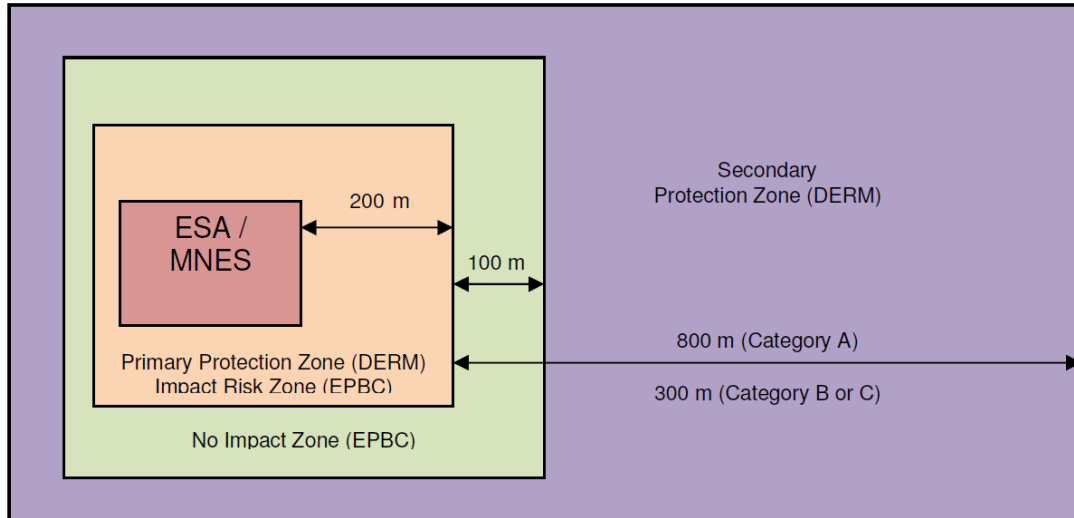


Figure 3 Diagram of State and Commonwealth buffer zones (not to scale) (excludes linear infrastructure)

Classes can be either upgraded or downgraded according to the ecological assessment undertaken in accordance with this FMP.

A range of data layers and the results from previous field ecological surveys (See EIS Appendix N1) were used to compile the constraints classes. The data layers utilised include:

- QLD State government listed Category A, B and C Environmentally Sensitive Areas;
- Regional Ecosystem Mapping v6 under the VM Act, regulated by DEHP;
- EPBC Act listed threatened communities, regulated by SEWPaC;
- Habitat mapping of EPBC Act listed species;
- Queensland Directory of Important Wetlands produced by DEHP;
- Essential Habitat Mapping for NC Act listed significant species, produced and regulated by DEHP; and
- Bioregional Corridors Mapping.

In addition to the constraints mapping, Santos has undertaken a secondary mapping exercise to identify potential habitat values and presence of EPBC listed species/communities and threatened NC Act listed species within the RFDA. The vegetation mapping (Regional Ecosystem Mapping as generated by DEHP) is indicative only and may need to go through a change process with DEHP (via the QLD Herbarium). Notification of incorrect vegetation mapping is required under the EA and no disturbance is allowed to take place in an area identified as incorrectly mapped until DEHP has assessed the proposed changes. Changes to the mapping include incorrect regional ecosystem classifications, areas incorrectly mapped as remnant vegetation or areas incorrectly mapped as non-remnant vegetation. These proposed changes have been identified through ground-truthing of the RFDA, aerial imagery interpretation and knowledge of the area. A Regional Ecosystem change report is then submitted to DEHP for review.

Any clearing within an area identified as high value regrowth vegetation or a regrowth watercourse must be carried out in accordance with the DEHP [Regrowth Vegetation Code – On freehold and Indigenous land and leasehold land for agriculture and grazing – version 1](#). The class of the regrowth will depend on its value as defined in the code.

7.2 Field Management Procedures for Constraints Classes

7.2.1 Constraints Class A

Constraints Class A areas include all QLD State Government listed Category A ESAs and the community of native species dependant on natural discharge of groundwater from the Great Artesian Basin.

These areas are of very high conservation value and are designated ‘no-go’ areas. No-go areas are where petroleum activities will be prohibited from being undertaken. Ordinarily no petroleum activities are permitted in Constraints Class A areas. However, specific and mutually beneficial activities in a (Limited Depth) National Park may be allowed with express written permission from DNPRSR. Santos will only seek permission to enter a (Limited Depth) National Park on limited occasions where no other feasible option exists. Activities in (Limited Depth) National Parks are likely to be restricted to the maintenance of access tracks. In addition, all work will be conducted in accordance with Santos’ specific management principles: Avoid, Minimise, Mitigate, Remediate, and Rehabilitate.

The granting of express written permission to conduct mutually beneficial activities in a National Park does not in any way remove or limit the field management procedures imposed by other constraints mentioned in this protocol. That is, where an activity is allowed within a National Park the conditions imposed by all other constraints and their management procedures apply.

Limited petroleum activities are permitted within an 800 m buffer zone, defined as the secondary protection zone around the Constraints Class A area plus the primary protection zone of 200m.

Constraints Class A areas will also include those areas where the disturbance limits for environmentally sensitive areas, including MNES, have been reached.

7.2.2 Constraints Class B

Constraints Class B areas includes all QLD State government Category B ESAs, MNES and Core Essential and General habitat of listed species as identified in Section 6.8.1. A complete listing of Category B ESAs is included in Appendix F.

Limited petroleum activities may be undertaken within the primary protection zone (DEHP) or Impact Risk Zone (SEWPaC), or in the following specified Category B ESAs provided that it does not overlap with any other Category A, B or C Environmentally Sensitive Areas or its associated primary protection zone. Drilling and production wells will not be located in Constraints Class B areas unless the location is justified as an exception given other constraints, and the impact on any MNES will be minimal, short term and recoverable.

Additional approvals for disturbance in Constraints Class B may be required under the *Forestry Act 1959* where petroleum activities are proposed to be carried out in designated State Forests or Timber Reserves.

Constraints Class B areas are considered to be the most environmentally sensitive landscapes within which the new petroleum activity will operate. As such the strictest

FMP are to be applied on unavoidable activities within Constraints Class B areas. Protocols for management of activities in Class B sites include:

- Avoidance;
- Pre-clearance surveys;
- Mitigation;
- Post Construction Surveys; and
- Remediation

7.2.2.1 Avoidance

Constraints Class B areas will be avoided where possible at the planning stage for the siting of wells, access routes and other infrastructure associated with petroleum activities. If the Class B area cannot be avoided through relocation at the planning stage, then well sites or associated infrastructure will be sited in previously disturbed areas if possible, or in locations least likely to cause adverse impacts based on the pre-clearance surveys (Section 7.2.2.2).

Disturbance in areas of MNES will not be permitted if the approved disturbance limits outlined in Table 4, Table 5 and Table 6 for that MNES has been reached.

Clearing in Class B areas will be in accordance with the following order of preference:

- Pre-existing cleared areas or significantly disturbed areas less than 200 m from an Endangered/Of concern RE;
- Undisturbed areas of less than 200 m from an Endangered/Of concern RE;
- Pre-existing areas of significant disturbance within an Endangered/Of concern regional ecosystem (e.g. areas where significant clearing or thinning has been undertaken within a regional ecosystem, and/or areas containing high densities of weed or pest species which has inhibited re-colonisation of native regrowth); and
- Areas where clearing of an 'Endangered' or 'Of concern' regional ecosystem is unavoidable, however no exploration or production wells will be located within Class B areas unless the impact on any MNES is minimal, short term and recoverable.

Should any significant disturbance to land occur in or within 200 m of an Endangered / Of concern regional ecosystem, details and a record of assessment will be kept and submitted to the administering authority when requested.

7.2.2.2 Pre-Clearance Surveys

Pre-clearance ground surveys will be undertaken by a qualified ecologist approved by SEWPaC to confirm that vegetation mapping associated with the planned sites is accurate and to confirm the localised ecological values. The ground survey will identify specific locations of 'Endangered' REs and MNES in the area of the proposed development. The survey will:

- Be undertaken in accordance with the most current SEWPaC survey guidelines (<http://www.environment.gov.au/epbc/guidelines-policies.html#threatened>);
- Take account of and reference previous ecological surveys undertaken in the area and relevant new information on likely presence or absence of MNES;

- Document the survey methodology, results and significant findings in relation to MNES; and
- Apply best practice (including optimum timing and frequency) site assessment and ecological survey methods appropriate for each listed threatened species, migratory species, their habitat and listed ecological communities.

The survey report will detail the location and extent of the proposed disturbance to each relevant environmentally sensitive area, including MNES. The report will also document the current cumulative disturbance extent for each environmentally sensitive area, including MNES.

If Category B ESAs or MNES are found not to be present in the ground assessment, the site will be re classified as Constraints Class C or D accordingly.

Where Endangered REs or MNES are confirmed, a more detailed ecological site survey will be undertaken to ground truth boundaries of sensitive habitats, verify vegetation types, assess habitat condition and assess likelihood of presence of threatened species or communities. Survey design of targeted field assessment will be developed utilising standard or targeted methodologies. Management of the area will be undertaken in accordance with the SSMP.

Pre-clearance surveys of the activities in gas fields must identify koala habitat as defined under the *Nature Conservation (Koala) Conservation Plan 2006*. Specific mitigation measures and habitat offsets for residual impacts to koala habitat must be provided. Information regarding specific mitigation measures and habitat offsets is included in the Significant Species Management Plan (Section 11.5).

If the pre-clearance survey indicates that a regional ecosystem (RE) mapped as 'Endangered' or 'Of concern' by the Queensland Herbarium should be in a different conservation value classification, Santos will advise the DEHP in writing before any significant disturbance to land takes place.

Survey reports will be published on the Santos website 20 business days before clearance of native vegetation in an infrastructure impact area and provided to SEWPaC on request.

7.2.2.3 Mitigation

The following mitigation measures will be adhered to for Constraints Class B areas:

- Specific sites for the wells, access routes and associated infrastructure will be selected to avoid sensitive areas confirmed by the pre-clearance surveys where feasible.
- If the proposed site is proximate to sensitive areas, specific management measures, such as minimising pad area or multiple pad drilling using Horizontal Directional Drilling (HDD) techniques, retention of buffer zones and specific placement of tracks and pipelines (e.g. co-location of pipelines and access tracks within the same corridor) will be implemented.
- Clearing of vegetation will not exceed those limits specified in Table 2 and Table 3 unless otherwise approved by the administering authority in writing.
- Clearance for linear and non-linear disturbance will not exceed the disturbance limits outlined in Table 4, Table 5 and Table 6.

- Gas and water trunkline rights of way, water distribution pipeline rights of way and other major linear infrastructure disturbance corridors within constraints class B and the impact risk zone must be:
 - Limited to 30 m in width where there are one or two gas and water trunklines, 33 kV power lines and fibre optic cables in parallel; and
 - Limited to 30 m plus an additional 4 m for every additional gas or water trunkline in parallel with the initial one or two gas or water trunklines, power lines and fibre optic cable.
- Where feasible, gas trunklines, pipelines for associated water and other transmission lines will be co-located to reduce total disturbance on MNES.
- Pipeline trenches will only be left open for the minimum time practicable.
- The length of pipeline trench open at any one time will be minimised as far as practicable.
- For clearing in proximity to identified significant fauna habitat a suitably qualified person spotter catcher is to be present during vegetation clearing activities.
- If the pre-clearance survey has determined that there is a low risk to sensitive environments, then a suitably qualified spotter catcher will be available to attend during clearing operations should any disturbance to sensitive vegetation or fauna occur. The spotter catcher will be advised by the environmental representative when they would be required. The spotter catcher will be present to ensure that no harm befalls wildlife. If wildlife is injured, they will remove it to the care of a DEHP recognised wildlife carer.
- Undertake progressive rehabilitation of disturbed areas using best practice techniques and to agreed standards in accordance with the RRRMP (Section 10) and statutory approvals.
- Site specific work instructions and site mitigation plans will be developed and used for all petroleum activities during construction.

Any unavoidable disturbance to an EVNT flora or fauna species that will have a 'adverse impact to the local population' of that species identified by the pre-clearance surveys will trigger re-classification of the area identified to a constraints Class A area and alternative options for operations will be explored to reduce impact on the EVNT species population (e.g. pad drilling outside the habitat to extract CSG). Areas where the disturbance limit for an environmentally sensitive area, including MNES, has been reached will also be reclassified to a constraints Class A area.

Pipeline, track and road construction works may be undertaken in watercourses, wetlands or springs where there is no reasonable or practicable alternative (i.e., trenchless methods) for a maximum period of 10 business days, provided that the works are conducted in accordance with the following order of preference:

- Conducting work in times of no flow; and
- Using all reasonable and practicable measures to reduce impacts in times of flow.

A site specific work instruction and site mitigation plan for the development of each well site and associated infrastructure will be produced prior to construction commencing.

Survey reports will be published on the Santos website 20 business days before clearance of native vegetation in an infrastructure impact area and provided to SEWPaC on request.

7.2.2.4 Post Construction Surveys

A post construction survey will be undertaken to document the actual extent of disturbance to environmentally sensitive areas, including MNES. The survey information will be recorded and included in future gas field design processes. This information will also be included in the annual environmental return.

7.2.2.5 Remediation

Remediation will commence as soon as practicable following construction in line with the requirements of the RRRMP.

7.2.3 Constraints Class C

Constraints Class C areas include all QLD State government Category C ESAs, including:

- Nature refuges as defined under the *Nature Conservation Act 1992*;
- Koala habit areas as defined under the *Nature Conservation Act 1992*;
- State forests or timber reserves as defined under the *Forestry Act 1959*;
- Declared catchment areas under the *Water Act 2000*;
- Resources reserves under the *Nature Conservation Act 1992*;
- An area identified as 'Essential Habitat' for a species of wildlife listed as endangered, vulnerable rare or near threatened under the *Nature Conservation Act 1992*;
- Any wetland shown on the *Map of Referable Wetlands* available from DEHP's website; and
- Bioregional corridors.

Protocols for management of activities in Constraints Class C sites include:

- Pre-clearance surveys;
- Mitigation; and
- Post Construction Surveys.

7.2.3.1 Pre-Clearance Surveys

Pre-clearance ground surveys will be undertaken to confirm that vegetation mapping associated with the planned sites is accurate and to confirm the localised ecological values. The surveys will be undertaken by a qualified ecologist approved by SEWPaC. The survey must:

- Be undertaken in accordance with the most current SEWPaC survey guidelines (<http://www.environment.gov.au/epbc/guidelines-policies.html#threatened>);
- Take account of and reference previous ecological surveys undertaken in the area and relevant new information on likely presence or absence of MNES;
- Document the survey methodology, results and significant findings in relation to MNES; and

- Apply best practice (including optimum timing and frequency) site assessment and ecological survey methods appropriate for each listed threatened species, migratory species, their habitat and listed ecological communities.

Where a Category C ESA is confirmed in the area of the proposed development, a more detailed ecological site survey will be undertaken by an ecologist to ground truth the boundaries of sensitive habitats, verify vegetation types, assess habitat condition, and determine likelihood of presence of threatened species or communities (Methodology as per Appendix B). If the likely presence of threatened species is confirmed, then a targeted survey by a suitably qualified person will be undertaken to confirm the presence and minimise impact.

If any Category A or B ESAs or MNES are confirmed as present by the pre-clearance survey, the site will be upgraded to the appropriate class. Alternatively, if there is no Category C ESA confirmed then the site will be downgraded accordingly.

A site specific work instruction and site mitigation plan for the development of each well site and associated infrastructure will be produced prior to construction commencing.

7.2.3.2 Mitigation

- The specific sites for the wells, access routes and associated infrastructure will be selected to avoid sensitive areas confirmed by the pre-clearance surveys where feasible and in accordance with approval conditions.
- Any unavoidable disturbance to an EVNT flora or fauna species that will impact the local population of that species identified by the pre-clearance surveys will trigger re-classification of the site to a Class A area and alternative options for operations will be explored to reduce impact on the EVNT species population. Other options may include obtaining a clearing permit under the NC Act or providing environmental offsets.
- If a pre-clearance survey has determined that there is a risk (low or high) to sensitive environments, then a suitably qualified person will be available at short notice to attend during clearing operations should any disturbance to sensitive vegetation or fauna occur. The spotter catcher will be advised by the environmental representative when they would be required. The spotter catcher will be present to ensure that no harm befalls wildlife. If wildlife is injured, they will remove it to the care of a DEHP recognised wildlife carer.
- Undertake progressive rehabilitation of disturbed areas using best practice techniques and to agreed standards in accordance with the RRRMP (Section 9) and statutory approvals.
- Site specific work instructions and site mitigation plans will be developed and used for all petroleum activities during construction.

7.2.3.3 Post Construction Surveys

- A post construction survey will be undertaken to document the actual extent of disturbance to environmentally sensitive areas, including MNES. The survey information will be recorded and included in future gas field design processes. This information will also be included in the annual environmental return.

7.2.4 Constraints Class D

Constraints Class D areas are QLD State government listed remnant REs which are classified as 'Not of Concern' under the VM Act. These are generally areas of low environmental sensitivity.

Protocols for management of activities in Constraints Class C sites include:

- Pre-clearance surveys;
- Mitigation; and
- Post Construction Surveys.

7.2.4.1 Pre-Clearance Surveys

An Environmental Representative will determine whether a pre-clearance survey is required based on results of the desktop assessment. If the proposed site is within 500 m proximity of Class A or B area then a pre-clearance survey to confirm RE types will be undertaken.

Any unavoidable disturbance to an EVNT flora or fauna species that will have an impact on the local population of that species identified by the pre-clearance surveys will trigger re-classification of the area identified to a constraints Class A area and alternative options for operations will be explored to reduce impact on the EVNT species population (e.g. pad drilling outside the habitat to extract CSG).

If any Category A, B and C ESAs, MNES or 'Of Concern' REs are confirmed as present by the pre-clearance survey, the site will be upgraded to the appropriate class. If there is no remnant vegetation present, then the site will be re-classified as Class E area.

Site specific work instructions and site mitigation plans will be developed and used for all petroleum activities during construction.

7.2.4.2 Mitigation

- Any unavoidable disturbance to an EVNT flora or fauna species that will have an impact to the local population of that species identified by the pre-clearance surveys will trigger re-classification of the site to a Class A area and alternative options for operations will be explored to reduce impact on the EVNT species population.
- If the pre-clearance survey identifies any potential significant fauna habitat a suitably qualified person will be available during clearing at short notice to attend should any disturbance to sensitive vegetation or fauna occur.
- Undertake progressive rehabilitation of disturbed areas using best practice techniques and to agreed standards in accordance with statutory approvals, the RRRMP and SSMP.

7.2.4.3 Post Construction Surveys

A post construction survey will be undertaken to document the actual extent of disturbance to environmentally sensitive areas, including MNES. The survey information will be recorded and included in future gas field design processes. This information will also be included in the annual environmental return.

7.2.5 Constraints Class E

Constraints Class E areas are mapped by the QLD State government as non-remnant vegetation under the VM Act. They are generally modified habitats such as agricultural lands, grazing lands or residential areas. Although these areas have the lowest level of ecological constraints, they may contain point features or microhabitat for significant flora and fauna species, including isolated hollow bearing trees, wetland sites (and artificial water bodies), habitat connectivity along fence lines or road easements minor riparian corridors and cracking clay pans. Protocols for management of activities in Constraints Class E sites include:

- Pre-clearance surveys;
- Mitigation; and
- Post Construction Surveys.

7.2.5.1 Pre-Clearance Surveys

A Santos Field Supervisor (for non-remnant areas) or a Santos environmental representative (for regrowth or regrowth within remnant buffer zones) will determine whether a pre-clearance survey is required based on results of the desktop assessment. The Field Supervisor or environmental representative will utilise air photos, scouting photos and notes, etc to initially view the general area during the desktop assessment process. If unmapped habitats or point features (as listed above) are potentially present further field investigation is required by a suitably qualified person.

If any Category A, B or C ESAs, MNES, 'Of Concern' REs or remnant vegetation are confirmed as present by the pre-clearance survey, the site will be upgraded to the appropriate class.

7.2.5.2 Mitigation

- If point features or habitats are identified, field management steps will be taken to avoid these areas where possible, and a suitably qualified person must be available during clearing at short notice to attend should any disturbance to sensitive vegetation or fauna occur. The spotter catcher will be advised by the environmental representative when they would be required.
- Any unavoidable disturbance to an EVNT flora or fauna species that will have an impact to the local population of that species identified by the pre-clearance surveys will trigger re-classification of the site to a Class A area and alternative options for operations will be explored to avoid impact on the EVNT species population.
- Undertake progressive rehabilitation of disturbed areas using best practice techniques and to agreed standards in accordance with the RRRMP (Section 10) and statutory approvals.

7.2.5.3 Post Construction Surveys

- A post construction survey will be undertaken to document the actual extent of disturbance to environmentally sensitive areas, including MNES. The survey information will be recorded and included in future gas field design processes. This information will also be included in the annual environmental return.

8 Internal Approval Process

An Internal Approval Flow Chart has been prepared to diagrammatically represent the internal approval process for the Protocol (Appendix H). The flowchart outlines the decision making process that will be used by Santos to approve a new petroleum activity. Santos will ensure that relevant information on environmentally sensitive areas, including MNES is available and used to support field development and management decisions throughout the life of the project.

The processes shall be applied as early as possible in the planning, design and decision making processes for any new petroleum activity and provide for the involvement and input of relevant employees, contractors, relevant land users, government and other stakeholders relevant to the activity.

There are three distinct stages involved in implementing the Protocol for new petroleum activities. These stages include:

- **STAGE 1** – Planning and Internal Approvals
- **STAGE 2** – Implementation Stage
- **STAGE 3** – Post Construction Operations

Each stage has specific steps that must be completed in order gain internal approval.

Santos will ensure that constraints planning and field development decisions are made in accordance with the Protocol (including any relevant species and ecological community management plans) before final selection of specific sites for field development.

8.1 STAGE 1: Planning and Approvals

Site access approval is required for all new petroleum activities. The Project Manager will initiate this process in accordance with 0020-GLNG-3-3.3-0058 Upstream Surface Facilities Contractor Site Access Procedure – Design Finalisation Phase (DFP) (internal Santos document).

8.1.1 Step 1 – Request for Internal Approval

Personnel required:

- Project Manager
- Development Team

In order to ensure that the location of disturbances take into consideration land access, cultural heritage, topographical and environmental values, the relevant Project Manager will ensure that an initial field survey of each proposed location of new activity is undertaken by a member of the development team (who is a competent scouting person). The relevant Project Manager shall ensure that Section A of a Site Scout form is completed in accordance with the requirements of Guideline for Site Scouting (Appendix I). The guideline will establish the required scope for each survey that will be undertaken. Standard field survey methodologies will be employed to ensure consistency across all operations. Where necessary or where required by approval conditions, a qualified ecologist will be engaged to provide advice.

During the site scouting all reasonable and practical measures will be taken to minimise the area required to be cleared and where possible to avoid the clearing of

mature trees. Any new petroleum activity that requires land disturbance within the GLNG CSG fields will require an internal assessment via the relevant Disturbance Inspection Form. These forms are located on the [Environment](#) team site on the Well.

Following the site scout and prior to undertaking field based activities; the relevant internal approval must first be obtained for all new CSG activities from an appropriate authority within the Development Team. Once approval is obtained the relevant Project Manager will request authorisation from the Assessment Team via the submission of a formal request to the Assessment Team.

The internal approval process uses an Intranet Well Based system. For activities that may impact environmentally sensitive areas, including MNES approvals will be sought from the relevant Environmental Representative through the completion of the Environmental Approvals Request form. The Form is located on the [Environmental Approvals](#) team site, which also provides a link to the [Environmental Approvals Request Guideline](#). This provides instructions on how to complete the Environmental Approvals Request Form (only available internally).

8.1.2 Step 2 – Desktop Evaluation of Petroleum Activities

Personnel required:

- Assessment Team (including the Environmental Representative and approved ecologist)

Once the Environmental Approvals Request form is submitted, the relevant Environmental Representative is electronically notified. The Environmental Representative shall assess the potential environmental impacts of new activities using the Land Disturbance – Site Selection and Inspection Form (Appendix D). This form addresses issues that must be taken into consideration for new petroleum activities, including:

- Determining the initial Constraints Class;
- Further constraints that need to be taken into consideration during the preliminary field inspection (e.g. Cultural Heritage, Slope, Hydrology, Soils, etc.);
- Recommendations for further surveys;
- Field verification results;
- Compliance with Commonwealth and State Requirements (including disturbance limits, disturbance to any MNES and the cumulative extent of disturbance relative to disturbance limits);
- Recommended actions regarding the proposed new petroleum activity; and
- Specific work instruction and site mitigation measures required.

The form captures the information from the initial desk top evaluation of the constraints and habitat mapping, provides recommendation for subsequent field surveys, provides detail on other constraints information (such as Cultural Heritage, Soils etc) as well as EPBC Act related matters.

The Environmental Representative will need to review the following information:

- Location Map;
- Site access;
- Ecological Constraints Mapping;

- EPBC Act – Fauna Habitat Mapping;
- Site photos, aerial photography and other relevant spatial imagery;
- Relevant CSG Environmental Management Plan;
- Relevant Statutory Approvals – Conditions of relevant environmental approvals; and
- Other documents specified in this Guideline & field management protocols.

The Environmental Representative will need to review the proposed disturbance area against disturbance that has already occurred or has been approved to determine the cumulative disturbance area. This is essential to ensure that the disturbance limits set out in Table 4, Table 5 and Table 6 are not exceeded.

The information on site details, constraints layers, habitat mapping and further recommendations on additional survey work and field investigations is incorporated into the Land Disturbance – Site Selection and Inspection Form (Appendix D).

Ecological constraints mapping will be assessed through the use of the Santos GIS. The most commonly used layers include:

- Aerial photography
- Wells proposed
- Hydrology_Drainage
- Contours for relevant project area (both major and minor)
- Roads and access tracks
- Pipelines
- Seismic Lines (2D and 3D)
- Homesteads
- Pipelines_proposed and Pipelines_possible
- Essential Habitat
- Protected Areas
- Cadastral_phad (landholder parcels)
- Remnant Vegetation (switch between Management and Biodiversity)
- Tenures Santos (Production and Exploration)

This assessment will allow for the preliminary determination of the Constraints Class (A, B, C, D or E) of land that the proposed new petroleum activity is located.

The relevant Environmental Representative shall complete the assessment section (Section B) of the Environmental Approvals Request form and include any specific conditions that must be complied, including the requirement to undertake specific field investigations.

The relevant Environmental Representative shall confirm the level of environmental approval required, depending on the complexity of the proposal, the land class it falls within and any statutory requirements (e.g. clearing permits under the *Nature Conservation Act 1992*).

The Environmental Representative will determine the level of assessment required based on the review of the above information sources and the Field Assessment Matrix (Appendix C). The matrix provides clarity on who will be responsible for undertaking the field scouting exercises and who will be responsible for the ultimate decision on the proposed action. The matrix will ensure that the decision making process is undertaken at an appropriate level of authority and accountability within Santos.

8.1.3 Step 3 – Field Assessment and Verification

Personnel required:

- Environmental Representative; or
- Ecologist

Subject to the recommendations made in Step 2 – Desktop Evaluation of Proposed Activity, a Field Assessment survey will be undertaken of the proposed location for the new activity. The survey will be completed following the Field Assessment Flowchart (Appendix J) and the Significant Species Management Plan (SSMP). The objective of the survey is to verify the accuracy of the constraints mapping, to determine the presence or absence of MNES and State listed threatened species or ecological communities, to determine whether there is suitable habitat for protected species at the location of the proposed activity and to determine whether the area requires re-classification in accordance with the constraints classes. Field Assessment surveys will identify and assess options relating to potential field development impacts on MNES and provide recommendations to inform Santos' decision to site and develop infrastructure.

The assessment of the actual extent of disturbance to environmentally sensitive areas, including MNES, will also be considered at this stage, along with the cumulative extent of disturbance relative to the disturbance limits. If the disturbance limits set out in Table 4, Table 5 and Table 6 have been reached; the area is reclassified as constraints Class A (i.e. a 'no-go' area).

The surveys will:

- Be undertaken in accordance with the SEWPaC Guidelines for *Biological Survey and Mapped Data* in effect at the time of the survey. (This information can be obtained from the [EPBC Act policy statements](#));
- Take into account and reference previous ecological surveys undertaken in the area and relevant new information on the likely presence or absence of MNES;
- Be undertaken by a suitable qualified ecologist approved by SEWPaC;
- Document the survey methodology, results and significant findings in relation to environmental sensitive areas, including MNES;
- Apply best practice site assessment and ecological survey methods appropriate for each listed threatened species, migratory species, their habitat and listed ecological communities;
 - Note - Best practice includes applying the optimum timing and frequency of site assessments and surveys to determine presence or absence of listed threatened species or migratory species of their habitat, or a listed threatened ecological community.
- Apply the mapping of environmental constraints Class B, the infrastructure requirements, minimum no impact zones, impact risk zones and the width requirements for the linear infrastructure corridors described in Section 6.7;

- Reports will be published on the internet 20 business days before the clearance of native vegetation in an infrastructure impact area and provided to the Commonwealth Department on request; and
- Survey data will be included in the GIS for further optimisation of any future developments within the gas fields.

The anticipated locations and extents of areas of disturbance to MNES will be clearly documented. All linear disturbances within constraints class B for MNES and the impact risk zone will be designed in accordance with the limits set out in Table 2 and Table 3.

The Field Assessment survey reports will include the name, qualifications and experience of ecologists involved in various aspects of the assessment and reporting process.

Santos is developing a database to record and track disturbances to MNES in accordance with the Protocol. It will be the Environmental Representatives responsibility to check this data base prior to any approval given for land disturbance.

If the proposed new petroleum activity site is located within a Constraints Class A area, the Project Manager will be notified of the need to relocate the site/activity.

Where an assessment identifies that whole near threatened, vulnerable and endangered plants are to be taken and the take cannot otherwise be reasonable avoided, Santos will seek the relevant clearing permits under the NC Act.

Verification of the ecological constraints mapping and habitat suitability types will determine the appropriate FMP that must be implemented. The FMP outline the actions that must be taken when undertaking activities that impact environmentally sensitive areas.

Should the survey identify a listed threatened ecological community or migratory species and their habitat that have not previously been assessed, measures for its protection shall be undertaken in line with the SSMP. Notification of additional MNES found will be provided to the Commonwealth in writing within 10 business days.

To avoid direct and indirect adverse impacts on environmentally sensitive areas, including MNES, fragmentation and edge effects, the FMP requires proposed infrastructure to be located in accordance with the following guidelines:

- Preferentially avoid native vegetation that constitutes a listed ecological community and/or may provide habitat for listed species and utilise previously cleared or previously utilised areas. Potential impact mitigation measures must include the allowance for regrowth of natural vegetation in the parts of the pipeline corridors (flow lines, trunk lines and water pipelines) and areas of non-linear activities not required for routine operation and maintenance in order to partially address fragmentation of habitat for small animals including birds, mammals, reptiles and amphibians. Exclude exploration drilling and production wells from within areas identified as environmental Constraint Class B unless their location in Class B is justified as an exception given other constraints and the impact on any MNES will be minimal, short term and recoverable;
- Either:
 - Exclude other non linear infrastructure from the no impact zone; or

- Where the location of other non linear infrastructure in the no impact zone cannot be avoided, only authorise the siting of that infrastructure in that zone where field ecological surveys demonstrate that there will be minimal, short term, and recoverable, or no adverse impact on any MNES including habitat for any listed species; and
- Either:
 - Exclude linear infrastructure from the impact risk zone; or
 - Where the location of linear infrastructure in the impact zone is justified given other constraints and cannot be avoided, only authorise the siting of that infrastructure in that zone where field ecological surveys demonstrate that there will be minimal adverse impact on any MNES, including habitat for any listed species.

Based upon the ecological survey and report, the environmental representative will make recommendations to the relevant Project Manager to:

- Provide site clearance for the proposed activity;
- Provide conditional approval for the proposed activity by making specific recommendations for environmental conditions (e.g. reduction in well lease size) or use of alternate technologies or other means;
- Request that the site or activity be:
 - Reconfigured to avoid direct impacts to environmentally sensitive areas, including an MNES, for the proposed location; or
 - Relocated to a more suitable location that would not result in direct impacts to an environmentally sensitive area, including an MNES.

The completed Land Disturbance – Site Selection and Inspection Form shall be attached to the relevant Environmental Approvals Request form.

A SSMP has been developed for the GLNG CSG fields. The plan addresses both Commonwealth and State listed species and ecological communities that, as indicated through assessment or more recent information, may be potentially impacted within the project area or external to it by gas field development. The plan was developed by a qualified ecologist approved by SEWPaC.

Information from the SSMP will be used to guide the Environmental Representative to program specific survey requirements. An ecologist will be engaged to determine the final survey methodology and undertake the work as necessary (Appendix G).

8.1.4 Step 4 – Assessment of the Proposed Activity

Personnel required:

- Assessment Team
- Project Director
- Development Team

The Internal Approval Flowchart (Appendix H) provides clarity on who will be responsible for the ultimate decision on the new petroleum activity. The flowchart and related approval processes is based upon environmental risk to environmental sensitive areas, including MNES. The risk assessment is based on the proposed nature of the activity and the potential ecological impact. The flowchart will ensure that

the decision making process is undertaken at an appropriate level of authority and accountability within Santos. The anticipated location and extent of area of disturbance to MNES (if any) will be reviewed during this process.

If the new petroleum activity site is located in Class B, the Project Manager is notified of the need to reconsider the location of the proposed development. If relocation is possible, the approval process recommences. If relocation is not possible, then the Project Manager will need to consider whether alternative management or mitigation strategies can be employed to enable the development to proceed. In the event that impacts to environmentally sensitive areas, including MNES will occur, then the Project Manager must seek specific approval from Project Director for the work to proceed.

Where a proposal would, in combination with prior disturbance events, exceed the disturbance limits outlined in Table 4, Table 5 and Table 6, then the proposal must be rejected.

The siting of non-linear infrastructure in Class B will only be authorised where field ecological surveys demonstrate that there will be minimal, short term and recoverable, or no adverse impact on any MNES, including habitat for any listed species. The siting of linear infrastructure will only be authorised where field ecological surveys demonstrate that there will be minimal adverse impact on any MNES, including habitat for any listed species.

Any unavoidable disturbance to environmentally sensitive areas, including MNES, will need to be deducted from the disturbance limits outlined in Section 6 of the Protocol. For Classes B – E, the works are designed as per the relevant protocol (Sections 7.2.2, 7.2.3 and 7.2.4).

For Class D or E protocols, the Assessment Team reviews the proposed site design. For Class B or C protocols, the Project Director reviews the proposed site design. If the design is suitable, work can proceed in accordance with the Assessment Team / Project Director approval recommendations. If the design is not suitable, the site needs to be redesigned by the Development Team and the process starts again. For Class A areas, the Project Director is responsible for ensuring that these areas remain undisturbed. Where express written permission from DNPRSR has been granted for specific and mutually beneficial activities in a National Park, the Project Director is responsible for obtaining the permission and ensuring the activities are conducted in accordance with the approval or agreement.

The results of the decision making process will be recorded onto the Santos Intranet Well system. This system is used by Santos to track and record approvals for all new GLNG CSG activities. The report will detail who authorised the approval, the nature of the approval and the justification for the relevant decisions.

8.1.5 Step 5 – Approval

Personnel Required:

- Assessment Team
- Project Manager
- Project Director

Subject to the completion of Step 4 the Project Manager shall, prior to issuing an internal approval, ensure that:

- Relevant employees and contractors have been consulted;
- All necessary internal (e.g. landholder & cultural heritage) approvals have been obtained; and
- The issues mentioned above are considered in accordance with EHSMS 9.5 Appendix C Site Scouting Procedure (Appendix I).

A new petroleum activity is given internal approval by completing Sections B and C of the relevant Environmental Approvals Request form. The Land Disturbance – Site Selection and Inspection Form is completed and attached to Section B of the Environmental Approvals Request form.

The relevant Project Manager or Project Director shall acknowledge the receipt of an internal environmental approval and any attached conditions by completing Section D of the relevant Environmental Approvals Request form. Works cannot commence until section D is signed off.

8.2 STAGE 2: Field Development and Construction

8.2.1 Step 6 – Implementation of the Authorised Activity

Personnel required:

- Implementation Team
- Assessment Team

Subject to the recommendations made in Step 5, the internal approval for the authorised activities will be issued. The responsibility for undertaking the proposed works will involve the Implementation Team.

The works are undertaken in accordance with the approved program and work instructions, including the following, as a minimum:

- Environmental Management Plans;
- Fauna Management Plans;
- Pest and Weed Management Procedures;
- The Soil Management Plan;
- The Remediation, Rehabilitation, Recovery and Monitoring Plans;
- The Significant Species Management Plan; and
- Santos Environment, Health and Safety Management System (EHSMS).

The Assessment Team (or their nominated representatives) will undertake internal audits of the construction activities to ensure compliance with the approvals. Base line information will be collected including site photos, clearance records, surveying of post disturbance footprint, construction techniques etc. This information will be kept and used with the RRRMP for rehabilitation to a condition that is equal to or better than the pre-disturbance condition.

During clearing, Type A restricted plants (Schedule 7 of the Nature Conservation (Administration) Regulation 2006) must be salvaged and used for onsite revegetation purposes. This includes species in the family *Cycadaceae*, *Orchidaceae* and *Zamiaceae* and species in the genus *Brachychiton*, *Hydnophytum*, *Huperzia*, *Livistonia*, *Myrmecodia*, *Platynerium* and *Xanthorrhoea*.

8.2.1.1 Environmental Disturbance Inventory Database

Land disturbance information, including the findings of field verification and / or detailed ecological surveys, will be recorded and tracked in the Santos Environmental Disturbance Inventory Database (EDIDB) Geographic Information System (GIS). The EDIDB is a database developed to assist in the management of land disturbance sites.

Prior to commencing any petroleum activity involving land disturbance, a Land Disturbance Inspection Form shall be completed. The relevant forms are provided in EHS01 Land Disturbance. The appropriate Disturbance Inspection Forms are completed and submitted to Geoscience Support for entry into the EDIDB.

Land disturbance data shall be used to:

- Continue to build capacity and understanding of Santos' environmental footprint (area and nature of disturbance);
- Provide a consistent land disturbance data to track performance in public reports (e.g. Sustainability Reports);
- Meet compliance reporting requirements; and
- Update and be included into the functionality of the RRRMP and SSMP.

8.3 STAGE 3: Post Construction

8.3.1 Step 7 – Monitoring and Internal Reporting

Personnel required:

- Assessment Team (or their nominated representatives)

Monitoring against the requirements of this Protocol will be undertaken to satisfy:

- Conditions of the Commonwealth and State government approvals; and
- Internal Santos standards and procedures.

Monitoring will take into consideration the potential environmentally sensitive areas, including MNES values, which have been avoided by implementing the relevant FMP. Monitoring of the FMP will include a requirement to report on circumstances where the implementation of the Protocol has reduced the potential and actual impacts to environmental sensitive areas, including MNES.

8.3.1.1 Constraint Class Impacts

The impacts associated with the GLNG CSG activities will be recorded against the known constraint layers using EDIDB. Santos will use this data base to quantify the impacts to environmentally sensitive areas, including MNES.

If an impact occurs to an environmentally sensitive area, including an impact or presumed impact (where the species is presumed to be present) to MNES during gas field development, operation or decommissioning, Santos will:

Record the impact by reference to:

- The location, specific site and type of infrastructure or activity;
- Each environmentally sensitive area, including MNES subject to disturbance;

- The related site assessment or field ecological survey documentation and recommendations;
- The disturbance limits set out in Section 6.8;
- The total area of actual disturbance;
- The remaining limit for each affected environmental sensitive area, including MNES;
- The reasons behind the decision including justification for the action taken, description of the efforts taken to avoid impact and an explanation why other constraints might justify the impact on environmental sensitive area, including MNES;
- Actions and commitments by Santos to remediate, rehabilitate or make good any unauthorised disturbance; and
- Record the information to a standard that can be independently audited.

The implementation of the FMP will result in a significant reduction in impacts on environmentally sensitive areas, including MNES matters. The impact reductions from implementing the FMP will be documented.

Santos will mitigate damage from taking whole least concern protected plants by:

- Utilising native endemic species in landscaping and revegetation components of the projects; and
- Promoting natural regeneration of native ecosystems, by ongoing weed control, management of soil erosion, the stabilisation of soil seed banks and wildfire management.

Natural regeneration, landscaping and revegetation will aim to achieve a self-sustaining endemic plant community which includes the affected least concern plant species cleared.

In all sites located within a constraints Class B area and/or where impacts to MNES have been approved, a post construction survey will be undertaken to document any discrepancies between 'predicted' and 'actual' extents of impacts to MNES. Where a discrepancy is identified an assessment of the causes of the difference will be documented, along with any necessary changes to the FMPs.

A post construction survey will be undertaken within four weeks of the completion of land disturbance activities.

The maximum acceptable timeframe for assessing and recording unauthorised impacts to a MNES following Santos becoming aware of the impact is five business days. Unauthorised impacts will be assessed by a suitable qualified ecologist approved by SEWPaC, with the name and qualifications of the person(s) undertaking the assessment to be recorded on the report.

8.3.2 Step 8 – Auditing

Internal environmental auditing will be undertaken in accordance with Santos auditing requirements. Santos will undertake internal auditing during the course of the development of the GLNG CSG fields to ensure compliance with:

- Conditions of the Commonwealth and State government approvals;

- The agreed FMP and authorised disturbance limits; and
- Internal Santos standards and procedures.

External auditing by a third party is a requirement of the CG Report and the relevant EAs. SEWPaC may also request that Santos undertake an independent audit under the EPBC Act approval conditions. This may include auditing of the Protocol.

8.3.3 Step 9 – External Reporting to Regulatory Agencies

Santos commits to report on the GLNG CSG Field activities as required under the relevant Commonwealth and State government approvals.

Details of any impact or presumed impact to a MNES and/or any significant disturbance to land undertaken within the primary protection zone of, or in a Category B or C ESA, along with a record of any assessments required will be kept, and submitted to the administering authority as required.

Santos will report to the Commonwealth and State government departments on the impacts to environmental sensitive area, including MNES, with the submission of each Annual Return for the relevant CSG Field Project Areas. The Annual Environmental Return will:

- Address compliance with the conditions;
- Record any unavoidable adverse impacts on MNES, mitigation measures applied to avoid adverse impacts on MNES, and any rehabilitation work undertaken in connection with any unavoidable adverse impacts on MNES;
- Identify all non-compliances with the conditions; and
- Identify any amendments needed to plans to achieve compliance with the conditions.

Reporting will also include a current account of environmental values impacted against set targets and offset values secured. Reporting is also required by the Commonwealth to take into consideration the potential environmental sensitive area, including MNES values that have been avoided by implementing the Protocol.

If the assessment indicates that a regional ecosystem (RE) mapped as 'Endangered' or 'Of Concern' by the Queensland Herbarium should be in a different conservation value classification, and, within the 20 business days following the lodgement of the notification, the administering authority notifies Santos, in writing, that the regional ecosystem mapping requires further validation, then significant disturbance to land in the mapped regional ecosystem are prohibited until the administering authority provides written advice that significant disturbance to land may proceed.

Information on EPBC Act related matters obtained during Step 3 – Field Assessment and Verification (Section 8.1.3), will be recorded by the Environmental Representative using the SEWPaC draft guideline Guidelines for Biological Survey and mapped Data and be provided to SEWPaC upon request .

For clearing impacts that result in the permanent loss of least concern native plants (cannot be re-established within three years of clearing or floristic modification), Santos will provide DEHP with a written detailed report of permanent vegetation loss, including

the areas, species affected and mapping of affected areas, within three months of completion of the clearing activities.

A record of clearing activities where whole plants have been taken under the NC Act exemption will be kept in a form that identifies the area cleared in a manner acceptable to DEHP and outlines any mitigation measures taken.

9 Decommissioning and Demolition Management Plan

After the gas supply from each well is exhausted, the well sites and associated facilities and infrastructure will be decommissioned and demolished.

The Decommissioning and Demolition Management Plan (DDMP) provides a discussion on the potential future decommissioning and demolition activities, focusing on the process of decommissioning and demolition and mitigation of environmental impacts. The DDMP does not provide specific site-by-site and/or asset-by-asset information. Due to the complexity of each site, the site and asset-specific detail will be provided as standalone documents and in site-specific decommissioning and demolition plans that will be developed prior to the initiation of activities.

Santos anticipates that the site-specific decommissioning and demolition plans will be prepared based on a detailed review of all of the engineering plans, drawings and a site inspection. The site documents will be collected and consolidated and form the basis, along with the DDMP, of a checklist to identify the nature and scope of decommissioning and demolition activities. This checklist will then be utilised as part of a comprehensive site inspection to determine the nature and extent of existing infrastructure and equipment.

Decommissioning and demolition success will be monitored for a period agreed with the relevant authorities. Instances of non-conformances will be documented, reported and corrected.

10 Site Remediation, Rehabilitation and Recovery Monitoring Plan

Progressive rehabilitation of disturbed sites will occur as soon as practicable following the completion of works. There are two primary stages when there will be a requirements for rehabilitation works, these being the immediate post construction stage of each project site and then at the decommissioning stage of each project site.

Santos will commence rehabilitation as soon as practicable in accordance with the relevant statutory requirements and approvals, unless an agreement is in place with the relevant administering authority and relevant Landholder. This agreement may allow the disturbance to be beneficially re-used, for example farm dams, roads, etc.

The initial rehabilitation works will be targeted at stabilizing disturbed areas by implementing soil erosion control measures, establishing an appropriate vegetation cover and by preventing the outbreak of declared weeds. The primary objective of the initial rehabilitation works is to stabilize the disturbed area (e.g. a completed well lease) during the operational life of the CSG infrastructure asset.

Upon cessation of the petroleum activities, the CSG infrastructure will be decommissioned in accordance with the statutory requirements outlined in the

Petroleum and Gas Act 2004 (P&G Act), other relevant State approvals and the DDMP (Section 9). Final rehabilitation will then commence as soon as practicable. Where a direct or indirect impact has occurred to an environmentally sensitive area, including MNES, Santos will apply remediation, rehabilitation and recovery measures appropriate for each environmentally sensitive area, including MNES to restore connectivity or rehabilitate disturbed areas to pre-clearance quality or better, and to minimise cumulative impacts throughout the life of the project.

Rehabilitation of the gas fields must allow for the maximum re-establishment of native vegetation including the shrubby understorey and ground cover, providing habitat for small ground dwelling fauna species and restoration of landscape connectivity. Rehabilitation of areas containing least concern plants that are disturbed during clearing activities, where required by a clearing permit issued under the *NC Act 1992*, will be commenced within three months of completion of activities. Revegetation will be consistent with the plant density, floristic composition and distribution of the surrounding regional ecosystem types and within the province of the vegetation being cleared.

Santos has developed a Remediation, Rehabilitation, Recovery and Monitoring Plan (RRRMP) that forms part of the Operational Plan for each GLNG CSG project area. The RRRMP enables Santos to plan and implement a staged rehabilitation program in line with the proposed development of GLNG CSG field. The RRRMP includes recommendations towards rehabilitation outlined in the SSMP.

The RRRMP:

- Includes site remediation measures including timeframes and standards for preventing erosion and stabilising disturbed soil in impact areas;
- Includes measures to support recovery of listed species' habitat and recovery of listed ecological communities affected by the gas field development;
- Includes responses to threats to environmental sensitive areas, including MNES from Santos operational activities and land management activities including the disposal and use of CSG water, damage by livestock and impacts from weeds and pest animals;
- Provides for fire management regimes appropriate for the environmental sensitive areas, including MNES;
- Includes performance measures and related monitoring to assess site remediation, rehabilitation and recovery;
- Provides for reporting on the implementation of the RRRMP, including monitoring and performance to a standard that can be independently audited; and
- References relevant conservation advice, recovery plans, species management plans, or policies, practices, standards or guidelines endorsed or approved from time to time by SEWPaC or the Minister.

The RRRMP will address all relevant rehabilitation conditions that are outlined in the Coordinator-General approval and the relevant environmental authority for each project area.

The RRRMP has been submitted to SEWPaC for written approval by the Minister. The approved RRRMP will be implemented.

Where requested by the Minister the RRRMP will be periodically reviewed by a SEWPaC approved ecologist, or other experts, approved by the Commonwealth to take into account any new information available, including any information and advice provided by Commonwealth or Queensland government agencies, or available from other CSG proponents, at Santos' expense. The review will be conducted every three years, in line with the submission of a new Operational Plan.

Pre- and post construction survey information will be used for completing rehabilitation and used in the review of the RRRMP.

11 Other Documentation

Links to other documentation that have been referenced throughout the Protocol are below.

11.1.1 Internal (Santos personnel access only)

[Environment, Health and Safety Management System \(EHSMS\)](#)

[Environmental Approvals](#) team site

[Environmental Approvals Request Guideline](#)

11.1.2 External

[Environmental Protection and Biodiversity Conservation \(EPBC\) Act 1999](#)

[Environmental Protection \(EP\) Act 1994](#)

[Environmental Protection Regulation \(EPR\) 2008](#)

[EPBC Act policy statements](#)

[Forestry Act 1959](#)

[Guidelines for Biological Survey and Mapped Data](#)

[Map of Referable Wetlands](#) (DEHP)

[Nature Conservation \(NC\) Act 1992](#)

[Regional Ecosystem Description Database](#) (DEHP)

[Regrowth Vegetation Code – On freehold and Indigenous land and leasehold land for agriculture and grazing – version 1](#) (DEHP)

[Sustainable Planning \(SP\) Act 1999](#)

11.2 Environmental Management Plans

Environmental Management Plans (EMPs) have been developed for each of the Project Areas within the CSG Fields as required by conditions of the CG Report and to support the application of Environmental Authorities. EMPs provide a generalised discussion regarding the potential future activities in the Project Areas as a whole, including the potential environmental impacts and likely control measures, rather than providing site by site and asset by asset specific information.

EMPs are structured to provide:

- An introduction to the project, stakeholders and approval process;
- An outline of the environmental legislative framework;
- An overview of Santos' EHSMS;
- Background information relating to the Project Areas;
- An outline of the contents of the Operational Plan to be developed after authorisation;
- A description of the proposed activities;
- A description of the potential environmental impacts and management strategies relating to the application; and
- A summary of the key environmental issues applicable to the EA application.

11.3 Cumulative Impact Assessment Report

The Cumulative Impact Assessment was undertaken to assess the potential for impacts from the GLNG CSG field development to have compounding or synergistic interactions with similar impacts from other projects proposed or under development by third party proponents.

The cumulative impacts identified for the GLNG CSG Fields ranged from low to medium. The low rating was mainly due to the environmental management strategies proposed to be implemented by Santos and many of the other projects considered as well as the geographical separation between the Project and other projects assessed. The medium impacts can be managed by the application of strict mitigation measures and targeted monitoring programs.

For the GLNG CSG Field, Land and Terrestrial Ecology were assessed as Low Impact Ratings. Land Use was assessed as a Medium Impact Rating.

11.4 Species Management Programs

Species Management Programs (SMP) have been developed for least concern wildlife, with the exception of some specified least concern species, for the purposes of section 332 of the *Nature Conservation (Wildlife Management) Regulation 2006* (Wildlife Management Regulation). The SMP provides a working arrangement for activities that may require the tampering with animal breeding places in a way that meets the legislative requirements of the NC Act. Animal species prescribed as 'extinct in the wild', 'endangered', 'vulnerable' or 'near threatened' under the Wildlife Regulation are not subject to this SMP.

The SMP does not apply within a Forest Reserve or Protected Area prescribed under the NC Act, nor does it obviate the operation of any other legislation.

The procedures will include training and awareness of staff and contractors and ensure that any planned fauna handling is undertaken by a suitable qualified person.

A copy of the procedures will be made available to the administering authority upon request.

11.5 Significant Species Management Plan

A Significant Species Management Plan (SSMP) has been prepared by a qualified ecologist approved in writing by SEWPaC. The SSMP will be reviewed prior to the commencement of each major stage of field development. The SSMP will provide specific management measures to be implemented prior to, during and post construction / development activities within the GLNG CSG fields for threatened and significant species and ecological communities pursuant to both the EPBC Act and the NC Act, including Santos' approval for taking a protected plant in the course of an activity under an authority, granted or given under the *Petroleum Act 1925*, P&G Act, *Greenhouse Gas Storage Act 2009* and the *Petroleum (Submerged Lands) Act 1982*.

The Protected Plants Exemption under S41(1)(a)(ii) of the *Nature Conservation (Protected Plants) Conservation Plan 2000* and the SMP that provides authorisation under s332(4)(a) of the *Nature Conservation (Wildlife Management) Regulation 2006* to tamper with animal breeding places, is sufficiently robust to support the development or determine whether additional measures area required (i.e. the SMP does not apply to least concern and/or threatened fauna, they are included in the SSMP).

The following EPBC Act species and Threatened Ecological Communities requirements are addressed via the SSMP:

- Current legal status (under the EPBC Act);
- Known distribution;
- Known species' populations and their relationships with the region;
- Extent of ecological community fragmentation within the region and if appropriate minimum patch size for that community;
- To support field identification and ecological surveys, a description of the relevant characteristics of the ecological community;
- Species' biology and reproduction and description of general habitat;
- To support field identification and ecological surveys, a description of the species' habitat, which may be described in terms of essential habitat, and microhabitat including associations with geology, soils, landscape features and associations with other native fauna and/or flora or ecological communities, and where relevant specific niche habitat descriptions that can be meaningfully applied in constraints planning and used in field ecological surveys;
- Threats to MNES relating to the development and management of land within the gas fields including from the development, operation and decommissioning of infrastructure within the gas fields, and from extraction, use and disposal of CSG water whether the threat is within or outside the project area;
- Relevant management practices and methods to minimise impact that will include:
 - Site rehabilitation timeframes, standards and methods;
 - Use of sequential clearing to direct fauna away from impact zones;
 - Re-establishment of native vegetation in linear infrastructure corridors;
 - Welfare and safe handling of fauna specimens;
 - Handling practices of flora specimens;
 - Translocation practices and monitoring for translocation success;

- Monitoring methods including rehabilitation success and recovery;
- Surface and ground water quality and quantity requirements, including relevant downstream environmental quality parameters;
- Reference to relevant conservation advice, recovery plans, or other policies, practices, standards or guidelines relevant to MNES published or approved from time to time by the Department or the Minister.

The relevant Environmental Representative will need to take into consideration the recommendations made in the SSMP for the GLNG CSG Fields when determining field evaluation requirements, particularly those for targeted flora and fauna surveys.

Should activities be undertaken that will impact an EPBC Act listed species or threatened ecological community, the SSMP will specify the relevant management and mitigation measures that must be implemented.

The SSMP will be routinely reviewed by a qualified ecologist (with other experts as appropriate) and take into account any new information available, including any information and advice provided by Commonwealth or Queensland government agencies, or available from other CSG proponents. This review will occur every three years in line with the Upstream Operational Plans review. Reviews will also occur in response to new information becoming available to Santos (e.g. when a new flora or fauna species or threatened ecological community is listed under the EPBC Act). Pre- and post construction survey information will be used in the review of the SSMP.

Commencement of each major stage of gas field development within the project area will not occur without written approval of the SSMP for each listed species and ecological community within the proposed area of development. Santos may undertake activities that are critical to commencement that are associated with mobilisation of plant and equipment, materials, machinery and personnel prior to the start of development only if such activities will have no adverse impact on MNES, and only if the proponent has notified the Department in writing before an activity is undertaken. The approved SSMP will be implemented.

The SSMP will also be used in conjunction with the RRRMP, where rehabilitation, remediation, recovery and monitoring is required for an environmentally sensitive area, including MNES, included in the SSMP.

The Minister may require through a request in writing the periodic review of the species and ecological community management plans either by SEWPaC; or alternatively by an independent qualified ecologist, or other experts, approved by SEWPaC.

An external review of the SSMP by SEWPaC may be required at the request of the Minister, at Santos' expense. Once independently reviewed, plans must be submitted for written approval by SEWPaC. Approved plans must be implemented.

The SSMPs include:

- Relevant avoidance and mitigation measures that will be applied; and
- Measures for protecting each listed threatened species and migratory species and their habitat and threatened ecological communities.

Should pre-clearance surveys identify a MNES within the project area that has not been previously assessed then written notification of the MNES found will be provided

to the Commonwealth within 10 business days. A species management plan will then be developed and submitted to SEWPaC for approval.

11.6 Pest and Weed Management Program

Santos has developed an effective pest and weed management program that includes but is not limited to the following:

- Identification of pest and weed species and infestation areas;
- Prevention and/or minimisation of the introduction and/or spread of pests;
- Control and management of pest outbreaks as a result of petroleum activities; and
- A process for review and updating if and when new weed or pest occurrences are identified.

A copy of the Pest and Weed Management Program will be made available to both the State and Commonwealth Departments upon request.

11.7 Fauna Management Plans

Fauna Management Plans (FMPs) have been developed to detail the requirements for the management of fauna associated with the construction and operation of the CSG Fields. The FMPs will be implemented prior to the commencement of the petroleum activities authorised under the relevant EA.

The objectives of the FMPs are to:

- Provide a framework for minimising the potential risk of the operation causing injury, harm or entrapment to fauna, including the consideration and maintenance of bioregional corridors within the CSG Fields;
- Address any impact to species and provide for the species survival in the wild;
- Ensure fauna management practices are supportive of sustainable development and comply with Santos policies, industry standards, legislative obligations and license conditions; and
- Ensure compliance with the relevant EAs.

11.8 Soil Management Plans

The Soil Management Plan (SMP) provides a framework to facilitate the successful implementation of soil management measures to mitigate potential environmental impacts and ensure compliance with Commonwealth and State imposed conditions. In addition the SMP provides a mechanism to ensure that Santos meets its internal environmental performance targets and where applicable, realise potential opportunities for enhanced environmental outcomes.

Due to the extensive project area and changing nature of gas field projects the SMP has been developed to serve as a management framework document that outlines general soil management policies, specific investigation methodologies as well as information needed to guide day to day soil management decisions. The SMP also provides guidance on performance and compliance monitoring of management measures, development and implementation of corrective actions, and the review process for continual improvement. Approval and Review of the Santos Environmental Protocol for Constraints Planning and Field Development for the GLNG CSG Fields

12 Approval and Review of the Santos Environmental Protocol for Constraints Planning and Field Development for the GLNG CSG Fields

The Protocol will be submitted for the approval of the Minister and commencement of gas field development will not occur without approval. The approved Protocol will be implemented.

When a review is required, it will take into account all the relevant studies, policies, standards, guidelines and advice relating to CSG activity published or provided to Santos by SEWPaC or relevant Queensland government departments, or published or provided by other proponents undertaking similar activities, or published or provided by other parties, including any findings of an audit against conditions, or plans or other documentation required under the conditions of this approval.

The Protocol and related plans will be reviewed and updated to take into account the findings of the Cumulative Impact Assessment Report required by the Queensland Government, before each major stage of gas field development, or following a written request from the Commonwealth Department. Reviewed and updated Protocols and plans will be submitted for the Minister's written approval. Once approved, updated Protocols will be implemented. The Department may also request that the Protocol and related plans be revised or amended before approval. Any such request will be acted on within the time frame specified.

Additional requirements for periodic review, including aligning with Queensland Government requirements, may be specified in writing by SEWPaC.

If the Protocol is required to be changed in any way, the GLNG Management of Change (MOC) Process will be utilised. All relevant stakeholders will be engaged to review the change. Examples of changes that will require the implementation of the MOC Process include:

- Changes in listed flora and fauna species;
- Changes in Threatened Ecological Communities;
- Revisions to databases and datasets;
- Amendments to EAs;
- Amendments to legislation;
- At the request of the State or Commonwealth; and
- Following periodic review of the Protocol.

The Protocol will be incorporated in Santos' management procedures, operational plans and other relevant documentation and kept current for the life of the project.

13 Publication and Notification

If any assessment indicates that a QLD State government listed regional ecosystem (RE) mapped as 'Endangered' or 'Of Concern' by the Queensland Herbarium should be in a different conservation value classification, Santos will advise the administering authority in writing before any significant disturbance to land takes place.

The Protocol and all plans approved by the Minister under conditions imposed under the EPBC Act will be published on the GLNG website within 30 days of approval by the Minister.

If requested, Santos will provide to SEWPaC all species and ecological survey data and related survey information from ecological surveys undertaken for MNES within 30 business days of the survey, or other timeframe agreed to by SEWPaC. The data must be collected and recorded so as to conform to the SEWPaC *Guideline for Biological Survey and Mapped Data*

14 Definitions

Associated infrastructure	Permanent and temporary camps, access roads, waste management areas, borrow pits, quarries, laydown and storage areas, etc
Brigalow	<p>For the purposes of the application of the Constraints Planning and Field Development Protocol the presence of the Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant) ecological community includes Brigalow regrowth that retains the species composition and structural elements typical of that found in the undisturbed listed regional ecosystems but does not include:</p> <p>(a) vegetation that has been comprehensively cleared (not just thinned) within the last 15 years</p> <p>(b) vegetation in which exotic perennial plants have more than 50% cover, assessed in a minimum area of 0.5 ha (100 m by 50 m)</p> <p>(c) individual patches of Brigalow that are smaller than 0.5 ha.</p> <p>(EPBC Act approval 2008/4059 conditions)</p>
Clearance of native vegetation	The cutting down, felling, thinning, logging, removing, killing, destroying, poisoning, ringbarking, uprooting or burning of native vegetation
Commencement	Any physical disturbance including clearance of native vegetation, new road work, and the establishment of well sites to develop the gas field project area. Commencement does not include minor physical disturbance necessary to undertake preclearance surveys or to establish monitoring programs
Conditions	These conditions attached to the approval of the action
Department of Sustainability, Environment, Water, Population and Communities (SEWPaC)	means the Australian Government department responsible for administering Part 4 of the EPBC Act
Environment	<p>Includes:</p> <ul style="list-style-type: none"> • land, air, water(including both surface and underground water) • buildings, structures and cultural artefacts • productive capacity or potential • the social and economic structure • the amenity value of areas
Environmental authorisation	A works approval, licence or exemption to undertake a prescribed activity of environmental significance obtained in accordance with the relevant state environmental legislation
Environmental Impact	A formal process used to predict the environmental, social and health

Assessment (EIA)	effects of development activities and to address the mitigation of identified potential impacts.
Environmental Management Plan (EMP)	Site or project specific plan which sets out a management framework for environmental issue management, monitoring programs and preparing statutory reports.
Environmentally sensitive areas	Areas where the environment may be adversely impacted easily e.g. surface water or groundwater, marine environment, wetlands, gibber plains. Includes areas declared by legislation to have conservation value.
Gas field development	All activities associated with the development of the gas fields including (but not limited to) site clearance and site preparation; development of exploration and production wells; development of water and gas transmission pipelines; infrastructure access road construction; construction of workers accommodation and office facilities; construction of gas compression stations; construction of pumping stations; construction of water treatment facilities; and construction of water storage dams.
GLNG	Together, Santos, PETRONAS, KOGAS and Total, being the joint proponents of the GLNG Project
GLNG CSG fields	CSG fields operated by Santos on behalf of the GLNG joint venture and proposed to supply CSG to the LNG facility on Curtis Island for export as part of the GLNG Project, being the tenements comprising the Reasonable Field Development Area (RFDA)
High Value Regrowth	Mature native vegetation that hasn't been cleared since 31 December 1989 (DEHP).
Impact risk zone	The area within 200 metres from the perimeter of environmental constraint class B (EPBC Act approval 2008/4059 conditions)
Key Stakeholders	Typically the owner, holder or occupier of the land; the relevant land council/Aboriginal party; or the local authorities.
Legal Requirements	All laws, regulations, conditions of permits, licences, approvals and rules of conduct established by national, state or local government authorities.
Limited petroleum activities	Activities including geophysical surveys (including seismic activities), well sites, well pads, sumps, flare pits, flow lines and supporting access tracks. Limited petroleum activities do not include the construction of production infrastructure for processing or storing petroleum or by-products, dams, compressor stations, campsites/workforce accommodation, power supplies, waste disposal or other supporting infrastructure for the project (DEHP, Environmental authority conditions).
Linear infrastructure	Infrastructure including (but not limited to) gas and water gathering lines, low and high pressure gas and water pipelines, roads and tracks, power lines and other service lines
Listed	Those species, ecological communities or other identified matters of environmental significance listed for protection under Part 3 of the EPBC Act
Minister	The Minister responsible for Part 4 of the EPBC Act, and may include a delegate of the Minister under s.133 of the EPBC Act

MNES	Matters of national environmental significance, being the relevant matters protected under Part 3 of the EPBC Act
New Petroleum Activity	New petroleum activities that may cause land disturbance e.g. disturbing soils and/or vegetation, land clearing
No impact zone	The area within 300 metres from the perimeter of environmental constraint class B (EPBC Act approval 2008/4059 conditions)
Non-linear infrastructure	Infrastructure including (but not limited to) exploration and production wells, compressor stations, regulated dams, reverse osmosis plants, brine encapsulation facilities, workers camps, and maintenance facilities
Plan	Includes a report, study, protocol or strategy (however described)
Point Features or microhabitat for significant flora and fauna species	Including isolated hollow bearing trees, wetland sites (and artificial waterbodies), habitat connectivity along fence lines or road easements minor riparian corridors and cracking clay pans.
Population of a Species	An occurrence of the species in a particular area. In relation to critically endangered, endangered or vulnerable threatened species, occurrences include but are not limited to: <ul style="list-style-type: none"> • a geographically distinct regional population, or collection of local populations, or • a population, or collection of local populations, that occurs within a particular bioregion”.
Primary Protection Zone	An area within a 200 m buffer from the boundary of any Category A, B or C Environmentally Sensitive Area (DEHP, Environmental Authority conditions).
Proponent	The holder of the approval to which these conditions relate, and includes any person acting on behalf of the proponent
Regulatory agency	Agencies administering the EPBC Act and the EP Act (Qld)
Release	Release includes water discharge, compressor emission and other releases of pollutants beyond the boundary of the activity or project.
Relevant Authority	A person or body authorised in writing to exercise powers under Government environmental Regulations or Acts.
Secondary Protection Zone	In relation to a Category A Environmental Sensitive Area means as are within an 800 m buffer distance from the boundary of a primary protection zone. In relation to a Category B or C Environmentally Sensitive Area means an area within a 300 m buffer distance from the boundary of a primary protection zone (DEHP).
Significantly disturbed land or significant disturbance to land or significant	As defined in section 28 of the <i>Environmental Protection Regulation 2008</i> . 28 What is significantly disturbed land (1) Land is significantly disturbed if— (a) it is contaminated land; or

<p>disturbance</p>	<p>(b) it has been disturbed and human intervention is needed to rehabilitate it—</p> <ul style="list-style-type: none"> (i) to a condition required under the relevant environmental authority; or (ii) if the environmental authority does not require the land to be rehabilitated to a particular condition—to the condition it was in immediately before the disturbance. <p><i>Examples of a disturbance to land -</i></p> <ul style="list-style-type: none"> • The covering, compaction, exposure, removal or stockpiling of soil or other material • The destruction or removal of vegetation • The carrying out of a mining activity in a watercourse or wetland • The submergence of an area with a hazardous contaminant, tailings, or water <p>(2) Without limiting subsection (1)(b), land requires human intervention to rehabilitate it if -</p> <ul style="list-style-type: none"> (a) the disturbance has made the land more susceptible to erosion; or (b) the land use capability or suitability of the land is diminished; or (c) the quality of water in a watercourse downstream of the land has been significantly reduced. <p>(3) If land is significantly disturbed land because it is contaminated land, it ceases to be significantly disturbed land if a suitability statement is issued for the land.</p> <p>(4) If land is significantly disturbed land under subsection (1)(b), it ceases to be significantly disturbed land if the administering authority is satisfied the land has been rehabilitated -</p> <ul style="list-style-type: none"> (a) to the condition it was in immediately before the disturbance; or (b) to another condition decided by the administering authority.
<p>Stakeholders</p>	<p>Individuals and organisations with an interest in or adversely effected by proposed projects and activities (proposed development activities) including relevant governments (local, state and national), NGOs (conservation, catchment management groups) Aboriginal peoples and representative groups, landholders and other interested parties.</p>
<p>Suitably Qualified Person</p>	<p>A person who has professional qualifications, training, skills and experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis to performance relative to the subject matter using the relevant protocols, standards, methods or literature (DEHP 2010 Model Conditions).</p>
<p>Third Party Auditor</p>	<p>A suitable qualified person who is either a certified third party auditor or an internal auditor employed by the holder of the environmental authority and the person is independent of the day to day management and operation of activities covered by the environmental authority (DEHP 2010 Model Conditions).</p>
<p>Trunkline rights of way</p>	<p>The linear construction footprint required to install gas and water trunklines, 33 kV power lines, above ground 33 kV power lines, fibre optic cable and gas and water gathering lines. Trunkline rights of way may contain between one and ten gas and water trunklines, between</p>

	one and ten power lines, between one and ten fibre optic cables and between one and up to twelve gathering lines running in parallel
Water distribution pipelines	Pipeline used to transfer treated water from the water treatment plant to a user of that water or to transfer brine between facilities that manage brine
Water gathering lines	Pipelines used to transfer water between wells and storage ponds
Water trunklines	Pipelines used to transfer water between storage ponds and water treatment plants.

Appendix A EPBC Act Conditions and the Relevant Section of Protocol where they are Addressed

Number		EPBC Act Conditions	Section of Protocol
Constraints Planning, Field Development and Field Management <i>Protocol for Constraints Planning and Field Development</i>			
3		Before the commencement of gas field development, the proponent must develop a Constraints Planning and Field Development Protocol (the Protocol).	This document
4		The Protocol must include and apply for the life of the project, the principles of:	Section 1
	a	avoiding direct and indirect impacts on MNES;	
	b	mitigating and managing direct and indirect impacts to minimise cumulative impacts on MNES;	
	c	active site remediation and rehabilitation of impacted areas to promote and maintain long-term recovery of MNES.	
5		The Protocol must:	7.2.2
	a	Classify the following as being within the proponent's high environmental constraint class B (or should the proponent's classification be revised, an equivalent high environmental constraint class):	
	i	All listed threatened ecological communities;	
	ii	All listed flora species; and	
	iii	Those listed threatened and migratory fauna species habitats as identified in management plans required under these conditions, which where relevant may be described in terms of specific niche habitat types; Note: The proponent's approach to environmental constraint class B and related avoidance and impact mitigation is described in SEIS Attachment D5 (dated November 2009). The protocol conditions do not apply to the other constraints that the proponent has included in environmental constraint class B unless these are relevant to MNES.	
	b	Take into account all current survey data and available information and maps all MNES relevant to the project area as within environmental constraint class B;	7.2.2
	c	Require the undertaking and documentation of planning and pre-clearance site assessments and field ecological surveys in proposed gas field development areas where MNES are likely or found. The pre-clearance site assessments and ecological surveys must identify and assess options relating to potential gas field development impacts on MNES and provide recommendations to inform the proponent's decision to site and develop infrastructure in the project area;	8.1.3
	d	To avoid direct and indirect adverse impacts on MNES, including fragmentation and edge effects, require the proponent to determine the location of proposed infrastructure in accordance with the following:	8.1.4 Appendix H
	i	Preferentially avoid native vegetation that constitutes a listed ecological community and/or may provide habitat for listed species and utilise previously cleared or previously utilised areas;	

Number		EPBC Act Conditions	Section of Protocol														
	ii	Exclude exploration drilling and production wells from within areas identified as environmental constraint class B unless their location in environmental constraint class B is justified as an exception given other constraints and the impact on any MNES will be minimal, short term and recoverable; and Note: Directional drilling and multiple drill holes from one well pad are options to avoid well site and related infrastructure disturbance to environmental constraint class B.															
	iii	Either:															
	1	Exclude other <u>non linear</u> infrastructure from the no impact zone; or															
	2	Where the location of other <u>non linear</u> infrastructure in the no impact zone cannot be avoided, only authorise the siting of that infrastructure in that zone where field ecological surveys demonstrate that there will be minimal, short term, and recoverable, or <u>no</u> adverse impact on any MNES including habitat for any listed species; and															
	iv	Either:															
	1	Exclude <u>linear</u> infrastructure from the impact risk zone; or															
	2	Where the location of linear infrastructure in the impact zone is justified given other constraints and cannot be avoided, only authorise the siting of that infrastructure in that zone where field ecological surveys demonstrate that there will be <u>minimal</u> adverse impact on any MNES, including habitat for any listed species; Note: Justification is reportable in accordance with condition 13)a)vii). The management plan requirements under condition 8) h) may also indicate that a species or its habitat can co-exist with specific types of gas field infrastructure and operations.															
	e	Require the proponent to plan for and decide the extent that proposed linear infrastructure may have an adverse impact on MNES in accordance with the following:															
	i	All linear disturbance within environmental constraint class B for MNES and the impact risk zone must be in accordance with the limits specified in Table 1 and Table 2 and condition 5e)ii): Table 1: Gathering pipeline network corridor widths (right of way)															
<table border="1"> <thead> <tr> <th>Pipeline Number (based on 2 pipelines per trench and provision for an access track)</th> <th>Maximum width (m) (without power provision)</th> <th>Maximum width (m) (with power provision)</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>9.5</td> <td>19.5</td> </tr> <tr> <td>4</td> <td>14</td> <td>24</td> </tr> <tr> <td>6</td> <td>18.5</td> <td>28.5</td> </tr> <tr> <td>8</td> <td>23</td> <td>33</td> </tr> </tbody> </table>				Pipeline Number (based on 2 pipelines per trench and provision for an access track)	Maximum width (m) (without power provision)	Maximum width (m) (with power provision)	2	9.5	19.5	4	14	24	6	18.5	28.5	8	23
Pipeline Number (based on 2 pipelines per trench and provision for an access track)	Maximum width (m) (without power provision)	Maximum width (m) (with power provision)															
2	9.5	19.5															
4	14	24															
6	18.5	28.5															
8	23	33															
Note: These widths include 3m offset from the road and provision of 5m spacing from the edge of trench to the edge																	

6.7
8.1.3

Number		EPBC Act Conditions	Section of Protocol												
		of clearing to allow for stockpiling trenching spoil, topsoil and cleared vegetation. Table 2: Road and co-located infrastructure corridor widths (right of way) <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Road Class</th> <th>Power Provision (m)</th> <th>Road Width (m)</th> <th>Road/Pipeline Separation (m)</th> <th>Pipeline Provision (m)</th> <th>Maximum Total Corridor Width (m)</th> </tr> </thead> <tbody> <tr> <td>C (single)</td> <td>10</td> <td>11</td> <td>3</td> <td>6</td> <td>30</td> </tr> </tbody> </table> Note: Table 2 relates to formed roads other than tracks.	Road Class	Power Provision (m)	Road Width (m)	Road/Pipeline Separation (m)	Pipeline Provision (m)	Maximum Total Corridor Width (m)	C (single)	10	11	3	6	30	
Road Class	Power Provision (m)	Road Width (m)	Road/Pipeline Separation (m)	Pipeline Provision (m)	Maximum Total Corridor Width (m)										
C (single)	10	11	3	6	30										
	ii	Gas and water trunkline rights of way, water distribution pipeline rights of way and other major linear infrastructure disturbance corridors within environmental constraint class B and the impact risk zone must be:	7.2.2.3												
	1	Limited to 30m in width where there are one or two gas and water trunklines, underground 33kV power lines and fibre optic cables in parallel;													
	2	Limited to 30m plus an additional 4 m for every additional gas or water trunkline in parallel with the initial one or two gas or water trunklines, power lines and fibre optic cable.													
	iii	Where feasible, gas trunklines, pipelines for associated water and other transmission lines must be co-located to reduce total disturbance on MNES. Note: Any area of disturbance referred to in this condition would be subtracted from the disturbance limits specified elsewhere in these conditions.													
f		support bioregional corridors for listed threatened species and migratory species, and connectivity for listed threatened ecological communities;	6.5 7												
g		ensure site assessments and field ecological surveys:	8.1.3 Appendix G												
	i	are undertaken in accordance with the Department's survey guidelines in effect at the time of the survey. This information can be obtained from http://www.environment.gov.au/epbc/guidelines-policies.html#threatened ;													
	ii	Take into account and reference previous ecological surveys undertaken in the area and relevant new information on likely presence or absence of MNES;													
	ii	are undertaken by a suitably qualified ecologist approved by the Department;													
	iv	document the survey methodology, results and significant findings in relation to MNES.													
	v	Apply best practice site assessment and ecological survey methods appropriate for each listed threatened species, migratory species, their habitat and listed ecological communities. Note: Best practice includes applying the optimum timing and frequency of site assessments and surveys to determine presence or absence of listed threatened species or migratory species or their habitat, or a listed threatened ecological community.													
	vi	apply the mapping of environmental constraints class B; the infrastructure location requirements; minimum no impact zones; impact risk zones; and the width requirements for linear infrastructure corridors described in e);													

Number			EPBC Act Conditions	Section of Protocol
		vii	reports are published by the proponent on the internet 20 business days before clearance of native vegetation in an infrastructure impact area and provided to the Department on request;	
		h	Require species and ecological community management plans which include:	11.4
		i	Relevant avoidance and mitigation measures to be applied; and	11.5
		ii	Measures for protecting each listed threatened species and migratory species and their habitat, and each listed threatened ecological community not previously assessed by the proponent, should one or more be found in the project area at any time over the life of the project. Any such management plans must be developed in a timeframe to be approved by the Department. Notification of additional MNES found must be provided to the Department in writing within 10 business days. Measures must include the development of a management plan consistent with requirements under condition 8.	11.5
		i	The proponent must ensure constraints planning and field development decisions are made in accordance with the Protocol (including any relevant species and ecological community management plans) before final selection of specific sites for gas field development within the project area.	8
6			The Protocol must ensure relevant information on MNES is available and used by the proponent to support field development and management decisions throughout the life of the project.	6 7.2 7.2.2 11.5 11.4 Appendix F
<i>Management Plans for listed species and ecological communities</i>				
7			Before commencement of each major stage of gas field development the proponent must develop management plans for that area addressing each listed species and listed ecological community that, as indicated through assessment or more recent information, may be potentially impacted by gas field development within the project area (defined by condition 1), or external to the project area as a result of gas field development. Note 1: The proponent may develop management plans to align with the requirements of the Queensland Government where there are species and ecological communities covered by both Queensland requirements and the requirements of this approval. Note 2: Major stages of development are to be notified under condition 88.	11.4 11.5 Note: These plans will be provided separately in a standalone document
8			Management plans required under condition 7 must be developed by a qualified ecologist approved in writing by the Department and at least address those listed ecological communities in Table 3 and those listed in Table 4 of these conditions. As a minimum each plan must address the following as is relevant to each MNES.	11.4 11.5
		a	current legal status (under EPBC Act);	

Number		EPBC Act Conditions	Section of Protocol
	b	known distribution;	
	c	known species' populations and their relationships within the region;	
	d	Extent of ecological community fragmentation within the region and if appropriate minimum patch size for that community;	
	e	To support field identification and ecological surveys, description of the relevant characteristics of the ecological community;	
	f	Species' biology and reproduction and description of general habitat;	
	g	To support field identification and ecological surveys, description of the species' habitat, which may be described in terms of essential habitat, and microhabitat including associations with geology, soils, landscape features and associations with other native fauna and/or flora or ecological communities, and where relevant specific niche habitat descriptions that can be meaningfully applied in constraints planning and used in field ecological surveys; Note: Constraints mapping may be limited by available data for many species and may therefore be inadequate to map habitat requirements for planning and management purposes, or to indicate presence without on ground assessment. Condition *g) requires the essential components of a species' habitat to be described where relevant to support field identification and environmental constraints decision making. This should include essential habitat components for widely distributed species present in low numbers and for other species likely to be present but not often observed.	
	h	threats to MNES relating to the development and management of land within the gas fields including from the development, operation and decommissioning of infrastructure within the gas fields; and from groundwater extraction and aquifer depressurisation, CSG water use and disposal, whether the threat is within or outside the project area; Note: This part of a management plan may also indicate that a species or its habitat can co-exist with specific types of gas field operations.	
	i	relevant management practices and methods to minimise impact and recover from impact should include	
	i	site rehabilitation timeframes, standards and methods;	
	ii	use of sequential clearing to direct fauna away from an impact zone;	
	iii	re-establishment of native vegetation in linear infrastructure corridors;	
	iv	welfare and safe handling of fauna specimens requiring relocation from impact sites;	
	v	handling practices for flora specimens;	
	vi	translocation practices and monitoring for translocation success;	
	vii	monitoring methods including for rehabilitation success and recovery;	
	j	surface and ground water quality and quantity requirements, including relevant downstream environmental quality parameters;	

Number		EPBC Act Conditions	Section of Protocol
	k	reference relevant conservation advice, recovery plans, or other policies, practices, standards or guidelines relevant to MNES published or approved from time to time by the Department or the Minister. Note 1: The management plans must include sufficient detail to inform field development decisions, ongoing management and decommissioning to minimise impacts on MNES through the life of the project. Note 2: To the extent that the requirements of condition 8 are satisfied for each species, a single plan may be prepared to address a group of species which have similar ecological characteristics and habitat needs. Other conditions also require species or ecological community management plans to be developed in certain circumstances in accordance with condition 8.	
9		Each species and ecological community management plan must be submitted for the approval of the Minister. Commencement of each major stage of gas field development must not occur without written approval of each plan for each listed species and ecological community within the proposed area of development. The proponent may undertake activities that are critical to commencement that are associated with mobilisation of plant and equipment, materials, machinery and personnel prior to the that of development only if such activities will have no adverse impact on MNES, and only if the proponent has notified the Department in writing before an activity is undertaken. Approved species and ecological community management plans must be implemented.	11.4 11.5
10		The proponent must establish a program for routine review of the species and ecological community management plans by a qualified ecologist (with other experts as appropriate) to take into account any new information available to the proponent, including any information and advice provided by Commonwealth or Queensland government agencies, or available from other CSG proponents.	11.4 11.5
11		The Minister may require through a request in writing the periodic review of the species and ecological community management plans by the Department, or alternatively by independent qualified ecologist (or other experts) approved by the Department. Plans must be approved by the Department in writing.	11.4 11.5
12		Independent review of plans will be at the financial expense of the proponent. Once independently reviewed, plans must be submitted for written approval by the Department. Approved plans must be implemented.	11.4 11.5
Record of impacts			
13		If an impact (which may include a presumed impact where the species is presumed to be present) occurs to a MNES during gas field development, operation, or decommissioning the proponent must:	8.3.1.1
	a	record the impact by reference to:	
	i	the location, specific site and type of infrastructure or activity;	
	ii	each MNES subject to disturbance;	
	iii	the related site assessment or field ecological survey documentation and recommendations, or the decision that the particular MNES was presumed to be present;	
	iv	the disturbance limit set under condition 25;	

Number		EPBC Act Conditions	Section of Protocol
	v	the total area of actual disturbance;	
	vi	the remaining disturbance limit for each affected MNES;	
	vii	the reasons for the decision including justification for the action taken, description of the efforts taken to avoid impact, and explanation why other constraints might justify the impact on MNES; and	
	viii	actions and commitments by the proponent to remediate, rehabilitate, or make good any unauthorised disturbance. Note: This condition applies to any impact on MNES, whether or not a disturbance limit has been set, and whether or not the impact has been decided by the proponent under the Protocol based on other physical constraints.	
	b	record the information to a standard which can be independently audited.	
Site remediation, rehabilitation and recovery plan			
14		Where a direct or indirect impact has occurred to MNES (which may include a presumed impact where the species is presumed to be present) the proponent must under the Protocol apply remediation, rehabilitation and recovery measures appropriate for each MNES to restore connectivity or rehabilitate disturbed areas to pre-clearance quality or better, and to minimise cumulative impacts throughout the life of the project.	10 Note: These plans will be provided separately in a standalone document
15		Before commencement of gas field development the proponent must develop a Remediation, Rehabilitation, Recovery and Monitoring Pan. The Plan must:	10
	a	include site remediation measures including timeframes and standards for preventing erosion and stabilising disturbed soil in impact areas;	
	b	include measures to support recovery of listed species' habitat and recovery of listed ecological communities affected by gas field development;	
	c	include responses to threats to MNES from the proponent's operational activities and land management activities including the disposal and use of associated water, damage by livestock, and impacts from feral animals and weeds;	
	d	provide for fire prevention and management regimes during construction, operation and decommissioning to protect MNES;	
	e	include performance measures and related monitoring to assess site remediation, rehabilitation and recovery;	
	f	provide for reporting on the implementation of the Remediation, Rehabilitation, Recovery and Monitoring Pan including monitoring and performance to a standard which can be independently audited;	
	g	reference to relevant conservation advice, recovery plans, species management plans, or policies, practices, standards or guidelines endorsed or approved from time to time by the Department Note: The proponent may develop the plan to satisfy the requirements of both the Queensland Government and these conditions as indicated in condition 98b.	

Number		EPBC Act Conditions	Section of Protocol
16		The Remediation, Rehabilitation, Recovery and Monitoring Plan must be submitted for the approval of the Minister. Commencement of gas field development must not occur without written approval of this plan. The proponent may undertake activities that are critical to commencement that are associated with mobilisation of plant and equipment, materials, machinery and personnel prior to the start of development only if such activities will have no adverse impact on MNES, and only if the proponent has notified the Department in writing before the activity is undertaken. The approved Remediation, Rehabilitation, Recovery and Monitoring Pan must be implemented.	10
17		The proponent must establish a program to routinely review the Remediation, Rehabilitation, Recovery and Monitoring Plan by a qualified ecologist, or other experts, approved by the Department to take into account any new information available to the proponent, including any information and advice provided by Commonwealth or Queensland government agencies, or available from other CSG proponents.	10
18		The Minister may require through a request in writing the periodic review of the Remediation, Rehabilitation, Recovery and Monitoring Plan by the Department, or alternatively by independent qualified ecologist, or other experts, approved by the Department. Plans must be approved by the Department in writing.	10
19		Independent review of the plans will be at the financial expense of the proponent. Once independently reviewed, plans must be submitted for written approval by the Department. Approved plans must be implemented.	10
Approval and Review of Protocol			
20		The Protocol must be submitted for the approval of the Minister. Commencement of gas field development must not occur without written approval of the Protocol. The proponent may undertake activities that are critical to commencement that are associated with mobilisation of plant and equipment, materials, machinery and personnel prior to the start of development only if such activities will have no adverse impacts on MNES, and only if the proponent has notified the Department in writing before an activity is undertaken. The approved Protocol must be implemented. Note: The review required following completion of the <i>Cumulative Impact Assessment Report</i> required by the Queensland Government may be done after the approval of the Protocol. The Department may seek review of the Protocol to align with Queensland Government requirements to support efficiency and avoid duplication.	0
21		The proponent's review of the Protocol must take into account all relevant studies, policies, standards, guidelines and advice relating to CSG activity published or provided to the proponent by the Commonwealth or Queensland governments, or published or provided by other proponents undertaking similar activities, or published or provided by other parties, including any findings of an audit against conditions, or plans or other documentation required under the conditions of this approval.	0
22		The Protocol and related plans must be reviewed and updated by the proponent to take into account the findings of the Cumulative Impact Assessment Report required by the Queensland Government, before each major stage of the proponent's gas field development, or following a written request from the Department, or following a written request from the Department. Reviewed and updated Protocols and plans must be submitted for the Minister's written	0

Number		EPBC Act Conditions	Section of Protocol																							
		approval. Once approved, updated Protocols and plans must be implemented.																								
23		The Department may require through a request that that Protocol and related plans be revised or amended before approval. Any such request must be acted on within the time frame specified.	0																							
24		The approved Protocol must be incorporated into the proponent's management procedures, operational plans and other relevant documentation and kept current for the life of the project.	0																							
Disturbance Limits																										
		<p>The following maximum disturbance limited in Table 3 and Table 4 below apply to authorised unavoidable adverse impacts on MNES as a result of exploration, development, operation and decommissioning of the CSG fields within the Project areas illustrated in Figure 1, and external to it, ('whole of project' disturbance limits) as a result of all associated gas field activities for the life of the project.</p> <p>Table 3: Disturbance limits for listed threatened ecological communities</p> <table border="1"> <thead> <tr> <th>Ecological Community</th> <th>EPBC Act Status</th> <th>Disturbance Limit (ha)</th> </tr> </thead> <tbody> <tr> <td>Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant)</td> <td>Endangered</td> <td>19.6</td> </tr> <tr> <td>Semi-evergreen, vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions</td> <td>Endangered</td> <td>0.8</td> </tr> <tr> <td>Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin</td> <td>Endangered</td> <td>5.2</td> </tr> <tr> <td>The community if native species dependant on natural discharge of groundwater from the Great Artesian Basin</td> <td>Endangered</td> <td>0 (No disturbance authorised)</td> </tr> </tbody> </table> <p>Note: Table 3 is derived from the Queensland Santos Coordinator-General Report, Appendix 2, Condition 16 – Gas Field Disturbance Limit; and Santos EIS and listed in Table 3.3 - 4 of the <i>Ecofund Offset Package Report</i> of 28 May 2010.</p> <p>Table 4: Disturbance limits for listed species</p> <table border="1"> <thead> <tr> <th>Species</th> <th>EPBS Act Status</th> <th>Disturbance Limit (ha)</th> <th>Indicative Habitat</th> </tr> </thead> <tbody> <tr> <td><i>Dasyurus hallucatus</i> (Northern Quoll)</td> <td>Endangered</td> <td>100.1 ha of habitat type</td> <td>Habitat generally encompasses some form of rocky area for denning purposes with surrounding vegetated habitats used for foraging and dispersal. Preferred habitat of rocky hills and escarpments, open forest and open woodland.</td> </tr> </tbody> </table>	Ecological Community	EPBC Act Status	Disturbance Limit (ha)	Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant)	Endangered	19.6	Semi-evergreen, vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	0.8	Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin	Endangered	5.2	The community if native species dependant on natural discharge of groundwater from the Great Artesian Basin	Endangered	0 (No disturbance authorised)	Species	EPBS Act Status	Disturbance Limit (ha)	Indicative Habitat	<i>Dasyurus hallucatus</i> (Northern Quoll)	Endangered	100.1 ha of habitat type	Habitat generally encompasses some form of rocky area for denning purposes with surrounding vegetated habitats used for foraging and dispersal. Preferred habitat of rocky hills and escarpments, open forest and open woodland.	6.8
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25																										

Number		EPBC Act Conditions				Section of Protocol
		<i>Chalinolobus dwyeri</i> (Large-eared Pied Bat, Large Pied Bat)	Vulnerable	108.1 ha of habitat type	Usually found in proximity to cliff lines and escarpments and sandstone outcrops where shallow caves appear to be used as roosts, although the species is also known to use tree hollows. Known to forage in adjoining woodlands including Brigalow ecological communities.	
		<i>Turnix melanogaster</i> (Black-breasted Button-quail)	Vulnerable	0.1 ha of habitat type	Drier low closed forests, particularly semi-evergreen vine thicket, low microphyll vine forest, araucarian microphyll vine forest and araucarian notophyll vine Forest.	
		<i>Erythrotriorchis radiatus</i> (Red Goshawk)	Vulnerable	139.4 ha of habitat type	Eucalypt woodland, open forest, gallery rainforest, swamp sclerophyll forest and rainforest margins, usually in association with large tracts of forest. Prefers a mosaic of vegetation types and permanent water.	
		<i>Rostratula australis</i> (Australian Painted Snipe)	Vulnerable	11.2 ha of habitat type	Potentially any wetland and farm dams with suitable vegetation cover, temporary and permanent lakes, swamps and claypans. Favours freshwater swamps and samphire salt marshes.	
		<i>Paradelma orientalis</i> (Brigalow Scaly-foot)	Vulnerable	205.3 ha of habitat type	Occurs in a wide range of (dry) forest and woodland habitats, including Brigalow woodland, Vine thicket regrowth and rocky habitats on sandstone ridges to flats and gently undulating plains with clay, loam or sand. Not tolerant of clearings. Specific habitat where species found includes remnant Brigalow woodland with sparse tussock grasses on grey cracking clay soils.	

Number				EPBC Act Conditions		Section of Protocol		
				<i>Delma torquata</i> (Collared Delma)	Vulnerable	41.6 ha of habitat type	Eucalypt or acacia dominated woodland including Brigalow ecological communities and open forest where it is associated with suitable microhabitats (exposed rocky outcrops or a sparse understorey of tussock grass, shrubs or semi-evergreen vine thickets).	
				<i>Geophaps scripta scripta</i> (Squatter Pigeon (Southern))	Vulnerable	199.2 ha of habitat type	Grassy woodlands and open forest that are dominated by eucalypts, open grassy pastures in association with cattle grazing marshes, acacia growth and disturbed habitats (i.e. around stockyards, along roads and railways, and around settlements).	
				<i>Denisonia maculata</i> (Ornamental Snake)	Vulnerable	44.0 ha of habitat type	Brigalow (<i>Acacia harpophylla</i>) woodland growing on clay cracking clay soils and sandy soils, riverside woodland and open forest growing on natural levees and other riparian habitats. Shelters under fallen timber and in soil cracks. Known from cleared grazing and cropping lands where suitable soils exist.	
				<i>Egernia rugosa</i> (Yakka Skink)	Vulnerable	119.9 ha of habitat type	Open dry sclerophyll forest or woodland, Brigalow, shrublands, lancewood forests on sandy and open textured soils. Dense ground cover, cavities in soil-bound root systems of fallen trees and beneath rocks, hollow logs and animal burrows are considered to provide suitable microhabitat for this species.	
				<i>Furina dunmali</i> (Dunmall's Snake)	Vulnerable	205.3 ha of habitat type	Brigalow (<i>Acacia harpophylla</i>) forest and woodland growing on cracking black clay and clay loam soils (usually on heavy clay soils). Also	

Number				EPBC Act Conditions				Section of Protocol
							known to occur in eucalypt and callitris woodland with fallen timber and ground litter.	
				<i>Nyctophilus timoriensis</i> (Eastern Long-eared Bat)	Vulnerable	275.4 of habitat type	River red gum forest, semi-arid woodlands, savannahs and open woodlands, often in association with riverine environments in Brigalow Belt of inland Queensland.	
<p>Note 1: Table 4 is derived with information from the Queensland Santos Coordinator-General's Report, Appendix 2, condition 16 - Gas field Disturbance Limit; and Santos EIS and listed in <i>Table 3.3 – 4</i> of the <i>Ecofund Offset Package Report</i> of 28 May 2010 and from the listed threatened species profiles available on the Department's website.</p> <p>Note 2: Habitat for species in Table 4 will be described in the management plan for each species as required under condition 8. The habitat described in Table 4 is general and indicative only.</p>								
Publication of Protocol and Plans								
85				The Protocol and all plans approved by the Minister under these conditions must be published on the proponent's website within 30 business days of approval by the Minister.				13
86				The Department may request the proponent to publish on the internet a plan in a specified location or format, and with specified accompanying text. The proponent must comply with any such request.				13

Appendix B CG Report Conditions and the Relevant Section of Protocol where they are Addressed



Reference	Condition / Commitment	Section of Protocol
Constraints Planning		
Appendix 2 Part 2 Condition 1	<p>The proponent must prepare a constraints planning and field development protocol for petroleum activities that:</p> <ul style="list-style-type: none"> a) Includes all category A, B and C environmentally sensitive areas. Category C Environmentally Sensitive Areas must include: <ul style="list-style-type: none"> i) Nature refuges as defined under the Nature Conservation Act 1992 ii) Koala habitat areas as defined under the Nature Conservation Act 1992 iii) State forests or timber reserves as defined under the Forestry Act 1959 iv) Declared catchment areas under the Water Act 2000 v) Resources reserves under the Nature Conservation 1992 vi) An area identified as 'Essential Habitat' for a species of wildlife listed as endangered, vulnerable rare or near threatened under the Nature Conservation Act 1992 vii) Any wetland shown on the Map of Referable Wetlands available from DEHP's website; or 'Of concern' regional ecosystems identified in the database maintained by DEHP called 'Regional ecosystem description database' containing regional ecosystem numbers and descriptions b) Nuisance constraints for noise and air impacts c) Soils constraints (including Good Quality Agricultural Land and Strategic Cropping Land) d) Exclusion of petroleum activities in Riverine improvement trust asset areas e) The exclusion of infrastructure (that are not pipelines or roads) from flood areas impacted by a 1:50 ARI f) Bioregional corridors g) Other constraints identified by Santos is siting infrastructure h) Commits to undertaking and documenting field surveys for all classes of constraints prior to commencing petroleum activities i) Commits that field surveys inform the Field Management Protocols and will be undertaken at all times by a 	<p>This document</p> <p>7.2.2</p> <p>6.1</p> <p>6.2</p> <p>6.3</p> <p>6.4</p> <p>6.5</p> <p>6.6</p> <p>8.1.3</p> <p>8.1.3</p>

Reference	Condition / Commitment	Section of Protocol
	qualified person	
	j) Commits to incorporating constraints commitments into operational plans for the life of the project.	0
	The constraints planning and field development protocol is to be submitted to the Coordinator-General for review prior to the issue of environmental authorities for petroleum tenure.	0
Nature Conservation Act		
Appendix 2 Part 2 Condition 13	The following requirements apply to clearing of plants protected under the Nature Conservation Act 1992:	
	a) Clearing of plants must only occur in accordance with a clearing permit issued under the Nature Conservation Act 1992	10
	b) For near threatened, rare, vulnerable and endangered species listed under the Nature Conservation (Wildlife) Regulation 2006, and species identified as critical and high priority under the DEHP <i>Back on Track</i> species prioritisation methodology, a Significant Species Management Plan detailing specific measures for the mitigation or offsetting of all impacts must be provided to DEHP for approval	11.5
	c) Offsets must be provided for the permanent loss (or take) of near threatened, rare, vulnerable and endangered plants in accordance with the Queensland Government <i>Environmental Offsets Policy 2008</i> and generally in accordance with the Queensland Government <i>Policy for Biodiversity Offsets (Consultation Draft)</i>	1
	d) Type A restricted least concern plants (Schedule 7 of the Nature Conservation (Administration) Regulation 2006) must be salvaged and used for onsite revegetation purposes. This includes species in the family <i>Cycadaceae</i> , <i>Orchidaceae</i> and <i>Zamiaceae</i> , and species in the genus <i>Brachychiton</i> , <i>Hydnophytum</i> , <i>Huperzia</i> , <i>Livistonia</i> , <i>Myrmecodia</i> , <i>Platynerium</i> and <i>Xanthorrhoea</i>	8.2.1
	e) Clearing shall be conducted in a sequential manner and in a way that directs escaping wildlife away from the activity and into adjacent natural areas	8.2.1
	f) Rehabilitation of areas containing least concern plants that are disturbed during clearing activities, where required by the clearing permit, must be commenced within three months of completion of pipeline construction. Revegetation should be consistent with the plant density, floristic composition and distribution of the surrounding regional ecosystem types and within the province of the vegetation being cleared	10
	g) For clearing impacts that result in permanent loss of least concern native plants (cannot be re-established within three years of clearing or floristic modification), the permit holder must provide the DEHP with a written detailed report of permanent vegetation loss, including the area, species affected and mapping of affected areas, within three months of completion of the pipeline construction (Note: this is in addition to the	8.3.1.1



Reference	Condition / Commitment	Section of Protocol
	required Return of operations)	
Gas Field Disturbance Limits		
Appendix 2 Part 2 Condition 16	The following maximum disturbance limits apply to any disturbance authorised for the gas field activities environmental authority under the Environmental Protection Act 1994 and any other relevant legislation: <ul style="list-style-type: none"> a) Sensitive Regional Ecosystems disturbance limit b) Essential Habitat (Vegetation Management Act) disturbance limit c) Protected Plant Species (Nature Conservation Act 1992) disturbed by gas field development d) Protected Fauna Species (Nature Conservation Act 1992) disturbance limit e) EPBC Ecological Communities disturbance Limit 	6.8 Table 4 Table 5 Table 6

Appendix C Field Assessment Matrix

		Pre-clearance Survey				Final Category Approval
		Non-remnant Areas	Regrowth	Regrowth within Remnant Buffer Zones	Remnant Vegetation	
Class (Constraints Mapping)	E*	Santos Field Supervisor	Santos Environmental Representative	Santos Environmental Representative	Santos Environmental Representative	Assessment Team
	D*	Santos Field Supervisor	Santos Environmental Representative	Santos Environmental Representative	Santos Environmental Representative	Assessment Team
	C	Santos Environmental Representative	Ecologist	Ecologist	Ecologist	Project Director
	B	Ecologist	Ecologist	Ecologist	Ecologist	Project Director
	B (Within Impact Risk Zone)	Ecologist	Ecologist	Ecologist	Ecologist	Project Director
	A (Secondary Protection Zone)	Ecologist	Ecologist	Ecologist	Ecologist	Project Director
	A	N/A	N/A	N/A	N/A	Project Director

N/A: All petroleum activities are excluded from Category A ESAs

Impact Risk Zone: The area within 200 m from the perimeter of Constraints Class B

Secondary Protection Zone: In relation to a Category A ESA means an area within an 800 m buffer from the boundary of a Primary Protection Zone (DEHP).

Primary Protection Zone: An area within a 200 m buffer from the boundary of any Category A, B or C ESA (DEHP).

* If the proposed site is within 500 m proximity of Class A or B area then a pre-clearing survey by an ecologist will be undertaken to confirm RE types.

Appendix D Land Disturbance – Site Selection and Inspection Form

Land Disturbance – Site Selection and Inspection Form

Disturbance Type	[Type] – well pad, access tracks, flowlines etc
Location Details	[Project area & GPS coordinates]
Description	[Description of activity]
Site Access	[Description of proposed site access]

Step 2	Initial Desk Top Evaluation (GIS Review)		
Environmental constraints	Result		REQUIRED action if YES
	Yes	No	
A			Relocate site or seek alternative access
B			Ecologist Field Verification
C			Ecologist Field Verification
D			Environmental Representative Field Inspection
E			Field Services Assessment

Habitat Mapping (EPBC Act Listed Species) Assessment:
 [Description of potential species that may be encountered based on complimentary habitat mapping and the Significant Species Management Plan]

Recommendations	Description of survey required based on constraints layers & potential habitat type
------------------------	---

Step 3	Detailed Field Assessment Results
Inspection Number:	
Inspection Date:	
Inspection Type	
Inspected By:	

Site Description	
Constraints Class	Field Verification Results
B	Assessment Results:
C	Assessment Results:
D	Assessment Results:
E	Assessment Results:
Habitat Types	
	Likely presence of listed species

Relevant Statutory Conditions	Compliant / Non Compliant	Assessment

Recommended Action	Result	Comments:
Relocation of site		
Reconfigure site / realign access or select alternate route		
Proceed with activity		

Specific Work Instructions & Site Mitigation Measures Required

ATTACHMENTS
Maps, Figures, Photos, Reports etc

This Form is to be attached to the Environmental Approvals Form.

Recommendation for Approval	
YES	<input type="checkbox"/>
NO	<input type="checkbox"/>

Appendix E Ecological Constraints Mapping

Constraints Mapping

Constraints Classes

GLNG has developed five classes of land within the RFDA with graduated levels of ecological sensitivity (constraints classes) based on the constraints mapping. The five classes of land are, in general terms:

- **Constraints Class A** – Contains QLD State government listed Category A Environmentally Sensitive Areas (e.g. National Parks) and the communities of native species dependant on natural discharge of groundwater from the Great Artesian Basin;
- **Constraints Class B** – Contains all QLD State government listed Categories B Environmentally Sensitive Area which includes EPBC Act threatened ecological communities, all listed flora species and those listed threatened and migratory fauna species habitats (See Section **Error! Reference source not found.**) as identified in management plans required under the approved EPBC No. 2008/4059 conditions. Constraints Class B also includes the primary protection zone (DEHP) or impact risk zone (SEWPaC) which is the area within 200 m from the perimeter of Constraints Class B and the secondary protection zone (DEHP) which is the area within a 800 m buffer from the boundary of a primary protection zone of a Category A ESA (Constraints Class A) or 300 m buffer from the boundary of a primary protection zone of a Category B ESA;
- **Constraints Class C** – Contains all QLD State government listed Category C Environmentally Sensitive Areas. Also contains the primary protection zone (DEHP) which is an area within 200 m from the perimeter of Constraints Class C and the secondary protection zone which is the area within a 300 m buffer from the boundary of a primary protection zone of a Category C ESA.
- **Constraints Class D** – Contains QLD State government listed "Not of concern" Regional Ecosystems under the VM Act; and
- **Constraints Class E** – Contains QLD State government listed "Non-remnant" vegetation - generally modified habitats such as agricultural lands, grazing lands, residential lands or regrowth vegetation.

Data Layers

A range of data layers and the results from field surveys (EIS Appendix N1) were used to compile the constraints classes (Section 2) used to formulate this mapping. The data layers utilised include:

- Environmentally Sensitive Areas (ESAs);
- Regional Ecosystem Mapping v6;
- EPBC Act-listed threatened communities;
- Queensland Directory of Important Wetlands;
- Essential Habitat Mapping; and
- Bioregional Corridors Mapping.

All datasets are products of the Queensland Department of Environment and Resource Management (DEHP). Details of the datasets are explained below.

Environmentally Sensitive Areas

Category A and B Environmentally Sensitive Areas (ESAs) are defined in the *Environmental Protection Regulation 2008* (Table 1). Category A and B ESAs were utilised as they are easily applied as most are based on land tenure. The other classifications are areas mapped by the State Government. The classifications refer to designations of higher levels of protection and management and thus give an automatic and easily identifiable indication of the sensitivity of these areas.

Category C ESAs are defined in the DEHP *Draft Code of Environmental Compliance for Level 2 Petroleum Activities* (Table 1). These are automatically inferred as having a lower sensitivity than Category A and B ESAs and can be used to apply a lesser level of management or monitoring.

In Queensland, petroleum activities can be undertaken in Category B and C ESAs. Petroleum activities may not be undertaken in land comprising Category A ESAs such as National Parks.

Regional Ecosystem Mapping

The Queensland Government has mapped the remnant vegetation in Queensland as Regional Ecosystems (REs). REs are defined as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil (Sattler and Williams, 1999). REs were derived from a broad range of existing information sources including land system, vegetation and geology mapping and reports. REs (biodiversity status) are listed as 'Endangered', 'Of Concern' and 'Not of Concern' depending upon remaining extent of the particular RE and factors such as disturbance and biodiversity loss (DEHP, 2007).

REs were utilised as they form the standard vegetation mapping data in Queensland. The three levels of status also allow for an immediate appreciation of the sensitivity of the vegetation community.

EPBC Act Related Matters

EPBC Act listed Ecological Communities

The EPBC Act provides for the listing of nationally threatened native species and ecological communities, native migratory species and marine species. It does this by the:

- Identification and listing of species and ecological communities as threatened;
- Development of conservation advice and recovery plans for listed species and ecological communities;
- Development of a register of critical habitat;
- Recognition of key threatening processes; and
- Where appropriate, reducing the impacts of these processes through threat abatement plans.

The EPBC Act list of Threatened Ecological Communities uses the categories of Vulnerable, Endangered, and Critically Endangered.

The GLNG EIS identified the potential presence of four 'Endangered' ecological communities in the northern GLNG CSG fields and four 'Endangered' and one 'Critically Endangered' ecological communities within the southern GLNG CSG fields as sourced from the Matters of National Environmental Significance (MNES) Report. These are:

14.1.1.1 Northern GLNG CSG Fields

Endangered Ecological Communities

- Brigalow (*Acacia harpophylla* dominant and co-dominant);
- Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin;
- Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions; and
- The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin.

14.1.1.2 Southern GLNG CSG Fields

Endangered Ecological Communities

- Brigalow (*Acacia harpophylla* dominant and co-dominant);
- Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin;
- Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions; and
- The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin.

Critically Endangered Ecological Community

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

As detailed mapping for each of the threatened communities is not available, potential presence and mapping for communities within the GLNG CSG fields was determined through the extrapolation of equivalent REs as presented on the Listing Advice or Community Profiles accessible on the EPBC Act threatened communities' webpage. This particular community is not located within the GLNG CSG field tenements.

Table 8 EPBC Act listed threatened ecological communities and their equivalent REs

EPBC-LISTED THREATENED COMMUNITY STATUS	CORRESPONDING REGIONAL ECOSYSTEMS (WITHIN BIOREGION 11 – BRIGALOW BELT)
Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant). Endangered.	RE 11.3.1- <i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest on alluvial plains; RE 11.4.3- <i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> shrubby open forest on Cainozoic clay plains; RE 11.4.7-Open forest of <i>Eucalyptus populnea</i> with <i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> on Cainozoic clay plains; RE 11.4.8- <i>Eucalyptus cambageana</i> open forest with <i>Acacia harpophylla</i> or <i>A. argyrodendron</i> on Cainozoic clay plains; RE 11.4.9- <i>Acacia harpophylla</i> shrubby open forest with <i>Terminalia oblongata</i> on Cainozoic clay plains; RE 11.4.10- <i>Eucalyptus populnea</i> or <i>E. pilligaensis</i> , <i>Acacia harpophylla</i> , <i>Casuarina cristata</i> open forest on margins of Cainozoic clay plains; RE 11.5.16- <i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest in depressions on Cainozoic sand plains/remnant surfaces;

EPBC-LISTED THREATENED COMMUNITY STATUS	CORRESPONDING REGIONAL ECOSYSTEMS (WITHIN BIOREGION 11 – BRIGALOW BELT)
	<p>RE 11.9.1-<i>Acacia harpophylla-Eucalyptus cambageana</i> open forest on Cainozoic fine-grained sedimentary rocks;</p> <p>RE 11.9.5-<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest on Cainozoic fine-grained sedimentary rocks;</p> <p>RE 11.9.6-<i>Acacia melvillei</i> ± <i>A. harpophylla</i> open forest on Cainozoic fine-grained sedimentary rocks;</p> <p>RE 11.11.14-<i>Acacia harpophylla</i> open forest on deformed and metamorphosed sediments and interbedded volcanics; and</p> <p>RE 11.12.21-<i>Acacia harpophylla</i> open forest on igneous rocks; colluvial lower slopes.</p>
<p>Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin.</p> <p>Endangered.</p>	<p>RE 11.3.21 <i>Dichanthium sericeum</i> and/or <i>Astrebla</i> spp. grassland on alluvial plains - Cracking clay soils;</p> <p>RE 11.4.4 <i>Dichanthium</i> spp., <i>Astrebla</i> spp. grassland on Cainozoic clay plains;</p> <p>RE 11.4.11 <i>Dichanthium sericeum</i>, <i>Astrebla</i> spp. and patchy <i>Acacia harpophylla</i>, <i>Eucalyptus coolabah</i> on Cainozoic clay plains;</p> <p>RE 11.8.11 <i>Dichanthium sericeum</i> grassland on Cainozoic igneous rocks;</p> <p>RE 11.9.3 <i>Dichanthium</i> spp., <i>Astrebla</i> spp. grassland on fine-grained sedimentary rocks;</p> <p>RE 11.9.12 <i>Dichanthium sericeum</i> grassland with clumps of <i>Acacia harpophylla</i> on fine-grained sedimentary rocks; and</p> <p>RE 11.11.17 <i>Dichanthium sericeum</i> grassland on old sedimentary rocks with varying degrees of metamorphism and folding.</p>
<p>Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions.</p> <p>Endangered.</p>	<p>RE 11.2.3-Microphyll vine forest ("beach scrub") on sandy beach ridges;</p> <p>RE 11.3.11-Semi-evergreen vine thicket on alluvial plains;</p> <p>RE 11.4.1-Semi-evergreen vine thicket ± <i>Casuarina cristata</i> on Cainozoic clay plains;</p> <p>RE 11.5.15-Semi-evergreen vine thicket on Cainozoic sand plains/remnant surfaces;</p> <p>RE 11.8.3-Semi-evergreen vine thicket on Cainozoic igneous rocks;</p> <p>RE 11.8.6-<i>Macropteranthes leichhardtii</i> thicket on Cainozoic igneous rocks;</p> <p>RE 11.8.13-Semi-evergreen vine thicket and microphyll vine forest on Cainozoic igneous rocks;</p> <p>RE 11.9.4-Semi-evergreen vine thicket on Cainozoic fine-grained sedimentary rocks;</p> <p>RE 11.9.8-<i>Macropteranthes leichhardtii</i> thicket on Cainozoic fine-grained sedimentary rocks; and</p> <p>RE 11.11.18-Semi-evergreen vine thicket on old sedimentary rocks with varying degrees of metamorphism and folding.</p>

EPBC-LISTED THREATENED COMMUNITY STATUS	CORRESPONDING REGIONAL ECOSYSTEMS (WITHIN BIOREGION 11 – BRIGALOW BELT)
<p>The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin.</p> <p>Endangered.</p>	<p>It should be noted that although this community was identified within the MNES, the only springs community mapped as an RE within the Brigalow Belt bioregion (RE 11.3.22 (Springs associated with recent alluvia) are <u>not</u> part of the listed ecological community.</p>
<p>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.</p> <p>Critically Endangered.</p>	<p>In Queensland the ecological community is a primary component of the following REs within the Brigalow Belt bioregion:</p> <p>11.8.2a-<i>Eucalyptus tereticornis</i> and <i>E. melliodora</i> occurring on low hills. Cainozoic igneous rocks;</p> <p>11.8.8 <i>Eucalyptus albens</i>, <i>E. crebra</i> woodland on Cainozoic igneous rocks. Hillsides; and</p> <p>11.9.9 <i>Eucalyptus crebra</i> woodland on fine-grained sedimentary rocks.</p> <p>It can also be a smaller component of the following regional ecosystem:</p> <p>11.3.23, <i>Eucalyptus conica</i>, <i>E. nobilis</i>, <i>E. tereticornis</i>, <i>Angophora floribunda</i> on alluvial plains. Basalt derived soils.</p>

The REs listed in, above, where present within the GLNG CSG fields, are used as surrogates for the EPBC-listed threatened communities.

Queensland Directory of Important Wetlands

Waterways and wetlands data has been used to map these important habitat features. As many of the streams within the GLNG CSG fields are ephemeral, only larger streams capable of retaining water for long have been mapped as these are most likely to support aquatic fauna such as the Murray Cod or birds such as the black-throated finch, whose range is constrained by the presence of permanent water. Data for waterways and wetlands has been sourced from the Queensland Directory of Important Wetlands.

Essential Habitat Mapping

Essential Habitat mapping identifies vegetation in which a species that is conservation significant has been known to occur or may potentially to utilise, based on known species range and distribution habitat. Essential Habitat mapping it has been utilised as a layer to make these locations obvious. It can be used as a trigger for a greater level of ground verification for conservation significant species, in particular the species for which the Essential Habitat mapping is centred on.

Bioregional Corridors

The Bioregional Corridors data is derived from Brigalow Belt Biodiversity Planning Assessment. The regional and state corridor data has been merged to form a single corridor layer. This has been applied over the GLNG CSG fields to indicate vegetation that is considered as significant for the movement of fauna and flora. It has been included as a guide to decision making where linear infrastructure such as tracks and pipelines may impact on the functionality of corridors.

Previous Survey Work

A series of flora and fauna habitat field surveys were conducted within targeted representative habitats of the Reasonably Foreseeable Development Area (RFDA) to characterise significant ecological values and verify the validity of current desktop data layers such as RE and Essential Habitat mapping (EIS Section 6 and EIS Appendix N1). A detailed description of habitat values for each of the individual GLNG CSG fields was then developed based on results from these survey results and a further detailed evaluation of desktop information and aerial photography (EIS Appendix N1, EIS Sections 4.2.6 and 4.2.7). Resulting habitat descriptions for each of the each of the GLNG CSG fields included a section detailing:

- Overall Description of landform;
- Diversity of habitat;
- Habitat Values for Fauna Assemblages;
- Corridor linkages;
- Previous Fauna records;
- Conservation Significant Species; and
- Pest species.

In addition, a summary of ecologically significant values for each individual CSG field based on results of field verification was also provided in table format in the EIS (EIS Appendix N1, EIS Sections 4.2.6 and 4.2.7) and included:

- Summaries of mapped REs; and
- Mapped significant REs and potentially present Endangered, Vulnerable and Near Threatened (EVNT) fauna and flora species.

Fauna Habitat Maps

Santos has also developed a further layer of constraints mapping based on potential habitat for fauna species listed under the EPBC Act within the RFDA Area. These have been incorporated into Constraints Class B.

Appendix F Environmentally Sensitive Areas

Category A ESAs

Land Area Classification	Administering Legislation	Administering Authority
National Parks (Scientific); National Parks; National Parks (Aboriginal Land); National Parks (Torres Strait Islander Land); National Parks (Recovery); and Conservation Parks.	<i>Nature Conservation Act 1992.</i>	Department of Environment and Resource Management (DEHP).
Wet Tropics Wet Tropics.	<i>World Heritage Protection and Management Act 1993.</i>	Wet Tropics Management Authority.
Restricted Areas (includes Constructed Water Reservoirs).	<i>Mineral Resources Act 198.9</i>	DEEDI
Great Barrier Reef Marine Park Region.	<i>Great Barrier Reef Marine Park Act 1975 (Cwlth).</i>	Great Barrier Reef Marine Park Authority.
Marine Parks (other than general use zones).	<i>Marine Parks Act 1982 (Qld).</i>	DEHP.

Category B ESAs

Land Area Classification	Administering Legislation	Administering Authority
Coordinated Conservation Areas; Wilderness Areas; World Heritage Management Areas; International Agreement Areas; An area of Critical Habitat; or Major Interest identified under a Conservation Plan; Areas subject to an Interim Conservation Order; and Forest Reserves.	<i>Nature Conservation Act 1992.</i>	DEHP.
An area subject to following conventions: (a) Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 23 June 1979); (b) Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar, 2 February 1971); and (c) Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris, 16 November 1972).	International Conventions.	DEHP.
General Use Zones of a Marine Park	<i>Marine Parks Act 1982.</i>	DEHP.
An Area to the Seaward Side of the Highest Astronomical Tide	Nil.	DEHP.
Place of Cultural Heritage Significance; Protected Area; Registered Places; and Restricted Zone.	<i>Queensland Heritage Act 1992.</i>	DEHP.

Land Area Classification	Administering Legislation	Administering Authority
Designated Landscape Area (other than the area known as the 'Stanbroke Pastoral Holding').	<i>Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987</i>	DEHP.
Feature Protection Area, State Forest Park or a Scientific Area.	<i>Forestry Act 1959.</i>	DEHP.
Fish Habitat Area; and A place in which a Marine Plant is situated.	<i>Fisheries Act 1994.</i>	Department of Employment, Economic Development and Innovations (DEEDI).
Endangered Regional Ecosystems; and An area of High Nature Conservation Value.	Nil.	DEHP.

Category C ESAs*

Land Area Classification	Administering Legislation	Administering Authority
Nature Refuges	<i>Nature Conservation Act 1992.</i>	DEHP.
Koala Habitat Area.	<i>Nature Conservation (Koala) Conservation Plan 2006.</i>	DEHP.
Essential Habitat for a species of wildlife listed as endangered, vulnerable, rare or near threatened.	<i>Nature Conservation Act 1992.</i>	DEHP.
Declared Catchment Areas.	<i>Water Act 2000.</i>	DEHP and/or Relevant Storage Operator or Board.
State Forest or Timber Reserves.	<i>Forestry Act 1959.</i>	DEHP.
An area shown as a wetland on a 'map of referable wetlands'.	<i>Environmental Protection Act 1994.</i>	DEHP.
An 'of concern' regional ecosystem identified in the database maintained by the EPA called 'Regional ecosystem description database' containing regional ecosystem numbers and descriptions.	Nil.	DEHP.
Resources Reserves	<i>Nature Conservation Act 1992</i>	DEHP

*Category C ESA's will be confirmed upon the receipt of the GLNG CSG Fields environmental authorities

Appendix G Field Survey Methodology

Site assessments and field ecological surveys will:

- Be undertaken in accordance with the Commonwealth Department's survey guidelines in effect at the time of the survey. This information can be obtained from <http://www.environment.gov.au/epbc/guidelines-policies.html#threatened>;
- Take into account and reference previous ecological surveys undertaken in the area and relevant new information on the likely presence or absence of MNES;
- Be undertaken by a suitable qualified ecologist approved by the Commonwealth Department;
- Document the survey methodology, results and significant findings in relation to MNES;
- Field data is to be collected in the Santos GIS database in the Environmental field inspection layer- 'notable EVNT & type A species' to record all significant species locations as well as areas inspected. This is maintained in the Environmental Inspections layer.
- Where data is not directly collected into the Santos GIS database the information should be supplied to Santos GIS department with relevant survey detail maintain the layer integrity.
- Apply best practice site assessment and ecological survey methods appropriate for each listed threatened species, migratory species, their habitat and listed ecological communities;
- Apply the mapping of environmental constraints Class B, the infrastructure requirements, minimum no impact zones, impact risk zones and the width requirements for the linear infrastructure corridors described in Section 6.7; and
- Reports will be published on the internet 20 business days before the clearance of native vegetation in an infrastructure impact area and provided to the Commonwealth Department on request.

Detailed ecological site assessments should include the following flora and fauna survey methodologies where applicable.

Flora Field Survey Methodology

The flora survey will employ assessment of floral taxa and vegetation communities suitable for use in RE map amendment requests and in keeping with the methodology employed by the Queensland Herbarium for the survey of REs and vegetation communities (Neldner et al., 2005).

Preliminary community definition (utilising colour aerial photography and interpretation of current DEHP 1:100,000 RE mapping) will be used to identify locations for representative field survey sample plots to obtain floristic and structural data and ground truth communities. Field surveys will include botanical assessment at a number of representative sites within each vegetation community, employing a number of standard methods including: secondary survey sites; quaternary survey sites; and random meander search areas.

Secondary Survey Sites

Secondary survey sites comprise of 10 m x 50 m (500 m²) transects. Fieldwork within secondary survey sites will include floristic and structural analysis as detailed below.

Floristic analysis will include plant identification and species diversity characterisation of all floras present. Relative abundance will be assigned for all species recorded. Plant

identification and estimation of relative abundance will be undertaken by an experienced botanist with previous survey experience of the bioregion.

Structural analysis will include recording the height class and life form of the dominant species within each strata present. Height of each strata will be recorded using a hand held Optilogic laser rangefinder. Foliage Projection Cover (FPC) of the canopy and mid strata (where applicable) will be calculated using the canopy intercept method. FPC of the ground layer will be determined using ocular estimation of cover within several 1 m subplots along the secondary transect.

Evidence of previous disturbance, fire history, incidence of exotic species and general notes on soil type and ecological integrity will be compiled for each secondary survey site. A time encoded digital photograph will be taken at each plot as a reference. Locations of each secondary transect will be recorded using a GPS unit.

Quaternary Survey Sites

Quaternary survey sites will be utilised to ground truth vegetation units and confirm dominant characteristic species. Structural analysis included recording the height class and life form of the dominant species within the mid and canopy strata will be in accordance with Neldner *et al.* (2005).

Evidence of previous disturbance, fire history, incidence of exotic species and general notes on soil type and ecological integrity will be compiled for each quaternary survey site. A time encoded digital photograph will be taken at each plot as a reference. Locations of each quaternary transect will be recorded using a GPS unit.

Meander Searches

Following assessment of each secondary survey site and selected quaternary sites, an area of approximately 1 ha surrounding each plot will be searched for 20 minutes utilising the random meander technique (Cropper, 1993). The aims of the random meander searches are to:

- Identify additional less abundant species not recorded within survey plots;
- Identify any potential significant threatened or species not identified within the survey plot;
- Confirm the representativeness of plot locations; and
- Confirm boundaries and ecotonal areas between vegetation communities.

Fauna Habitat Survey Methodology

Habitat suitability assessments will be conducted within vegetation communities to ascertain the suitability and extent of potential fauna habitat supported within the community. Habitat assessments will be designed to specifically target habitat of conservation significant species identified as potentially present from detailed literature reviews. Key characteristics assessed for habitat suitability will include:

- Structure and dominant floristics of woodland canopy;
- Presence of large mature trees for arboreal fauna, nesting bird species, insectivorous bats and perching raptors;
- Presence of faunal refugia such as hollow bearing trees, fallen timber and large woody debris;
- Diversity and density of the shrub layer and ground cover provided as habitat for ground dwelling mammals;

- Presence of rock outcrops and dry cracking clays as habitat for reptile and small ground dwelling mammal species; and
- Connectivity and linkages of riparian corridors, core habitat and major habitat units.

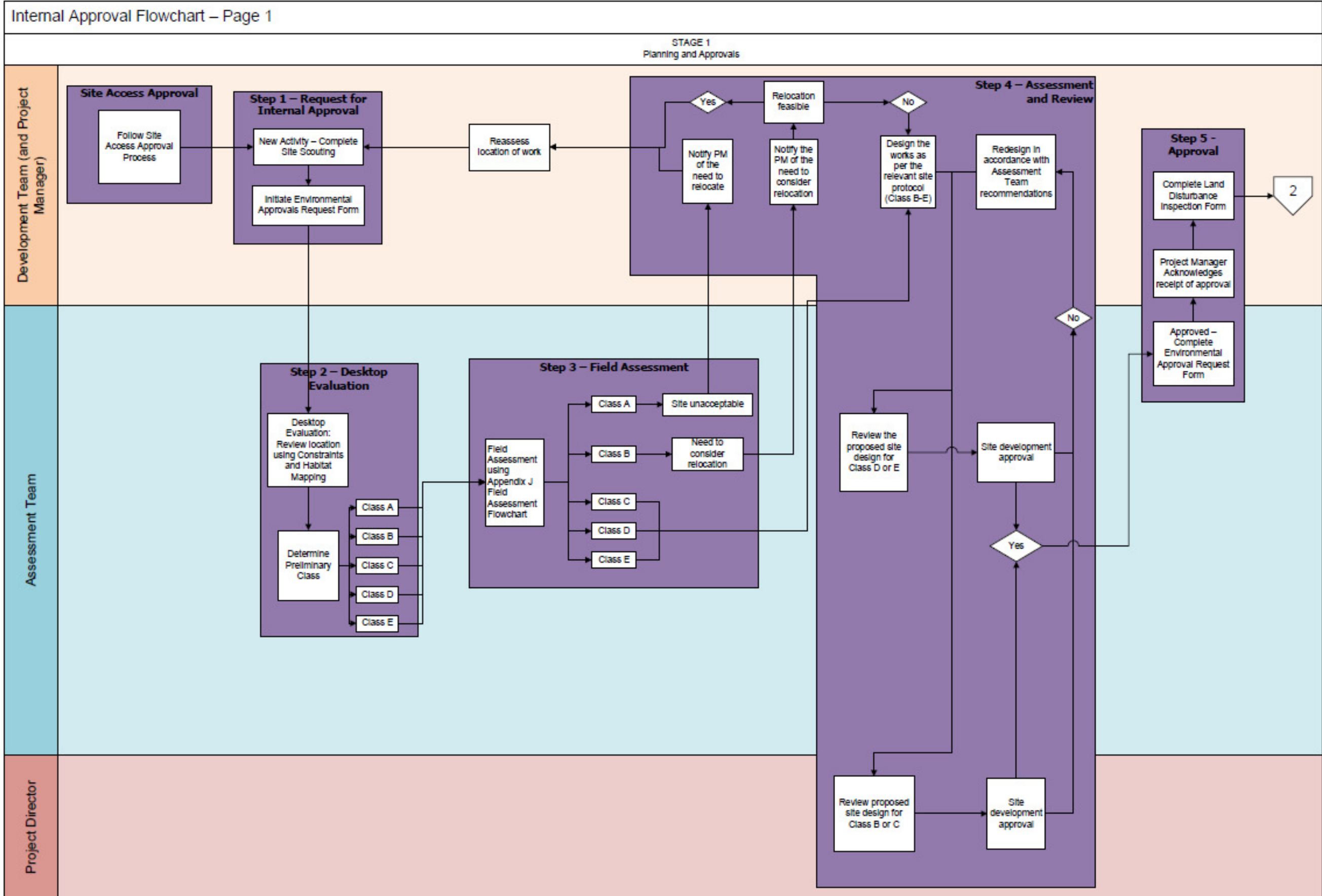
Active diurnal searches for reptiles, amphibians and mammals will involve searching for individuals active in targeted micro-habitat such as aquatic habitat, groundcover, trees/rock faces, fallen wood debris, decorticating bark and forest litter.

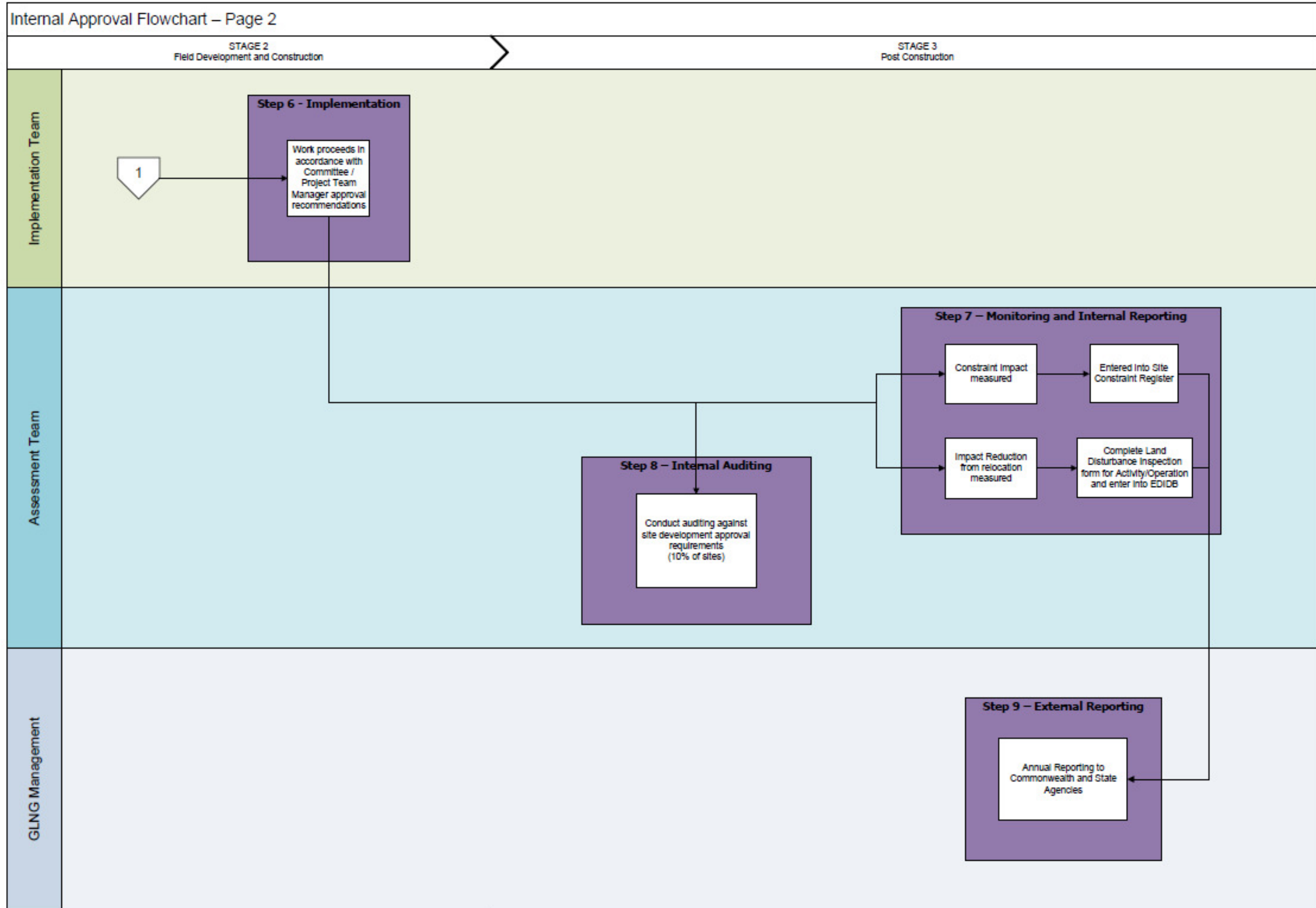
Searches for tracks and signs will involve both active and opportunistic observations of scats, scratchings, diggings and other signs of fauna activity. Where possible predator scats will also be collected for hair analysis for identification of prey species.

At each fauna sampling site habitat conditions will be recorded including dominant vegetation structure and floristics, level of fallen timber, hollow bearing trees, leaf litter, rocks, rank grasses or dense shrub layers, levels of disturbance and obvious signs of animal activity.

Separate targeted significant species surveys will also be employed within specific habitat types where appropriate to ascertain presence or absence of potential significant cryptic species if critical habitat for these species is identified at a sampling location.

Appendix H Internal Approval Flow Chart





Appendix I Guideline for Site Scouting

1. GENERAL

In order to ensure that the location of disturbances take into consideration environmental and cultural heritage impacts, a scout (preliminary field survey) of each proposed location is to be undertaken by competent scouting personnel. This guideline describes the process to be followed for scouting new disturbances. This guideline will be applied to all new disturbances.

2. REQUIREMENTS

The scout of new disturbances shall be undertaken by suitably qualified personnel that have an awareness of environmental considerations.

2.1 General Criteria

Scouting an area for a disturbance should give due consideration to:

- Relevant Field Development Plan (FDP);
- Using previously disturbed sites or areas naturally devoid of native vegetation;
- In the event that an area naturally devoid of native vegetation cannot be located, clearance should be minimised;
- Avoidance of known sites of scientific, natural, or cultural heritage significance;
- Minimising cut/fill operations during construction;
- Maintaining sufficient distance from all major watercourses, creeks, surface water bodies and other sensitive environments;
- Minimising soil erosion;
- Minimising the aesthetic impact;
- Safety hazards; and
- Avoiding disturbance to the infrastructure or operations of other land users.

In addition, authorisation from a Santos cultural heritage adviser is required prior to any disturbance activities to ensure the requirements of the relevant approved Cultural Heritage Management Plan, including any necessary survey and agreed management measures, have been complied with or are implemented.

2.2 Specific Criteria

2.2.1 Campsites

For temporary campsites:

- If there is a designated field campsite present, that campsite will be used where possible (drilling camps excepted);
- Campsites will, where possible, be located adjacent to existing tracks and roads, in an area not subject to flooding and in a manner which minimises visual impact;

- No campsite will, where possible, be located within one kilometre of any stock watering place; and
- Sufficient distance from homesteads, settlements and other sensitive land uses will be kept, so as not to cause disturbance (e.g. lighting, noise, odours etc).

2.2.2 Roads

The construction of parallel and multiple tracks and roads will be avoided where possible. Where provision of a new access track is unavoidable it will be located in a manner best designed to:

- Minimise long term visual impact;
- Minimise land clearance and hence disturbance to soils, vegetation and wildlife habitats;
- Support the intended traffic; and
- Avoid steep cuts and fills which may cause erosion.

Construction of access tracks across watercourses will be avoided where possible. Where crossing of the watercourse is unavoidable:

- Roads and access tracks will follow, wherever possible, existing disturbance lines (e.g. old seismic lines or roads); and
- Ensure creek crossings are kept to an absolute minimum and aligned 90 degrees to the drainage line.

2.2.3 Borrow Pit

An existing unrestored borrow pit will be used where possible in preference to disturbing a new site, with the following provisos:

- Existing pits can be reworked provided they are at least 75 m from a public road or other facility, or they are naturally screened by vegetation;
- Where practical, re-working (the additional extraction of materials) will take place on the side of the pit furthest from the existing road or facility, or roads or facilities currently under construction; and
- If the existing borrow pit location will result in the haulage of material in excess of one kilometre, a new borrow pit may be constructed.

Where new borrow pits are required:

- Pits are not to be located in sensitive locations, except where there is no practical alternative within a reasonable distance from the work site;
- Where a borrow pit is to be located in sensitive areas the site must be selected to minimise impacts;
- Pits are to be at least 75 m from existing tracks, roads and other facilities and 200 m from fence lines; and

- Where possible, the pit is to be located in a manner which utilises the natural vegetation or landscape to screen the pit from view.

2.3 Cultural Heritage

To avoid unnecessarily disturbing cultural heritage sites, care must be taken to scout only the area immediately surrounding the proposed disturbance.

2.4 Photomonitoring

For each new disturbance that involves significant earthworks (eg. well leases, borrow pits, roads, pipelines, etc), photomonitoring points are to be established during the scout.

2.5 Consultation with Key Stakeholders

Either during, or immediately following the scouting, consultation with key stakeholders is to be undertaken (where necessary) regarding the location of the disturbance. Key stakeholders include:

- The owner, holder or occupier of the land;
- The relevant land council;
- The relevant Aboriginal Party in accordance with the terms of the applicable Cultural Heritage Management Plan; and
- Local authorities where applicable.

The consultation will be undertaken by authorised persons to seek approvals and to address any concerns. A record of the discussions with the key stakeholders will be recorded.

Correspondence must be provided to the key stakeholders confirming discussions and agreed actions. This correspondence shall be copied to the Environmental Representative and the Stakeholder Adviser.

2.6 Scout Report

The results of each scout should be recorded on the relevant forms found on the [Environment](#) team site on the Well (Internal Santos documents not available publicly).

A comprehensive sketch is to be prepared of the disturbance detailing all of the following topographical and surface features:

- North point and relevant seismic shot points;
- The preferred access and egress from the nearest existing road or track which is to be utilised;
- The location of any other roads or tracks in the vicinity of the proposed location;
- The position of any existing CSG or pastoral infrastructure such as well heads, pipelines, powerlines, fences or watering points;

- The relative position of the proposed location to sensitive locations and drainage or creek lines;
- The position of any large trees or shrubs on or in close proximity to the proposed location and the position of any less vegetated or previously disturbed areas which may be suitable;
- The position and distance of any sites of scientific, natural, Aboriginal or non-Aboriginal heritage significance in relation to the proposed site;
- The preferred orientation of the well lease so as to minimise earthworks as well as environmental impact and cost; and
- The natural fall of the land and the possible position of a containment bank (if it should be required).

These forms, together with photographs and key stakeholder conversation records are to be sent to the environmental representative.

Appendix J Field Assessment Flow Chart

