



B2 | Gas Transmission
Pipeline EMP

Section 12

Gas Transmission Pipeline Environmental
Management Plan

12.1 Introduction

The purpose of this preliminary Environmental Management Plan (EMP) prepared for the GLNG Project is to propose environmental protection commitments to protect the environmental values that may be affected by the development of the project and to assist the administering authorities to decide the appropriate approval conditions for the project (under Section 310D of the *Environmental Protection Act 1994* (Queensland) (EP Act)).

EMPs are designed to be dynamic documents, which will be reviewed and revised as the project progresses through public consultation including feedback from regulatory agencies including the Queensland Department of Environment and Resource Management (DERM) and the Commonwealth Department of Environment, Water, Heritage and the Arts (DEWHA), detailed design, to construction, operational and decommissioning phases. It is envisaged that the final EMPs for each component of the project will provide additional, more detailed guidance for construction and operational personnel, regulators and stakeholders prior to the application for the respective environmental authorities. The EMPs will contain clear commitments, framed in a way that enables assessment of the extent to which the commitment has been met.

The following five preliminary EMPs were prepared as part of the EIS process for the GLNG project:

- Coal Seam Gas Fields EMP;
- Gas Transmission Pipeline EMP;
- LNG Facility EMP;
- Marine Facilities EMP; and
- Access Road and Bridge EMP.

Each EMP has been prepared as a 'stand alone' document, to be used as the basis for actively managing activities as the project progresses.

This preliminary EMP has been prepared based on the findings outlined in Section 7 of the EIS (March, 2009) and additional work undertaken during the preparation of the EIS Supplement. It relates to construction and operation of the gas transmission pipeline.

This preliminary EMP has been structured to be in accordance with the project's Terms of Reference (TOR) and to satisfy the requirements of the DERM guidelines and related operational policies as outlined in Table 12.1.1 below. The EMP proposes environmental management strategies to prevent or minimise environmental harm while allowing for environmentally sustainable development. Monitoring, corrective actions and reporting requirements form part of this EMP, which will ensure that the proposed management strategies are being properly implemented.

Table 12.1.1 EMP Structure

Structure	Description
Element/issue	How elements of the activity (construction or operation) are to be managed (as it affects environmental values).
Operational Policy	The operational policy or management objective that applies to the element.
Performance Criteria	Measurable performance criteria (outcomes) for each element of the operation.
Implementation Strategy	The strategies, tasks or action programs (to nominated operational design standards) that will be implemented to achieve the performance criteria.
Monitoring	The monitoring requirements to measure actual performance (i.e. specified limits to pre-selected indicators of change).
Auditing	The auditing requirements to demonstrate implementation of agreed construction and operation environmental management strategies and compliance with agreed performance criteria.

Structure	Description
Reporting	Format, timing and responsibility for reporting and auditing of monitoring results.
Corrective Action	The action (options) to be implemented in case a performance requirement is not reached and the person(s) responsible for action (including staff authority and responsibility management structure).

This preliminary EMP will be refined and finalised after negotiation as agreed with DERM, then used to support the necessary applications for environmental authorities (petroleum activities) for respective pipeline licenses issued under the *Petroleum and Gas (Production & Safety) Act 2004* and/or the *Petroleum (Submerged Lands) Act 1982*.

12.2 Objectives

The objectives of this EMP are to provide:

- Evidence of practical and achievable plans to ensure that the project's environmental requirements are complied with;
- An integrated plan for monitoring, assessing and controlling potential impacts;
- Local, State and Commonwealth authorities with a common focus for approval conditions and compliance with policies and conditions; and
- The community with evidence that the gas transmission pipeline development will be managed in an environmentally acceptable manner.

This EMP will be reviewed and updated, to reflect knowledge gained during the course of the assessment of the GLNG Project. Changes to the EMP will be made in consultation with the relevant authorities where necessary.

12.3 Links to the EIS

Potential environmental issues requiring management and monitoring were identified during the impact assessment process and detailed throughout the GLNG EIS.

This EMP has been structured to provide a link between the proposed authorised activities, the receiving environment and the selection of appropriate management strategies to prevent or minimise any potential environmental harm arising from the development of the GLNG Project. The EMP also incorporates monitoring and corrective actions to ensure compliance with the commitments made in the EIS and the conditions of any statutory approvals. The management strategies outlined within this EMP were selected after detailed investigations of potential environmental impacts assessed during the EIS process.

A number of other key aspects of construction, operation and decommissioning phases for the gas transmission pipeline have been included such as weed management, emergency response procedures and incident management.

12.4 Legislation

Section 1 of the EIS specifies the legislation and policies controlling the approval process for the gas transmission pipeline. Appendix C of the EIS provides a list the development approvals required for the GLNG Project including the gas transmission pipeline.

Environmental requirements of all relevant legislation are addressed within the EMP. The requirements of local government, the community and other stakeholders have also been addressed.

12.5 Santos Environment, Health and Safety Management System (EHSMS)

Santos has a company-wide EHSMS which provides a structured framework for effective environmental and safety practice across all of its activities and operations. The framework has been developed to ensure compliance with AS/NZS ISO 14001:1996 *Environmental Management Systems – Specification with guidance for use* and Australian Standard 4801:2000 *Occupational Health and Safety Management Systems – Specification with guidance for use*.

The EHSMS framework consists of multiple layers, the key components being management and hazard standards that have been developed as part of the EHSMS. These standards guide the implementation of the EMPs. The management standards define the requirements necessary to ensure that environmental (health, safety and process safety) risk is systematically managed. The elements of each Standard will be appropriately incorporated into this EMP.

12.6 Responsibilities

Santos will be responsible for ensuring that this EMP is implemented. The assignment of roles, responsibilities and accountability will be in accordance with the EHSMS.

Santos staff and contractors will be responsible for implementing the final EMP in a manner which complies with all relevant environmental standards, adheres to all legislative requirements, and ensures that all environmental objectives associated with the work are achieved. Contract documents will include the necessary environmental specifications and commitments and require compliance with the EMP, construction specifications, technical drawings and the general environmental duty.

12.7 Monitoring Programs

Monitoring programs will be undertaken in accordance with this EMP.

Routine environmental monitoring of the gas transmission pipeline will be conducted to ensure performance standards put in place are met. Monitoring, undertaken by GLNG operational and corporate personnel and specialist service providers, will be periodically conducted in accordance with site-specific monitoring plans.

Specialist studies to investigate particular aspects of the environment (e.g. flora and fauna, weeds, hydrological risk) will be periodically commissioned when a need is determined during environmental review and risk assessment.

12.8 Reporting and Auditing

This preliminary EMP will be finalised after the issue of the Coordinator-General's conditions.

During construction and operations, compliance audits will be conducted in accordance with the requirements of this EMP as well as construction procedures, relevant legislation, license and permit conditions and industry standards. To ensure appropriate stakeholders are adequately informed of relevant EHS performance, reports, where necessary, will be prepared for internal and stakeholder review.

All inspection and audit reports of environmental performance will be stored in the Audit and Inspection Manager (AIM). AIM is an electronic database that is used to enable corrective actions identified during the inspection / auditing process to be recorded, tracked and closed out. The information will be made available to the relevant regulatory authorities as required.

In addition to the monitoring and reporting requirements documented in the relevant sections of the EMP, the following auditing regime will be implemented:

- During construction, the contractor will be required to report on environmental compliance on an incident, weekly and monthly basis;
- During construction, internal audits will be undertaken at regular intervals to verify that all work is proceeding in accordance with the EMP;
- A post-construction audit of the gas transmission pipeline right of way and other related infrastructure will be conducted annually for two years following construction to evaluate revegetation, erosion and soil stability, weed control, watercourse alteration prevention and success of bed and bank re-profiling; and
- During the operational phase of the gas transmission pipeline, internal audits of environmental compliance will be undertaken on a regular basis.

Section 37 of the EP Act requires that any person who becomes aware of any event that may cause or has caused environmental harm, reports the event/incident to their employer. Details of the nature and circumstances of the event must be provided.

Any environmental incident, hazard, near miss, non-conformance or third party complaint will be managed in accordance with this EMP and recorded in the Incident Management System (IMS), an electronic notification and recording system. All non-conformances lodged are tracked and actioned by nominated personnel, which includes the investigation and implementation of corrective action where required.

Regulatory agencies will be notified of any reportable environmental incident or non-conformance with statutory approvals within the appropriate timeframe and as soon as practicable.

Relevant records supporting inspections and audits (in addition to monitoring and other critical aspects of the management system) will be generated and maintained. In accordance with the various statutory approvals required for the project, Santos will report annually to the administering authorities on the petroleum activities undertaken during the previous 12 months.

12.9 Training and Communications

All Santos personnel, contractors and visitors are required to undertake appropriate environmental training and induction programs. This standard identifies and records the competencies and training results from the assessment of all staff and contractors.

All managers and supervisors will be responsible for ensuring that personnel under their control have the requisite competencies, skills and training to carry out their assigned tasks in accordance with the requirements of the EMP. They will also be responsible for identifying additional training and competency requirements.

All staff will complete a comprehensive project induction. The induction will include a comprehensive review of environmental requirements and standards, safety, and access protocols. All project supervisors and managers will have additional detailed training on the use and implementation of the EMP.

All managers and supervisors will hold regular toolbox meetings with personnel to discuss issues associated with their scheduled work. This will include highlighting and discussing relevant environmental issues.

12.10 Review

This EMP will be a dynamic document. The EMP will be reviewed regularly and revised to reflect project changes and new developments. Revisions will include, but not be limited to:

- Inclusion of relevant approval conditions arising from the project's approval and subsequent permits, authorities and/or licenses; and

- Inclusion of any site-specific elements relevant to new developments as they occur during the life of the project.

Additional revisions will occur on an as-needed basis, including revisions to address items identified during incident investigations, inspections or audits.

Santos will be responsible for regular review of the EMP to achieve continuous improvement in environmental performance.

12.11 Description of Relevant Petroleum Tenures

Santos proposes to construct a high pressure gas transmission pipeline that will transport CSG from the CSG fields at Roma, Fairview and Arcadia Valley to the proposed LNG facility on Curtis Island. The gas transmission pipeline will require one or more pipeline licences issued under the *Petroleum and Gas (Production & Safety) Act 2004* and/or the *Petroleum (Submerged Lands) Act 1982*. Separate environmental authorities will be required for each pipeline licence.

Section 3 of the EIS provides a detailed description of the proposed gas transmission pipeline and the preferred pipeline route for the GLNG Project. The gas transmission pipeline will be a buried, high pressure steel pipeline. It will be designed in accordance with the requirements of AS 2885 Pipelines – Gas and Liquid Petroleum and constructed in accordance with the Australian Pipeline Industry Association’s Code of Environmental Practice (APIA, 2005).

The proposed gas transmission pipeline corridor is closely aligned with the existing Queensland Gas Pipeline (QGP) for much of its length with the exception of the section north of Injune where the corridor will run up the western side of the Arcadia Valley. The pipeline will approach Gladstone from the south-west and will pass through the Gladstone State Development Area (GSDA) before crossing Port Curtis to Curtis Island. The length of this route is approximately 435 km.

The proposed gas transmission pipeline will be located adjacent to the existing QGP right of way (ROW) for approximately 300 km of the corridor from south of Rolleston to Gladstone. This will reduce the area of land disturbed and the impact on existing land use and infrastructure. However there are sections along the corridor where due to land use, environmental or topographical constraints the proposed GLNG pipeline will by necessity deviate from the QGP ROW.

The criteria used to determine the most appropriate route for the gas transmission pipeline were based on the APIA (2005) code and Australian Standard AS2885.

The gas transmission pipeline will have the following above ground infrastructure along the pipeline ROW:

- **Mainline Valves.** A mainline valve (MLV) is a buried valve with an above-ground bypass valve and blowdown piping. MLVs are used for isolating sections of the pipeline and venting gas to enable maintenance activities or in the event of an incident.
- **Scraper Stations.** Scraper stations are used for inserting and removing in-line cleaning and inspection tools to enable cleaning, maintenance and assessment of pipeline integrity.
- **Gas Receival and Metering Stations.** A gas receival station will be constructed at the LNG facility on Curtis Island where the gas will leave the gas transmission pipeline. The gas receival station will consist of a station limit valve, scraper receiver, gas filters and flow control equipment together with metering.
- **CP Test Posts.**
- **CP Rectifier Station.**
- **Warning Signs.** Pipeline warning signs will be erected along the gas transmission pipeline ROW in accordance with AS 2885.
- **Aerial pipeline markers** will be installed along the pipeline and denote the chainage in kilometres from the start point. Aerial markers will be at 10 km intervals.

Section 7 of the EIS provides real property descriptions, mining and petroleum tenures that are traversed by the gas transmission pipeline corridor and the relationship with disturbance types, identifies the topographic features, places and/aspects of potential interest to the administering authorities or other relevant stakeholders.

Section 9 of the GLNG EIS identifies all relevant stakeholders and details the consultation process that was undertaken for the gas transmission pipeline during the preparation of the EIS.

12.12 Description of Relevant Petroleum Activities

Section 3 of the GLNG EIS provides a detailed description of the relevant petroleum activities that will be undertaken as part of the construction and operation of the gas transmission pipeline for the project. The section includes a description of:

- The type and scale of the proposed petroleum activities;
- The petroleum operations and environmentally relevant activities carried out on the site;
- The planned project life identifying construction, operation, decommissioning and rehabilitation phases;
- Activities which may cause environmental harm; and
- Strategies for the rehabilitation and remediation of environmental harm caused by petroleum activities.

A summary of the typical construction procedures and activities is provided below.

- Survey of the pipeline route.
- Provision of access tracks and temporary facilities. Existing roads will be utilised as far as practicable to minimise disturbance to the surrounding areas. Access tracks will be positioned and constructed in consultation with landholders.
- Clear and grade the ROW. The gas transmission pipeline route will be marked, vegetation and other obstacles removed from the ROW, topsoil removed and stockpiled. Temporary fencing and gates will also be installed to allow easy access between properties.
- Pipe stringing and bending. The pipe will be laid out in preparation for welding and pipes bent as required by route and terrain.
- Pipe welding and Non-Destructive Testing (NDT). The pipe will be welded into long lengths, typically up to 1000 m, called pipe strings.
- Trenching. A pipeline trench will be excavated, with the subsoil stockpiled adjacent to the trench.
- Pipe placement in the trench (lowering in and laying). The trench spoil, where suitable, will be used as bedding and backfill for the pipeline. The pipe will then be lowered into the trench using side boom tractors and the trench backfilled and compacted. In addition, marker tape will be laid in the trench at designated areas.
- Hydrotesting. The gas transmission pipeline will be cleaned and gauged prior to being hydrostatically tested for strength and leaks.
- Rehabilitation. Following construction, rehabilitation will involve removal of construction material, surface re-contouring, fence repair, respreading of topsoil and vegetation and seeding/revegetation.

The construction of the submerged gas transmission pipeline that crosses Port Curtis between Friend Point and Laird Point will require a different suite of techniques. The gas transmission pipeline will be laid in a trench below the sea bed and backfilled with rock for protection. Construction techniques to install the pipeline may include:

- Cable pull – the pipe is fabricated onshore and is winched through a pre-prepared trench;
- Lay barge – progressively constructing / laying the pipeline; or

- Floatation – fabrication of the pipe string onshore and floating it to the crossing location before sinking it into position.

The layer of rocks will act:

- As additional buoyancy protection;
- As mechanical protection from vessels (e.g. anchors, hulls); and
- To limit scouring due to tidal flows.

The construction techniques that will be chosen will be determined during the front end engineering design (FEED) process to reflect design and operational requirements, local conditions and any regulatory requirements.

Section 5 of the EIS provides a detailed waste inventory for the gas transmission pipeline. A comprehensive waste management plan will be developed that details the proposed source, nature, composition, rate and the immediate or ultimate destination of wastes generated during the construction and operation of the gas transmission pipeline. A description of waste management is provided in this EMP.

12.13 Description of Environmental Values, Potential Impacts and Proposed Management Strategies

Section 7 of the EIS provides a detailed description of the environmental values that occur along the gas transmission pipeline corridor, the potential impacts from the proposed activities, environmental protection objectives and management strategies to mitigate those impacts. The potential impacts on environmental values that were identified through the EIS process form the basis for developing the most appropriate mitigation measures.

The assessment of the beneficial or adverse effects has included an assessment of the following aspects:

- Magnitude or relative size of impact in relation to the environmental value being affected;
- Severity of any adverse effect or scale of beneficial outcome;
- Duration of the effect, for example the impact may range from a seasonal change, or it may end with the petroleum activity or extend beyond cessation of the petroleum activity; and
- An indication of the level of uncertainty and any assumptions used to address the uncertainty in any of the data or proposed commitments to protect the environmental values.

In relation to Sections 11.10, 11.11 and 11.12 of this EMP, the GLNG EIS provides appropriate maps, plans and/or aerial photographs to identify the location of the gas transmission pipeline, related infrastructure and environmentally sensitive areas.

12.14 Rehabilitation Program and Financial Assurance

This EMP incorporates a rehabilitation program and decommissioning plan for the gas transmission pipeline. Sections 3 and 7 of the EIS outline the rehabilitation objectives, performance criteria and strategies that will be employed for rehabilitating the areas disturbed during the construction phase of pipeline.

The EP Act requires the holder of an environmental authority (petroleum activities) to provide a financial assurance in the amount and form required by the administering authority (the DERM) as security to ensure compliance with an environmental authority or to cover costs or expenses, or likely costs or expenses, associated with rehabilitation of disturbed areas should the holder default on their rehabilitation obligations. The calculation of financial assurance must be in accordance with the DERM guideline document *Financial Assurance for Petroleum Activities*.

The amount of financial assurance may change over the life of the project. The amount is defined as the maximum total rehabilitation cost to complete rehabilitation of all disturbed areas at any one time, which

may vary on an annual basis due to progressive rehabilitation. This includes any disturbance that occurred under a prerequisite or replaced petroleum authority. The amount required for the financial assurance must be the highest total rehabilitation cost calculated for any year of the EMP.

During the application stage for the relevant environmental authority, Santos will calculate the required financial assurance for the initial construction and operation of the gas transmission pipeline. The financial assurance will be calculated using the DERM guidelines and will be regularly reviewed in accordance with any statutory requirements.

12.15 Gas Transmission Pipeline Environmental Management Plan Overview

The gas transmission pipeline EMP consists of construction and operational elements.

12.15.1 Construction Activities

The construction elements of the EMP consist of:

- Access;
- Clearing and Grading;
- Pipe Stringing, Welding and Non-Destructive Testing (NDT);
- Trenching;
- Pipe Laying and Backfilling;
- Hydrotesting;
- Rehabilitation;
- Terrestrial Flora and Fauna Management;
- Marine Flora and Fauna Management;
- Mosquito and Biting Midge Management;
- Weed Management;
- Water Management;
- Soil Management;
- Waste Management;
- Chemical and Dangerous Goods Management;
- Noise and Vibration;
- Air Quality;
- Transport and Traffic Management;
- Cultural Heritage;
- Social and Community;
- Third Party Infrastructure;
- Emergency Response;
- Fire Management; and
- Incidents and Complaints.

12.15.2 Operational Activities

Prior to commencement of operations, the EMP will be reviewed and updated to:

- Include the organisational structure for operations and allocation of responsibilities in line with the organisational structure;

- Establish reporting structures based on the organisational structure;
- Include relevant approval conditions arising from the approval process and subsequent permits, authorities and licences relevant to the pipeline's operation;
- Review control strategies, objectives and performance indicators to ensure that these are appropriate for operations;
- Include reference to "as constructed" drawings, particularly those that reference areas of environmental sensitivity; and
- Review inspection and audit schedules and inclusion of specific locations where a higher level of inspection is required (e.g. to monitor rehabilitation success of sensitive areas).

The key operational activities that may have an impact on environmental values are:

- Access to the ROW;
- Maintenance of the ROW, involving management and/or control of vegetation, weeds, pests, bushfire, erosion and sedimentation, pipeline subsidence, cultural heritage and third party infrastructure/landuse;
- Maintenance of the pipeline, including excavation, hydrotesting, pigging, and welding. Where maintenance activities to be undertaken are similar to construction activities, the activity-based management plans presented in the construction EMP will apply;
- Operation of the pipeline involving management of leaks and emergency response; and
- Monitoring activities including patrols, inspections, marine and aerial surveys.

12.15.3 Operational Monitoring

The GLNG gas transmission pipeline is to be monitored remotely from a gas control centre via supervisory control and data acquisition system.

12.15.4 Ground Patrols

Regular inspections will be carried out along the pipeline ROW by vehicle and foot patrols to check on the condition of the ROW and identify any activities that may have the potential to impact on the integrity of the pipeline. The inspection will include, but not be limited to, a review of:

- Activity on the pipeline corridor and in the vicinity;
- Use of access tracks and pipeline corridor and any unauthorised traffic;
- Access track condition and maintenance requirements;
- Evidence of erosion, washouts or land subsidence;
- Evidence of pipeline exposure;
- Vegetation cover;
- Excess vegetation on the pipeline corridor;
- Weed and pest infestation;
- Condition of pipeline crossings;
- Disturbance to protected heritage sites;
- Indications of leaks;
- The presence of refuse or litter;
- Damages to fences, gates, signs, markers etc; and
- Security of sites and evidence of unauthorised entry.

The frequency of ground patrols will be determined during the FEED as part of the Integrity Management Plan (IMP). Special patrols will be undertaken after heavy storms or significant events to check for damage to the pipeline.

12.15.5 Aerial Surveillance

Aerial patrols along the pipeline ROW will be undertaken on a regular basis. The frequency of aerial patrols will be determined during the FEED process and will reflect operational requirements, local conditions and regulatory requirements. Aerial surveillance will check for:

- Bare patches or damaged vegetation (indicating possible leaks or erosion);
- Pipeline exposure;
- Scouring, sink holes, areas of active or potential erosion;
- Condition of water crossings;
- Noxious weed areas;
- Ploughed areas and/or evidence of third party activity;
- Areas of limited revegetation success; and
- Vegetation regrowth that will require control.

12.15.6 Marine Surveillance

The submerged gas transmission pipeline from Friend Point on the mainland to Laird Point on Curtis Island will be regularly inspected to confirm that the backfill protection to the pipeline is intact and has not been degraded. The inspection will be mainly visual, supplemented as-and-when required by seabed profiling using echo-sounding or similar equipment.

12.15.7 Internal Pipeline Inspections

Internal pipeline inspections to monitor the integrity of the pipe will be carried out by intelligent pigs on an as-required basis. The initial frequency of intelligent pigging will be determined during the FEED process as part of the IMP to reflect operational requirements, local conditions and regulatory requirements.

12.15.8 Cathodic Protection Surveys

A cathodic protection system will be installed along the gas transmission pipeline and will be checked on a regular basis. The frequency of checking the cathodic protection system will be determined during the FEED process as part of the IMP to reflect operational requirements, local conditions and regulatory requirements. Similarly, the location and numbers of test points will also be determined during the front end engineering design process to reflect design and operational requirements, local conditions and regulatory requirements.

12.15.9 Issue Specific Monitoring

Areas that require a high level of monitoring, such as water course crossings, will be identified and incorporated into the operations monitoring program.

Special ground, marine and/or aerial patrols may be undertaken after heavy storms or earthquakes to check for damage to the ROW.

12.15.10 Decommissioning

The EMP includes a decommissioning element outlining the implementation strategies, monitoring, auditing, reporting and corrective actions at pipeline end-of-life.

12.16 Environmental Management Plan - Construction

12.16.1 Access

Element/Issue	Access
Operational Policy or Management Objective	<p>To provide access to gas transmission pipeline operations in a manner that is acceptable to stakeholders and is compliant with our licence conditions, EMP and statutory obligations.</p> <p>To utilise, to the extent practicable, existing cleared areas and access tracks so as to:</p> <ul style="list-style-type: none"> • Minimise impacts to native flora and fauna; • Minimise impacts to soil and water; • Reduce the likelihood of the spread of weeds; • Minimise impacts on visual amenity; • Minimise the number of access tracks and diversions; • Minimise disruptions to landholders and third parties; • Manage road and track usage, and achieve satisfactory road and site rehabilitation; and • Minimise damage to existing road networks.
Performance Criteria	<ul style="list-style-type: none"> • No warranted complaints from landholders, and warranted complained responded to within 2 working days. • Access tracks and work areas/sites are readily manageable and able to be rehabilitated using standard techniques. • Erosion and sediment control in place. • No spread of weeds and compliant with the Weed Management Plan. • Existing environmental values protected.
Implementation Strategy	<ul style="list-style-type: none"> • Santos and/or the pipeline contractor will liaise with all residents along the pipeline corridor prior to any construction activities taking place to ensure that residents are fully informed of the proposed nature, timing and location of the construction works and any site specific mitigation measures to be implemented. • Route alignment, location of accommodation facilities, storage and additional work areas and new access tracks will be based on, to the extent practicable, the following criteria: <ul style="list-style-type: none"> – Avoiding unduly steep or rugged terrain. – Avoidance of areas of significant environmental value. – Avoidance of areas subject to flooding. – Avoidance of conflicting land uses. – Maximise the use of existing roads and tracks. – Minimise the width of tracks. – Landholder requirements. – Provision of adequate road access. – Proximity to existing infrastructure. • Existing roads and tracks will be used where practicable. • If necessary, existing tracks and roads will be upgraded to the applicable engineering design standards and the following will apply: <ul style="list-style-type: none"> – Roads or other structures on floodplains will be orientated and constructed so as not to divert or concentrate flood flows; – Road heights on floodplains will not exceed 20 cm above natural ground level (NGL); and – Invert levels will not be greater than 10 cm above NGL. • Only designated access tracks will be used by construction vehicles, including personnel vehicles. • Property access will be provided for landholders at all times. • Property fences and gates will be installed, maintained and reinstated to a condition at least equal to the pre-existing condition.

Element/Issue	Access
	<ul style="list-style-type: none"> Gates will be left as found. If closed gates are required to be open for a period of time, they will not be left unattended unless by prior agreement with the landholder. Where access is required in the long term, tracks will be constructed with a gravel surface and maintained to permit all weather access. Where access is required for temporary (construction) use only, disturbed areas will be rehabilitated. Where new vehicle tracks are required they will generally not exceed 5 m in width. Where there is a risk of land degradation, access during wet weather will be undertaken in consultation with the relevant landholder. Temporary access tracks will be removed from land unless otherwise agreed with the landholder. Disturbed areas will be graded to a level consistent with lands adjacent, pre-stripped topsoil replaced and erosion protection measures installed. Public and private access tracks will be reinstated to the pre-construction condition. Workforce education, signage and boundary demarcation will be used to ensure vehicles remain on designated access tracks. New tracks will be located as close to fences or property boundaries as possible subject to the requirements of the landholder. Weed control measures will be implemented in accordance with the requirements of the weed management component of this EMP. Santos and/or the construction contractor will consult with all landholders prior to construction commencing to minimise fragmentation or reduced property access.
Monitoring and Auditing	<p>Access roads will be regularly inspected to assess the effectiveness of protection measures with particular attention to erosion control, topsoil management and waste management.</p> <p>Monitoring of the various construction processes will occur on a daily, weekly and monthly basis.</p> <p>Audits will be conducted throughout the project to monitor against this EMP and other licence conditions.</p>
Reporting and Corrective Action	<ul style="list-style-type: none"> Recommendations and corrective actions arising from audits and reviews will be implemented. Reporting will occur on an incident, weekly and monthly basis to the appropriate Environmental Manager. Non-compliances, environmental incidents and their corrective actions will be managed through the IMS and reported to the appropriate authority as required. Landholder complaints will be recorded in a complaints register (which forms part of the EHSMS) and appropriate corrective actions will be implemented and closed out by the appropriate Environmental Manager.

12.16.2 Clearing and Grading

Element/Issue	Clearing and Grading
Operational Policy or Management Objective	<p>To manage the impact of site clearing and disturbance such that:</p> <ul style="list-style-type: none"> Impacts on vegetation and ecological communities are minimised. Cleared material is stored appropriately and able to be effectively used during restoration activities. The rehabilitation success of the disturbed areas is optimised.

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Element/Issue	Clearing and Grading
Performance Criteria	<ul style="list-style-type: none"> • No warranted complaints from landholders, and warranted complained responded to within 2 working days. • No unplanned or unapproved damage to flora and fauna. • Environmental impacts are within authorised limits. • Installation and maintenance of erosion control measures. • Soils and vegetation stored appropriately to allow for restoration of disturbed areas to equivalent to surrounding area after construction. • Compliance with the Weed Management Plan. • Prompt reinstatement of disturbed areas.
Implementation Strategy	<ul style="list-style-type: none"> • No clearing of protected vegetation for field development will occur until appropriate permits have been obtained. • All clearing boundaries and ESA's will be illustrated on construction drawings and clearly marked in the field. • Clearing will be limited to the minimum area practicable. The following are examples of how this can be achieved: <ul style="list-style-type: none"> – Having defined limits on the clearing plan; – Identification of areas where clearing is restricted i.e. 30 m in ESAs; – Demarcation of "no go" areas; and – Implementing access control. • Where practical, on the perimeter of the ROW, trees will be trimmed rather than felled. Individual trees to be retained or preserved on the ROW will be clearly marked in the field, before clearing activities in that area begin. • The width of clearing in riparian vegetation will be minimised to safely allow construction vehicle traffic to cross the water course and meet the following environmental requirements by the following measures: <ul style="list-style-type: none"> – Clearing in the watercourse for pipeline installation to be left until the last moment so as to expose the area for the minimal time possible; – Where minimal earthworks are required, retain the root mass, especially in sodic soil areas; and – Where cleared vegetation is stockpiled, measures should be taken to avoid concentration of overland flows. • Where crossings traverse flowing wet watercourses, containment dams will be constructed to isolate work areas. • Water flow in waterways will be maintained. • The work area will be isolated from the flowing waterway. • Crossings will be designed to provide for fish passage. Where practicable, bridge crossings will be designed to be single span (to minimise in-stream disturbance). Culverts will be avoided where possible and level crossings will be installed which allow the passage of heavy vehicles through the waterway but does not interfere with the flow of water. Where culverts can't be avoided, they will be designed so that they are: <ul style="list-style-type: none"> – As short and wide as possible, and allow the passage of anticipated flood volumes and debris; – Deep enough to allow fish movement (a minimum depth of 0.5 m for the fish species present); and – Installed without a 'drop off' at the culvert outlet or inlet (these impede fish migration). • Cleared vegetation will be stockpiled for respreading during rehabilitation. • Cleared vegetation will be stockpiled beyond the flood line of watercourses. • Cleared vegetation or soil will not be pushed up against trunks of trees.

Element/Issue	Clearing and Grading
	<ul style="list-style-type: none"> • Cleared vegetation and soil will not be stored against fence lines. • Soil stockpiles will not be placed within the bed or banks of watercourses. • The stockpiles will be breached in appropriate locations (coinciding with designated access roads or tracks, fence lines) to allow vehicular, stock and wildlife access. Vehicular movement over stockpiled soil will not be allowed. • Soil and surface stability will be maintained at all times (e.g. temporary erosion control berms, drains and sediment barriers will be installed as necessary and maintained until final construction clean-up is completed). • Water trucks will be used (particularly in hot and windy conditions) , on access roads to reduce dust generation. • Dust will be managed along all access tracks and work areas with a variety of dust mitigation strategies – e.g. water trucks, dust suppressants and capping the area with alternative material such as gravel. • Contractor to take photos of all waterway and infrastructure crossings and ESAs to be recorded for the restoration process. • Vehicle speeds will be restricted on unsealed roads. <p>Soil and Erosion Management</p> <ul style="list-style-type: none"> • Install, maintain and monitor erosion and sediment control devices (e.g. berms, silt fences, jute matting) so that ground is stable and vegetation cover is maintained and promoted. • Ensure that runoff control devices (e.g. whoaboys) are maintained and work at all times to prevent erosion. • Carry out excavation works in conformity with the provisions of the construction EMP. • Install permanent erosion controls around active erosion adjacent to the ROW and watercourses as needed to keep areas stable. • Remove and stockpile topsoil where excavation for subsidence remediation is to occur. Replace topsoil as soon as practicable after works have finished. • Empty sediment control devices after heavy rain. • Maintain sediment control devices to ensure they remain effective including emptying regularly. • Consider erosion potential, sedimentation and land contamination issues when formulating incident specific emergency responses. • Repair or replace damaged or ineffective erosion and sediment controls as soon as practicable. • Sediment control measures will be used to preserve stockpiled soils to prevent siltation of any land surface and water or blockage of any existing drainage channels. • Where erosion management structures are impacted they will be reinstated as quickly as practicable or alternative structures erected to retain an adequate level of erosion control. <p>To ensure problem soils are avoided where practicable Santos will:</p> <ul style="list-style-type: none"> • Conduct pre-construction soil surveys which should identify problem soil areas that, where practical, should be avoided for locating facilities and access tracks. • In sodic soil areas, the following measures will be applied: <ul style="list-style-type: none"> – Energy dissipaters at the end of contour banks; – Avoid unnecessary exposing or disturbance of sodic soils; – Retention of topsoil; – Capping of sodic soils with other material; and – Avoiding ponding of water on site, allow water to drain from the site and disperse. • Appropriate controls will be implemented during any diversion of watercourses to minimise the impact of the project on aquatic species. • Measures to minimise the impacts of temporary damming of watercourses for the construction of crossings and obstruction of fish passage will be implemented and

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Element/Issue	Clearing and Grading
	include appropriate controls and monitoring during the diversion of watercourses.
Monitoring and Auditing	<p>Monitoring and auditing will be conducted in accordance with Section 12.7 of this EMP. Erosion and sediment controls will be inspected before and after rain events. Inspections of the site for compliance will occur on a daily, weekly and monthly basis. Audits will be conducted throughout the project to monitor against this EMP and other licence conditions.</p> <p>All cleared areas will be regularly inspected to assess the effectiveness of the environmental protection measures with particular attention to areas such as clearing widths, topsoil and vegetation storage and erosion and sediment control measures. This will be overseen by the appropriate Environmental Manager.</p>
Reporting and Corrective Action	<ul style="list-style-type: none"> Reporting of environmental performance data will be conducted in accordance with Section 12.8 of this EMP. Reporting, investigation and management of corrective actions associated with environmental events (including incidents, hazards, near misses, non-compliance vents and third party complaints) will be managed through the use of the IMS and reported to the appropriate authority as required. Reporting will occur on an incident, weekly and monthly basis to the appropriate Environmental Manager. Landholder complaints will be recorded in a complaints register (that forms part of the EHSMS) and appropriate corrective actions will be implemented and closed out by the appropriate Environmental Manager.

12.16.3 Pipe Stringing and Welding

Element/Issue	Pipe Stringing and Welding
Operational Policy or Management Objective	To carry out pipe stringing and welding in a safe and responsible manner with minimal interference to landholders or risk to the environment.
Performance Criteria	<ul style="list-style-type: none"> No warranted complaints from landholders, and warranted complained responded to within 2 working days. No uncontrolled fires. Fire Fighting Equipment at each hot work site. Debris removed from ROW.
Implementation Strategy	<ul style="list-style-type: none"> Pipe will be strung, allowing gaps for access across the line of pipe. Gaps will coincide with access roads or tracks, boundary fences and gaps in stockpiled vegetation, and will be located in consultation with relevant landholders. Dust and noise impacts related to pipe transport traffic will be minimised by scheduling deliveries during daylight hours where practicable. All welding, welding procedures, welder qualifications, the use of welding consumables, and the removal of weld defects will conform to relevant Australian Standards. The following precautions will be taken to minimise the possibility of fire due to welding activities: <ul style="list-style-type: none"> The construction area along the ROW (other than the designated stockpile areas) will be cleared of combustible vegetation to reduce the risk of fire; Stockpiled vegetation will be separated from welding activity; Water trucks (also used for dust suppression) will be available for use as fire trucks in the event of fire; and Fire extinguishers will be available to all appropriate crew members. 'Night caps' or other appropriate devices will be placed over the open pipe string ends to prevent the ingress of dust, wildlife or other objects into welded pipes. All welding waste will be managed appropriately and removed from the ROW on a

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Element/Issue	Pipe Stringing and Welding
	daily basis.
Monitoring and Auditing	<p>Inspections of the site for compliance will occur on a daily, weekly and monthly basis. Audits will be conducted throughout the project to monitor against this EMP and other licence conditions.</p> <p>The entire length of the ROW will be regularly inspected to assess the effectiveness of protection measures, with particular attention to debris control and availability of fire fighting equipment and crew preparedness.</p>
Reporting and Corrective Action	<ul style="list-style-type: none"> Reporting of environmental performance data will be conducted in accordance with Section 12.8 of this EMP. Reporting, investigation and management of corrective actions associated with environmental events (including incidents, hazards, near misses, non-compliance vents and third party complaints) will be managed through the IMS and reported to the appropriate authority as required. Reporting will occur on an incident, weekly and monthly basis to the appropriate Environmental Manager. Landholder complaints will be recorded in a complaints register (that forms part of the EHSMS) and appropriate corrective actions will be implemented and closed out by the appropriate Environmental Manager.

12.16.4 Trenching

Element/Issue	Trenching
Operational Policy or Management Objective	<p>To manage the impacts of trenching activities such that:</p> <ul style="list-style-type: none"> No unplanned disturbance to landholders or third party infrastructure. Erosion or subsidence is controlled. Topsoil quality is protected. Adverse impacts to native fauna are avoided.
Performance Criteria	<ul style="list-style-type: none"> Subsoil segregated from topsoil and vegetation. Ramps and fauna exit points are installed and maintained. Access for landholders and third parties maintained. No unplanned or uncontrolled disturbance to third party infrastructure.
Implementation Strategy	<ul style="list-style-type: none"> The location of the existing third party infrastructure in the ROW will be accurately identified on the alignment sheets and marked physically on the ground prior to trenching activities. Crossing of infrastructure will be completed in accordance with agreements reached with infrastructure owners/managers. Known contaminated areas will be identified on field maps, located on site, fenced and avoided. Trenching supervisor will be instructed in process for handling previously unidentified contaminated areas (e.g. dip, waste pit) or acid sulphate soil (ASS) in the event that any such areas are uncovered during trenching. These will include: <ul style="list-style-type: none"> Cessation of trenching at the location. Relocation and recommencement of trenching 50 m ahead. Advising Construction Manager and completing an assessment of the potential contamination. This may require the collection and analysis of the soil. Initiating appropriate remedial action based on the assessment. This may include deviating around the site. Topsoil stockpiles will not exceed 1.5 m in height. Trench spoil (sub soils) will be stockpiled separately to topsoil and vegetation. Areas of potential ASS will be clearly marked on construction drawings. Where potential or actual ASS is disturbed during trenching, trench must be stockpiled within a contained area.

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Element/Issue	Trenching
	<ul style="list-style-type: none"> Trench spoil will be stockpiled outside watercourses, and/or behind containment structures so as to prevent siltation of any land or surface water or blockage of any existing drainage channels. Regular gaps and spaces in the topsoil, subsoil and vegetation stockpile will be provided for fauna movement. The distances between gaps in stockpiles will be reduced at approaches to stream crossings. Trench plugs will be utilised at appropriate intervals to minimise erosion and allow access across the ROW. The pipeline trenches will be left open for the minimum time practicable. The trench will not be left open for extended periods on slopes leading to drainage lines or watercourses. Ramps will be installed in the trench to allow the easy egress of fauna trapped in the trench. In areas of high fauna density, additional ramps, branches, hessian sacks or similar devices to enable small fauna to exit the trench will be used. Temporary sediment and erosion control devices will be reinstated. The crossing method for all major road and rail crossings will be agreed beforehand with the facility owner/manager. Open cut crossing of minor roads and tracks will be managed in consultation with landholders and relevant third parties and alternative traffic management plans developed and implemented.
Monitoring and Auditing	Monitoring and auditing will be conducted in accordance with Section 12.7 of this EMP. Completed trenches will be regularly inspected to assess the effectiveness of protection measures with particular attention to areas such as soils management and trench compaction. During construction, the entire length of the ROW will be regularly inspected to assess the effectiveness of protection measures, with particular attention to areas such as soils segregation, erosion control devices, fauna escape ramps and access across the easement.
Reporting and Corrective Action	<ul style="list-style-type: none"> Reporting of environmental performance data will be conducted in accordance with Section 12.8 of this EMP. Reporting, investigation and management of corrective actions associated with environmental events (including incidents, hazards, near misses, non-compliance vents and third party complaints) will be managed through the IMS and reported to the appropriate authority as required. Reporting will occur on an incident, weekly and monthly basis to the appropriate Environmental Manager. Landholder complaints will be recorded in a complaints register (that forms part of the EHSMS) and appropriate corrective actions will be implemented and closed out by the appropriate Environmental Manager.

12.16.5 Pipe Laying and Backfilling

Element/Issue	Pipe Laying and Backfilling
Operational Policy or Management Objective	To manage the impacts of pipe laying and backfilling such that: <ul style="list-style-type: none"> Disturbance to landholders and third parties is minimised. The likelihood of erosion or subsidence is minimised. Topsoil is preserved for rehabilitation. There are no significant barriers to the re-establishment of overland flow of water.
Performance Criteria	<ul style="list-style-type: none"> No warranted complaints from landholders, and warranted complained responded to within 2 working days. No inversion of subsoil and topsoil. Well compacted trench line with appropriately installed trench breakers and contour banks.

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Element/Issue	Pipe Laying and Backfilling
Implementation Strategy	<ul style="list-style-type: none"> Where landholders require a greater depth than 1,200mm, this can be negotiated with GLNG management and it will be included in project documentation. GLNG will plan to locate infrastructure such as pipelines, roads and wells so that they will not adversely impact on existing landholder management practices such as placement of farm infrastructure, fences and erosion management structures. The period of time between trenching and backfilling will be minimised to prevent erosion of exposed soils. Appropriate means, such as trench blocks (i.e. trench/sack breakers), contour banks, whoa boys, drains and compaction of backfilled soils, will be used to prevent erosion along the backfilled trench. Compaction will be carried out in layers and will use techniques and equipment that will not damage the pipeline, pipeline coating and/or fibre optic cable. Pipe laying crews will prepare for identified third party crossings and will have materials and equipment available. Gentle crown to be left over the trench line to allow for future settlement of soils, with appropriate breaks to allow for natural surface water flows across the ROW. Measures including pipeline markers and landholder liaison will be used to alert third parties to the presence of the buried pipelines. Markers will be installed with appropriate regard to land use. Topsoil will not be used as bedding material. Topsoil will only be reinstated after the excavated spoil has been backfilled and compacted. Compaction is to be completed prior to spreading topsoil. Erosion berms will be constructed across the ROW on slopes to divert rainfall runoff away from the ROW and to discharge onto stabilised areas.
Monitoring and Auditing	<p>Monitoring and auditing will be conducted in accordance with Section 12.7 of this EMP. Inspections of the site for compliance will occur on a daily, weekly and monthly basis. Audits will be conducted throughout the project to monitor against this EMP and other licence conditions.</p> <p>The ROW will be regularly inspected to assess the effectiveness of protection measures with particular attention to areas such as soils management and trench compaction.</p>
Reporting and Corrective Action	<ul style="list-style-type: none"> Recommendations and corrective actions arising from audits and reviews will be implemented. Routine work reports will be recorded and reviewed by each supervisor/manager. Non-compliances, environmental incidents and their corrective actions will be managed through the IMS and reported to the appropriate authority as required. Reporting will occur on an incident, weekly and monthly basis to the appropriate Environmental Manager. Landholder complaints will be recorded and appropriate corrective actions implemented and closed out by the appropriate Environmental Manager.

12.16.6 Hydrotesting

Element/Issue	Hydrotesting
Operational Policy or Management Objective	To protect the quality of local land and water resources during pipeline hydrotesting.
Performance Criteria	<ul style="list-style-type: none"> Appropriate permits obtained prior to drawing water. No existing water sources unsustainably depleted to provide hydrotesting water. No adverse impacts on soil or surface water as the result of discharging hydrotesting water.
Implementation	<ul style="list-style-type: none"> Relevant permits to draw water obtained.

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Element/Issue	Hydrotesting
Strategy	<ul style="list-style-type: none"> Hydrotest water will be re-used on multiple and adjacent pipeline sections as much as possible to reduce actual volumes used. Pipe sections crossing water bodies will be tested prior to installation. Inspection of all pipeline section welds, or hydrotesting of pipeline sections before installation under water bodies, will be performed in accordance with construction specifications/procedures. Biocides, where required, will be biodegradable. Where biocides are added, discharge water will be aerated. Prior to discharge, the contractor will determine whether testing of the hydrotest water is necessary and submit a plan for review to GLNG. Where the water source and water quality is known, and no chemicals have been added, water quality testing may not be required. Hydrotest water will be treated as necessary and then disposed of such that it does not enter into any watercourses or run in an uncontrolled manner onto open land. Where water cannot be discharged to ground, other options will be considered to ensure compliance with all regulations. Discharge of hydrotesting water will comply with all regulatory and landholder requirements.
Monitoring and Auditing	Inspections of hydrotesting water source against requirements of relevant permits and discharge locations will be conducted in accordance with Section 12.7 of this EMP.
Reporting and Corrective Action	<ul style="list-style-type: none"> Reporting of environmental performance data will be conducted in accordance with 12.8 of this EMP. Reporting, investigation and management of corrective actions associated with environmental events (including incidents, hazards, near misses, non-compliance vents and third party complaints) will be managed through the IMS and reported to the appropriate authority as required. Reporting will occur on an incident, weekly and monthly basis to the appropriate Environmental Manager. Landholder complaints will be recorded in a complaints register (that forms part of the EHSMS) and appropriate corrective actions will be implemented and closed out by the appropriate Environmental Manager.

12.16.7 Rehabilitation

Element/Issue	Rehabilitation
Operational Policy or Management Objective	To restore the ROW to be compatible with the surrounding conditions and pre-construction land use and compatible with the pipeline's operation.
Performance Criteria	<ul style="list-style-type: none"> No new weed species introduced. Revegetation re-established similar to surrounding condition. No significant change in drainage pattern. ROW stabilised with no significant erosion events. Reinstated drainage patterns.
Implementation Strategy	<ul style="list-style-type: none"> Rehabilitation of disturbed areas will be undertaken progressively as works progress. Subsoil will be respread and compacted over the trench, with crown development, and used for the construction of contour banks on steep slopes and above banks at water crossings. Areas of the ROW will be deep ripped prior to topsoil spreading in consultation with the landholder. The ROW will be re-profiled to original or stable contours, re-establishing surface drainage lines and other land features. Topsoil application will only take place after subsoil respreading and compaction and will be evenly spread and left with a slightly rough surface.

Element/Issue	Rehabilitation
	<ul style="list-style-type: none"> • Driving vehicles on freshly topsoiled ROW will be prohibited. • Subsoil displaced by the pipe, and not utilised in backfill, may be stockpiled in locations approved by the landholder for use during operations. • Imported topsoil, of an appropriate quality and weed free, may be required for ROW repairs, and will only be used with landholder approval. • Flagging used to identify clearing boundaries and sensitive features will be removed. • Erosion and sediment control measures will be installed. Existing soil erosion measures will be reinstated to a condition at least equal to the pre-existing state. • Cleared native vegetation will be respread over the ROW to assist in the distribution of seed stock and provide shelter for fauna. Distribution of vegetation will be controlled to ensure that any erosion or subsidence that may occur will not be hidden from view during subsequent monitoring inspections. • Native groundcover and shrubs will be encouraged to revegetate to minimise habitat barrier effects in significant habitat areas. • Trees will be permitted to grow in proximity to the pipeline only when pipeline integrity is not affected. • Environmental features such as rocks and dead timber will be replaced in the ROW where appropriate. • If revegetation is proposed, it will take place as soon as practicable after topsoiling. • A reseeding plan based on soil types, existing local vegetation characteristics and landholder preferences will be developed. • Seeding will be utilised in areas where rapid restoration is required e.g. watercourse crossings and areas of high erosion potential. • Where disturbed areas are to be re-planted or reseeded, preference will be given to local native species. However, non-native and non-invasive grass seed stock may be used where approved by the landholders to provide environmentally acceptable short term surface stability. • Trees and shrubs will be allowed to regenerate naturally on cleared areas not required to be kept tree free for pipeline protection and maintenance. • In areas proposed for revegetation, seed will be evenly dispersed over the entire disturbed area. • Fertilisers and soil supplements will be used only as necessary with the agreement of landholders and authorities. • Permanent pipeline warning signs will be erected along the easement. • All waste materials and equipment will be removed from the ROW once backfilling and tie-ins are completed. • Temporary access roads will be closed and rehabilitated to a condition compatible with the surrounding land use or as agreed with the landholder. • Where access routes are to be retained, but are not public access, the entry will be disguised (e.g. by dog-legging, brush spreading). • Disused silt fences will be removed. • Fences or other barriers will be installed where appropriate and where approved by the landholder to minimise unauthorised access.
Monitoring and Auditing	<p>Monitoring and auditing of rehabilitation will be conducted in accordance with Section 12.7 of this EMP.</p> <p>A photo record will be preserved before work commences for use during rehabilitation. Regular inspections will be undertaken during construction to monitor for trench subsidence, presence of weeds, revegetation success and stability of the ROW.</p> <p>Until regrowth is established, significant areas (e.g. riparian zones) and any seeded areas will be monitored regularly to ensure adequate growth and if necessary appropriate reapplication of seed will be carried out.</p> <p>The success of restoration will be assessed by comparing the percentage cover and species diversity on the ROW with that of adjoining land.</p> <p>Monitoring will also include an assessment of the effectiveness of weed control measures.</p>

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Element/Issue	Rehabilitation
Reporting and Corrective Action	<ul style="list-style-type: none"> Reporting of environmental performance data will be conducted in accordance with Section 12.8 of this EMP. Reporting, investigation and management of corrective actions associated with environmental events (including incidents, hazards, near misses, non-compliance vents and third party complaints) will be managed through the IMS and reported to the appropriate authority as required. Reporting will occur on an incident, weekly and monthly basis to the appropriate Environmental Manager. Any sites not displaying stability (after 12 months) will undergo additional rehabilitation using a method approved by the relevant authority or landholder. Landholder complaints will be recorded in a complaints register (that forms part of the EHSMS) and appropriate corrective actions will be implemented and closed out by the appropriate Environmental Manager.

12.16.8 Terrestrial Flora and Fauna Management

Element/Issue	Terrestrial Flora and Fauna Management
Operational Policy or Management Objective	To minimise and manage impacts to the ecological values of the gas transmission pipeline project area and to rehabilitate disturbed areas to as close as practical to the pre-construction condition.
Performance Criteria	<ul style="list-style-type: none"> Minimal disturbance of terrestrial flora and fauna during construction of the pipeline, associated tracks, services and accommodation facilities. No unplanned or unapproved damage to flora and fauna. No overall net loss of threatened species or communities. Restoration of disturbed areas to as close as practical to the pre-construction condition.
Implementation Strategy	<p>Planning</p> <ul style="list-style-type: none"> The route has been selected to avoid disturbance to endangered, vulnerable and rare (EVR) flora species as far as possible and to minimise fragmentation and habitat disturbance of protected fauna species. A significant species management plan will be developed prior to the disturbance of any EVR species. Specific measures will be included in the plan for the mitigation of any disturbed <i>Cycas megacarpa</i> including potential options for propagation or translocation. The sites of accommodation facilities, additional work areas, storage areas and access roads will be selected to avoid clearing of significant remnant vegetation. A pre-construction vegetation survey will be completed in targeted areas of the ROW to identify for flagging individual EVR species and trees that contain hollows that may be avoided during construction. Appropriate permits for the clearing of vegetation, including any marine vegetation, will be obtained prior to the commencement of construction. The location of vegetation to be retained will be clearly indicated on all construction drawings. Flagging of clearing boundaries though areas of significant vegetation will be completed during the pre-construction pegging of the pipeline alignment. Construction will be scheduled for the dry season wherever possible. Where avoidance is not possible, the loss of EVR environmental values will be offset in accordance with the requirement of the biodiversity offset strategy. Ensure that professionals are engaged to undertake specialist environmental investigations. Surveys will be undertaken for nesting sites for Fitzroy River turtle (<i>Rheodytes leukops</i>) at any major waterways where the species is considered potentially present. A program to implement offsetting of cleared vegetation communities will be undertaken as required in accordance with legislative criteria for the offsetting of

Element/Issue	Terrestrial Flora and Fauna Management
	<p>significant vegetation communities. A biodiversity offset strategy and management plan will be developed.</p> <p>Construction</p> <ul style="list-style-type: none"> • Disturbance will generally be restricted to the 40 m ROW which will be reduced to 30 m within areas wherever 'Endangered' or 'Of concern' REs are present. • Access tracks, laydown areas and other associated clearing will be placed outside of significant RE areas. • Physical barriers will be installed around significant vegetation areas in order to restrict access and avoid disturbance. • Trenching will occur progressively to minimise the length of time the trench is open. • Clearing of hollow bearing trees will be avoided as far as possible. • Areas of vegetation to be cleared will be restricted to the minimum width required. Areas to be cleared will be clearly delineated, prior to commencement. Clearing of all remnant regional ecosystems will be avoided where possible. • Clearing and disturbance in riparian and marine areas will be minimised to that necessary to safely construct the pipelines and meet other environmental requirements (e.g. separation of stock piles, erosion control) and will be controlled by: <ul style="list-style-type: none"> – education of all personnel on procedures for working in these environments; – reviewing and accepting detailed procedures to be submitted prior to commencing these activities; and – continuous monitoring of these sensitive operations to ensure compliance with the procedures. • Removed vegetation will be respread over the ROW. • Where roads traverse suitable koala habitat (RE12.33), fence design will incorporate the need to allow movement of koalas and other fauna species. • A biodiversity offset strategy and management plan will be developed and implemented for significant vegetation communities over an appropriate time frame to accomplish the following specific aims: <ul style="list-style-type: none"> – Identification of suitable potential offset areas with ecological values analogous to impacted ecological communities; – Assessment of the ecological value and equivalence of offsets to ensure suitable offset extent, species assemblage, floristic structure and ecological integrity utilising an appropriate biometric field methodology; – Development of appropriate management prescriptions to ensure long term viability of offsets (such as pest control, livestock management, access exclusion, ameliorative plantings and fire regime management); – Placement of appropriate covenants for future conservation and management of offsets; – Development of appropriate monitoring and maintenance activities and performance review processes to ensure long term viability of the offsets; and – The process of developing a suitable biodiversity offset management plan will be an iterative process with State and Commonwealth regulatory bodies. • Trees and shrubs will be allowed to regenerate naturally on cleared areas not required to be kept clear for pipeline protection and maintenance (subject to landholder agreement). • Fauna escape ramps or ladders and water-soaked, sawdust filled hessian sacks (used to support pipes prior to lay-in) will be placed at regular intervals along the open trench. • Where habitat is to be cleared, appropriate mitigation measures will be implemented including adopting a protocol to ensure fauna spotters are present during clearing of woodland vegetation and any other areas of faunal habitat. • Liaison with wildlife rescue organisations or individuals. • Minimise speed limits in high-potential areas for faunal impact. • Cleared native vegetation and timber will be respread over the ROW to aid regeneration and provide fauna habitat (subject to landholder agreement).

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Element/Issue	Terrestrial Flora and Fauna Management
	<ul style="list-style-type: none"> Timber should be stacked in piles to provide fauna habitat and assist revegetation (subject to landholder agreement). A “no burning” policy will be implemented.
Monitoring and Auditing	<p>Monitoring and auditing will be conducted in accordance with Section 12.7 of this EMP. The entire length of the ROW will be regularly inspected to assess the effectiveness of protection measures, with particular attention to management of flora and fauna protection and clearing boundaries.</p> <p>Ongoing monitoring will be undertaken to assess the success and integrity of construction and rehabilitation measures and ensure appropriate follow-up rehabilitation measures are implemented.</p>
Reporting and Corrective Action	<ul style="list-style-type: none"> Reporting of environmental performance data will be conducted in accordance with Section 12.8 of this EMP. Reporting, investigation and management of corrective actions associated with environmental events (including incidents, hazards, near misses, non-compliance vents and third party complaints) will be managed through the IMS and reported to the appropriate authority as required. Reporting will occur on an incident, weekly and monthly basis to the appropriate Environmental Manager. Landholder complaints will be recorded in a complaints register (that forms part of the EHSMS) and appropriate corrective actions will be implemented and closed out by the appropriate Environmental Manager.

12.16.9 Marine Flora and Fauna Management

Element/Issue	Marine Flora and Fauna Management
Operational Policy or Management Objective	To limit impacts to the marine flora and fauna as a result of the GLNG project activities to those areas directly affected.
Performance criteria	<ul style="list-style-type: none"> No unplanned or unapproved damage to marine flora and fauna. Restoration of disturbed areas to equivalent of surrounding area after construction.
Implementation Strategy	<p>Strategies outlined below will be implemented to meet the proposed performance criteria for marine flora and fauna:</p> <ul style="list-style-type: none"> Implement a training programme for dredger crew to be able to identify large aquatic fauna. Designation of a buffer zone around the dredger when the protection strategy will be applied if large aquatic fauna is sighted within the buffer. Maintain a lookout for Dugongs, turtles, marine mammals and other large fish whilst dredging and sailing between the dredge area and the dredge material placement facility. Apply turtle exclusion devices to the draghead of the dredger if the water depths are sufficient that it is safe to do so. Where possible use water jets on the draghead to guide turtles away from the dredger prior to suction starting. As this measure would cause additional losses of suspended sediment into the water column it should only be used if the risk to turtles is considered to be greater than the risk to water quality i.e. if turtles are present in the buffer zone then a temporary reduction in water quality may be considered acceptable. Lighting for GLNG Project related activities will comply with the Occupational Health and Safety (OSH) guidelines to minimise where practicable light spill on marine fauna. GLNG Project related vessels will abide by the Port of Gladstone speed restrictions and exclusion zones. GLNG Project related vessels will be aware of marine mammals in Port Curtis. A risk assessment of potential marine pest introductions will be carried out for each proposed GLNG Project related vessel:

Element/Issue	Marine Flora and Fauna Management
	<ul style="list-style-type: none"> – For GLNG Project vessels that are considered high risk, inspections of the hulls and/or hoppers may be carried out, and, for overseas vessels, preferably before they depart for Australian waters. • Santos will promote that all chartered vessels adhere to the International Maritime Organisation’s voluntary ballast water management guidelines. • Undertake targeted surveys in any mangrove / or intertidal habitat to be directly disturbed by proposed construction. Trapping will be conducted so as to coincide with tidal events where high tide is in a later part of the afternoon to allow for an extended trapping time during the nocturnal period, prior to incoming tide necessitating trap removal. • Provide training for staff regarding the sensitivity of wetland ecosystems: <ul style="list-style-type: none"> – Interpretive signage will be used to notify construction staff of the reasons why trespassing on these ecosystems is prohibited and the impacts this might have. – Fences will be erected around ecologically sensitive areas to visually and physically enforce the need for avoidance of disturbance to these areas. • A total ban on fishing, crabbing activities on all GLNG project related personnel and contractors in the area from Hamilton Point to the start of the protected area, near Grahams Creek. • Appointment of a Fisheries Liaison Officer: <ul style="list-style-type: none"> – Pre-dredging communication with fishing industry to identify and locations or periods of particular importance of sensitivity. – Planning of dredging to reduce impacts at those locations or during those times, if it is reasonable and practical to do so.
Monitoring and Auditing	<p>Monitoring and auditing will be conducted in accordance with section 12.7 of this EMP. The following records will be maintained.</p> <ul style="list-style-type: none"> • Records of quarantine clearances and ballast water management will be maintained for ships servicing the GLNG Project. • Records of hull inspections of all high risk ships will be maintained. • The marine facilities’ marine monitoring program will include surveys for potential introduced marine pests.
Reporting and Corrective Action	<p>Reporting of environmental performance data will be conducted in accordance with Section 12.8 of this EMP.</p> <p>Reporting, investigation and management of corrective actions associated with environmental events (including incidents, hazards, near misses, non-compliance events and third party complaints) will be managed through the IMS.</p> <p>Any third party complaints will be recorded in the Santos complaints register (part of the EHSMS) and appropriate corrective actions will be implemented and closed out by the Project appropriate Environmental Manager.</p> <p>The Project appropriate Environmental Manager will report any incidents of marine flora disturbance to the Construction Manager, or the Project Manager and appropriate regulatory body as necessary.</p> <p>The following constitute an incident or failure to comply in regard to marine flora management:</p> <ul style="list-style-type: none"> • Unauthorised disturbance of marine vegetation outside the defined construction areas. • Unauthorised disturbance of marine habitat. <p>In the event of a failure to comply, investigations will be undertaken into the cause of the incident or failure to comply and the appropriate corrective actions taken to overcome the problem and prevent recurrence</p>

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12.16.10 Mosquito and Biting Midge Management

Element/Issue	Mosquito and Biting Midge Management
Operational Policy or Management Objective	To prevent the occurrence of potential mosquito and biting midge breeding sites and the presence of adult mosquitoes and biting midges.
Performance criteria	<ul style="list-style-type: none"> No unnecessary exposed bodies of water on the project which can promote mosquito and midge breeding sites.
Implementation Strategy	<ul style="list-style-type: none"> Depressions in the ground surface (such as wheel ruts) will be filled as soon as practicable to prevent the ponding of water. Pools of stagnant water will be drained and/or the depressions filled. Storage containers capable of ponding water will be either discarded after use or stored in an inverted position (care will be taken to ensure that ponding does not occur in waste storage areas). Erosion and washdown practices will be controlled to prevent the formation of standing water pools in natural water courses adjacent to the sites. Staff will be trained to recognise mosquito and biting midge breeding activity and the treatment of breeding sites. An assessment of work areas will be undertaken prior to works and on an ongoing informal basis to identify potential breeding sites. Workforce accommodation facilities to be fitted with protective barriers, such as fly screens and air conditioning. Insect repellent will be made available to GLNG personnel as required. Any required specific area control plans based on assessment of potential breeding sites will conform to the DERM's Mosquito Management Code of Practice for Queensland. Queensland Health and the relevant local councils will be contacted for assistance in choosing a suitable method of larviciding / eradication should this be necessary.
Monitoring and Auditing	<p>Monitoring and auditing of environmental performance will be conducted in compliance with Section 12.7 of this EMP.</p> <p>A record of periodic monitoring of ponding waters and rainwater tanks inspections for mosquitoes and biting midges will be maintained.</p> <p>Areas of ponding and pooled water that cannot be easily removed or backfilled will be inspected regularly for presence of larvae.</p>
Reporting and Corrective Action	<ul style="list-style-type: none"> Reporting of environmental performance data will be conducted in accordance with Section 12.8 of this EMP. Reporting, investigation and management of corrective actions associated with environmental events (including incidents, hazards, near misses, non-compliance vents and third party complaints) will be managed through the IMS and reported to the appropriate authority as required. Reporting will occur on an incident, weekly and monthly basis to the appropriate Environmental Manager. Landholder complaints will be recorded in a complaints register (that forms part of the EHSMS) and appropriate corrective actions will be implemented and closed out by the appropriate Environmental Manager.

12.16.11 Weed Management

Element/Issue	Weed Management
Operational Policy or Management Objective	To prevent the introduction and spread of weed species in association with the construction and operation of the pipeline.

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Element/Issue	Weed Management
Performance Criteria	<ul style="list-style-type: none"> • No new weed infestation in the ROW as a result of construction or operational activities. • No spread of weeds from infested areas to previously weed-free areas. • ROW restored to a state that minimises the potential for weed colonisation of disturbed areas.
Implementation Strategy	<p>As further investigations and planning have occurred, the following commitments are proposed to supersede the previously listed ones:</p> <ul style="list-style-type: none"> • A weed management plan will be prepared in accordance with: <ul style="list-style-type: none"> – Each of the respective Regional Council's weed and pest animal management plans; – The <i>Land Protection (Pest and Stock Route Management) Act 2002</i>, which governs actions with respect to the control and management of declared plants and animals in the state; – The requirements of relevant weed management officers of the Department of Employment, Economic Development and Innovations (DEEDI) (formally Primary Industries and Fisheries) and the relevant local councils; – Biosecurity Queensland's Annual Pest Distribution Survey 2008 data and predictive pest maps available on the DEEDI website: http://www.dpi.qln.gov.au/cps/rde/dpi/hs.xsl/4790_9827_ENA_HTML.htm; and – Queensland Herbarium naturalised flora data. • Control programs shall be prioritised to high risk areas adjacent to land of conservation significance. • Following rehabilitation, weed survey and control will be incorporated into the monitoring plan. • Weed inspection of the ROW will be completed prior to construction and the location of declared plants and other weeds recorded. <p>The weed control program will consist of the following strategies:</p> <ul style="list-style-type: none"> – Vehicle and equipment washdowns; – Record keeping; – Close monitoring; – Spraying; – Vehicle stickers; – Training; and – Management of vehicle movements. <p>Vehicle and Equipment Washdowns</p> <ul style="list-style-type: none"> • All vehicles, plant, portable infrastructure (including trailers, generators, workshop and accommodation huts etc) and equipment must be cleaned and certified as clean prior to entering and leaving the project area and a Weed Declaration Hygiene Form must be completed. • Weed zones will be identified along the pipeline defining whether weeds are present or not on that property and the zones will be numbered sequentially along the line. • When moving from a dirty zone to a clean zone, the vehicle must be cleaned down and certified at the designated washbay by an authorised Weed Inspector and recorded in the Washdown register at the facility and in the vehicle log. • Washdown facilities will be established in accordance with DEEDI (previously DPI&F) and local government standards and washdown will be supervised by trained personnel. • Cleaning procedures will be as per the standards of DEEDI (previously DPI&F) and thorough to remove all soil and organic matter from the surfaces of vehicles, equipment and portable infrastructure, including the undercarriage. Personnel will also ensure all soil and organic matter is removed from clothing and footwear. • All approved weed washdown facilities will be marked on project maps and clearly

Element/Issue	Weed Management
	<p>signed on the project area.</p> <p>Record keeping</p> <p>All washdowns are to be recorded in the facility washdown register and the vehicle washdown log.</p> <p>The register and log will contain information including: date, time, location, vehicle type, rego, individual name, zone travelling from, zone travelling to, sticker number, certifiers' signature.</p> <p>Close Monitoring</p> <ul style="list-style-type: none"> • Audits will be conducted of the washdown registers, vehicle logs and sticker numbers to ensure compliance. • Project area will be regularly inspected to ensure that there is no mature weed plants (in flower or in seed) present on site. • Following restoration, weed survey and control will be incorporated into the monitoring plan. <p>Spraying</p> <ul style="list-style-type: none"> • Weed control of the ROW, access tracks and project area will be undertaken prior to and regularly during and after construction. • Spraying will be conducted by a licensed contractor authorised to do so. • GLNG must be notified prior to spraying occurs. • Landholders will be notified prior to spraying and information such as chemical, location, amount, time, weather etc will be available if required. <p>Vehicle Stickers</p> <ul style="list-style-type: none"> • Stickers will be used to identify which zone the vehicle is authorised to be in. • Stickers will be numbered and only administered by the Weed Inspector. • As a vehicle passes into a new zone (clean or dirty), a new sticker must be administered. <p>Training</p> <ul style="list-style-type: none"> • All personnel working on the pipeline shall receive at minimum the training as outlined: <ul style="list-style-type: none"> – Basic identifying features of declared weeds including the major weed species posing as a threat within and to the area; – Weed reporting procedures; – Weed risk assessment forms and vehicle washdown requirements; – Completion of the DEEDI Weed Hygiene Declaration and vehicle/machinery inspection report; – Explanation of any quarantine zones and relevant procedures for decontamination that apply; and – Procedures outlined within this EMP and the CEMP. <p>Management of Vehicle Movements</p> <ul style="list-style-type: none"> • Access roads to the ROW will be defined to minimise the potential for the spread of weed species and protocols established for washdown of vehicles travelling along the ROW. • Project vehicles will not be permitted to travel off the ROW or approved access tracks to minimise the possible distribution of weeds. • Imported material shall be obtained from weed free areas. A weed hygiene declaration form will be obtained from all suppliers of gravel, sand, soil, mulch, packing material, machinery, vehicles, water and any other potentially contaminated products, to certify the product is weed/contaminant free. • Quarantine zones will be established if a declared or important weed is detected in the ROW and movement of plant and vehicles represent a risk of spreading a serious weed infestation.

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Element/Issue	Weed Management
	<ul style="list-style-type: none"> Topsoil and vegetation material will be respread in the immediate vicinity of the area of origin to limit the potential spread of weeds and pathogens.
Monitoring and Auditing	<p>Monitoring and auditing will be conducted in accordance with Section 12.7.</p> <p>A pre-construction weed survey of the ROW will be undertaken and all identified areas of weed occurrence identified.</p> <p>The ROW, work areas and access tracks will be regularly inspected by qualified personnel to assess the effectiveness of protection measures with particular attention to access to and travel along the ROW, washdown activities and records and restoration activities.</p>
Reporting and Corrective Action	<ul style="list-style-type: none"> Reporting of environmental performance data will be conducted in accordance with Section 12.8 of this EMP. Reporting, investigation and management of corrective actions associated with environmental events (including incidents, hazards, near misses, non-compliance vents and third party complaints) will be managed through the IMS and reported to the appropriate authority as required. Reporting will occur on an incident, weekly and monthly basis to the appropriate Environmental Manager. Landholder complaints will be recorded in a complaints register (that forms part of the EHSMS) and appropriate corrective actions will be implemented and closed out by the appropriate Environmental Manager. If weeds are identified in areas previously without weeds, control measures will be undertaken as soon as possible in order to remedy and control and included in the Weed Management Plan.

12.16.12 Water Management

Element/Issue	Water Management
Operational Policy or Management Objective	To minimise the potential impacts associated with erosion, prevent the release of contaminants that may adversely affect downstream surface water quality, and protect the quality of the existing groundwater resources.
Performance Criteria	<ul style="list-style-type: none"> Prevention of direct or indirect release of contaminants to surface waters. Minimisation of incidences of accelerated erosion as a result of construction activities. Groundwater quality will not be impacted by development activities. Spill containment facilities constructed in accordance with AS 1940 (2004) and AS 3780 (1994). Environmental impacts are within authorised limits.
Implementation Strategy	<p>Planning</p> <ul style="list-style-type: none"> Watercourse crossing points will be selected to, where practicable: <ul style="list-style-type: none"> Minimise the extent of clearing of riparian vegetation. Avoid unstable and/or steep incised banks. Avoid bends in the channel and confluence with other channels. Avoid permanent and semi-permanent waterholes, and artesian springs. Detailed watercourse crossing plans will be prepared once the crossing methodology has been selected. Findings of engineering and geotechnical studies will be utilised in the design of crossings to ensure that the hydrological flow regimes are maintained. Horizontal directional drilling (HDD) will be used on selected watercourses, where practicable, taking into account environmental, engineering, logistical and geotechnical issues and advice from the drilling operator. Where HDD techniques are used, drilling mud will be treated as a hazardous substance and treated appropriately. Potential escape of drilling mud will be minimised by careful geotechnical investigation prior to drilling to ensure that geological fractures are avoided. Relevant approvals and permits will be obtained for crossings prior to construction.

Element/Issue	Water Management
	<ul style="list-style-type: none"> • Crossings will, where practicable, be constructed in no-flow or low-flow conditions, and rehabilitation completed prior to the next wet season. • The crossings will typically be at right angles to the direction of water flow to minimise scour potential. • The disturbance corridor for the bed, bank and approaches to watercourses will be the narrowest practicable for safe construction. • Additional work areas may be required at crossing locations for equipment operation and stockpiling of excavated material. These will be located outside the riparian area. <p>Construction</p> <ul style="list-style-type: none"> • No refuelling of plant, equipment or vehicles will occur within 50 m of any watercourse. • All construction vehicles shall carry spill clean-up kits, commensurate with the size and type of vehicle. • Regional weather conditions and river flow levels will be monitored during construction to pre-empt changes in weather patterns and flow regimes to minimise impacts associated with wet weather. • Storage and loading/decanting areas for fuels and chemicals will be bunded and located outside the floodplain of the stream channels (i.e. approximately 50 m away from the top bank). • The staging areas will be limited to the narrowest area feasible and located outside the stream channel and riparian area. • Large mature trees will be retained where practicable and trees will be trimmed in preference to removal to retain the root stock for stabilisation of the banks. • Clearing of the slopes leading to the watercourses will be delayed until the construction of the crossing is imminent. Where this is not possible, other soil protection measures will be applied. • All stockpiles (vegetation, watercourse bed material, watercourse bank material) will be stockpiled and stored separately in areas above the top of the bank and outside the riparian area where it will not be buried or damaged (i.e. free from traffic). • Stream bed material consisting of rocks, pebbles or coarse gravel overlaying finer material will be stockpiled separately for replacement during restoration. • Silt fences will be located on the lower side of topsoil and bed and bank stockpiles and installed between the watercourse and the construction area to minimise sediment releases. • Soils will be graded away from the watercourse, not towards it. • Sediment and erosion control measures will be installed as required on watercourse approaches and banks to prevent any runoff from entering watercourses. • Diversion banks will be used at the crest of, and on the slopes of, approaches to stream crossings to divert sheet flow away from backfilled trenches. • Each diversion bank will have a stabilised outlet to safely disperse channelised flows. • Watercourse crossings will be rapidly stabilised following construction. • The bed and bank of watercourses will be restored as near as practical to the original profile and banks compacted to ensure stability. • Topsoil will be respread over the area from where it was removed. • Where required, sandbags, gabion or other scour protection measures will be installed, ensuring these are placed to conform as far as possible with existing natural contours. • Where required and agreed by landholders, access to the crossings will be restricted (i.e. by fencing or barriers). • Where required, terracing or surface water diversion berms will be placed along the top and intermediate points down the bank slope to encourage runoff to discharge on to stable (i.e. vegetated) areas or via sediment settling basins and not directly to the watercourse. • Silt and sediment fences will be installed on slopes where appropriate to filter surface runoff water even if the watercourse is dry. • Watercourses will be stabilised (e.g. rock gabion, jute matting) as required.

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Element/Issue	Water Management
	<ul style="list-style-type: none"> All flammable and combustible liquids and dangerous goods will be stored, handled, used and transported in accordance with relevant Australian and Santos standards. Hydrocarbon spillage from storage areas, diesel and chemical spills from construction equipment, and industrial waste spill will be contained, reported, and treated/remediated in accordance with appropriate legislative and regulatory agency requirements. Drainage will be reinstated. Wastewater from construction, cleaning and testing operations will be treated and managed in accordance with the relevant environmental authorities. Treated sewage effluent will generally be disposed of by irrigation. Sensitive areas will be avoided as will soil erosion and soil structure damage. There will be no discharge of treated effluent from wet weather storage to any waters. Management of hydrotest water will be in accordance with the environmental authority. A water supply strategy will be developed for the provision of water for the pipeline's construction. All necessary approvals will be sought from the relevant authorities. Contractors and suppliers shall source water for the workforce accommodation camps only from authorised sources of water.
Monitoring and Auditing	<p>Monitoring and auditing will be conducted in accordance with Section 12.7 in this EMP and licence conditions.</p> <p>Watercourse crossings will be regularly inspected to assess the effectiveness of protection measures with particular attention to clearing of riparian area, location of work activities with respect to watercourses, timing of construction of crossings and restoration activities.</p> <p>Erosion control and sediment collection devices will be inspected regularly, particularly following heavy rain.</p> <p>Monitoring of water quality during crossing construction upstream and downstream of the construction area on wet crossings will include:</p> <ul style="list-style-type: none"> Observation of sediment plumes and surface sheen; and Measurement of turbidity, suspended solids, pH and dissolved oxygen. <p>Monitoring of the watercourses post-construction will be carried out to ensure that rehabilitation works and stability of the watercourses is at least equal to the pre-construction condition.</p>
Reporting and Corrective Action	<ul style="list-style-type: none"> Reporting of environmental performance data will be conducted in accordance with Section 12.8 of this EMP. Reporting, investigation and management of corrective actions associated with environmental events (including incidents, hazards, near misses, non-compliance vents and third party complaints) will be managed through the IMS and reported to the appropriate authority as required. Reporting will occur on an incident, weekly and monthly basis to the appropriate Environmental Manager. Landholder complaints will be recorded in a complaints register (that forms part of the EHSMS) and appropriate corrective actions will be implemented and closed out by the appropriate Environmental Manager.

12.16.13 Soil Management

Element/Issue	Soil Management
Operational Policy or Management Objective	<p>To appropriately minimise and manage adverse impacts to soils by:</p> <ul style="list-style-type: none"> Limiting the occurrence and extent of trench subsidence and soil erosion. Preventing soil inversion. Developing a stable, vegetated ROW post-construction.
Performance Criteria	<ul style="list-style-type: none"> Erosion controlled and limited to that consistent with "natural processes" such that pipeline cover is maintained and land capacity is not reduced. All erosion control strategies implemented and functional. All topsoil stockpiled separately and no spoil piles remain on surface after restoration.

Element/Issue	Soil Management
Implementation Strategy	<ul style="list-style-type: none"> • All access contained to designated areas. <p>Topsoil and Subsoil</p> <ul style="list-style-type: none"> • Where present, topsoil will be stripped across the ROW and trench for re-use. • Topsoil and subsoil will be stockpiled separately within the easement and all necessary measures will be taken to prevent contamination. • Stripped vegetation will be stockpiled separately from soil stockpiles. • Topsoil will be placed on the high side of the ROW on hills and slopes where practicable and safe to do so. • Stockpiles will not exceed 1.5 m in height and will have gaps for drainage and possible stock and wildlife movement. • Topsoil will not be used for backfill. • Where practicable, additional topsoil and subsoil from places where cut and fill is required will be stockpiled in a temporary work space, wherever possible, practicable or relevant. • Soil stockpiles near drainage lines will be bound with silt fencing on the down slope and placed at least 10 m away (where practicable) from banks. • Where strongly or very strongly sodic and/or dispersive materials are identified they will not be used for rehabilitation purposes. Suspected sodic or dispersive materials exposed as a result of site earthworks will be treated as appropriate. <p>Erosion</p> <ul style="list-style-type: none"> • Temporary and permanent erosion control banks will be installed across slopes and in the vicinity of drainage lines along the easement as necessary. • Permanent trench breakers will be placed at regular intervals along sloping trenches, at the bases of slopes, adjacent to water bodies and wetlands and at road crossings. • Location of trench breakers will be marked prior to backfilling. • Final diversion banks will be installed immediately down slope of the trench breaks so that seepage water will be diverted away from the easement. • Earth banks across entire disturbed width will be installed on slopes (depending on gradient and soil type) immediately following clear and grade. • Banks will be high enough to collect water but low enough to drive out safely. • Banks will be restored, if damaged, until permanent establishment (sandbags replaced regularly can be used as an alternative). • Water will be discharged down slope to undisturbed vegetation where practicable or into a silt fence. • Erosion control measures put in place prior to construction will be recontoured to the original conditions as soon as practicable following construction, in consultation with the landholder. <p>Acid Sulphate Soils (ASS)</p> <ul style="list-style-type: none"> • A targeted ASS survey will be completed where there is the potential to disturb potential ASS and the results will be considered in the design of the crossings. • Where identified, all areas of Actual ASS (AASS) or Potential ASS (PASS) will be clearly shown on construction plans. • If ASS is identified, site specific mitigation measures will be developed such as: <ul style="list-style-type: none"> – Minimising time the trench spoil is stockpiled. – Neutralising trench spoil with lime. – Containing runoff from stockpile areas in holding ponds or bunded areas. – Disposing of trench water only after analysis. – Burying of soil below the water table. – Compacting the backfill to prevent acid leach migration. • An ASS management plan will be developed to detail the specific measures to be implemented to manage ASS. <p>Land Contamination</p> <ul style="list-style-type: none"> • Consultation will continue with landholders prior to construction to determine whether

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Element/Issue	Soil Management
	<p>any potential areas of contamination are located within the ROW.</p> <ul style="list-style-type: none"> • A suitably qualified person will be onsite to identify any evidence of contamination in sections of the pipeline identified in the EIS Supplement to be proximal to areas of potential concern (AOPC). • Site-specific and contaminant-specific management measures will be developed for any areas that are not avoidable through realignment of the pipeline. • If suspect contamination is found during earthworks, work in that area will stop until a suitably qualified person has inspected the site, the hazard has been assessed and appropriate action has been taken. • DERM approval will be obtained if contaminated material must be removed from the work area. • All personnel will be made aware of potential contamination issues during induction training.
Monitoring and Auditing	<p>Monitoring and auditing will be conducted in accordance with Section 12.7 of this EMP and licence conditions.</p> <p>Erosion and sediment controls will be inspected before and after rain events to ensure functionality.</p> <p>Inspections of the site for compliance will occur on a daily, weekly and monthly basis.</p> <p>Audits will be conducted throughout the project to monitor against this EMP and other licence conditions.</p> <p>The entire length of the ROW will be regularly inspected to assess the effectiveness of protection measures with particular attention to management of soil and spoil stockpiles, erosion control devices and the effectiveness of control measures following rainfall.</p>
Reporting and Corrective Action	<ul style="list-style-type: none"> • Reporting of environmental performance data will be conducted in accordance with Section 12.8 of this EMP. • Reporting, investigation and management of corrective actions associated with environmental events (including incidents, hazards, near misses, non-compliance vents and third party complaints) will be managed through the IMS and reported to the appropriate authority as required. • Reporting will occur on an incident, weekly and monthly basis to the appropriate Environmental Manager. • Landholder complaints will be recorded in a complaints register (that forms part of the EHSMS) and appropriate corrective actions will be implemented and closed out by the appropriate Environmental Manager.

12.16.14 Waste Management

Element/Issue	Waste Management
Operational Policy or Management Objective	To ensure that the transmission pipeline construction adheres to the waste management hierarchy of avoid, reuse, re-use and recycle. Where this is not possible, to dispose of waste in the most appropriate manner.
Performance Criteria	<ul style="list-style-type: none"> • No inappropriate disposal or management of waste. • No contamination of soil, air or water as a result of waste handling.
Implementation Strategy	<p>General</p> <ul style="list-style-type: none"> • Management strategies for specific waste streams will be developed prior to the activity commencing. • On completion of each section of pipeline, all waste material will be removed from the workplace. No wastes will be buried or disposed of on-site without local government and/or DERM approval. • The Construction Contractor will advise designated disposal areas for each section of the ROW. • General waste will be collected and transported generally to local council approved disposal sites.

Element/Issue	Waste Management
	<ul style="list-style-type: none"> • Food wastes will be collected, where practicable, considering health and hygiene issues, for disposal off-site. • Refuse containers will be located at each worksite. • Where practical, wastes will be segregated and reused / recycled (e.g. scrap metal). • All personnel will be instructed in project waste management practices and procedures as a component of the environmental induction process. • Suppliers will be requested to minimise packaging where practicable. • Emphasis will be placed on housekeeping and all work areas will be maintained in a neat and orderly manner. • All equipment and facilities will be maintained in a clean and safe condition. <p>Liquid Waste</p> <ul style="list-style-type: none"> • Wastewater from construction, cleaning and testing operations will be treated and managed in accordance with the relevant environmental authorities. • Sewage or grey water will either be collected for treatment and disposal off-site or treated via an on-site treatment system and disposed of to effluent absorption beds or irrigation fields, with treated sewage effluent generally to be disposed of by irrigation. • The treatment method will be selected in consultation with a relevant local authority and DERM and the relevant environmental authority obtained. • The plant and equipment used for sewage treatment or disposal will be installed, maintained and operated in a proper and efficient manner by a suitably qualified and experienced person. • Sewage effluent absorption beds and/or irrigation fields will be selected and designed to ensure that: <ul style="list-style-type: none"> – Sensitive areas are avoided; – Soil erosion and soil structure damage is avoided to the extent possible; – There is no ponding or runoff of effluent; – The receiving environment has the capacity to assimilate the contaminants; and – There will be no discharge of treated effluent from wet weather storage to any waters. <p>Hazardous Waste</p> <ul style="list-style-type: none"> • Chemical wastes will be collected in 200 litre drums (or similar sealed container) and appropriately labelled for safe transport to an approved chemical waste depot or collection by a liquid waste treatment service. • Storage, transport and handling of all chemicals will be conducted in accordance with all legislative requirements. • Containment bunds and/or sumps will be drained periodically to prevent overflow and subsequent pollution of the surrounding land and/or water body. • All hazardous wastes will be appropriately stored in bunded areas away from watercourses and in accordance with legislative requirements. • Hazardous wastes, such as solvents, rust proofing agents and primers will be managed in accordance with the requirements of relevant legislation and industry standards. • A hazardous materials inventory will be prepared. • Material Safety Data Sheets (MSDS) for hazardous materials will be available at all work sites. • Hydrocarbon wastes, including lube oils, will be collected for safe transport off-site for reuse, recycling, treatment or disposal at approved locations. • All regulated waste will be removed from site by a person who holds a current authority to transport such waste under the provisions of the EP Act and sent to a facility licensed to accept such waste. • If a hazardous contaminant is released to waters or land the following steps must be taken: <ul style="list-style-type: none"> – Take immediate action to stop any further release and make sure that the area is safe;

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Element/Issue	Waste Management
	<ul style="list-style-type: none"> – Take immediate action to contain the hazardous contaminant to the affected area, taking particular care to protect environmentally sensitive areas; – Restore or rehabilitate the environment to its condition before the release occurred; and take necessary action to prevent a recurrence of the release; and – Ensure that all health risks associated with the disposal and reuse of treated sewerage is mitigated through appropriate primary and secondary treatment.
Monitoring and Auditing	<p>Monitoring and auditing will be conducted in accordance with Section 12.7 of this EMP. Housekeeping checks will be undertaken to ensure waste is being stored correctly and that no littering is occurring.</p> <p>Inspections of the site for compliance will occur on a daily, weekly and monthly basis. Audits will be conducted throughout the project to monitor against this EMP and other licence conditions.</p> <p>Work and accommodation sites will be inspected after relocation to ensure that no waste material remains.</p> <p>The quality characteristics of treated effluent (if discharged to land) will be monitored in accordance with the environmental authority conditions.</p>
Reporting and Corrective Action	<p>Reporting of environmental performance data will be conducted in accordance with Section 12.8 of this EMP.</p> <p>Landholder complaints will be recorded in a complaints register (that forms part of the EHSMS) and appropriate corrective actions will be implemented and closed out by the appropriate Environmental Manager.</p> <p>An annual report will be provided to the administering authority with the annual return. This report shall provide all information as required by the licence conditions.</p>

12.16.15 Chemical and Dangerous Goods Management

Element/Issue	Chemical and Dangerous Goods Management
Operational Policy or Management Objective	To ensure that storage and handling of chemicals and dangerous goods does not cause environmental harm or harm to persons.
Performance Criteria	<ul style="list-style-type: none"> • No hazardous goods contamination of the environment. • Storage and handling procedures correct and appropriate. • Chemicals stored in secure areas.
Implementation Strategy	<ul style="list-style-type: none"> • Spill control procedures will be prepared and personnel trained. • Dangerous goods will be stored and handled as per the requirements of relevant Australian Standards. • Dangerous goods will, where appropriate (e.g. outside locations), be stored in bunded areas away from watercourses. • Explosives will be stored in magazines constructed and located as prescribed in AS 2187. • Material safety data sheets for chemicals and dangerous goods will be available on-site. • Waste dangerous goods, which cannot be recycled, will be transported to a designated disposal site as approved by the local authority. • Spills of dangerous goods will be rendered harmless and collected for treatment and disposal at a designated site, including cleaning materials, absorbents and contaminated soils. • Absorbent and containment material (e.g. absorbent matting) will be available where hazardous materials are used and stored and personnel trained in their correct use. • Protective clothing, appropriate to the materials in use, will be provided. • Relevant permits will be held and conditions of permits met.

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Element/Issue	Chemical and Dangerous Goods Management
Monitoring and Auditing	<p>Monitoring and auditing will be conducted in accordance with Section 12.7 of this EMP.</p> <p>Regular inspections to ensure that chemical storage facilities continue to meet Australian Standards.</p> <p>Audits will include inspection of dangerous goods storage areas.</p> <p>Inspections of the site for compliance (including to ensure that chemical storage facilities continue to meet Australian standards) will occur on a daily, weekly and monthly basis.</p> <p>Audits will be conducted throughout the project to monitor against this EMP and other licence conditions.</p>
Reporting and Corrective Action	<ul style="list-style-type: none"> Reporting of environmental performance data will be conducted in accordance with Section 12.8 of this EMP. Reporting, investigation and management of corrective actions associated with environmental events (including incidents, hazards, near misses, non-compliance vents and third party complaints) will be managed through the IMS and reported to the appropriate authority as required. Reporting will occur on an incident, weekly and monthly basis to the appropriate Environmental Manager. Landholder complaints will be recorded in a complaints register (that forms part of the EHSMS) and appropriate corrective actions will be implemented and closed out by the appropriate Environmental Manager.

12.16.16 Noise and Vibration

Element/Issue	Noise and Vibration
Operational Policy or Management Objective	<ul style="list-style-type: none"> To construct the pipeline in a manner to minimise the impact of construction related noise and vibrations on surrounding residences and industry.
Performance Criteria	<ul style="list-style-type: none"> No warranted complaints from residents and landholders, and warranted complained responded to within 2 working days. Compliance with licence conditions and industry standards. Noise mitigation measures will be implemented where required in accordance with AS 2436-1981 "Guide to Noise Control on Construction, Maintenance and Demolition Sites". Blasting activities will meet the applicable Australian Standards and statutory requirements.
Implementation Strategy	<ul style="list-style-type: none"> All activities will be conducted in accordance with licence conditions and industry standards. Where heavy rock-breaking and/or drilling and blasting is necessary for rock removal for pipeline trench excavation, the work will be carried out during normal daylight working hours to minimise the effects of noise impacts in built-up or established farming areas. In general, any blasting that may be required will be carried out in accordance with relevant guidelines and AS 2885. Adequate community consultation will be provided of any scheduled atypical noise events and protection of third party infrastructure. Where applicable, construction work during evening and night-time periods (6.30 pm to 6.30 am) and on Sundays/Public Holidays will be undertaken in accordance with "best practice" noise management. Any blasting will be carried out in accordance with relevant legislation. A blasting plan will be prepared prior to the commencement of any blasting activities, giving consideration of potential air blast pressure and vibration and will include mitigation measures. Construction equipment will be fitted with noise control devices.

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Element/Issue	Noise and Vibration
Monitoring and Auditing	<p>Construction equipment will be inspected regularly to maintain optimal working conditions. Throughout construction, the contractor's environmental representative will undertake regular environmental audits.</p> <p>Inspections of the site for compliance will occur on a daily, weekly and monthly basis.</p> <p>Audits will be conducted throughout the project to monitor against this EMP and other licence conditions.</p>
Reporting and Corrective Action	<ul style="list-style-type: none"> • Reporting of environmental performance data will be conducted in accordance with Section 12.8 of this EMP. • Reporting, investigation and management of corrective actions associated with environmental events (including incidents, hazards, near misses, non-compliance vents and third party complaints) will be managed through the IMS and reported to the appropriate authority as required. • Reporting will occur on an incident, weekly and monthly basis to the appropriate Environmental Manager. • Landholder complaints will be recorded in a complaints register (that forms part of the EHSMS) and appropriate corrective actions will be implemented and closed out by the appropriate Environmental Manager.

12.16.17 Air Quality

Element/Issue	Air Quality
Operational Policy or Management Objective	<ul style="list-style-type: none"> • To complete the installation of the pipelines in a manner that maintains ambient air quality within the local airshed.
Performance criteria	<ul style="list-style-type: none"> • No warranted complaints from landholders, and warranted complained responded to within 2 working days. • No excessive dust emissions during construction or operation of the pipeline. • No air quality-related complaints from neighbouring residential areas and industrial areas.
Implementation Strategy	<ul style="list-style-type: none"> • Consult with and advise any landholders with the potential to be impacted by temporary construction dust emissions prior the commencement of activities. • Vehicles and machinery will be fitted with appropriate exhaust systems and emission control devices. The devices will be maintained in good working. • Construction sites and access roads will be watered on an as required basis to minimise the potential for environmental nuisance due to dust. Watering frequency will be increased during periods of high risk (e.g. high winds). • The extent and period of exposure of bare surfaces will be minimised. • The disturbed corridor will be promptly restored following construction to stabilise the disturbed surface and limit the potential for dust generation. • Vehicles will be operated in a fuel efficient manner so as to minimise fuel consumption and vehicle emissions at all times. • Maintenance procedures during operations will ensure that the duration and frequency of venting of gas via the main release valves is minimised. • Timber should be stacked in piles to provide fauna habitat and assist revegetation (subject to landholder agreement).

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Element/Issue	Air Quality
Monitoring and Auditing	<p>All active and rehabilitated work areas will be regularly inspected to assess the effectiveness of dust mitigation measures.</p> <p>Regular visual monitoring of dust emissions will be conducted and watering frequency altered as required.</p> <p>When requested by an administering authority, dust and particulate monitoring will be undertaken within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer) of environmental nuisance at any sensitive place or commercial place.</p>
Reporting and Corrective Action	<ul style="list-style-type: none"> Reporting of environmental performance data will be conducted in accordance with Section 12.8 of this EMP. Reporting, investigation and management of corrective actions associated with environmental events (including incidents, hazards, near misses, non-compliance vents and third party complaints) will be managed through the IMS and reported to the appropriate authority as required. Reporting will occur on an incident, weekly and monthly basis to the appropriate Environmental Manager. Landholder complaints will be recorded in a complaints register (that forms part of the EHSMS) and appropriate corrective actions will be implemented and closed out by the appropriate Environmental Manager.

12.16.18 Transport and Traffic Management

Element/Issue	Transport and Traffic Management
Operational Policy or Management Objective	To minimise any potential impacts associated with traffic generated by construction traffic.
Performance Criteria	No serious traffic-related complaints and incidents.
Implementation Strategy	<ul style="list-style-type: none"> All heavy vehicles travelling to and from the construction areas will follow dedicated heavy vehicle routes to avoid built-up areas wherever possible. Access to and from the ROW will be via designated routes. No vehicles associated with pipeline activities will be driven on unauthorised land. Use of carpooling and bus services will be implemented where practicable to minimise worker trips during construction. Where practicable, truck deliveries will be restricted to daytime working hours. Dangerous goods will be transported along preferred dangerous goods routes in accordance with the Australian Code for the Transport of Dangerous Goods by Road and Rail and in accordance with the requirements of the Queensland <i>Transport Operations (Road Use Management – Dangerous Goods) Regulation 1998</i> and the <i>Transport Infrastructure Act 1994</i>. If possible, the transport of oversize loads will be restricted to non-peak periods to minimise traffic disruptions and will be provided with appropriate escorts and approvals from both the Main Roads Department and the Police. Clear traffic signs and signals will be installed on-site to provide for safe traffic movement. Santos will negotiate with the Department of Main Roads and relevant local authorities regarding the development of a traffic management plan for the construction of the pipeline. This will be undertaken during the detailed design phase of the project, once the pipe source and delivery mode has been determined. The following issues will be specifically addressed in the plan: <ul style="list-style-type: none"> Development of designated access routes for pipeline delivery and construction traffic;

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Element/Issue	Transport and Traffic Management
	<ul style="list-style-type: none"> – Inspection of access roads in consultation with relevant local authority representatives to determine the state of the road, whether any upgrade is required, and to record the preconstruction condition of the road (eg, written record, photographs); and – Identification of locations where additional traffic control measures will be necessary to ensure safe traffic movement and minimise disruption to public traffic flows. • Development of temporary traffic control measures necessary to ensure safe traffic movement during construction. • Santos proposes to enter into an Agreement with Council identifying the likely issues associated with road infrastructure related to the GLNG Project. This Agreement will identify the contribution attributable to GLNG for its specific impact on road infrastructure and identify the means of mitigating this impact. • Development of temporary traffic control measures necessary to ensure safe traffic movement during construction. • Santos will develop appropriate management plans for the unloading and loading of pipes at the wharf prior to the commencement of shipping to ensure environmental impacts on the surrounding area are considered. • GLNG is committed to discuss with Queensland Rail (QR) requirements for upgrades to the QR network that will be impacted by the construction of the gas transmission pipeline prior to construction.
Monitoring and Auditing	Monitoring and auditing of environmental performance will be in accordance with Section 12.7 of this EMP.
Reporting and Corrective Action	<p>Reporting of environmental performance data will be conducted in accordance with Section 12.8 of this EMP.</p> <p>Landholder complaints will be recorded in a complaints register (that forms part of the EHSMS) and appropriate corrective actions will be implemented and closed out by the appropriate Environmental Manager</p> <ul style="list-style-type: none"> • Non-compliances, environmental incidents and their corrective actions will be managed through the IMS and reported to the appropriate authority as required. • Reporting will occur on an incident, weekly and monthly basis to the appropriate Environmental Manager. <p>The following will constitute an incident or failure to comply in regard to traffic management:</p> <ul style="list-style-type: none"> • Not following designated routes; • Vehicles not observing site traffic regulations, eg, speed regulations; • Transport of overside loads at times and in such manners as to disrupt other on-site and off-site road users; and • Necessary approvals for traffic-related activities not obtained from relevant bodies, eg, Main Roads and local councils. <p>In the event of a complaint, an incident or failure to comply with requirements, relevant corrective action will be taken which could include the following:</p> <ul style="list-style-type: none"> • Traffic patterns will be investigated and vehicles will be rescheduled or rerouted if possible. • Repeatedly offending vehicles will be identified and operators instructed on the required operation protocol for the vehicle or removal from this responsibility. • Appropriate approvals will be sought from relevant authorities where this has not been done. • Issues of non-compliance will be rectified. • Review and modification of the traffic management plan.

12.16.19 Cultural Heritage

Element/Issue	Cultural Heritage
Operational Policy or Management Objective	To protect the cultural heritage values of the transmission pipeline corridor.
Performance Criteria	<ul style="list-style-type: none"> • Compliance with the requirements of the <i>Aboriginal Cultural Heritage Act 2003</i> and the relevant Cultural Heritage Management Plans (CHMPs). • No disturbance of any place on the Queensland Heritage Register in accordance with the requirements of the <i>Queensland Heritage Act 1992</i>.
Implementation Strategy	<ul style="list-style-type: none"> • Santos will develop and implement CHMPs in consultation with the relevant Aboriginal Parties. Protection, management and mitigation measures will be agreed after cultural heritage surveys are complete, and will be incorporated in the Santos cultural heritage management system. • Santos will seek to gain relevant native title permissions for the pipeline via the negotiation and registration of Indigenous Land Use Agreements (ILUAs) or the grant of Ministerial permissions under the <i>Petroleum and Gas (Production and Safety) Act 2004</i> where ILUAs are not achievable. • Infrastructure will be located to avoid known cultural heritage sites. All heritage sites shall be demarcated and access restricted where construction works are close to the heritage site. • Where potential non-indigenous heritage material is identified and likely to be disturbed, Santos will determine the significance of the site in consultation with the DERM and undertake relocation / preservation of the material. A project specific conservation management plan will be prepared to establish mitigation, management and approval procedures. • Include cultural heritage issues in the project induction program and involve representatives from the Aboriginal Parties in the development and implementation of such programs. • Specific mitigation measures will be developed to minimise any impact on the Kilbirnie Homestead site in consultation with relevant stakeholders including the DERM. • Santos will educate its staff and contractors on the location and significance of the heritage sites to avoid disturbance.
Monitoring and Auditing	<p>Auditing of compliance with the CHMPs in accordance with the processes defined within the CHMP.</p> <p>Auditing of any non-indigenous cultural heritage encountered during pipeline activities.</p>
Reporting and Corrective Action	<p>Any signs of disturbance of artifacts will be reported in accordance with the respective CHMP.</p> <p>The following will constitute an incident or failure to comply:</p> <ul style="list-style-type: none"> • Failure to prepare and/or implement a CHMP; • Unauthorised disturbance to any artifacts. <p>In the event of an incident or failure to comply, the commitment that has not been undertaken will be reviewed and modifications implemented as appropriate.</p> <ul style="list-style-type: none"> • Non-compliances, incidents and their corrective actions will be managed through the Cultural Heritage Management Plan. <p>Reporting will occur on an incident, weekly and monthly basis to the Cultural Heritage Manager.</p>

12.16.20 Social and Community

Element/Issue	Social and Community
Operational Policy or Management Objective	To minimise any social disruption to the local communities from the construction of the gas transmission pipeline.
Performance Criteria	No warranted complaints from landholders and the community, and warranted complained responded to within 2 working days Provision of food in the workforce accommodation facilities will be in compliance with the <i>Food Act 2006</i> .
Implementation Strategy	To minimise social and community impacts from the project Santos will: <ul style="list-style-type: none"> • Provide on-site accommodation for construction workers. • Develop a social management plan to monitor social impacts associated with the project and work with local services and stakeholders to develop practical solutions. • Adopt local procurement policies in order to enhance local economic benefits. • Minimise social impacts on indigenous persons in the project area by the implementation of the Santos Aboriginal Engagement Plan. • Contribute to local liveability programs and will initiate a community consultation and awareness campaign to promote project benefits to the community.
Monitoring and Auditing	Auditing of compliance with the social management plan and the Aboriginal Engagement Plan.
Reporting and Corrective Action	<ul style="list-style-type: none"> • The following will be classified as an incident or failure to comply: <ul style="list-style-type: none"> – Failure to prepare or comply with the social management plan or the Aboriginal Engagement Plan; and – Receipt of complaints from local community members about the construction or operation of the pipeline. • In the event of an incident or failure to comply, the commitment that has not been undertaken will be reviewed and modifications implemented as appropriate. • Non-compliances, incidents and their corrective actions will be managed through the IMS and reported to the appropriate authority as required. • Reporting will occur on an incident, weekly and monthly basis to the relevant manager within the pipeline management team.

12.16.21 Third Party Infrastructure

Element/Issue	Third Party Infrastructure
Operational Policy or Management Objective	To minimise potential impacts to third party infrastructure during the construction of the pipeline.
Performance Criteria	Minimal interruption to third party infrastructure. No unauthorised impacts on third party infrastructure.
Implementation Strategy	<ul style="list-style-type: none"> • Infrastructure will be accurately identified during detailed design and recorded on construction drawings. • Disturbance to pre-existing soil conservation measures (e.g. levee/contour banks) will be avoided as far as possible. Where disturbance is required, the banks/levees will be reinstated as soon as practicable, in consultation with the relevant landholder. • Where required along the route, temporary fences will be installed to protect humans and livestock. • The location of existing fences will be determined prior to construction and temporary gates will be installed at locations where the pipeline crosses fence lines. • Fences will be reinstated post construction.

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Element/Issue	Third Party Infrastructure
	<ul style="list-style-type: none"> • Santos will work with infrastructure owners/managers (road, rail, pipelines, powerlines) in regard to: <ul style="list-style-type: none"> – Accurately determining the location of existing underground infrastructure. – Designing the crossings, taking into account the specific requirements of the infrastructure owners/managers. – Developing agreed safety protocols for the purpose of constructing crossings. – Obtaining the relevant consent/licence agreements for crossings. – Agreeing a schedule for construction of crossings. – Developing agreed protocols for any operational activities associated with the pipelines where an infrastructure crossing exists. • Where the pipeline crosses a rail line, the crossing will be either bored or directionally drilled. Where the pipeline parallels a rail line it will be set back an appropriate distance (as stipulated in AS 2885) so as not to interfere with railway infrastructure or to induce electric currents in the pipe. • Road crossing arrangements as determined in consultation with the Department of Main Roads and local authorities will be documented in a traffic management plan. • When the pipeline is required to cross a powerline it will be located so as to not interfere with any pylons or other associated infrastructure. • Crossings will be designed in accordance with AS 2285 to maintain the integrity of the existing infrastructure and public safety. • Santos will consult with relevant petroleum authorities to ensure disruption to activities is minimised to the extent practicable.
Monitoring and Auditing	Routine monitoring of implementation of agreed protocols.
Reporting and Corrective Action	<ul style="list-style-type: none"> • Reporting of environmental performance data will be conducted in accordance with Section 12.8 of this EMP. • Reporting, investigation and management of corrective actions associated with environmental events (including incidents, hazards, near misses, non-compliance vents and third party complaints) will be managed through the IMS and reported to the appropriate authority as required. • Reporting will occur on an incident, weekly and monthly basis to the appropriate Environmental Manager. • Landholder complaints will be recorded in a complaints register (that forms part of the EHSMS) and appropriate corrective actions will be implemented and closed out by the appropriate Environmental Manager.

12.16.22 Emergency Response

Element/Issue	Emergency Response
Operational Policy or Management Objective	To ensure that project personnel can respond effectively and efficiently in the event of an emergency associated with development and operation of the gas transmission pipeline.
Performance Criteria	<ul style="list-style-type: none"> • Emergency plans for construction developed and in place prior to activities commencing. • All personnel familiar with emergency procedures and their role in the event of emergency, and drills undertaken. • All personnel familiar with the District Disaster Management Group and their role in the event of a disaster.
Implementation Strategy	<p>Santos will prepare and implement a detailed emergency response plan which will include consideration of the following:</p> <ul style="list-style-type: none"> • Information outlining the connection to relevant legislation as well as specific GLNG project Environmental Management Plans. • Inclusion of the District Officers from the local police districts to represent the

Element/Issue	Emergency Response
	<p>Queensland Police Service (QPS) as a stakeholder when developing the Emergency Response Plan (ERP).</p> <ul style="list-style-type: none"> • Communication and coordination between GLNG and the District Disaster Management Group regarding the project's activities. • Development of a response, investigation, command, control and recovery for both natural disasters and other disasters/emergencies and incidents. • The Emergency Response plan shall include information outlining the connection to relevant legislation as well as specific GLNG project EMPs. • Santos will ensure engagement with QPS and other agencies in Emergency response exercises. • Response procedures in the event of a fire, chemical release, spill, leak, explosion, equipment failure, bomb threat, natural disaster (including severe storm and flood events) or any other likely emergency. • Communication arrangements and contact details. • Roles and responsibilities of responsible personnel. • Emergency controls and alarms. • Evacuation procedures. • Emergency response equipment. • Leak detection and control points. • Training requirements. • Site access and security.
Monitoring and Auditing	<p>The effectiveness of the emergency response plan will be regularly tested and audited.</p>
Reporting and Corrective Action	<ul style="list-style-type: none"> • Reporting, investigation and management of corrective actions associated with emergency response events (including incidents, hazards, near misses, non-compliance vents and third party complaints) will be managed through the IMS and reported to the appropriate authority as required. • Reporting will occur on an incident, weekly and monthly basis to the appropriate Environmental Manager. • Landholder complaints will be recorded in a complaints register (that forms part of the EHSMS) and appropriate corrective actions will be implemented and closed out by the appropriate Environmental Manager. • The Pipeline Health and Safety Manager will be responsible for compiling results of testing and audit programs. • The following constitute incidents or failure to comply: <ul style="list-style-type: none"> – Emergency response plan is not prepared or implemented; – Emergency response equipment is not provided; – Emergency response training is not undertaken; and – Emergency response procedures are not followed in the event of an incident. • In the event of an incident or a failure to comply, one or more the following actions will be undertaken as appropriate: <ul style="list-style-type: none"> – Prepare or implement the emergency response plan; – Provide the necessary equipment or training; and – Investigate why the emergency response procedures were not followed and implement mitigation measures.

12.16.23 Fire Management

Element/Issue	Fire Management
Operational Policy or Management Objective	To prevent the initiation of bushfires as a result of GLNG project related activities. To protect GLNG personnel and key GLNG project infrastructure from bushfire and fire impacts.
Performance Criteria	<ul style="list-style-type: none"> Develop and implement emergency response plans that include fire management. No unplanned or uncontrolled fires caused by GLNG project relative activities. Emergency plans for construction developed and in place prior to activities commencing. All personnel familiar with emergency procedures and their role in the event of emergency, and drills undertaken.
Implementation Strategy	<ul style="list-style-type: none"> Minimise fire risk through evaluation processes and management of those risks. Restrict high-risk activities in accordance with local fire bans or in times of high fire danger. Maintain a plan for rapid and co-ordinated response to the outbreak of fire through an established fire response plan in conjunction with the local metropolitan and rural fire brigades. Implement evacuation procedures and hazard reduction. Implement and maintain building fire detection and alarm systems, emergency lighting, fire hydrants, fire hose reels, fire extinguishers and service checks to relevant specifications as per Australian Standards. Undertake fire safety awareness training as part of site inductions. Conduct fire safety awareness training as part of site inductions. Conduct regular fire drills and record exercises as actions generated. Conduct periodic fire equipment audits. Consult with all relevant fire management authorities. Adhere to fire bans. Maintain fire fighting equipment at all hot work sites.
Monitoring and Auditing	The effectiveness of the fire management component of the emergency response plan will be regularly tested and audited. The Pipeline Health and Safety Manager will be responsible for compiling the results of testing and auditing programs.
Reporting and Corrective Action	<ul style="list-style-type: none"> Report all fire events to the Pipeline Health and Safety Manager and landholder immediately. Notify fire brigade and implement evacuation procedure if appropriate. Review fire management plans prior to the fire season and following fire events.

12.16.24 Incidents and Complaints

Element/Issue	Incidents and Complaints
Operational Policy or Management Objective	To manage and respond to any environmental or social incidents and complaints from the community regarding the development and operation of the gas transmission pipeline.
Performance Criteria	Incidents and complaints regarding environmental and social issues will be minimised and mitigation measures implemented to reduce the incidence of complaints.

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Implementation Strategy	<p>All incidents and complaints will be documented and managed through the Incident Management System and Complaints Register.</p> <p>The complaints form will document at least the following information:</p> <ul style="list-style-type: none"> • Time, date and nature of complaint. • Type of communication (telephone, letter, email, visit). • Name, contact address and contact number (if provided). • Response and investigation undertaken as a result of the complaint. • Action taken and signature of person investigating complaint. <p>Each complaint will be investigated as soon as practicable and, where appropriate, corrective action taken to remedy the cause of the complaint.</p>
Monitoring and Auditing	<p>The appropriate Environmental Manager will ensure the IMS complaints register is maintained and ensure all complaints are resolved. The complaint form will be checked within 7 days of complaint receipt to ensure follow-up action has been taken to resolve the issue.</p>
Reporting and Corrective Action	<p>All complaints and incidents are to be reported to the appropriate Environmental Manager and reported within the IMS and reported to the appropriate authority as required.</p> <p>The complainant will be advised of what action, if any, has been taken as a result of the complaint.</p> <p>Should further incidents occur or complaints be received in relation to previous occurrences, an appropriate selection of the following corrective actions will be undertaken:</p> <ul style="list-style-type: none"> • Additional environmental awareness training of the workforce with respect to the procedures to be followed for environmental incidents or complaints. • Investigation into why the incident/complaint was not addressed within the specified time frame. • Incident/complaint follow-up according to the results of the investigation. • Where required, work place practices will be reviewed.

12.17 Environmental Management Plan – Operations

12.17.1 Flora and Fauna Management

Element/Issue	Flora and Fauna Management
Operational Policy or Management Objective	<p>To avoid and manage impacts to the ecological values of the project and to rehabilitate disturbed areas to as close as practical to the pre-constructed condition.</p>
Performance Criteria	<ul style="list-style-type: none"> • Minimal disturbance to native vegetation. • No outbreak of new pest species/diseases. • No unplanned or unapproved damage to flora and fauna. • No spread of existing weed species into previously clean areas as a result of pipeline operational activities. • Successful rehabilitation of vegetation enabling fauna movement to continue unimpeded.
Implementation Strategy	<p>Regular inspections will be carried out along the pipeline ROW by vehicle and foot patrols to check on the condition of the ROW and identify any activities that may have the potential to impact on the integrity of the pipeline. The inspection will include, but not be limited to, a review of:</p> <ul style="list-style-type: none"> • Activity on the pipeline corridor and in the vicinity. • Use of access tracks and pipeline corridor and any unauthorised traffic. • Access track condition and maintenance requirements. • Evidence of erosion, washouts or land subsidence. • Evidence of pipeline exposure. • Vegetation cover.

Element/Issue	Flora and Fauna Management
	<ul style="list-style-type: none"> • Excess vegetation on the pipeline corridor. • Weed and pest infestation. • Condition of pipeline crossings. • Disturbance to protected heritage sites. • Indications of leaks. • The presence of refuse or litter. • Damages to fences, gates, signs, markers etc. • Security of sites and evidence of unauthorised entry. <p>The frequency of ground patrols will be determined as part of the FEED process in the IMP, but will be at least monthly. Special patrols will be undertaken after heavy storms or significant events to check for damage to the ROW.</p> <p>Aerial patrols along the pipeline ROW will be undertaken on a regular basis. The frequency of aerial patrols will be determined during the FEED process and will reflect operational requirements, local conditions and regulatory requirements. Aerial surveillance will check for:</p> <ul style="list-style-type: none"> • Bare patches or damaged vegetation (indicating possible leaks or erosion). • Pipeline exposure. • Scouring, sink holes, areas of active or potential erosion. • Condition of water crossings. • Noxious weed areas. • Ploughed areas and/or evidence of third party activity. • Areas of limited revegetation success. • Vegetation regrowth that will require control. <p>Implement and maintain weed and pest management strategies.</p> <p>Restrict clearing of vegetation to large vegetation regrowth occurring within 3 m of the pipeline.</p> <p>Re-establish grasses, where soil is exposed during pipeline maintenance works, using varieties native to the area.</p> <p>Maintain records of properties where pest control infrastructure is maintained.</p> <p>Ensure all fencing is left undisturbed and gates are closed.</p> <p>Use biodegradable chemicals/herbicides, where practicable, for the treatment of weed species.</p> <p>Re-establish the ROW with native grass species to minimise fragmentation and prevent impacts on natural ecosystem functioning and fauna movement.</p> <p>Limit vehicle speed along ROW (reduce dust, reduce fauna fatalities).</p>
Monitoring and Auditing	<p>Monitoring and auditing will be conducted in accordance with Section 12.7 of this EMP.</p> <p>The entire length of the ROW will be regularly inspected to assess the effectiveness of protection measures, with particular attention to management of flora and fauna protection and clearing boundaries.</p> <p>Ongoing pipeline monitoring will be undertaken to assess the success and integrity of revegetation and to ensure appropriate follow-up measures are implemented.</p> <p>Regular audits and reviews will be undertaken and recommendations and corrective actions will be implemented.</p>
Reporting and Corrective Action	<ul style="list-style-type: none"> • Reporting of environmental performance data will be conducted in accordance with Section 12.8 of this EMP. • Reporting, investigation and management of corrective actions associated with environmental events (including incidents, hazards, near misses, non-compliance vents and third party complaints) will be conducted in accordance with Santos Incident Management System and reported to the appropriate authority as required. • Landholder complaints will be recorded in a complaints register (that forms part of the EHSMS) and appropriate corrective actions will be implemented.

12.17.2 Soil and Erosion Management

Element/Issue	Soil and Erosion Management
Operational Policy or Management Objective	To appropriately minimise and manage adverse impacts to soils.
Performance Criteria	<ul style="list-style-type: none"> All necessary erosion mitigation measures are in place and effective. No evidence of collapsed or eroded watercourse banks or beds at crossing locations. Erosion controlled and limited to that consistent with “natural processes” such that pipeline cover is maintained and land capacity is not reduced. No evidence of subsidence or exposure of pipeline. Prompt reinstatement of disturbed areas.
Implementation Strategy	<ul style="list-style-type: none"> Install, maintain and monitor erosion and sediment control devices (e.g. berms, silt fences, jute matting) so that ground is stable and vegetation cover is maintained. Ensure that runoff control devices are maintained to prevent erosion. Install sediment fencing around active erosion adjacent to watercourses as needed to keep areas stable. Empty sediment control devices after heavy rain. Repair leaks as soon as practicable.
Monitoring and Reporting	ROW surveys to be undertaken as described in the flora and fauna component of this EMP. Report internally all incidents that deviate from normal operating conditions. Review non-compliance and incident reporting and close out by senior management to ensure prompt rectification and change management as required.
Reporting and Correction Action	<ul style="list-style-type: none"> Reporting of environmental performance data will be conducted in accordance with Section 12.8 of this EMP. Reporting, investigation and management of corrective actions associated with environmental events (including incidents, hazards, near misses, non-compliance vents and third party complaints) will be managed through the IMS and reported to the appropriate authority as required. Landholder complaints will be recorded in a complaints register (that forms part of the EHSMS) and appropriate corrective actions will be implemented and closed out by the appropriate Environmental Manager.

12.17.3 Access and Security

Element/Issue	Access and Security
Operational Policy or Management Objective	Maintain and provide safe access to the ROW and pipeline facilities for maintenance, inspection and operations with minimal disturbance to landholders and the environment.
Performance Criteria	<ul style="list-style-type: none"> Minimise the number of access tracks and diversions. Minimise disruption to landholders and third parties. Manage road and track usage, and achieve satisfactory road and site rehabilitation. Minimise damage to existing road networks.
Implementation Strategy	<ul style="list-style-type: none"> Access ROW only for activities essential to ensuring continued safe pipeline operation and protection of the local environment (the pipeline ROW will not be used as a general thoroughfare). Access the pipeline ROW, as far as is practicable, by existing roads/tracks. Arrange private property access to the pipeline ROW with individual landholders, managers and/or lessees. Minimise the width of any access track to the minimum practical to enable safe vehicle movement.

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Element/Issue	Access and Security
	<ul style="list-style-type: none"> Restrict public access along the pipeline ROW unless that right already exists. Restrict public access to the pipeline ROW by minimising visibility (e.g. dogleg service track entrances or revegetation plantings), or by physical barriers (e.g. gates, fences, log and rock barriers, trenches) and signs. Control vegetation and soil erosion to ensure continued access and safe navigation by vehicles. Notify landholder, if possible, at least 24 hours before access is required. Where this is not possible, reach alternative agreements regarding ongoing access. Limit speed along the ROW.
Monitoring and Reporting	Regular audits and reviews will be undertaken, and recommendations and corrective actions will be implemented.
Corrective Actions	<ul style="list-style-type: none"> Reporting of environmental performance data will be conducted in accordance with Section 12.8 of this EMP. Reporting, investigation and management of corrective actions associated with environmental events (including incidents, hazards, near misses, non-compliance vents and third party complaints) will be managed through the IMS and reported to the appropriate authority as required. Landholder complaints will be recorded in a complaints register (that forms part of the EHSMS) and appropriate corrective actions will be implemented and closed out by the appropriate Environmental Manager.

12.17.4 Emergency Response

Element/Issue	Emergency Response
Operational Policy or Management Objective	To ensure that operations personnel can respond effectively and efficiently in the event of an emergency associated with the operation of the pipeline.
Performance Criteria	<ul style="list-style-type: none"> Emergency plans for pipeline operations developed and in place prior to operations. Operational personnel familiar with emergency procedures and roles in the event of an emergency and emergency drills have been undertaken. All personnel familiar with the District Disaster Management Group and their role in the event of a disaster.
Implementation Strategy	<p>Santos will prepare a detailed emergency response plan prior to the end of the construction phase. The plan will include consideration of the following:</p> <ul style="list-style-type: none"> Information outlining the connection to relevant legislation as well as specific GLNG project Environmental Management Plans. Inclusion of the District Officers from the relevant police districts to represent the Queensland Police Service (QPS) as a stakeholder when developing the Emergency Response Plan (ERP). Communication and coordination between Santos and the District Disaster Management Group regarding the project's activities. Development of a response, investigation, command, control and recovery for both natural disasters and other disasters/emergencies and incidents. Response procedures in the event of a fire, spill, leak, explosion, equipment failure, bomb threat, natural disaster (including severe storm and flood events) or any other likely emergency. Communication arrangements and contact details. Roles and responsibilities of responsible personnel. Emergency controls and alarms. Evacuation procedures. Emergency response equipment.

Section 12

Gas Transmission Pipeline Environmental Management Plan

Element/Issue	Emergency Response
	<ul style="list-style-type: none"> • Leak detection and control points. • Training requirements. • Site access and security. <p>The key principles for the response to a pipeline related incident, in particular a breach of the pipeline include:</p> <ul style="list-style-type: none"> • Continual monitoring of pipeline flow/pressure. • Immediate shut down of the pipeline where an incident is detected. • Mobilisation of crews and equipment to identify nature and severity of the incident, minimise impacts to the surrounding areas and implement actions to manage immediate threats. • Notification to relevant regulatory agencies and emergency services as required. • Notification to relevant landholders. • Detailed investigation of the incident and development and implementation of corrective actions. • Development and implementation of comprehensive restoration plan. <p>The Integrity Management Plan (IMP) will be developed to address all potential risks to the pipeline integrity and will provide mitigation measures and management strategies to minimise these risks, and will implement the following procedures:</p> <ul style="list-style-type: none"> – internal pipeline inspections to monitor the integrity of the pipe will be carried out by intelligent pigs at the start of operations and on an as-required basis. The frequency of intelligent pigging will be determined during the FEED process to reflect operational requirements, local conditions and regulatory requirements. A Cathodic protection system will be installed along the gas transmission pipeline and will be checked on a regular basis. The frequency of checking the Cathodic protection system will be determined during the FEED process to reflect operational requirements, local conditions and regulatory requirements. – The location and numbers of Cathodic protection system test points will be determined during the FEED process to reflect design and operational requirements, local conditions and regulatory requirements.
Monitoring and Auditing	<p>The effectiveness of the emergency response plan will be regularly tested and audited. Internal pipeline inspections and cathodic protection system checking will be undertaken in accordance with the schedule to be determined during the FEED.</p>
Reporting and Corrective Action	<p>Reporting, investigation and management of corrective actions associated with emergency response events (including incidents, hazards, near misses, non-compliance vents and third party complaints) will be conducted in accordance with Section 12.8 of this EMP.</p> <p>Landholder complaints will be recorded in a complaints register (that forms part of the EHSMS) and appropriate corrective actions will be implemented and closed out by the appropriate Environmental Manager</p> <p>The Pipeline Operations Manager will be responsible for compiling the results of testing and auditing programs.</p> <p>The following constitute incidents or failure to comply:</p> <ul style="list-style-type: none"> • Emergency response plan is not prepared or implemented. • Emergency response equipment is not provided or training is not undertaken. • Emergency response procedures not followed in the event of an incident. <p>In the event of an incident or failure to comply, a selection of the following actions will be undertaken as appropriate:</p> <ul style="list-style-type: none"> • Prepare or implement the emergency response plan. • Provide the necessary equipment or training. • Investigate why the emergency response procedures were not followed and implement mitigation measures.

12.17.5 Fire Management

Element/Issue	Fire Management
Operational Policy or Management Objective	<p>To prevent the initiation of bushfires as a result of Santos Pipeline Operations related activities.</p> <p>To protect Santos personnel and key Santos infrastructure from bushfire and fire impacts.</p>
Performance Criteria	<ul style="list-style-type: none"> • Develop and implement emergency response plans that include fire management. • No unplanned or uncontrolled fires caused by GLNG Project relative activities. • Consultation with all relevant fire management authorities. • Emergency plans for construction developed and in place prior to activities commencing. • All personnel familiar with emergency procedures and their role in the event of emergency, and drills undertaken.
Implementation Strategy	<ul style="list-style-type: none"> • Minimise fire risk through evaluation processes and management of those risks. • Restrict high-risk activities in accordance with local fire bans or in times of high fire danger. • Maintain a plan for rapid and co-ordinated response to the outbreak of fire through an established fire response plan in conjunction with the local metropolitan and rural fire brigades. • Implement evacuation procedures and hazard reduction. • Implement and maintain building fire detection and alarm systems, emergency lighting, fire hydrants, fire hose reels, fire extinguishers and service checks to relevant specifications as per Australian Standards. • Undertake Fire Safety Awareness Training as part of site inductions. • Conduct Fire Safety Awareness Training as part of site inductions. • Conduct regular fire drills and record exercises as actions generated. • Conduct periodic fire equipment audits. <p>Santos will minimise development in high bushfire and landslide risk areas. Where development is located in these areas, Santos will employ safety management procedures to minimise the likelihood of the project initiating or spreading bushfire. Management measures include:</p> <ul style="list-style-type: none"> • Design standards to control risk of fire occurring. • Inspection and monitoring. • Area around well heads cleared of vegetation. • Emergency response procedures.
Monitoring and Auditing	<p>The effectiveness of the fire management component of the emergency response plan will be regularly tested and audited.</p> <p>Fire drills to be conducted at least annually.</p>
Reporting and Corrective Action	<ul style="list-style-type: none"> • Report all fire events to the gas transmission pipeline Operations Manager and landholder. • Notify fire brigade and implement evacuation procedure if appropriate. • Review fire management plans following fire events. • The Pipeline Operations Manager will be responsible for compiling the results of testing and auditing programs.

12.17.6 Decommissioning

Element/Issue	Decommissioning
Operational Policy or Management Objective	To ensure that the gas transmission pipeline is effectively decommissioned in an environmentally sustainable manner.
Performance Criteria	<ul style="list-style-type: none"> • The pipeline corridor contains no long term environmental hazards. • Risks to the public are mitigated to acceptable levels. • The pipeline corridor is returned to a state suitable for other uses in the future.
Implementation Strategy	<p>Prior to the decommissioning of the pipeline, a detailed decommissioning plan will be developed that will establish procedures and methods for decommissioning. The plan will be prepared in consultation with the appropriate regulatory authorities and landholders.</p> <p>When the pipeline is no longer required, it will be decommissioned in accordance with the legislative requirements of the day and the Australian Pipeline Industry Association (APIA) Code of Environmental Practice. The most likely options are:</p> <ul style="list-style-type: none"> • Moth-balling – this involves depressurising the pipelines, capping and filling with an inert gas such as nitrogen and maintaining the cathodic protection system to prevent corrosion as applicable. • Abandonment – this could involve disconnecting the pipelines from all above-ground structures including the cathodic protection systems, purging the pipes of process materials, placing plugs at predetermined intervals to inhibit groundwater flow and removing all above ground facilities. The pipelines will then be abandoned to corrode in-situ. The pipe may be filled with a stable material (e.g. concrete grout) at critical locations such as where it passes under a thoroughfare.
Monitoring and Auditing	<p>A monitoring program that will assess the effectiveness of rehabilitation and decontamination efforts will be developed as part of the preparation of the decommissioning plans.</p> <p>On-going environmental monitoring may be required for a period of time to ensure decontamination and rehabilitation procedures have been successful and there is no likelihood of any further contamination resulting from the site's previous activities.</p>
Reporting and Corrective Action	<p>The results of rehabilitation and any monitoring programs will be kept and presented in a decommissioning report which will be submitted to the DERM.</p> <p>The following constitute an incident or failure to comply:</p> <ul style="list-style-type: none"> • Aspects of the decommissioning, remediation or rehabilitation do not satisfy the relevant regulatory authorities or other stakeholders in the project. • There is evidence of ongoing environmental harm following the completion of decommissioning activities. <p>In the event of a non-compliance, the appropriate corrective action will be undertaken to rectify the non-compliance.</p>