origin

AUSTRALIA PACIFIC LNG

MANAGEMENT PLAN

Construction Environment Management Plan

Q-LNG01-15-MP-1005

Australia Pacific LNG Upstream

This plan sets out the minimum environmental management requirements that must be met or exceeded throughout construction in the gas fields including gas field facilities and the gathering network.

Revision	Date	Description	Originator	Checked	QA	Approved
3	12/01/2015	Approved for Use	E Musk	J Schortinghuis	J Schortinghuis	E Musk
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Document Conventions

The following terms in this document apply:

- **Will**, **shall** or **must** indicate a mandatory course of action
- **Should** indicates a recommended course of action
- **May** or **can** indicate a possible course of action.

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Deviations from Document

Any deviation from this document must be approved by the Australia Pacific Upstream Project Environmental Team Lead - Gathering.

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1. Introduction

Australia Pacific Liquefied Natural Gas (Australia Pacific LNG) is a joint venture between Origin Energy, ConocoPhillips and Sinopec which proposes to develop a world scale, long-term coal seam gas (CSG) to LNG project in Queensland. The entire Project has a 30 year completion timeframe, which includes the following objectives:

- The progressive development of the Walloons gas fields in the Surat Basin in south central Queensland with up to 10,000 CSG wells;
- Construction and operation of a main gas transmission pipeline (approximately 450km) to connect the Walloons gas fields with the LNG facility near Laird Point; and
- Construction and operation of an LNG facility near Laird Point on Curtis Island near Gladstone for production and export of approximately 18Mtpa of LNG.

1.1. Purpose

This CEMP has been prepared to outline the minimum environmental management requirements that must be met or exceeded during construction and applies to Australia Pacific LNG project activities associated with development of the gas fields including gas field facilities and the gathering network for the duration of the Project.

2. Terms & Abbreviations

2.1. Abbreviations

Table 1: Abbreviations

Abbreviation	Description
ARI	Average Recurrence Interval
AS	Australian Standard
ASS	Acid Sulfate Soils
CEMP	Construction Environmental Management Plan
CLR	Contaminated Land Register
CSG	Coal Seam Gas
dB	Decibels
dBA	A weighted decibels
DAFF	Department of Agriculture Forestry and Fisheries (Queensland)
DBH	Diameter at breast height – the nominal trunk diameter at 1.4m above ground level determined from the circumference of the trunk divided by pi (π)
EA	Environmental Authority
EHP	Department of Environment and Heritage Protection (formerly DERM Department of Environment and Resource Management)
EIS	Environmental Impact Statement
EMR	Environmental Management Register
EP	Equivalent Person
EPBC	Environment Protection and Biodiversity Conservation Act 1999 (CTH)
ESA	Environmentally Sensitive Area
ESCP	Erosion and Sediment Control Plan
EVNT	Endangered, Vulnerable and Near Threatened

Abbreviation	Description
GIS	Geographic information system
GPS	Global Positioning System
GQAL	Good Quality Agricultural Land
HAZCHEM	Hazardous Chemicals
HSEMS	Health Safety and Environment Management System
HSSE	Health Safety Security and Environment
IECA	International Erosion Control Association
ICAM	Incident Cause Analysis Method
km	kilometre
LAeq, adj, 15 min	A weighted sound pressure level of a continuous steady sound, adjusted for tonal character, that within any 15 minute period has the same square sound pressure as a sound level that varies with time
LNG	Liquefied Natural Gas
m	metre
Max L_{pA}	The absolute maximum instantaneous A-weighted sound pressure level
MEDLI	Model for Effluent Disposal using Land Irrigation
MNES	Matters of National Environmental Significance
Mtpa	Million tonnes per annum
NATA	National Association of Testing Authorities
NCA	Nature Conservation Act 1992 (Queensland)
NTU	Nephelometric Turbidity Units
PASS	Potential Acid Sulfate Soils
PCEMP	Project Construction Environmental Management Plan
QLD	Queensland
ROW	Right Of Way
SAR	Sodium Adsorption Ratio
SCL	Strategic Cropping Land
SDS	Safety Data Sheets
SIMOPS	Simultaneous Operations
STP	Sewage Treatment Plant
TPZ	Tree Protection Zone
UXO	Unexploded Ordnance
WONs	Weeds of National Significance
WTF	Water Treatment Facility

2.2. Definitions

Table 2: Definitions

Abbreviation	Description
Approved	Means approved in writing by the Australia Pacific LNG Environmental Representative
Associated water	Associated water, also called CSG water, means underground water taken or interfered with, if the taking or interference happens during the course of, or results from, the carrying out of another authorised activity under a petroleum authority, such as a petroleum well, and includes waters also known as produced formation water. The term includes all contaminants suspended or dissolved within the water.
Clearing	Means: in relation to grass, scrub or bush – the removal of vegetation by disturbing root systems and exposing underlying soil (including burning), but does not include – the flattening or compactions of vegetation by vehicles if the vegetation remains living, the slashing or mowing of vegetation to facilitate access tracks, the clearing of weeds, or destroying standing vegetation by stock, and in relation to trees – cutting down, ringbarking, pushing over, poisoning or destroying in any way, but does not include lopping a tree.
CSG water	Coal Seam Gas Water, also called associated water, means groundwater that is necessarily or unavoidably brought to the surface in the process of coal seam gas exploration or production. Coal seam gas water typically contains significant concentrations of salts, has a high sodium adsorption ratio and may contain other contaminants that have the potential to cause environmental harm if released to land or waters through inappropriate management. Coal seam gas water is a waste as defined under section 13 of the *Environmental Protection Act 1994* (QLD).
Environmental Incident	Any occurrence that has resulted in or has the potential to result in adverse consequences to the environment, including air, water, land, natural resources, flora, fauna, habitats, ecosystems and/or biodiversity.
Essential petroleum activities	Means activities that are essential to bringing the resource to the surface and are only the following: • low impact petroleum activities • geophysical, geotechnical, geological, topographic and cadastral surveys (including seismic, sample /test / geotechnical pits, core holes) • single well sites not exceeding 1 hectare disturbance and multi-well sites not exceeding 1.5 hectare disturbance • well sites with monitoring equipment (including monitoring bores): - for single well sites, not exceeding 1.25 hectares disturbance - for multi-well sites, not exceeding 1.75 hectares disturbance • well sites with monitoring equipment (including monitoring bores) and tanks (minimum 1 ML) for above ground fluid storage: - for single well sites, not exceeding 1.5 hectares disturbance - for multi-well sites, not exceeding 2.0 hectares disturbance • associated infrastructure located on a well site necessary for the construction and operations of wells: - water pumps and generators - flare pits - chemical / fuel storages - sumps for residual drilling material and drilling fluids - tanks, or dams which are not significant or high hazard dams to contain wastewater (e.g. stimulation flow back waters, produced water) - pipe laydown areas - soil and vegetation stockpile areas - a temporary camp associated with a drilling rig that may involve sewage treatment works that are no release works - temporary administration sites and warehouses - dust suppression activities using water that meets the quality and operational standards approved under the environmental authority

Abbreviation	Description
	• communication and power lines that are necessary for the undertaking of petroleum activities and that are located within well sites, well pads and pipeline right of ways without increasing the disturbance area of petroleum activities • supporting access tracks • gathering / flow pipelines from a well head to the initial compression facility • activities necessary to achieve compliance with the conditions of the environmental authority in relation to another essential petroleum activity (e.g. sediment and erosion control measures, rehabilitation).
General ecologically significant wetland	Otherwise known as "wetlands of other environmental value" is a wetland that meets the definition of a wetland and is shown as a general ecologically significant wetland or "wetlands of other environmental value" on the map of referable wetlands
Notification, report	Means notification or report in writing
Regulated waste	Regulated waste is waste that— (a) is commercial or industrial waste, whether or not it has been immobilised or treated; and (b) is of a type, or contains a constituent of a type, mentioned in Schedule 7 listed under Section 65 in the *Environmental Protection Regulation 2008* (2) Waste prescribed under subsection (1) includes— (a) for an element—any chemical compound containing the element; and (b) anything that contains residues of the waste. Schedule 7 is outlined in Appendix G On 20th September 2013, the *Environmental Protection Regulation 2008 (QLD)* was amended to broaden the definition of what was **not** considered a regulated waste. The amendment is in *Part 2, Waste that is not regulated waste under Section 65(3):* "Groundwater or treated groundwater necessarily or unavoidably brought to the surface of the earth as part of an industrial process, if the groundwater— (a) has a pH of at least 6 but not more than 10.5; and (b) has an electrical conductivity of less than 15000 micro-Siemens a centimetre."
Sensitive place	A dwelling, library, child care centre, kindergarten, school, college, university or other educational institution, hospital, surgery or other medical institution, a protected area or an area identified under a conservation plan as a critical habitat or an area of major interest under the *Nature Conservation Act* 1992 (QLD), a marine park under the *Marine Parks Act 1982* (QLD), a park or garden that is open to the public for use other than sport or organised entertainment
Significant disturbance to land	Means disturbance to land as defined by the *Environment Protection Regulations* 2000
Waste	1. Waste includes anything, other than a resource approved under subsection (4), that is— (a) left over, or an unwanted by-product, from an industrial, commercial, domestic or other activity; or (b) Surplus to the industrial, commercial, domestic or other activity generating the waste. 2. Waste can be a gas, liquid, solid or energy, or a combination of any of them. 3. A thing can be waste whether or not it is of value. 4. The administering authority may approve a resource, or a stated type of resource, for subsection (1) if it considers the resource, or type of resource, has a beneficial use other than disposal.
Watercourse	As defined in section 5 of the *Water Act 2000* (QLD) and includes the bed and banks and any other element of a river, creek or stream confining or containing water.
Waters	Includes all or any part of a creek, river, stream, lake, lagoon, swamp, wetland, spring, unconfined surface water, unconfined water in natural or artificial watercourses, bed and bank of any waters, stormwater channel, stormwater drain, roadside gutter, stormwater

Abbreviation	Description
	runoff, and underground water
Waterway	As defined under the *Fisheries Act 1994* (QLD) and marked on the spatial data layer *Queensland Waterways for Waterway Barrier Works*
Weeds	Inclusive of all Weeds of National Significance, and all classes of State and Locally Declared species as per the *Land Protection (Pest and Stock Route Management) Act 2002 (QLD)*.
Weed managed area	A site or defined area that has been inspected by a suitably qualified person within the preceding three months and weeds have been removed or controlled and actively managed to ensure infestations of weeds do not recur.
Wetland	For Walloons, Condabri and Combabula: Areas shown on the Map of Referrable Wetlands as defined in the *Environmental Protection Regulation* 2008 AND as defined under the Queensland Wetland Program as areas of permanent or periodic / intermittent inundation, with water that is static or flowing fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six (6) metres, and posses one or more of the following attributes: 1) at least periodically, the land supports plants or animals that are adapted to and depend on living in wet conditions for at least part of their life cycle, or 2) the substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers, or 3) the substratum is not soil and is saturated with water, or covered by water at some time. For Spring Gully: as defined in the Environmental Authority
Wetland of high ecological significance	Otherwise known as “high conservation value wetland” is a wetland that meets the definition of a wetland and is shown as a wetland of high ecological significance or high conservation value wetland on the map of referable wetlands

3. Brief Description of Construction Activities

The following section briefly outlines the types of activities that maybe undertaken during the construction phase of the project and to which this CEMP applies. This description is for information only and is not intended to be comprehensive nor prescriptive.

3.1. Gas Field Facilities

Australia Pacific LNG anticipates that the following construction activities may take place for gas processing facilities and water treatment facilities:

- Geotechnical investigations will be undertaken to determine physical and chemical soil properties
- Vegetation will be cleared, stockpiled and may be mulched for reuse during rehabilitation. Large hollow logs and other habitat features will be salvaged and used in rehabilitation
- Topsoil will be stripped and stockpiled for use in future rehabilitation
- Existing soils will be used in cut and fill, where suitable, to minimise the requirements for cartage of additional fill material. Local material will be sourced, if available and commercially viable, for hardstand areas
- The facilities will be located on a flat pad prepared by earth moving equipment. Contouring will be completed to ensure any existing runoff is diverted around the construction site where required. Runoff within the facilities will be captured in first flush onsite sediment ponds and will be treated and reused onsite where possible
- Concrete foundations will be constructed to provide support to facility infrastructure as required. Foundation design may vary from site to site depending on the geotechnical nature of the soils
- Mechanical installation will involve placing the main processing modules and constructing aboveground steel piping connections between each module
- Electrical and instrument cabling will be installed for each processing module, connecting back to a main control room. This is usually installed in aboveground cable trays alongside the main piping runs

- Infrastructure will be constructed, tested and commissioned and
- Disturbed areas not required for ongoing operations will be progressively rehabilitated in accordance with the Australia Pacific LNG Remediation, Rehabilitation, Recovery and Monitoring Plan.

A number of support facilities and services will be provided during the construction phase including camps, site offices, lunch rooms and ablution blocks. These facilities will typically be modular transportable buildings, powered by diesel generators, unless reticulated power is available.

3.2. Gas Gathering Network and Flow Lines

The gas and water gathering network will be installed with consideration of the topography of the site and will be located, where possible, next to existing infrastructure, access roads and tracks to minimise overall disturbance. The low pressure gas and water gathering networks will be installed generally as follows:

- Vegetation will be cleared, stockpiled and mulched for reuse during rehabilitation. Large hollow logs and other habitat features will be salvaged and used in rehabilitation
- Topsoil will be stripped and stockpiled for use in future rehabilitation
- Trenching will be prepared and the pipeline strung out adjacent to the trench and lowered into the trench
- The trench will be backfilled and re-profiled consistent with the surrounding area. Once re-profiling is completed, the rehabilitation process of the right of way will commence.

4. Legal and Other Requirements

The Contractor must at all times comply with all applicable regulatory requirements relevant to the scope of works. This includes the general environmental duty under the *Environment Protection Act 1994* (QLD), compliance with any applicable requirements of all environmental Acts and Regulations as well as the project specific requirements of environmental approvals required to undertake the Project works.

The Australia Pacific LNG Regulatory Approvals Plan (Q-LNG01-15-MP-2000) sets out the relevant approvals required to conduct the proposed works. The Australia Pacific LNG Project Construction Environmental Management Plan (Q-LNG01-15-MP-1001) also provides a roadmap to key approvals requirements and responsibilities.

5. Roles and Responsibilities

5.1. Australia Pacific LNG Environmental Representative

Note that throughout this document Australia Pacific LNG Environmental Representative should be understood to mean Australia Pacific LNG Environmental Representative or delegate. For the purposes of this CEMP and all Environment related matters the Australia Pacific LNG Environmental Representative is the Australia Pacific LNG Environment Lead for the sub project.

5.2. All Personnel

All project staff (including sub-contractors) have a general environmental duty of care as defined in the *Environmental Protection Act 1994* (QLD) and are responsible for their own environmental performance whilst on the project. As a minimum, project staff are required to:

- Comply with the requirements of applicable environmental legislation and environmental authorities including the specific requirements of the project approvals and supporting documentation
- Undertake all activities in an environmentally responsible manner
- Undertake all activities in accordance with the agreed environmental management plans, procedures and work method statements

- Report any non-conformances with environmental management, legislative or approvals requirements
- Ensure that they are aware of the contact person regarding environmental matters and report any activity that has resulted in, or has the potential to result in an Environmental harm
- Ensure that they attend the environmental training provided relevant to their role and responsibilities.

5.3. Project Manager and Construction Manager

- Ensure project and construction activities are performed in compliance with all applicable legal, approval and project environmental obligations
- Ensure all project staff have a clear understanding of the environmental requirements relevant to their area/scope of work
- Ensure all project staff are competent to undertake their duties including fulfilment of the general environmental duty, with regard to appropriate education, training and experience
- Ensure the necessary resources and processes are in place for implementation of required environmental controls
- Ensure all site supervisors are familiar with environmental obligations, project approvals, CEMP, relevant environmental management plans and associated documents, and their responsibilities within them
- Participate and provide guidance in the regular review of the CEMP and associated documents
- Take action in the event of an emergency and allocating the required resources to minimise environmental impact
- Ensure non-conformances are identified, recorded and reported
- Report any activity that has resulted, or has the potential to result, in an environmental incident to the Australia Pacific LNG Environmental Representative
- Work with the environment group in planning and implementing environmental requirements.

5.4. Site Supervisor

- Communicate with all personnel and subcontractors regarding compliance with the CEMP and site specific environmental issues
- Coordinate the implementation of the CEMP and site environmental controls
- Work with the Environmental Representative in planning and implementing environmental requirements
- Undertake site inspections
- Ensure incidents and non-conformances are identified, recorded and reported
- Drive implementation of preventative and corrective actions
- Co-ordinate the implementation and maintenance of environmental control measures
- Provide necessary resources required for implementation of the CEMP
- Co-ordinate action in emergency situations and allocating required resources in accordance with the Emergency Response Plan
- Ensure that instructions are issued and adequate information provided to field based employees which relate to environmental risks on site.

5.5. All Construction Personnel

- Report any activity that has resulted in, or has the potential to result in an environmental incident immediately to the Site Supervisor, Construction Manager and Environmental Representative
- Undertake environmental inspections and keep environmental records, as required
- Carry out all activities in accordance with the CEMP
- Identify and report non-conformances
- Implement corrective and preventative action
- Work with the environmental group in planning and implementing environmental requirements.

5.6. Environment Team

- Provide advice on measures required to comply with the requirements of applicable environmental legislation and environmental authorities including the specific requirements of the project approvals and supporting documentation
- Provide advice on environmental matters to continually improve environmental performance
- Identify areas requiring improvement and develop action plans, communicate compliance requirements, and ensure all environmental obligations including legislative requirements and approvals are complied with
- Develop, review and implement environmental management plans and procedures for project activities
- Conduct environmental site inspections, auditing, monitoring and training, identify improvement actions and track implementation of actions
- Identify, investigate and report on actual and potential environmental incidents and non conformances
- Develop and implement corrective and preventive actions to prevent recurrence of incidents and non conformances
- Monitor the implementation and effectiveness of the CEMP
- Complete environmental record keeping and reporting requirements

6. Environmental Management Requirements

6.1. Air Quality

AIR QUALITY			
Objectives		To construct the gas fields in a manner that has minimal impact to the qualities of the air environment that are conducive to: • Protecting the health and biodiversity of ecosystems • Human health and wellbeing • Protecting the aesthetics of the environment, including the appearance of buildings, structures and other property • Protecting agricultural use of the environment	
Targets		• The release of odour, dust or any other air borne contaminants or light from petroleum activity(ies) must not cause an environmental nuisance at any sensitive place. A sensitive place may include a dwelling, commercial activity, retail activity, school, hospital, park or protected area. • Dust particulate matter must not exceed the following levels specified by the Environmental Protection (Air) Policy 2008 at any sensitive or commercial place in the event of a dust complaint: - Dust deposition of 120mg/m^2/day averaged over one month - PM10 concentration of 50µg/m^3 over a 24 hour averaging time - PM2.5 concentration of 25µg/m^3 over a 24 hour averaging time	
REF	**HEADING**	**REQUIRED ACTIONS**	**TIMING**
1.1	Origin Energy HSEMS – Environmental Effects and Management Directives	The Contractor must comply with all relevant requirements of Origin Energy HSEMS – Environmental Effects and Management Directives, as amended from time to time, including: • Air emissions ORG-HSE-DVE-035 • Greenhouse Gas and Energy Efficiency ORG-HSE-DVE-027	At all times
1.2	Australia Pacific LNG Greenhouse Gas Emissions Strategy	The Contractor must comply with any applicable requirements of the Australia Pacific LNG Greenhouse Gas Emissions Strategy (Q-LNG01-15-MP-0071) relevant to the Contractor's scope of works.	At all times
1.3		*Not used*	
1.4	Temporary Emissions Sources	With regard to locating and operation of temporary equipment, plant or activities carried out by the Contractor, reasonably expected sources of air emissions resulting from the construction activities that may cause nuisance or environmental harm should be located and designed in consultation with the Australia Pacific LNG Environmental Representative to minimise impacts, wherever possible.	At all times
1.5	Dust Control	Construction activities must be planned and undertaken to minimise generation of dust resulting from adverse weather conditions including: • scheduling dust generating activities to avoid adverse weather conditions such as extreme wind • modifying activities during windy weather to minimise dust generation • implementing additional dust mitigation measures when dust-generating weather is forecast	At all times

AIR QUALITY			
		• ceasing and/or rescheduling activities where dust mitigation measures are ineffective • minimising the area and duration of land disturbance activities • application of dust suppression techniques such as regular water application and approved soil binders (spraying of oil and oil by-products is prohibited) • in areas where dust may be readily generated implement additional dust suppression measures e.g. surfacing of major access roads • rehabilitating disturbed areas as soon as practicable	
1.6		Requirements for dust management must be communicated to all onsite personnel including that all site personnel have responsibility for monitoring work areas continually for dust emissions and reporting excessive dust generation, particularly in the vicinity of sensitive receptors.	At all times
1.7		Where appropriate, minimise ground disturbance through retaining existing groundcover vegetation on approved access routes (e.g. slashing).	At all times
1.8		Dust emissions from construction areas including stockpiles should be visually monitored throughout construction.	At all times
1.9		Dust suppression activities must be modified or increased in the event of unacceptable dust generation or in the event of a complaint.	As required
1.10		If all available methods of dust stabilisation fail to suppress dust and it continues to result in exceedence of dust levels specified in air quality targets, construction activities must be temporarily halted until dust generating conditions subside or are rectified, as agreed with the Australia Pacific LNG Environmental Representative.	As required
1.11	Stockpiles	Long-term stockpiles (>28 days) must be evaluated and where required stabilised with protective materials (e.g. geofabric or mulch), applying soil binders or seeding. Evaluation should comprise visual inspection of stockpile for signs of soil loss through erosion and consideration of further duration the stockpile is to remain in place and the erosion hazard at the site at the time of year. Erosion protection is required if the stockpile is to be in place for more than an additional month, and the erosion hazard is moderate or high within that period.	At all times
1.12	Plant/Equipment/ Vehicles	All trucks carrying dust generating materials such as spoil or sand onto or off site must be covered if travelling on public roads.	At all times
1.13		Truck queuing, unnecessary idling of trucks and unnecessary trips should be reduced through logistical planning of materials delivery, behavioural training and work practices.	At all times
1.14		Vehicles and equipment must be fitted with appropriate emission control equipment and routinely maintained. Plant should be switched off when not in use, wherever practicable.	At all times
1.15		All plant, equipment and vehicles are to be regularly monitored and maintained and records kept of maintenance. Engine tampering to increase power output is prohibited.	At all times
1.16		Air emissions from plant, vehicles and equipment should be visually monitored throughout construction.	At all times
1.17	Access Roads	The Contractor must implement and enforce speed restrictions on site (no greater than 40km/hr within construction areas). Speed on unpaved roads and tracks adjacent to dwellings should be reduced to minimise the generation of dust from vehicles. Where environmental and social objectives fail to be achieved, further restrictions on speed may be imposed by the Australia Pacific LNG Environmental Representative, as required.	At all times

AIR QUALITY			
1.18		Any spoiling of sealed and public roads must be cleaned as soon as practicable, or within two hours of any direction from the Australia Pacific LNG Environmental Representative.	At all times
1.19	Burning	No on-site burning of vegetation or waste materials is permitted.	At all times
1.20	Odour	Works undertaken around identified contaminated sites or live sewerage systems to be undertaken in a manner to ensure risk of odour impact on community and workforce is mitigated.	As required
1.21	Blasting	Blasting activities must be conducted according with the Contractor's Blast Management Plan and include appropriate dust control measures.	As required
1.22	Fuel burning	Contaminants emitted from fuel burning and combustion equipment point sources (excluding ground flares) that are capable of burning at least 500 kg in an hour must be directed vertically upwards.	As required
1.23	Pipeline purging	Purging or venting should be minimised by using methods that prevent or reduce the mixing of air, inert gas and product gas (e.g. use of a pig).	As required
1.24		Purging or venting gas from the pipeline should be conducted under favourable local meteorological conditions that facilitate rapid atmospheric dispersion of the gas.	As required
1.25		The Contractor must notify the Australia Pacific LNG Environmental Representative of any planned venting at least two (2) weeks prior to undertaking the activity, to enable notification of any sensitive receptors, as required.	2 weeks prior to purging
1.26	Greenhouse gas emissions	Clearing of vegetation must be minimised and larger trees must be avoided, where possible.	At all times

6.2. Noise and Vibration

<table>
<tr><th colspan="2">NOISE AND VIBRATION</th></tr>
<tr><td>Objectives</td><td>To construct the gas fields in a manner that has minimal impact to the qualities of the acoustic environment that are conducive to the following:
The health and biodiversity of ecosystems.
Human health and wellbeing, including by ensuring a suitable acoustic environment for individuals to sleep, study or learn, be involved in recreation, relax and converse.
The amenity of the community.
In relation to vibration, the structural and cosmetic integrity of non- Indigenous cultural heritage sites and dwellings is to be protected.</td></tr>
<tr><td>Targets</td><td>Noise from construction activities do not cause an environmental nuisance at any sensitive or commercial place.
Noise emissions construction activities do not result in levels at the nearest sensitive receptor greater than those specified in project Environmental Authorities and the following:
Table 3: Noise Limits at Sensitive Receptors
<table>
<tr><th>Time Period</th><th>Metric</th><th>Short Term Noise Event</th><th>Medium Term Noise Event</th><th>Long Term Noise Event</th></tr>
<tr><td>7:00am – 6:00pm</td><td>$L_{Aeq,\ adj,\ 15\ min}$</td><td>45 dBA</td><td>43 dBA</td><td>40 dBA</td></tr>
<tr><td>6:00pm – 10:00pm</td><td>$L_{Aeq,\ adj,\ 15\ min}$</td><td>40 dBA</td><td>38 dBA</td><td>35 dBA</td></tr>
<tr><td>Noise from drilling activities undertaken from 10:00pm – 7:00am</td><td>$L_{Aeq,\ adj,\ 15\ min}$</td><td colspan="3">30 dBA (measured indoors at any sensitive receptor)</td></tr>
<tr><td>Noise from fixed plant in gas field undertaken from 10:00pm – 7:00am</td><td>$L_{Aeq,\ adj,\ 15\ min}$</td><td colspan="3">28 dBA (measured indoors at any sensitive receptor)</td></tr>
</table>
Noise limits in Table 1 are taken to be measured outside a sensitive receptor unless stated otherwise.
$L_{Aeq,}$ and Max L_{pA} are to be measured over any 15 minute period
L_{ABG} is the deemed background noised levels which for the purposes of the above limits:
Noise Limits at Sensitive Receptors are:
7:00am – 6:00pm: 35 dBA
6:00pm – 10:00pm: 30 dBA
10:00pm – 6:00am: 25 dBA
6:00am – 7:00am: 30 dBA</td></tr>
</table>

NOISE AND VIBRATION

Short, Medium and Long term noise events are as defined in Condabri EA EPPG00853013

If noise subject to a complaint is tonal or impulsive the following adjustments to the above noise limits are to be added to the measured noise levels to derive $L_{Aeq, adj, 15\ min}$:

Noise Characteristic	Adjustment to Noise
Tonal Characteristic is just audible	+2 dBA
Tonal Characteristic is clearly audible	+5 dBA
Impulsive Characteristic is just audible	+2 dBA
Impulsive Characteristic is clearly audible	+5 dBA

- Temporary accommodation facilities (excluding mobile drilling camps) achieve the following noise levels to protect workers' health and wellbeing:

Table 4: Noise Objectives For Indoors, Measured At The Receptor In dBA

Time	Noise objectives for indoors, measured at the receptor in dBA		
	$L_{Aeq, adj, 1hr}$	$L_{A10, adj, 1hr}$	$L_{A1, adj, 1hr}$
Day and evening	35	40	45
Night	35	40	45

- Noise from blasting operations does not exceed an airblast overpressure level of 120 dB (linear peak) at any time, when measured at or extrapolated to any sensitive receptor.
- Ground-borne vibration peak particle velocity caused by blasting operations do not exceed 10mm/s at any time, when measured at or extrapolated at any sensitive receptor.

REF	HEADING	ACTIONS	TIMING
2.1	Origin Energy HSEMS – Environmental Effects and Management Directives	The Contractor must comply with all relevant requirements of Origin Energy HSEMS – Environmental Effects and Management Directives, as amended from time to time, including: • Environmental Noise ORG-HSE-DVE-019	At all times
2.2	Australia Pacific LNG Noise Management Plan Gas Field Operation	The Contractor must comply with all relevant requirements of Australia Pacific LNG Noise Management Plan Gas Field Operation (Q-LNG01-15-MP-0085) and must incorporate construction noise management measures into the Contractor's CEMP.	At all times
2.3	Traffic Management Plan	The Contractor must develop, maintain and implement Traffic Management Plans addressing the Contractor's scope of works throughout construction for all work sites. The Traffic Management Plan must include management of noise associated with traffic during the construction phase of the Project and measures to minimise disturbance to residents and traffic conditions. This should include identification of suitable routes, times of travel, speed restrictions, and management of night-time traffic.	At all times

NOISE AND VIBRATION			
2.4	Temporary Workers' Accommodation	Where camp design or fabrication is within the Contractors scope of works, the contractor must model the expected noise for any temporary workers accomodation (as defined in the Coordinator General's Report) that they have constructed or must operate and demonstrate it meets the Temporary Workers' Accommodation noise limits imposed by government (refer to limits provided in Targets above and the Australia Pacific LNG Coordinator General's Report on the EIS November 2010). Prior to occupation and during construction noise monitoring must be completed to demonstrate ongoing compliance with the noise limits. The results of any noise modelling and monitoring must be provided to Australia Pacific LNG within two weeks of completion.	Prior to first occupation and then regularly throughout construction
2.5		Temporary Workers Accommodation must be located at least 800m from the nearest sensitive receptors to ensure that noise from camp activities do not cause a noise nuisance. Camp rules should include consideration of neighbouring landholders and the local community with regard to noise and other nuisance activities.	Prior to construction
2.6	Reversing or warning alarms and beepers	The Contractor must implement methods to minimise noise impacts from reversing or warning audible alarms (that is 'beepers'). The use of acoustic reversing or warning alarms that cause annoyance to sensitive receivers will not be approved unless alternative alarms or methods of reducing risk from plant movements can be demonstrated to be impractical for the application. Alternatives considered should as a minimum include movement alarms, proximity sensor, broadband alarm or focussed alarm systems. Acoustic warning alarms must be approved by the Australia Pacific LNG Environmental Representative prior to use.	At all times
2.7	Hours of work	Construction activities must only occur between 6:00am and 6:00pm 7 days a week, unless otherwise approved in writing by the Australia Pacific LNG Environmental Representative. Note that noise limits (see above) are more stringent between 6:00am and 7:00am (i.e. 5dBA less than 7:00am to 6:00pm), the Contractor should take all reasonable measures to minimise noise during these times to ensure no breach of site noise requirements.	At all times
2.8		The Contractor must seek written approval from the Australia Pacific LNG Environmental Representative for any out-of-hours construction activities (i.e. 6:00pm-6:00am) a minimum of two weeks prior to commencement of these works and develop and implement appropriate noise and light mitigation measures. Contractors should note that out of hours construction may not be commenced if Australia Pacific LNG has not been able to negotiate a noise agreement with the landholder. Where written approval from the Australia Pacific LNG Environmental Representative is granted for works between 6:00pm and 6:00am the Contractor must comply with noise limits in the relevant Environmental Authority and "Targets" set out in Table 1 and Table 2 above, unless advised in writing that an alternative arrangement is in place. Where noise limits for construction activities are not specified in the relevant Environmental Authority, the Queensland *Environmental Protection (Noise) Policy* 2008 Schedule 1 Acoustic Quality Objectives must be complied with, which for night time prescribes a limit of 30 dBA LA_{eq} measured indoors.	Minimum of 2 weeks prior to undertaking activity
2.9	Deliveries	Truck deliveries to laydown areas, construction sites and well sites must be avoided between 6:00pm and 6:00am unless otherwise authorised by the Australia Pacific LNG Environmental Representative.	At all times
2.10		Suitable routes and times of travel should be identified to reduce disturbances to residents and traffic conditions.	At all times

NOISE AND VIBRATION			
2.11	Vehicles, Plant and Equipment	All construction equipment must be fitted with appropriate noise abatement devices (e.g. mufflers) and comply with any relevant Australian Standards. Equipment and noise abatement devices should be maintained in good working order as per manufacturer's instruction.	At all times
2.12		Construction plant and equipment should be located at appropriate distances from residences and/or within noise enclosures where possible. Noise attenuation should be utilised where appropriate e.g. screens, enclosures or barriers.	At all times
2.13		The following actions should be taken to minimise noise from construction activities: • Re-scheduling noisy construction activities • Modify the activity • Substitute noise generating plant with alternative quieter equipment • Enhancing noise attenuation measures on plant and equipment • Use of noise attenuation barriers	As required
2.14	Non-standard construction noise	The Contractor must notify the Australia Pacific LNG Environmental Representative at least 2 weeks prior to commencing non standard operations and submit for approval a Noise Mitigation Plan which must identify methods of reducing noise impacts on any sensitive receivers from the activity concerned. Non standard operations are those activities which are likely to cause altered or elevated noise emissions, for example rock sawing and rock-hammering. Non-standard operations may only occur following written approval of the Contractor's Noise Mitigation Plan and confirmation from the Australia Pacific LNG Environmental Representative that residents and/or businesses that may be affected by noise from these activities have received notification of commencement of these activities. Where practicable, excessively noisy construction activities should be scheduled for periods which are less likely to result in a noise nuisance; this may include provision of work breaks. Excessively noise activities must not be conducted out of hours unless in response to an emergency situation and in accordance with the written approval of the Australia Pacific LNG Environmental Representative.	At least 2 weeks prior to undertaking activity
2.15	Blast Management Plan	The Contractor must develop a Blast Management Plan in accordance with AS2187 and have the plan certified by a suitably qualified person, prior to each blasting activity. This plan should include detailing the proposed method of blasting, including safety, drill pattern, charges, explosives, detonation methods, debris control. The Blast Management Plan must ensure that any blasting is designed to meet the *Environmental Protection Act 1994* (QLD) criteria and not cause any structural damage to buildings, buried infrastructure or other sensitive structures (e.g. heritage listed sites). The plan must include measures to minimise the likelihood of any adverse effects being caused by air blast overpressure and/or ground borne vibrations at any sensitive receptor and demonstrate current best practice environmental management. The Blast Management Plan must include provision for management of blasting refuse, such as containers, cartridges, caps and wire, in accordance with regulatory requirements. Explosives must not be stored on site without permission of Australia Pacific LNG HSSE Manager. The Blast Management Plan must be submitted two weeks prior to any blast for review by the Australia Pacific LNG Environmental Representative.	2 weeks prior to any blast

NOISE AND VIBRATION			
2.16	Blast and Vibration Monitoring	The Contractor must undertake monitoring and recording of the air blast overpressure and ground borne vibration of every blast. The Contractor's Blast Management Plan must include as a minimum the following environmental monitoring of noise and vibration requirements for all blasts: • maximum instantaneous charge • location of the blast within the site (including any bench level if applicable) • airblast overpressure level (dB Linear Peak) • peak particle velocity (mm/s) • location, date and time of recording • measurement instrumentation and procedure • meteorological conditions for blast monitoring (including temperature, relative humidity, temperature gradient, cloud cover, wind speed and direction) • distances from the blast site to potentially noise-affected buildings or structures	At all times
2.17	Blasting	Controlled blasting should be conducted only where conventional excavation, rock hammering or trenching equipment is ineffective or where it can be demonstrated in writing to the Australia Pacific LNG Environmental Representative that blasting will reduce overall noise, vibration and/or nuisance impacts of the works. Blasting activities must be conducted according to regulations and with appropriate dust control measures. All blasting must be carried out by a qualified person and in accordance with Blast Management Plan. Evidence of all required licenses and approvals for blasting must be provided to Australia Pacific LNG prior to any blasting occurring. The Contractor must notify the Australia Pacific LNG Environmental Representative 2 weeks prior to any blasting activity.	2 weeks prior to blasting
2.18		In consultation with the Australia Pacific LNG Environmental Representative, the Contractor must conduct pre- and post-construction building condition surveys of identified structures or infrastructure. Vibration monitoring must be undertaken during construction if modelled levels of ground vibration are within 20% of statutory limits, or following the direction of Australia Pacific LNG.	As required
2.19		Blasting must not be conducted within a 100m from any identified: • cultural heritage sites • pipelines • sensitive receptors	At all times
2.20		The Contractor must ensure that blasting in or adjacent to ecologically sensitive areas incorporates appropriate precautions to protect ecological resources. For example, where possible, blasting should be scheduled to avoid sensitive lifecycle periods of fauna species (e.g. breeding, nesting, migration). Smaller and/or staggered charges should be used where practicable.	At all times
2.21		Blasting procedures must be strictly monitored and controlled for compliance with relevant Queensland legislation and Australian Standards.	At all times

NOISE AND VIBRATION			
2.22		Measures, such as appropriate blast design, blanketing and collaring, should be employed to prevent possible damage to nearby structures, utilities and sensitive habitat/fauna.	At all times
2.23	Noise related complaint	In the event of a noise related complaint from external stakeholders the Contractor must: • Notify the Australia Pacific LNG Environmental Representative immediately but no later than 4 hours of receiving the complaint • Check nature of activities being conducted • Investigate source of noise and identify all practical measures to reduce noise • Cease or reduce noisy or vibration generating activities where possible • Undertake any other possible corrective actions immediately • Undertake noise or vibration monitoring where necessary	As required

6.3. Water Management

WATER MANAGEMENT	
Objectives	To construct the development area in a manner that has minimal impact to the qualities of the surface water and aquatic ecology that are conducive to: • Protecting the health and biodiversity of aquatic ecosystems • Protecting the stability and function of watercourses • Human health and wellbeing • Sustaining the economic environment associated with watercourses • To construct the gas fields in a manner that minimises the potential impacts on groundwater to surrounding landowners and environmental values and maximise the long term sustainability of the groundwater resource.
Targets	• Minimal disturbance to riparian vegetation especially the removal of large canopy trees • No disturbance to riparian vegetation outside that approved for the project and as identified in the Australia Pacific LNG work pack • No failure of erosion and sediment control devices leading to unacceptable soil erosion and transport of sediment outside of construction extents • No barriers to fish passage • No introduction or spread of weed species • No translocation of noxious fish species • No uncontrolled release of CSG water • No spills or incidents associated with stored fuels or other contaminants that may result in contamination of the watercourse • No impact to groundwater dependent species • No change to flood efflux • No complaints about surface water aquatic ecology related matters from the local community for the duration of the construction phase • No impact to groundwater quality as a result of Australia Pacific LNG activities

WATER MANAGEMENT

- Stormwater and/or site runoff must meet the following water quality limits:

Water Quality Characteristics	Unit	Limit	Limit Type
pH	ph Units	6.5 to 8.5	Range
Turbidity	NTU	Less than 10% above receiving waters turbidity	maximum
Litter	-	None visible	-
Hydrocarbons	-	No visible sheen	-
Coarse Sediment	-	Retain coarse sediment on site	-

Note: Background water quality to be measured within 20m upstream of the construction activity where practicable. Where background water not present within 20m upstream of construction site an alternative background sampling point must be approved by the Australia Pacific LNG Environmental Representative

REF	HEADING	ACTIONS	TIMING
3.1	Origin Energy HSEMS – Environmental Effects and Management Directives	The Contractor must comply with all relevant requirements of Origin Energy HSEMS – Environmental Effects and Management Directives, as amended from time to time, including: • Water Management ORG-HSE-DVE-024	At all times
3.2	Australia Pacific LNG Land Release Management Plan	The Contractor must comply with all applicable requirements of the Australia Pacific LNG Land Release Management Plan. • Land Release Management Plan (Q-LNG01-15-MP-0354)	At all times
3.3	Australia Pacific LNG CSG Water Management Plan	The Contractor must take note of and comply with all applicable requirements of the Australia Pacific LNG CSG Water Management Plan for the Development Area. • Australia Pacific LNG Condabri CSG Water Management Plan (Q-1805-45-MP-0001) • Australia Pacific LNG Combabula CSG Water Management Plan (Q-4200-45-MP-0001) • Australia Pacific LNG Talinga CSG Water Management Plan (Q-4100-15-MP-0001)	At all times
3.4		*Not used*	
3.5	Site Stormwater Design – Major Sites	The Contractor must design stormwater systems at major site (including but not limited to all gas field facilities sites, camps, major laydown yards and as advised by the Australia Pacific LNG Environmental Representative) to divert stormwater around the construction site and to capture and treat stormwater generated within the site. Stormwater collected on the site must be directed to sedimentation ponds. Stormwater is only permitted to be discharged from site when water quality criteria are achieved. Surface water diversion channels must be designed by a suitably qualified person and sized to appropriately convey runoff e.g. around pond embankments, without causing additional erosion and scour of land.	Prior to construction and then during construction at all times

WATER MANAGEMENT			
		All associated water, plant wash down water and other potentially contaminated stormwater and liquid wastes must be segregated from stormwater systems. All process area wash down wastes must be captured and returned to ponds segregated from the stormwater system for appropriate treatment.	
3.6	Contaminants must not be released to waters	Contaminants must not be directly or indirectly released to any waters except as permitted under the relevant Environmental Authority. There must be no release of stormwater runoff that has been in contact with any contaminants at the site to any waters, including roadside gutters and stormwater drains. Where any water quality parameter relating to discharge is exceeded, that discharge must immediately cease and be reported to the Australia Pacific LNG Environmental Representative.	At all times
3.7		*Not used*	
3.8	Clearing of Riparian vegetation	Existing clearings through riparian vegetation must be utilised in preference to clearing, where practicable.	At all times
3.9		*Not used*	
3.10		Solid or continuous barrier fencing or clearly visible and distinctive marker posts or another method approved by the Australia Pacific LNG Environmental Representative must be erected to protect riparian vegetation including large canopy trees and to ensure that only the approved area is cleared.	At all times
3.11		Prior to clearing of riparian vegetation, the Contractor must make a photographic record of crossing area to be disturbed. For all work in waterways, a minimum of three *pre-works* photographs need to be taken of the waterway at the site of proposed works to commencement of clearing: • Photo A—looking across the waterway at the proposed site of works. • Photo B—looking downstream of the proposed site of works. • Photo C—Looking upstream of the proposed site of works All pre works photographs must be provided to Australia Pacific LNG 10 days prior to commencement of clearing or on request. For all work in waterways, a minimum of five *post-works* photographs need to be taken of the waterway after the works are completed. This includes the same photo locations for the pre-works notification and two additional photos looking at the completed barrier works from an upstream and downstream position. • Photo A—looking across the waterway at the completed works. • Photo B—looking downstream of the completed site of works. • Photo C—looking upstream of the completed site of works. • Photo D—looking at the completed barrier works from a downstream position. • Photo E—looking at the completed barrier works from an upstream position. All post works photographs must be provided to Australia Pacific LNG at workpack completion or on request.	At least 10 days prior to clearing riparian vegetation
3.12		Access to stream/drainage feature crossings must be restricted to defined access tracks to promote the rehabilitation of surrounding riparian habitat.	At all times

WATER MANAGEMENT			
3.13		Throughout construction temporary stabilisation of the bed and banks at stream/drainage feature crossing points using protective materials must be in place whenever rainfall causing runoff occurs or is forecast to occur until vegetation cover is re-established e.g. rock crossing or geofabric deployed across disturbed areas in drainage feature during construction phase. Where it is not feasible to deploy measures in response to forecast rainfall, stabilisation measures must be in place at all times other than when works are actively being undertaken in the stream/drainage feature.	At all times
3.14	Waterway crossings	All works in waterways must meet the requirements of the current, relevant self assessable code or be approved by a development approval in accordance with the *Fisheries Act 1994* (QLD) and *Sustainable Planning Act 2009* (QLD). Self assessable codes for works affecting waterways include but are not limited to: • WWBW01 *Code for self assessable development: Minor waterway barrier works*, Queensland Department of Employment, Economic Development and Innovation, including but not limited to - Part 1 construction of minor dams and weirs - Part 3 culvert crossings - Part 4 bed level crossings • WWBW02 *Code for self assessable development: Temporary waterway barrier works*, Queensland Department of Employment, Economic Development and Innovation	At all times
3.15		All works in waterways must comply with the following: • At all times while works in waterways are proceeding, at least one sign is to be erected at the construction entry to the property. Each sign must have minimum dimensions of 500 mm by 500 mm. The following words are to be legibly included on the sign— "Operational works conducted under Fisheries Queensland self-assessable code. Call 13 25 23". Signs must be removed within 48 hours of completion of works under this code. • During construction, disturbance to the in stream bed and bank sediment of the waterway beyond the barrier footprint must be minimised as much as practical • Provisions must be made to minimise the risk of fish kills arising from the works e.g. through entrapment of fish upstream or between works • In the event of fish that have been trapped by the works becoming distressed the Fisheries Queensland *Fish Salvage Guidelines* must be implemented immediately • Fish kills must be reported to Australia Pacific LNG Environmental Representative immediately • If there is more than one temporary waterway barrier in the location, the most downstream waterway barrier must be removed first • All waterway barrier material must be removed from within the waterway and be disposed of at least 50m away from the waterway • Works in waterways must not commence in times of elevated flows • Maximum duration of works as specified in the relevant Self Assessable Code or development approval for waterway barrier works must be complied with. Records of construction commencement and completion in waterways must be kept and provided at workpack completion or on request	At all times

WATER MANAGEMENT			
		Note: the maximum allowable duration for temporary waterway barrier works are: - For assessable (purple, grey) and high (red) waterways a maximum time of 180 calendar days - For moderate (amber) and low (green) impact waterways a maximum time of 360 calendar days. • Bed level crossing dimensions and design must comply with requirements of the WWBW01 *Code for self assessable development: Minor waterway barrier works Part 4 bed level crossings.*	
3.16	Watercourse Crossings	All watercourse crossings must meet the requirements of current relevant codes and standards including but not necessarily limited to: • Guideline – *Activities in a watercourse, lake or spring associated with mining operations December 2010*, Queensland Department of Environment and Resource Management Watercourse crossings should be perpendicular to direction of flow wherever practical.	At all times
3.17		The duration of works within 100m of and/or in a watercourse must not exceed the maximum time specified in the relevant Environmental Authority. Works within 100m of or in a watercourse must be conducted in the following order of preference: • Conducting works when no water is present • Conducting works in times of no flow • Conducting works in times of flow but in a way that does not negatively impact the flow of water within the watercourse, permanently impound water or permanently divert the flow of water	At all times
3.18		*Not used*	
3.19	Stream Crossings	Clearing slopes leading to watercourses, waterways and/or drainage features should be delayed, where practicable, until construction of the crossing is imminent, or alternative measures are employed to prevent and/or minimise erosion and sedimentation risk. For Gathering right of way construction clearing of riparian vegetation and stream/drainage feature crossings must be staged such that the access track only is cleared where required for construction access, and the remainder of the ROW width is only cleared when pipeline installation is imminent.	At all times
3.20		Grading should be undertaken in a direction away from watercourses, waterways and drainage features.	At all times
3.21		Temporary diversions or provision for clean water flow through the site must be available and installed where water flow does or is likely to occur during construction works within a watercourse, waterway and/or drainage feature. The Contractor must ensure that any required materials and equipment to prevent pollution of waters and impediment of flow is available during construction of watercourse, waterway and/or drainage feature crossings where water flow does or could occur including installation of diversion berms immediately above bank level, site stabilisation, stabilisation of stream/drainage feature bed and banks, bypass pumping, temporary berms, silt curtains and sediment control devices etc.	At all times
3.22		If a major rainfall event is forecast while construction activities in a watercourse, waterway and/or drainage feature is underway or planned to occur, the Contractor must conduct a risk assessment to identify appropriate mitigation measures such as monitoring of upstream flow conditions, rescheduling activities, site stabilisation and evacuation requirements.	As required

WATER MANAGEMENT			
3.23		Construction activities in watercourse, waterway and/or drainage feature must cease if a risk assessment indicates that any forecast rainfall event could cause unacceptable environmental or safety impact and not re-commence until a site inspection has determined that the watercourse, waterway and/or drainage feature has returned to stable flow (or no flow) conditions. Where a risk assessment indicates that any forecast rainfall event could cause unacceptable environmental or safety impact the site must be stabilised with all exposed surfaces covered, open excavations backfilled and equipment removed.	As required
3.24		Unless authorised in writing by the Australia Pacific LNG Environmental Representative and in accordance with the relevant Environmental Authority, clearing vegetation, earthworks, placing fill (including stockpiles) or significant disturbance to land other than that associated with construction or maintenance of linear infrastructure is not permitted in or within: a. 200 metres from any lake or spring; or b. 100 metres of the high bank of any watercourse.	At all times
3.25		Unless authorised by the Australia Pacific LNG Environmental Representative, the Contractor must not excavate or place fill that could adversely interfere with the flow of water in a watercourse, waterway, drainage line, wetland or spring. This includes works or placement of materials that divert the course of flow of the water or works that impound the water.	At all times
3.26		All equipment required for works in or near watercourse, waterway and/or drainage feature must be in good working order prior to work commencing on the crossing. All hydraulic, fuel and lubricating systems of machinery used in the watercourse, waterway and/or drainage feature crossing should be in good repair in order to avoid water pollution.	At all times
3.27		Temporary watercourse, waterway and/or drainage feature flow diversions must be removed as soon as the crossing construction has been completed.	At all times
3.28		*Not used*	
3.29		If, due to the construction activities water turbidity increases in the watercourse, waterway and/or drainage feature, lake, wetland or spring outside the construction area, works must cease and the sediment control measures must be rectified to limit turbidity before construction recommences. Construction may only recommence on the direction of the Australia Pacific LNG Environmental Representative.	At all times
3.30	Inspection and Corrective Actions	Routine, regular and frequent visual monitoring must be undertaken while carrying out construction work in a watercourse, waterway and/or drainage feature, lake, wetland or spring. In the event that water quality deterioration in surrounding water bodies is observed: • Inspect areas at and upstream of incident to identify source • Repair, protect and stabilise disturbed surfaces • Recover sediment if applicable • Repair or replace damaged devices and • Review and augment water quality control systems.	As required

<table>
<tr><th colspan="4">WATER MANAGEMENT</th></tr>
<tr><td>3.30a</td><td></td><td>Monitoring of drainage features must be undertaken as required in the Environmental Workpack for the work area and in accordance with Technical Instruction Monitoring Water Feature Crossings (Q-LNG01-15-TI-0033) including:
Provide, install and maintain water feature monitoring equipment throughout construction and reinstatement
Inspect, sample and analyse water samples
Assess compliance of sample results with Project environmental requirements
Remove monitoring equipment (for reuse) on reinstatement acceptance.</td><td>At all times</td></tr>
<tr><td>3.31</td><td>Hydrotest Water Management</td><td>Hydrotest water must not be released or discharged to any waters.
Hydrotest water released to land must not exceed water quality standards set out in relevant Environmental Authority. Hydrotest water released to land must be assessed prior to release, and may only be discharged if water quality does not exceed the following water quality limits:<table><tr><th>Parameter</th><th>Water Quality Limits (Maximum)</th></tr><tr><td>pH</td><td>6.5 - 8.5 (Range)</td></tr><tr><td>Arsenic (mg/L)</td><td>2.0</td></tr><tr><td>Cadmium (mg/L)</td><td>0.05</td></tr><tr><td>Chromium (mg/L)</td><td>1</td></tr><tr><td>Copper (mg/L)</td><td>5</td></tr><tr><td>Iron (mg/L)</td><td>10</td></tr><tr><td>Lead (mg/L)</td><td>5</td></tr><tr><td>Manganese (mg/L)</td><td>10</td></tr><tr><td>Zinc (mg/L)</td><td>5</td></tr><tr><td>Nitrogen (mg/L)</td><td>35</td></tr><tr><td>Phosphorus (mg/L)</td><td>10</td></tr><tr><td>Electrical Conductivity (µS/cm)</td><td>2000</td></tr></table></td><td>At all times</td></tr>
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<table>
<tr><th colspan="4">WATER MANAGEMENT</th></tr>
<tr><td></td><td></td><td>Release of hydrotest waters in Spring Gully development area must also comply with the following additional water quality limits:
<table>
<tr><th>Parameter</th><th>Water Quality Limits (Maximum)</th></tr>
<tr><td>Aluminium (mg/L)</td><td>20</td></tr>
<tr><td>Boron (mg/L)</td><td>0.5</td></tr>
<tr><td>Chloride (mg/L)</td><td>800</td></tr>
<tr><td>Fluoride (mg/L)</td><td>2</td></tr>
<tr><td>Mercury (mg/L)</td><td>0.002</td></tr>
<tr><td>Nickel (mg/L)</td><td>2</td></tr>
<tr><td>Selenium (mg/L)</td><td>0.05</td></tr>
<tr><td>Silver (mg/L)</td><td>5</td></tr>
<tr><td>Vanadium (mg/L)</td><td>0.5</td></tr>
<tr><td>Electrical Conductivity (µS/cm)</td><td>2900</td></tr>
</table>
If hydrotest water exceeds water quality limits, alternative off-site treatment or disposal options must be utilised, as approved in writing by the Australia Pacific LNG.</td><td></td></tr>
<tr><td>3.31a</td><td>Contractor’s Hydrotest Water management plan</td><td>20 business days prior to commencement of hydrotesting where release to land is anticipated the Contractor must submit to the Australia Pacific LNG Environmental Representative for approval a site specific Hydrotest Management Plan which includes:
A detailed risk assessment
Demonstrates compliance with all relevant requirements of the Australia Pacific LNG Land Release Management Plan (Q-LNG01-15-MP-0354) and this CEMP
Details of the impacts of hydrotest water activities
Source water quality data and characteristics of additives (particularly biocides)
The proposed storage, treatment and disposal/release methods
Site specific mitigation measures including monitoring and reporting</td><td>20 business days prior to commencement of hydrotesting</td></tr>
<tr><td>3.32</td><td></td><td>The following minimum management measures must be implemented at all times throughout hydrotesting:
Prior to commencement of hydrotesting, source water quality data must be obtained and reviewed to determine whether it meets minimum water quality standards for disposal to land. Records of this should be kept for auditing purposes and provided to Australia Pacific LNG at workpack completion or on request. Only source water that prior to use can meet the discharge criteria as specified in the relevant EA (and as outlined in 3.31), is permitted to be discharged to land.</td><td>At all times</td></tr>
</table>

WATER MANAGEMENT			
		• The use, management and disposal of any chemical additives in hydrotest water, such as corrosion inhibitors and biocides, must be approved in writing by the Australia Pacific LNG Environmental Representative prior to commencement. • Hydrotest water containing additives must not be disposed to land, unless authorised in writing by the Australia Pacific LNG Environmental Representative and in accordance with the relevant Environmental Authority. If additives are proposed to be added to hydrotest water alternative off-site treatment or disposal options must be approved in writing by the Australia Pacific LNG Environmental Representative prior to commencement. • Prior to commencement of hydrotesting, site environmental assessment information should be reviewed including soils mapping, results of any site soils investigations, land use, slope, proximity to sensitive receptors, site drainage and ESA reports. • In the event that a land release option is pursued a risk assessment must be conducted by the Contractor to determine the potential environmental impacts. This assessment must include the following: - The proposed release location (GPS coordinates and size/extent) and proximity to environmental constraints including sensitive environments, water bodies etc. - The characteristics of the proposed release location including: • Soil types in the area • Vegetation characteristics • The location and characteristics of the nearest watercourse • The grade and total area of land which will be used for the infiltration and evaporation of hydrotest water • The anticipated depth to groundwater and the potential that hydrotest water could infiltrate to groundwater - The volume and anticipated chemical characteristics of the hydrotest water that will be released. - The anticipated schedule for release of water. - Controls and management practices that will be implemented to prevent the ponding and runoff of hydrotest water. - An assessment of the potential impacts (if any) of the release on soils and groundwater and the potential for subterranean flow to surface water. • Key environmental characteristics of each application site including but not limited to ESAs must be tool-boxed with construction crews prior to commencement and periodically throughout works as required. Records of this must be kept for auditing purposes. • An up-to-date site plan clearly showing hydrotest discharge and storage locations (if applicable) must be available on site at all times. • Hydrotest water discharge is only permitted within the designated hydrotest discharge area approved in writing by Australia Pacific LNG. • The release of hydrotest water must be carried out in a manner that ensures that: - vegetation is not damaged	

WATER MANAGEMENT			
		- soil erosion and soil structure damage is avoided - quality of groundwater is not adversely affected - discharge rate for hydrotest water must be set to avoid ponding or off site runoff from the nominated discharge area; this may be determined through consideration of soil permeability, slope and ground cover - discharged in a manner which prevents erosion • Any release of hydrotest water must be located at least 100m from the nearest watercourse. • Hydrotest water must not be discharged to waters. • Hydrotesting of pipe sections crossing water bodies must be undertaken prior to installation of these pipe sections. • If it is likely that water quality characteristics have altered during the course of testing as determined in the pre commencement risk assessment; a sample must be taken and analysed to confirm water quality meets minimum water quality standards prior to discharge of hydrotest water to land. In general pre release testing is not anticipated to be required for testing of plastic pipes. Records of this should be kept for auditing purposes. • Discharge of hydrotest water must be supervised at all times to ensure compliance with the requirements of this plan. • Hydrotest water should be reused wherever practicable for multiple test sections, and/or other authorised uses as approved in writing by the Australia Pacific LNG Environmental Representative. • Where approved in writing by Australia Pacific LNG, hydrotest water may be provided to landholders for reuse. Hydrotest water discharge or recycling for secondary uses, such as pasture irrigation or livestock watering, must only be undertaken where water quality is within relevant water quality guidelines, as agreed in writing with Australia Pacific LNG. • Application of hydrotest water is not permitted during rainfall events. • All measures, plant and equipment must be operated and maintained in a proper and efficient manner.	
3.33	Hydrotest water storage	Storage of hydrotest water may utilise ponds, tankers and portable tanks. These will be placed proximal to the infrastructure being tested and installed in accordance with EA conditions. The placement of the temporary hydrotest water storages must be within the approved disturbance footprint and conducted in a manner that minimises disturbance and impact to vegetation, waters and soils. Hydrotest water storage ponds must be constructed and maintained in accordance with accepted engineering standards currently appropriate for the purpose for which they are intended. Hydrotest water that does not or may reasonably expect not to meet land discharge quality must be stored in lined ponds or tanks. All hydrotest water storage ponds must be hazard category assessed by a suitably qualified and experienced person in accordance with the "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams. Regulated dams must be designed and constructed in accordance with the requirements of the most recent version of the EHP "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams" as amended from time to time and under the supervision of a suitably qualified and experienced person.	At all times

WATER MANAGEMENT			
3.34	Hydrotest Water Use Monitoring and Records	Hydrotest water quality from a particular source must be sampled and analysed before first use and then monthly for the duration of use. Monitoring must be undertaken in accordance with Australia Pacific LNG Monitoring Program for Construction Activities (Q-4500-15-MP-1002). Hydrotest discharge must be continually supervised to ensure application rates do not cause ponding or runoff from the application area. The following records must be kept by the hydrotest water user: • hydrotest water provider and source • source water quality sampling and analysis records • contact name and telephone number of site supervisor and/or site environmental advisor • quantity (kL) • post hydrotest water quality sampling and analysis record • discharge location (i.e. lot/plan and GPS location) • time and date of hydrotest water discharge • daily weather observations – including rainfall depth, wind direction, wind strength • audit and inspection reports	At all times
3.35	Hydrotest Water Treatment and Disposal	On completion of hydrotesting, hydrotest water must be reused, treated or disposed of in accordance with the site specific risk assessment and the following hierarchy of preferred end uses: 1. Reuse for hydrotesting of other sections 2. Reuse in construction activities in accordance with the relevant water quality limits 3. Discharged to land in accordance with water quality limits Where water quality testing indicates that the relevant water quality limits are not satisfied, the following hierarchy of preferred end use must be followed: 1. Onsite treatment and reuse in construction activities in accordance with the relevant water quality limits 2. Onsite treatment and discharge to land in accordance with water quality limits 3. Transfer of water to Australia Pacific LNG water treatment facility 4. Transportation of the water to a licensed off-site treatment and disposal facility Transfer of test water to any Australia Pacific LNG water treatment facility must be authorised in writing by the Operations Superintendent prior to disposal. Record of this approval must be kept and made available on request. Transfer of test water third party treatment facility may only occur if the premises is suitably licensed. Waste transportation records must be completed. Record of approval and waste transportation documentation must be kept and made available on request (see section 6.9 Waste Management).	At all times

WATER MANAGEMENT			
3.36	Floodplains	Activities in floodplain areas must: • Prevent concentration of flood flows that may cause an adverse environmental impact • Avoid diversion of flood flows from natural drainage paths • Avoid increase in local duration of flood flows • Avoid increase in risk of detaining flood flows • Avoid unacceptable risk to safety of persons or damage to property from flooding.	At all times
3.37	Stormwater	Stormwater runoff must be diverted around disturbed areas. This includes any runoff from areas upslope of the works site. Clean water diversions through works sites must be installed as required to create a stable flow path to transfer clean water in a controlled manner across the worksite without becoming contaminated.	At all times
3.38		Stormwater runoff must be diverted around waste storage and handling areas.	At all times
3.39		There must be no release of stormwater runoff that has been in contact with any contaminants (including sediment) at the site to any waters, roadside gutter or stormwater drain. Contaminated runoff must be captured and appropriately treated prior to release from site. Releases from site must be in accordance with those levels prescribed in stormwater quality limits set out above and comply with requirements of the relevant Environmental Authority.	At all times
3.40		Where erosion within existing watercourse, waterway and/or drainage feature may be exacerbated by additional inflows, or where point source discharges are required, erosion protection, such as rock armour or a geosynthetic layer, must be installed in accordance with any required regulatory permits and approvals. Where temporary erosion protection is installed for additional inflows or point source discharges, the existing soils excavated from the watercourse, waterway and/or drainage feature should be stockpiled so it can be replaced following removal of the temporary protection measures.	At all times
3.41	Groundwater	Extraction of groundwater from underground aquifers must not directly or indirectly cause environmental harm to any waterway, watercourse, lake, wetland or spring. Any groundwater extraction must be approved in writing by the Australia Pacific LNG Environmental Representative and comply with any regulations regarding the use of groundwater. Baseline assessments of all groundwater bores must be conducted and records provided to the Australia Pacific LNG Environmental Representative prior to groundwater extraction.	At all times
3.42	Water Storage Ponds	Construction water storage ponds must be designed, constructed and maintained in accordance with accepted engineering standards currently appropriate for the purpose for which they are intended. The hazard category of construction water storage ponds which are low hazard dams must be determined by a suitably qualified and experienced person prior to its construction and prior to any change in its purpose or stored contents. This assessment will be submitted by Australia Pacific LNG to the regulator in accordance with the requirements of the relevant Environmental Authority. The condition of all low hazard dams must be monitored for early signs of a loss of structural or hydraulic integrity, based on the advice of a suitably qualified and experienced person which must be assessed by the person who conducts the dam hazard assessment. In the event of early signs of loss of structural or hydraulic integrity of a low hazard dam, immediate action must be taken to prevent or minimise any actual or potential environmental harm.	At all times

WATER MANAGEMENT			
3.43		All regulated dams must be constructed in accordance with the requirements of the most recent version of the EHP "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams" as amended from time to time and under the supervision of a suitably qualified and experienced person. All requirements of the Environmental Authority relevant to regulated dams must be complied with.	At all times
3.44	Pipeline Backfilling	During pipeline construction, appropriate measures should be employed to prevent obstruction of sub-surface water flows in side slopes (e.g. natural seepage zones) across the trench, such as the installation of permeable zones within the backfill adjacent to the seepage, or other forms of subsoil drainage.	At all times
3.45	Transfer of water between water catchment systems	No surface water must be transferred between water catchment systems, unless it has been treated to remove any pest fish and other aquatic species.	At all times
3.46	Trench/Excavation Water	Water accumulated in trenches or excavations must not be discharged within 50m of any waters. Any discharge of trench or excavation water must ensure that runoff does not enter any waters.	At all times
3.47		Where trench/excavation de-watering is required, appropriate measures should be undertaken in accordance with the Technical Instruction Construction Site Dewatering (Q-LNG01-15-TI-0011) to protect water quality. This includes: • Assessing water quality prior to discharge including as a minimum field testing of turbidity and pH and chemical analysis where it is suspected that some contaminant requiring laboratory analysis may be present • Containing and treating water onsite or removing water off-site for treatment/disposal if it does not meet stormwater criteria for release or where discharge cannot be contained onsite (i.e. if offsite runoff would occur) • Identifying a suitable location to discharge, considering site slope, proximity to drainage lines, soil permeability and ground cover • Set and regulate the dewatering rate to avoid offsite runoff or runoff to any nearby drainage line • Dewatering must be continually supervised • Dewater only to stabilised ground including areas with adequate ground cover, i.e. high coverage of well established existing vegetation, geofabric or clean rock to prevent erosion • Establish a suitable device such as filter pond, settling pond or install suitable sediment controls down slope of discharge areas comprising geolog, filter fence, sediment fence or mulch berm as appropriate • Bund dewatering pumps and generators or fuel storages to prevent fuel spill	As required
3.48	CSG Water Use	CSG water is only permitted for use for dust suppression on roads and for construction and operational purposes for authorised petroleum activities in accordance with the requirements of the Australia Pacific LNG Land Release Management Plan for the development Area and the relevant Environmental Authority. Written approval from the relevant local government must be provided prior to CSG water use for dust suppression on local government controlled roads. Where consistent with the relevant Environmental Authority, CSG water may be used with written approval from the Australia Pacific LNG Environmental Representative for dust suppression, irrigation and construction purposes in accordance with requirements of the General beneficial use approval Associated water (including coal seam gas water) (EHP, 2014) and any additional controls specified by Origin Energy.	At all times

<table>
<tr><th colspan="4">WATER MANAGEMENT</th></tr>
<tr><td>3.49</td><td></td><td>Use of CSG water for dust suppression in accordance with water quality limits must be carried out in a manner that:
vegetation is not damaged
soil quality is not adversely impacted
there is no surface ponding or runoff of the coal seal gas water from the application area
minimises deep drainage below the root zone of any vegetation
quality of shallow aquifers is not adversely affected
there are no releases of coal seam gas water to waters</td><td>At all times</td></tr>
<tr><td>3.49a</td><td></td><td>Where CSG water is proposed to be used for dust suppression in a particular location for less than three months, water quality must satisfy the limits below:
<table>
<tr><th>Water Quality Characteristics</th><th>Unit</th><th>Limit</th><th>Limit Type</th></tr>
<tr><td>pH</td><td>pH units</td><td>6.0 to 9.0</td><td>Range</td></tr>
<tr><td>Sodium Adsorption Ratio</td><td>Ratio</td><td>15</td><td>Maximum</td></tr>
<tr><td>Total Suspended Solids</td><td>mg/L</td><td>30</td><td>Maximum</td></tr>
<tr><td>Electrical Conductivity</td><td>µS/cm</td><td>3000</td><td>Maximum</td></tr>
<tr><td>Total Petroleum Hydrocarbons</td><td>mg/L</td><td>10</td><td>Maximum</td></tr>
<tr><td>Bicarbonate ion</td><td>mg/L</td><td>100</td><td>Maximum</td></tr>
</table>
Where CSG water is proposed or reasonably expected to be used for dust suppression in a particular location for greater than three months, water quality must satisfy the limits below:
<table>
<tr><th>Water Quality Characteristics</th><th>Unit</th><th>Limit</th><th>Limit Type</th></tr>
<tr><td>pH</td><td>pH units</td><td>6.0 to 9.0</td><td>Range</td></tr>
<tr><td rowspan="2">Sodium Adsorption Ratio</td><td rowspan="2">Ratio</td><td>8</td><td>80th Percentile</td></tr>
<tr><td>12</td><td>Maximum</td></tr>
<tr><td>Total Suspended Solids</td><td>mg/L</td><td>30</td><td>Maximum</td></tr>
<tr><td>Electrical Conductivity</td><td>µS/cm</td><td>2985 (Condabri)
2000 (Combabula & Walloons)</td><td>Maximum</td></tr>
<tr><td>Total Petroleum Hydrocarbons</td><td>mg/L</td><td>10</td><td>Maximum</td></tr>
</table>
CSG water for any use must not contain any slick or other visible or odorous evidence of oil, grease or petrochemicals nor contain visible floating oil, grease, scum or litter.</td><td>At all times</td></tr>
</table>

WATER MANAGEMENT			
3.50		The following minimum management measures must be implemented at all times throughout CSG water use for dust suppression or authorised construction or operational uses: • Prior to commencement of CSG water application site environmental assessment information should be reviewed including soils mapping, results of any site soils investigations, land use, slope, proximity to sensitive receptors, site drainage and environmentally sensitive areas. • Key environmental characteristics of each application site including but not limited to environmentally sensitive areas must be toolboxed with construction crews prior to commencement and periodically throughout works as required. • An up to date site plan clearly showing CSG water application areas and storage locations (if applicable) must be available on site at all times during CSG water use. • CSG water application is only permitted within the construction (or operational) disturbance area approved in writing by the Australia Pacific LNG Representative. • A buffer zone from the application site of at least 20 metres must be maintained to any sensitive receptor, watercourse or environmentally sensitive area. • CSG water quality data must be reviewed prior to application to confirm it meets minimum water quality standards. • Application of CSG water must be supervised at all times to ensure compliance with the requirements of this plan. • CSG water application must be applied close to the ground using low pressure spray with a large sized nozzle to minimise spray aerosol mist and spray drift. Where alternative application measures are required, this must be approved in writing by the Australia Pacific LNG Environmental Representative, and in accordance with the relevant Environmental Authority • The application rate for CSG water must be set to avoid ponding or runoff from the application area. This may be determined through consideration of engineering requirements, soil permeability, slope and visual assessment. • The minimum amount of CSG water necessary should be used to prevent degradation of soils, infiltration and subterranean flow of CSG water. • Application of CSG water is not permitted during rainfall events. • All measures, plant and equipment must be operated and maintained in a proper and efficient manner.	At all times
3.50a	CSG Water Transport and Storage	CSG Water that is a regulated waste (see 3.50b) must be transported in accordance with all applicable requirements for regulated waste as set out in the Australia Pacific LNG Waste Management Plan (Q-1000-15-MP-0001). CSG Water that is a regulated waste must be transported by a licensed contractor and the required EHP Waste Transportation Certificate completed. For all CSG waters the following requirements apply: • CSG water must be either stored in accordance with the relevant EA and the requirements of this plan or transported directly to the application area. • Construction water storage ponds must be lined, constructed and maintained in accordance with	At all times

<table>
<tr><th colspan="4">WATER MANAGEMENT</th></tr>
<tr><td></td><td></td><td>accepted engineering standards currently appropriate for the purpose for which they are intended.
• All regulated dams must be constructed in accordance with the requirements of the most recent version of the EHP “Manual for Assessing Hazard Categories and Hydraulic Performance of Dams” as amended from time to time and under the supervision of a suitably qualified and experienced person.
• CSG water storage ponds or tanks must not be located within 100m of a watercourse, or 50m of an identified drainage feature.</td><td></td></tr>
<tr><td>3.50b</td><td></td><td>CSG water is exempt from definition of regulated waste if it satisfies the following water quality limits:
<table>
<tr><th>Water Quality Characteristics</th><th>Unit</th><th>Limit</th><th>Limit Type</th></tr>
<tr><td>pH</td><td>pH units</td><td>6.0 to 10.5</td><td>Range</td></tr>
<tr><td>Electrical Conductivity</td><td>µS/cm</td><td>15,000</td><td>Maximum</td></tr>
</table>
Where these water quality limits are satisfied CSG water is exempt from waste tracking, transport and disposal requirements that apply to regulated wastes.
For any CSG water that is pH less than 6 OR pH greater than 10.5 OR has Electrical Conductivity greater than 15,000µS/cm all requirements applicable to regulated wastes must be complied with.</td><td>At all times</td></tr>
<tr><td>3.50c</td><td>CSG Water Use Monitoring and Records</td><td>CSG water quality from a particular source must be sampled and analysed before first use and then monthly for the duration of use.
Monitoring must be undertaken in accordance with Australia Pacific LNG Monitoring Program for Construction Activities (Q-4500-15-MP-1002).
CSG water application must be continually supervised to ensure application rates do not cause ponding or runoff from the application area.
Where CSG water for dust suppression use is proposed for a period of greater than three months soil quality should be sampled and analysed prior to CSG water application commencement and annually thereafter for the duration of CSG water application. Analysis should include pH, electrical conductivity, exchangeable cations, total cation concentration and sodium adsorption ratio (SAR) in addition to soil analysis as specified in the Condabri Soils Assessment and Management Plan (Q-4500-15-MP-1003). The number of samples required at a site should be derived from the sample density required for CSG water application areas in the Soils Assessment and Management Plan for the gas field.
The following records must be kept by the CSG water supplier:
• CSG water source including origin (e.g. WTF, well, pilot pond) and storage location
• name and address of users
• quantity (kL)
• water quality sampling and analysis records
• destination (i.e. asset identifier and GPS coordinates of application area)
• use (e.g. dust suppression, earthworks)
• waste tracking documentation (where required for regulated waste)
The following records must be kept by the CSG water user:
• CSG water provider and source</td><td>At all times</td></tr>
</table>

WATER MANAGEMENT			
		• contact name and telephone number of site supervisor and/or site environmental advisor • quantity (kL) • destination (i.e. application area GPS coordinates, infrastructure identifier, lot/plan, site description) • use (e.g. dust suppression, earthworks) • time and date of CSG water use • daily weather observations – including rainfall depth, wind direction, wind strength • waste tracking documentation (where required for regulated waste) • audit and inspection reports • CSG water usage and quality records must be reported monthly or on request.	
3.51		*Not used*	
3.52	Plant/vehicle maintenance	The maintenance and cleaning of any vehicles, plant or equipment must not be carried out in areas from which contaminants can be released into any waters. Any area used for cleaning or maintaining vehicles must include the use of an impermeable surface or bund suitable to contain any spills or leaks. Any waste water or liquids must be disposed of to suitable receptacles and stored within a bunded location until they are removed from site for treatment at a facility authorised to receive this waste and approved for use by Australia Pacific LNG (see Approved Waste Processing and Disposal Facilities Register LNG Business Unit OEUP-Q1000-REG-ENV-003).	At all times
3.53	Chemical Storage	Chemicals and hazardous substances are not permitted to be stored within 100m of any wetland, waterway or watercourse. All chemicals must be stored in bunded areas that meet relevant Australian Standards and minimise water ingress into the bund.	At all times
3.54	Wetlands	Works must not occur within a wetland of high ecological significance nor cause a negative impact on a wetland of high ecological significance.	At all times
3.55		Works other than linear infrastructure must not occur within wetlands. Notwithstanding this, linear infrastructure activities must not change the surface water hydrological regime of any general ecologically significant wetland other than temporary impacts during construction and maintenance.	At all times
3.56		Construction and/or maintenance of linear infrastructure that will result in significant disturbance to a general ecologically significant wetland must not: • Prohibit the flow of surface water in or out of the wetland • Impact surface water quality in the wetland other than as authorised by the Environmental Authority • Drain the wetland • Fill the wetland • Impact bank stability • Result in the clearing of riparian vegetation outside of the required footprint.	At all times

<table>
<tr><th colspan="4">WATER MANAGEMENT</th></tr>
<tr><td>3.57</td><td></td><td>Construction and/or maintenance of linear infrastructure that will result in significant disturbance to a general ecologically significant wetland must not release from the site any contaminants to any waters that exceed the following water quality limits:
<table>
<tr><th>Water Quality Characteristics</th><th>Unit</th><th>Limit</th><th>Limit Type</th></tr>
<tr><td>Turbidity</td><td>NTU</td><td>If background water turbidity is >45NTU: 10% above receiving waters turbidity
If background water turbidity is <45NTU: 50NTU</td><td>maximum</td></tr>
<tr><td>Hydrocarbons</td><td>-</td><td>No visible sheen</td><td>-</td></tr>
</table>
Note: Background water quality to be measured within 20m upstream of the construction activity where practicable. Where background water not present within 20m upstream of construction site an alternative background sampling point must be approved by the Australia Pacific LNG Environmental Representative</td><td>At all times</td></tr>
</table>

6.4. Land Management

LAND MANAGEMENT			
Objectives		To construct and operate the gas fields in a manner that does not exacerbate existing land contamination or cause new contamination. To construct and operate the gas fields and associated infrastructure in a manner that minimises any potential impacts on land use, GQAL and access by landholders.	
Targets		• Minimal disruption to daily activities of landholders. • Access to landholder property is maintained. • No damage to existing infrastructure. • No stock fatalities or injuries from construction or operation. • Reinstatement of site to original condition. • No complaints from landholders regarding disruption. • No complaints from landholders regarding reinstatement of property. • No contamination of land from construction activities • No complaints from landholders regarding land contamination • No fire events from CSG activities	
REF	**HEADING**	**ACTIONS**	**TIMING**
4.1	Origin Energy HSEMS – Environmental Effects and Management Directives	The Contractor must comply with all relevant requirements of Origin Energy HSEMS – Environmental Effects and Management Directives, as amended from time to time, including: • Land Management ORG-HSE-DVE-036	At all times
4.2	Australia Pacific LNG Fire Management Strategy	The Contractor must comply with all relevant requirements of the Australia Pacific LNG Fire Management Strategy (Q-LNG01-15-EA-0062).	At all times
4.3	Australia Pacific LNG Land Contamination Procedure	The Contractor must comply with all relevant requirements of the Australia Pacific LNG Land Contamination Procedure (Q-LNG01-15-AP-0013).	At all times
4.4	Land Contamination	Prior to land disturbance, the Contractor must undertake an assessment of the site to identify potential contamination. This should include as a minimum a visual assessment of the site, checking government registers of contaminated and potentially contaminated sites including the CLR and EMR, and reviewing the Australia Pacific LNG Workpack for the area and the Australia Pacific LNG Land Contamination Procedure: Discovered or known land contamination (Q-LNG01-15-AP-0013). If this preliminary review identifies that contamination may be present on site, the Contractor will notify the Australia Pacific LNG Environmental Representative immediately and must not commence land disturbance activities in the relevant area without written direction from the Australia Pacific LNG Environmental Representative. Records of this assessment must be made available on request.	20 business days from receipt of Environmental Workpack
4.5	Construction camps and worksites	The locations for all camps must be approved by Australia Pacific LNG prior to construction. All workers accommodation must be located above Q50 flood levels if to be in place for less than 5 years and Q100 levels if to be in place for more than 5 years.	At all times

LAND MANAGEMENT			
4.6	Borrow pits	Borrow pits may only be established with the approval of the Australia Pacific LNG Environmental Representative and in accordance with an Australia Pacific LNG Borrow Pit Approval which must include an assessment of the environmental values, potential impacts, mitigation measures for the site, construction, operation, decommissioning and rehabilitation of the borrow pit. The Contractor should note that regulatory development approval and/or sales permit may be required for each borrow pit and must be complied with. Borrow pits must be left in an environmentally stable condition that does not pose a safety hazard to the public.	As required
4.7	Land Disturbance	Disturbance to land is only permitted to occur as approved in writing by the Australia Pacific LNG Environmental Representative. The Contractor must ensure that all vehicles, equipment, plant, materials and personnel remain within the approved area at all times.	At all times
4.8		Written approval for disturbance to land will generally be provided via the "Environmental Work Pack" and Origin Energy Disturbance Approval provided by Australia Pacific LNG to the Contractor. Contractors should note any outstanding external approvals or actions required to be completed prior to, during or following construction included as a hold point in the work pack.	At all times
4.9	Land Contamination	If construction works uncover an area of unknown, suspected contamination, all work within 50m of the contamination must cease and the site made secure to enable an inspection and assessment of contamination levels to be carried out. Any suspected contamination of land must be immediately reported to the Australia Pacific LNG Environmental Representative. Works in the affected area must not recommence without the written approval of the Australia Pacific LNG Environmental Representative.	As required
4.10		Any excavated contaminated material must be kept separate from other soil to prevent cross-contamination and covered or placed in an impervious container to prevent migration of contaminants.	As required
4.11		Contaminated soil must not be removed from the site (that is the cadastral boundary) unless in accordance with government and Australia Pacific LNG requirements. Note also additional requirements will apply for removal of soil from a lot listed on the Environmental Management Register or Contaminated Land Register.	As required
4.12	Prevention of Land Contamination	The Contractor must implement practices to prevent land contamination including but not limited to: • Ensure fuel and chemical stores, maintenance and refuelling areas are provided with secondary containment • Temporary spill protection must be used during transfer and pump out of sewage treatment plants, effluent tanks and ablution blocks • Install either a concrete hardstand or other approved temporary containment or impervious bund area to prevent soil contamination • Use best practice techniques to minimise generation of liquid wastes from chemicals, bunded areas, refuelling, maintenance and servicing areas to prevent rainwater contamination (e.g. covering bunded areas, inventory management) • Install interceptor pits or similar to collect runoff and treat where required • Install tanks above ground with impermeable liners and bunds around tanks • Visually inspect decommissioned and rehabilitated chemical and fuel store areas, and removing and	At all times

LAND MANAGEMENT			
		managing any contaminated soil found present, according to EHP guidelines • Keep maintenance records and implementing monitoring checks for leaks, for all plant used on the gas fields • Provide appropriate and readily accessible spill kits and training staff in their use	
4.13		*Not used*	
4.14		A suitably qualified person must be present during construction through any confirmed contaminated site.	As required
4.15	Good Quality Agricultural Land	Construction activities in areas of Good Quality Agricultural Land should be timed to not unduly affect farming operations.	At all times
4.16		Pipelines construction in areas of Good Quality Agricultural Land must be buried at least 0.75m below the finished surface level or greater if deep ripping occurs on the site.	At all times
4.17		Temporary workers accommodation must not be constructed on land identified as good Quality Agricultural Land Categories A and B, unless authorised in writing by the Australia Pacific LNG Environmental Representative.	At all times
4.18	Excavated Materials	The Contractor should re-use excavated materials on site where practicable. Mobile crushers may be used (in accordance with relevant statutory approvals) to minimise the need for quarry materials from external sources. Excavated material is not permitted to be removed from site (i.e. removed from property) without written authorisation of the Australia Pacific LNG Environmental Representative.	At all times
4.19	Unexploded Ordnance (UXO)	Should unexploded ordnance (UXO) be found, work is to cease immediately and the following measures implemented: • DO NOT TOUCH or DISTURB IT • Notify the Site Supervisor immediately who must then notify the Police • Mark the location with high visibility tape or similar, at a safe distance • Ensure co-workers and or other people on the work site are aware of the find and instructed not to enter the marked off area.	As required
4.20	Stock routes and stock movement	Construction personnel should be informed of stock movement requirements and asked to remain aware of stray stock entering the construction area.	At all times
4.21		Where there are to be disruptions to the stock route network suitable arrangements must be put in place, as directed by the Australia Pacific LNG Environmental Representative, prior to the commencement of works. This may include: • realignment or replacement of corridors with a similar width and suitable country type to allow for the unimpeded movement of travelling stock • permanent or temporary diversions of stock provided that the routes are safe for travelling stock and drovers, and the travelling public • provision of adequate watering facilities and other travelling stock infrastructure	As required

LAND MANAGEMENT			
4.22	Access	Property fences and gates should be installed, maintained and reinstated to a condition equal or better than the pre-existing condition.	As required
4.23		Appropriate measures should be employed to prevent surface damage to public roads including limiting dirt track access during wet weather and protecting bitumen surfaces where tracked machinery is required to cross roads.	As required
4.24		Where vehicles are required to cross existing utilities (e.g. pipelines, fibre optic cables) protective measures such as berming or bridging should be implemented, where required.	As required
4.25		The Contractor must ensure that all vehicles remain on designated access roads and tracks, within the designated construction area and associated work/camp sites (e.g. workforce education, signs, boundary markers and fences) at all times. Tracks and roads must be suitable for safe 4WD passage.	At all times
4.26		The Contractor must ensure that gates are left as they are found or as sign posted. If closed gates are required to be opened for extended periods (e.g. convoy passage) they should not be left unattended unless otherwise agreed with the Australia Pacific LNG Environmental Representative.	At all times
4.27	State Forest	For activities in State Forest, timber should be harvested prior to land clearance in accordance with standard forest practice and in compliance with DAFF requirements. Access and construction activities within State Forests must have the appropriate permits from DAFF.	As required
4.28	Cut and Fill	Site re-levelling should seek to balance cut to fill to minimise earthworks requirements and avoid the need for disposal of spoil or importation of fill. Topsoil must be stripped in accordance with CEMP requirements prior to site re-levelling.	At all times
4.29	Slope Stability	A slope stability assessment must be carried out where clearing works are required on slopes with gradients greater than 10%. Refer to the site specific Erosion and Sediment Control Plan.	As required

6.5. Soil Management

SOIL MANAGEMENT			
Objective		To construct and operate the gas fields in a manner that has minimal impact to soils, land resources, topography and geomorphology.	
Targets		• No significant degradation of soil qualities • Construction of the gas fields in accordance with the soil management procedure and any site specific soil management plan • No significant change to land use capabilities • Reinstatement of landform consistent with pre-development conditions	
REF	**HEADING**	**ACTIONS**	**TIMING**
5.1	Australia Pacific LNG Soil Management Plan	The Contractor must comply with all relevant requirements of the Australia Pacific LNG Soil Assessment and Management Plan for the Development Area. • Australia Pacific LNG Condabri Soil Assessment and Management Plan (Q-4500-15-MP-1003) • Australia Pacific LNG Reedy Creek Facility Soil Assessment and Management Plan (Q-4240-15-MP-0001) • Australia Pacific LNG Combabula Gas Field Phase 1 Stage 1 (Overview) Soil Assessment and Management Plan (Q-4200-15-MP-0007) • Australia Pacific LNG Soil Assessment and Management Plan – Combabula / Reedy Creek Gathering (Gas Wells and Flowlines) (Q-4200-15-MP-1005) • Australia Pacific LNG Soil Assessment and Management Plan – Combabula / Reedy Creek FCSs and Trunklines (Q-4200-15-MP-1007) • Australia Pacific LNG Combabula Gas Processing Facility Soil Assessment and Management Plan (Q-4201-15-MP-0002) • Australia Pacific LNG Orana Facility Soil Assessment and Management Plan (Q-4301-15-MP-0001) • Australia Pacific LNG Soil Assessment and Management Plan – Talinga-Orana Gas Field (Gas Wells and Flowlines) (Q-4100-15-MP-014)	At all times
5.2	Training and Awareness	The Contractor must ensure that earthmoving plant operators are made aware of different soil management groups (as mapped and described in the Australia Pacific LNG Construction Soils Management Plan for the site and Soils Assessment and Management Plan for the Development Area), the differentiation between topsoil and subsoil and soil handling techniques. Supervision must be provided to ensure that stripping operations are conducted in accordance with required soil management parameters and any site specific Construction Soils Management Plan and in-situ soil conditions.	At all times
5.3	Acid Sulfate Soils Management Plan	The Contractor must develop and submit to the Australia Pacific LNG Environmental Representative for approval an Acid Sulfate Soils Management Plan for sites where acid sulphate soils (ASS) or potential acid sulphate soils (PASS) is identified. Works in affected areas must not commence unless in accordance with the approved Acid Sulfate Soils Management Plan.	20 business days prior to construction in ASS or PASS areas
5.4	General	Soil and surface stability must be maintained at all times. Erosion control measures must be installed as necessary and maintained until final construction reinstatement is completed.	At all times

SOIL MANAGEMENT			
5.5	Clearing	Construction works must be planned and staged to reduce duration and extent of exposed soils. The Contractor must minimise the duration that disturbed soil is exposed between clearing and rehabilitation. The maximum time duration of exposed soils should not exceed the requirements set out in the Best Practice Erosion and Sediment Control, 2008 Book 1, Chapter 4, section 4.4 Table 4.4.7 page 4.16. Where these time limits cannot be achieved the Contractor must implement additional erosion controls to mitigate elevated erosion risk. Suitable erosion controls must be approved by the Australia Pacific LNG Environmental Representative.	At all times
5.6		Vegetation clearance should be minimised as far as reasonably practicable to reduce the potential for soil erosion.	At all times
5.7		Soil should not be removed from site (i.e. removed from the property) unless approved in writing by the Australia Pacific LNG Environmental Representative.	At all times
5.8	Stockpile Management	Excavated soil must be stockpiled separately from other materials (e.g. vegetation and mulch), where it can be readily recovered for reuse. Topsoil, subsoil and vegetation stockpiles must be kept separate and clearly identified. The location of long term (>28 days) stockpiles must be recorded using GPS and provided to the Australia Pacific LNG Environmental Representative. Topsoil stockpiles within gathering right of way, and which will be used in rehabilitation of that right of way, are exempt from this requirement.	At all times
5.9		Stockpiles should be located so as to minimise loss of material from water and wind erosion and avoid subsequent sediment release. Stockpiles that are in place for extended periods (>42 days) must be evaluated and treated to prevent erosion and weed infestation, stockpiles may be vegetated, covered or sprayed with a soil binder. Evaluation should comprise visual inspection of stockpile for presence of weeds and signs of soil loss through erosion and consideration of further duration the stockpile is to remain in place and the erosion hazard at the site at the time of year. Erosion protection is required if the stockpile is to be in place for more than an additional month, and the erosion hazard is moderate or high within that period. Declared weeds must be removed/treated immediately in accordance with Origin Energy requirements.	At all times
5.10		Stockpiles must not be located where there is the potential to result in sedimentation or acidification of land or surface water. Soil containment measures (e.g. berms) should be used as necessary.	At all times
5.11		Stockpiled soil should not impede the movement of fauna, stock and vehicles across the construction area. Stockpile breaks should coincide with designated access roads or tracks, fence lines and gaps in stockpiled vegetation.	At all times
5.12		Stockpiles must not impede natural or constructed surface drainage channels or access tracks. Stockpiles in place for greater than 28 days must be located above the high bank unless authorised in writing by the Australia Pacific LNG Environmental Representative.	At all times
5.13		All soil and vegetation or other stockpiles must be stored within the approved construction area or right of way. Stockpiles must be located away from discharge zones and placed in locations where they will not be disturbed by other activities. Stockpiles must not be located against fence lines or within vegetation to be retained. Stockpiles, other than windrow stockpiles within linear corridors, must not be placed within the tree protection zones of vegetation to be retained.	At all times
5.14		Where practicable, soils should be replaced in order of excavation to restore subsurface soil horizons. Subsoils with deleterious characteristics (e.g. high sodicity, alkalinity, acidity or salinity) that may inhibit rehabilitation must be buried at depth and covered with stable material prior to topsoil replacement.	At all times

SOIL MANAGEMENT			
5.15		Stockpiles must be monitored for erosion and weeds (including all state and locally declared weeds and WONs) and appropriate controls implemented when required.	Weekly
5.16	Topsoil handling	Topsoil stripping works must not occur during significant rainfall events. Topsoil should not be stripped or stockpiles handled (including relocation or respreading) when wet.	At all times
5.17		Prior to commencement of construction activities the Contractor must undertake an assessment to determine the level of risk associated with the activity and the management requirements to be implemented during construction in accordance with Technical Instruction Topsoil Management – Depth Assessment, Stripping and Stockpiling (Q-LNG01-15-TI-0013). In high risk areas (as defined in the Technical Instruction) topsoil must be stripped to recover the maximum amount of topsoil based on site conditions, while preventing contamination of topsoil with subsoils, up to a maximum 200mm depth. In areas mapped as Strategic Cropping Land, recover the maximum amount of topsoil based on site conditions, while preventing contamination of topsoil with subsoils, up to a maximum 300mm depth. In moderate risk areas (as defined in the Technical Instruction) strip surface topsoil horizon to 100mm including seed bank and organic layer. In low risk areas (as defined in the Technical Instruction) no topsoil stripping is required.	At all times
5.18		The Contractor must implement all requirements of the Construction Soil Management Plan provided by Origin for the property. This includes topsoil stripping requirements, soil amelioration and reinstatement fertiliser rates. If no Construction Soil Management Plan is provided, prior to soil disturbance the Contractor must make an assessment of soil type, terrain and topsoil depth to determine the appropriate removal depth in accordance with Technical Instruction Topsoil Management – Depth Assessment, Stripping and Stockpiling (Q-LNG01-15-TI-0013). The Contractor must refer to site soils mapping and the Australia Pacific LNG Soils Assessment and Management Plan for the Development Area for guidance on typical topsoil depths.	At all times
5.19		Topsoils must be stockpiled separately and must not be mixed with subsoils, mulch or other materials. Where mixing of topsoil is unavoidable, soils must be ameliorated. Notwithstanding this, mixing must not exceed 10% by volume.	At all times
5.20		Topsoils must be stripped and handled with care to minimise compaction and structural degradation. Stripped topsoil should be re-used by application to areas where a similar soil type is required for rehabilitation.	At all times
5.21		Topsoils stockpiled for extended periods (>28 days) must be evaluated and treated to prevent erosion and weed (including all state and locally declared weeds and WONs) infestation, stockpiles may be vegetated, covered or sprayed with a soil binder. Evaluation should comprise visual inspection of stockpile for signs of soil loss through erosion and consideration of further duration the stockpile is to remain in place and the erosion hazard at the site at the time of year. Erosion protection is required if the stockpile is to be in place for more than an additional month, and the erosion hazard is moderate or high within that period. Topsoils stockpiled exposed for extended periods (longer than three months) must be evaluated and managed to maintain biological activity and prevent weed invasion such as revegetation by direct seeding with seed species compatible with local conditions.	At all times
5.22		Topsoil stockpile height must not be greater than 2m unless approved by Australia Pacific LNG. Topsoil stockpiles greater than 2m will be accepted only where seed bank is stripped and stockpiled separately to the remainder of topsoil.	At all times

SOIL MANAGEMENT			
5.23		Coarse textured topsoils must be stockpiled separately from fine grained (groups 4 and 5) soils.	At all times
5.24		*Not used*	
5.25		*Not used*	
5.26	Saline Soils	Saline soils must be stockpiled separately to prevent contamination with topsoil or other soils.	At all times
5.27		Saline subsoils disturbed during construction must be buried during site restoration/backfilling and covered with non-saline topsoil. In areas where there is little topsoil or there is evidence of existing salinity, topsoil may be ameliorated with mulch, manure or other approved ameliorant to facilitate re-vegetation.	At all times
5.28		Progressive rehabilitation and stockpiling of soils near the site of excavation should be conducted to minimise potential blending between non-saline and highly saline soils.	At all times
5.29		*Not used*	
5.30	Borrow pits	Borrow pit sites should be located away from problem soil areas, e.g. saline or Acid Sulphate Soils.	At all times
5.31		Site layout plans identifying topsoil, vegetation and spoil storage areas, access tracks and excavation boundaries should be prepared prior to commencement of borrow pit operations. Borrow pits may only be established and operated in accordance with the written approval from the Australia Pacific LNG Environmental Representative.	At all times
5.32	Reactive Soils	Construction in reactive soil areas should avoid heavy wet weather periods, wherever practicable.	At all times
5.33		Gravel access tracks, bog mats, working platforms or other approved method may be constructed where required to prevent rutting and damage to the soil during wet weather. The contractor should note that in periods of significant wet weather construction activities may be required to cease.	At all times
5.34		*Not used*	
5.35	Acid Sulfate Soils	Any discovered acid sulphate soil is to be mapped by GPS and reported to the Australia Pacific LNG Environmental Representative.	At all times
5.36	Sodic Soils	Sodic soils may require the addition of gypsum or dolomite. Sodic soils must be ameliorated in accordance with the Soil Assessment and Management Plan for the development area, or as directed by the Australia Pacific LNG Environmental Representative.	As required
5.37	Transportation of soils	The transportation of soil along linear construction corridors should be avoided where practicable.	At all times

6.6. Erosion and Sediment Control

EROSION AND SEDIMENT CONTROL			
Objectives		• To manage construction so that erosion is prevented and that sediment laden water does not leave the construction site or contaminate downstream waters. • To manage steep and or unstable land so as to prevent or minimise erosion.	
Targets		• No contaminants released to any nearby waterways or water courses as a direct result of construction activities • No deterioration in surface water quality bodies adjacent to the project construction footprint caused by sediment deposition from construction activities associated with the works. • No increase in erosion during construction within the work area or on adjacent lands. • No sedimentation of agricultural land from construction activities. • Construction activities must not cause an increase in water turbidity of any watercourse, lake, wetland, or a spring.	
REF	**HEADING**	**ACTIONS**	**TIMING**
6.1	Australia Pacific LNG Erosion and Sediment Control Plan	The Contractor must comply with all relevant requirements of the Australia Pacific LNG Erosion and Sediment Control Plan for the Development Area. • Australia Pacific LNG Erosion and Sediment Control Plan – Gas Field (Q-4500-15-MP-1001)	At all times
6.2	Contractor Erosion and Sediment Control Plans	Where preparation of a site erosion and sediment control plan forms part of the Contractors scope of works and as specified in the site Environmental workpack, the Contractor must prepare for each work site an Erosion and Sediment Control Plan developed in accordance with IECA Best Practice Erosion and Sediment Control Guidelines 2008 and certified by a suitably qualified person, and submit this plan to the Australia Pacific LNG Environmental Representative for approval 20 business days prior to commencement of any works. The Plan must be available on site and easily accessible at all times. The Erosion and Sediment Control Plan must include but not necessarily be limited to: • environmental constraints and site conditions including: acid sulphate soils, bull dust, bushfire, overland flow, saline soils, slaking soils, sodic soils and slope • managing and / or diverting uncontaminated stormwater run-off around areas disturbed by the construction activities or where contaminants or wastes are stored or handled that may contribute to contamination of waters • ensuring that contaminated stormwater runoff and incident rainfall is collected, treated, reused, or released to avoid release of contaminant and prevent any increase in turbidity in receiving waters • revegetating disturbed areas as soon as practicable after the completion of works • using materials and or processes (e.g. dry absorbents) to clean up spills that could cause contamination of waters • placing erosion and sediment control structures to minimise erosion of disturbed areas and prevent the contamination of waters • an inspection and maintenance program for the erosion and sediment control measures • provision for adequate access to maintain all erosion and sediment control measures especially during the wet season months from November to April	20 business days from receipt of Environmental Workpack

EROSION AND SEDIMENT CONTROL			
		• additional erosion and sediment control measures for construction of wells and pipelines on slopes >10% • a surface water monitoring program designed to detect impacts from sediment runoff into waters • identification of remedial actions required to ensure compliance with the conditions of the environmental authority. The Contractor's Erosion and Sediment Control Plan must include a site layout showing all Erosion and Sediment Control structures. This plan must be used throughout construction and through to final handover of the site to ensure no erosion or offsite sedimentation occurs. The layout plan must be available onsite at all times and kept current to reflect the changing conditions of the site through construction and handover phases. Proposed changes to the Contractor's Erosion and Sediment Control Plan must be submitted for approval to the Australia Pacific LNG Environmental Representative. The Contractor must implement all requirements of the Erosion and Sediment Control Plan as approved.	
6.3	Sediment Basins	In the event sediment basins are required, they should be designed to hold the runoff generated in a 1 year ARI 24-hour duration rainfall event. The spillway outlets on the sediment basins must discharge the peak flows for the critical duration 100 years ARI storm event and the embankments must be constructed with compacted material and grassed to minimise the risk of erosion if overtopped. The Contractor must develop and submit to the Australia Pacific LNG Environmental Representative for approval at least 20 business days prior to construction (or commencement of operation where the sediment basin was not constructed by the Contractor) a detailed procedure for dewatering sediment basins including but not limited to: • Water quality limits for discharge • Requirements for discharge valves to be locked closed when dewatering is not occurring • Requirements for dewatering activities to be continually supervised • Details of all sediment basins the Contractor is responsible for • Detail of types and dose rate of flocculants proposed to be used • Description of methodology for application of flocculants • Description of measures to prevent erosion at discharge locations • Detail of equipment that will be held onsite to enable sediment pond operation, including flocculation, testing and dewatering • Sampling and analysis including access and sample points • Monitoring and inspection The Contractors sediment basin designs and dewatering procedure must be submitted to the Australia Pacific LNG Environmental Representative for approval as part of the Contractor's Erosion and Sediment Control Plan.	20 business days prior to construction
6.4		Sediment basins should be constructed on the downhill side of major facility sites and temporary accommodation facilities	At all times
6.5		*Not used*	

EROSION AND SEDIMENT CONTROL			
6.6	General	The Contractor must install any required erosion control measures immediately following topsoil stripping and in any event prior to rainfall occurring, in accordance with the approved erosion and sediment control plan and IECA Best Practice Erosion and Sediment Control Guidelines 2008. The Contractor must ensure all required erosion and sediment controls are in place, operational and maintained.	Prior to construction, or as soon as reasonably practicable
6.7		The Contractor must implement all requirements of the Australia Pacific LNG site Erosion and Sediment Control Plan provided for the property (or approved plan for Contractor prepared ESCPs). This plan must be used throughout construction and through to final handover of the site to ensure no erosion or offsite sedimentation occurs. The plan must be available onsite at all times and kept current via amendments agreed in writing with the Australia Pacific LNG Environmental Representative to reflect the changing conditions of the site through construction and handover phases. The Contractor must inspect all installed erosion and sediment control devices to check compliance with the approved erosion and sediment control plan within 1 week of installation, and rectify any non-conformances within 1 week or prior to rainfall occurring.	At all times
6.8		Erosion and sediment control devices must be constructed or installed as specified on Origin Energy standard drawings, or where none exists, as specified in the IECA Best Practice Erosion and Sediment Control Guidelines 2008. Straw bales MUST NOT be used.	At all times
6.9		Where erosion and sediment control devices are found to be not in accordance with the erosion and sediment control management plan, control devices must be re-established to meet the design criteria.	As required
6.10		Where erosion and sediment control activities carried out in accordance with an approved erosion and sediment control management plan are found to be ineffective, the Contractor must implement immediate action to prevent environmental harm.	As required
6.11		Where erosion and sediment control activities carried out in accordance with an approved erosion and sediment control management plan are found to be ineffective, the plan must be revised to achieve the erosion and sediment control objectives and targets and resubmitted to Australia Pacific LNG for approval.	As required
6.12		Ground disturbance and vegetation clearing should be minimised as far as practicable to maintain soil stability.	At all times
6.13		Installation of drainage, erosion and sediment control measures should consider site conditions including: • natural and constructed drainage patterns • soil type and erodability potential • slope • rainfall frequency and intensity • catchment size and, therefore, required capacity and coordination of control structures • vegetation cover • proximity to sensitive environments, particularly sedimentation leading to impact on water quality • land use impacts (e.g. cultivation and grazing).	At all times

EROSION AND SEDIMENT CONTROL			
6.14		Erosion control berms should be constructed in a manner which ensures discharge run-off water does not lead to erosion or sedimentation by: • construct erosion berms to discharge run-off water to stable, vegetated land. Where vegetation is absent, erosion prevention and energy dissipation measures should be used • erosion control berm gradients should closely follow land contours to ensure low velocity discharge away from the exposed soils • run-off water from erosion control berms should be directed to the down slope side of the construction area to prevent discharge water from crossing the construction area • as applicable and where necessary, the installation of erosion control berms should coincide with the location of trench breakers to enable more effective water diversion (refer to engineering design).	At all times
6.15	Maintenance of Erosion and Sediment Control measures	Erosion control structures must be routinely inspected to ensure they remain effective particularly after high intensity rainfall or run-off events.	At all times
6.16		Erosion and sediment control devices must be cleared, repaired or replaced whenever inspections show signs of non-compliance or ineffective capability or capacity.	At all times
6.17		Erosion and sediment control devices must remain in place, and be maintained (e.g. removal of silt build up, reinforcing or re-establishing failed structures), to ensure effectiveness until the area has been effectively rehabilitated following completion of construction including 70% (or equal to adjacent to undisturbed area) ground cover has been achieved, or as directed in writing by the Australia Pacific LNG Environmental Representative.	As required
6.18		If erosion and scour occurs or could occur within a diversion or drainage channel, the area (including bed and banks for streams) must be stabilised using protective materials until vegetation cover is re-established.	As required
6.19		Emergency and/or continuance sediment control devices (sediment control logs, silt fencing, etc.) must be held onsite and/or be readily available.	As required
6.20		Clear access must be maintained at all times to Erosion and Sediment Control devices to enable maintenance. Of particular importance is ensuring access during the wet season between the months of November and April where rainfall and subsequent water flows could impede maintenance.	At all times
6.21	Vehicle access	Erosion control berms and drains should be constructed at appropriate spacing to control the flow of surface water and where access is required, be constructed to permit vehicles to move over them safely without destroying them. Any erosion and sediment control device including berms or drains that are damaged by vehicle or plant access must be immediately repaired.	At all times
6.22	Access tracks	Access track runoff controls should discharge run-off water in a manner which does not lead to sedimentation or erosion, i.e. low gradient run-off, broad dish shaped outlets to appropriately stable areas (e.g. vegetated or rip-rap stabilised).	At all times

EROSION AND SEDIMENT CONTROL			
6.22a		The Contractor must ensure that access track location and use conforms to the following: • Roads and tracks run across slopes or along ridgelines, wherever practicable; avoid access tracks that run diagonally across a slope or require excessive cut and fill batters • Existing tracks or final access road alignments should be used whenever possible. The duplication of parallel/multiple tracks or turnouts shall be avoided • Upslope and down slope access track batters must be stabilised throughout construction and rehabilitated on completion of works • Access track runoff control structures should discharge run-off water in a manner which does not lead to erosion or movement of sediment to surface waters • Vehicle movement over both retained vegetation and newly cleared areas where the topsoil has yet to be stripped should be avoided • Water a drive strip immediately after grading to enable compaction and formation of a firm crust, where practical • Stabilisation of access tracks that are to be exposed for prolonged periods or have been identified as problem soils (erosive/dispersive) should be considered and treatment measures approved by the Australia Pacific LNG Environmental Representative. This may include use of chemical surface stabilisers or physical alternatives such as crushed rock. • Note that in periods of significant wet weather construction activities may be required to cease, particularly on non-Origin owned properties, as directed by the Australia Pacific LNG Environmental Representative.	At all times
6.23	Clearing and Excavation works	Vegetation should be progressively cleared and rehabilitated to minimise the area of soil exposed.	At all times
6.24		Excavated material including stripped topsoil should be placed on the high side of open excavations i.e. the high side of the right of way or work site. This is required to create a clean water diversion around the disturbed area and to provide clean water passages through the site in a controlled manner. Where a perimeter bund is already established excavated material is exempt from this requirement e.g. trench spoil may be exempt from this requirement where a topsoil berm is already in place on the high side of the ROW. Notwithstanding this, a soil berm must be constructed around open excavations that are expected to be unavoidably open for more than 1 week (e.g. bell holes) to avoid flooding.	At all times
6.25	Slopes > 10%	A combination of erosion and sediment controls should be used on difficult slopes. As a minimum additional controls should be applied to slopes greater than 10%.	At all times
6.26	Runoff Control	Sediment and erosion control measures and areas receiving concentrated flows should be inspected on a regular basis, replaced where damaged and emptied following rainfall events, if required.	At all times

EROSION AND SEDIMENT CONTROL			
6.27		Erosion and sediment control measures, such as contour banks, should be placed across flow paths, where appropriate, and multiple discharge locations will be created to ensure discharges have low velocities and volumes, rather than channelling discharges to a central point, which can exacerbate erosion. Point source discharges of runoff must be directed into vegetated areas, stable waterways and/or drainage lines with engineering controls, such as scour protection and flow velocity limits, where required. Dirty water runoff (i.e. runoff that has been in contact with disturbed soil) must be treated prior to release with a suitable sediment control device. Clean water (i.e. uncontaminated water from undisturbed areas upslope/up catchment) diversions must be stabilised to prevent contamination of runoff.	At all times
6.28		Water quality of affected watercourse, drainage lines and waterways must be monitored prior to, during and following construction, in accordance with the Australia Pacific LNG Technical Instruction Monitoring Water Feature Crossings (Q-LNG01-15-TI-0033) and Upstream Construction Monitoring Plan (Q-4500-15-MP-1002).	At all times
6.29		Drainage lines and areas of concentrated water flow must be inspected regularly for erosion and to determine whether remedial action is required.	At all times
6.30	Stabilisation of problem soils	Stockpiles, soil berms and/or exposed soil areas, such as unsealed access tracks, which are exposed for prolonged periods (that is for durations greater than specified in the erosion and sediment control plan and as set out in Table 4.4.7 of the IECA Best Practice Guidelines for Erosion and Sediment Control), may receive concentrated flows or have been identified as problem soils (erosive/dispersive) must be stabilised as required. This may be done using soil ameliorants (e.g. gypsum, dolomite, lime), chemical stabilisers, vegetation or physical alternatives (e.g. crushed rock, geo fabric, mulch). Refer to the site specific Construction Soil Management Plan.	At all times
6.31	Trenching	Trench breakers should be installed as per design in the backfill at intervals appropriate to the steepness of the slope, where pipes go down slopes to prevent water tunnelling along the buried pipe and contour banks used on surface to divert water off the disturbed areas.	At all times
6.32		The period of time between trenching and backfilling should be minimised to prevent erosion of exposed soils as well as trench collapse and to minimise risk and inconvenience to third parties associated with the open trench.	At all times
6.33	Embankments	The Contractor must stabilise soils and provide erosion protection for exposed embankments through battering, soil amelioration, placement of topsoil, grass seeding or hydro-mulching, or through the use of measures such as erosion blankets (geo-textile fabrics for temporary stabilisation, biodegradable matting for reinstatement and rehabilitation).	As required

6.7. Fire Management

FIRE MANAGEMENT			
Objective		To minimise the risk of bushfires being started by the project and to manage the risk of off-site fires.	
Target		To reduce the risk of fires started by any aspect of the Project.	
REF	**HEADING**	**ACTIONS**	**TIMING**
7.1		Where multiple contractors are engaged on the one property, a property level fire management plan will be coordinated by Australia Pacific LNG. The Contractor must comply with all relevant requirements of an Australia Pacific LNG coordinated bushfire management plan, and the Australia Pacific LNG SIMOPS plan.	At all times
7.2	Fire Management Plan	At least 20 business days prior to commencement of construction the Contractor must develop a Fire Management Plan in accordance with the Australia Pacific LNG Fire Management Strategy (Q-LNG01-15-EA-0062). This Contractor's Fire Management Plan should include: • bushfire prevention • bushfire preparedness and training • emergency contacts • fire response procedures • fire response equipment • fire watch	Prior to commencement
7.3		Fire response preparation measures should include: • storage of appropriate fire fighting equipment at all work and camp sites in accordance with the requirements of the relevant Fire Protection Regulations • Equipment must be of the required standard and be inspected and well maintained throughout the construction phase • equipping construction machinery and vehicles with fire fighting equipment (e.g. water knapsacks, rake hoes and fire extinguishers) at the appropriate times in accordance with the relevant Fire Protection Regulations • having construction equipment, such as earthmoving machinery and water trucks, on standby at the construction site during work operations in high fire risk areas for fire control if required.	At all times
7.4	General	The Contractor must maintain fire breaks around major facilities, plant and equipment, as designated in Australia Pacific LNG approved clearing plans.	At all times
7.5		The Contractor must cooperate with the Rural Fire Service in respect to any controlled burning and other matters of mutual interest (e.g. which Australia Pacific LNG dams can be used for fire water).	At all times
7.6		The Contractor must provide cigarette butt bins to site personnel.	At all times
7.7		All construction vehicles should be equipped with portable fire extinguishers.	At all times
7.8		Machinery and vehicles should be parked in approved designated areas which must be maintained to be low fire risk.	At all times
7.9		Open fires, including barbecues, billy fires and brush burning are prohibited.	At all times
7.10		Flammable material must not be stockpiled or stored near hot work activities (including vegetation stockpiles).	At all times

FIRE MANAGEMENT			
7.11		Contractors must comply with fire restrictions and hot works permitting procedures.	At all times
7.12		The Contractor must manage Bushfire utilising at least the following measures: • Monitoring of a bushfire weather forecasting and forewarning system • Observation of fire bans for high risk days/seasons, where practical • Staff and contractor bushfire awareness toolbox sessions • Preparation and implementation of site and activity specific emergency response plans • Implementation of fire prevention, fire watch, and fire response procedures during construction, particularly within forested areas	At all times
7.13		Bushfire warnings must be incorporated into journey management plans.	At all times
7.14		Following any fire in a fuel or chemical storage area, tests for soil contamination should be undertaken. Remediation or management of contamination must be undertaken in accordance with the Australia Pacific LNG Land Contamination Procedure.	At all times
7.15	Bushfire Prevention and Preparedness	Fire prevention measures should include: • scheduling high risk construction activities to avoid high fire danger period • discontinuing construction in fire prone areas during extreme high fire danger periods • clearing all flammable material from around potential fire ignition sources, in accordance with Australia Pacific LNG approved clearing plans • utilising tarpaulins or fire resistant mats at welding or grinding stations in areas where minimal clearing of vegetation has been required • ensuring flammable materials are cleared from the immediate vicinity of equipment which may pose a potential fire hazard (e.g. petrol driven pumps, generators, fuel and chemical storages) in accordance with Australia Pacific LNG approved clearing plans • maintenance and operation of all machinery so as to comply with relevant fire safety standards thus minimising fire risk • machinery and vehicles not in use should be parked in approved designated areas free of flammable material and vegetation (e.g. not parked over shrubs, tall grass or cleared vegetation residue) • inspection and management of combustible materials (including mulch stockpiles) to minimise fire risk	At all times
7.16		Fire bans for high risk days, must be complied with.	During regional fire ban

6.8. Dangerous Goods and Hazardous Materials

DANGEROUS GOODS AND HAZARDOUS MATERIALS			
Objective		To construct and operate the gas fields in a manner that avoids the release of hazardous substances to land, surface water or groundwater.	
Targets		• To construct and operate the gas fields in a manner that does not exacerbate existing land contamination. • To construct and operate the gas fields in a manner that avoids the release of hazardous substances to land, surface water or groundwater.	
REF	**HEADING**	**ACTIONS**	**TIMING**
8.1	Australia Pacific LNG Emergency Response Plan	The Contractor must comply with any applicable requirement of the Australia Pacific LNG Emergency Response Plan for the development area. • Australia Pacific LNG Gathering Implementation Emergency Response Plan: Condabri (Q-LNG01-15-MP-0540) (Note: includes Walloons until Walloons specific plan released) • Australia Pacific LNG Gathering Implementation Emergency Response Plan: Reedy Creek (Q-LNG01-15-MP-0542) • Australia Pacific LNG Gathering Implementation Emergency Response Plan: Spring Gully (Q-LNG01-15-MP-0543)	At all times
8.2	Origin Energy HSEMS – Environmental Effects and Management Directives	The Contractor must comply with all relevant requirements of Origin Energy HSEMS – Environmental Effects and Management Directives, as amended from time to time, including: • Materials and Waste ORG-HSE-DVE-020 • Hazardous Materials and Secondary Containment ORG-HSE-DVE-015	At all times
8.3	Contractor Emergency Response Procedures	The Contractor must develop Emergency Response Procedures that meet or exceed the requirements of the Australia Pacific LNG Emergency Response Plan for the Development area, including detailed spill response instructions. The Contractor must submit these procedures to the Australia Pacific LNG Environmental Representative for approval at least 20 business days prior to commencement of any works.	20 business days prior to construction
8.4	General	The Contractor must ensure that any personnel involved in the handling of hazardous chemicals and fuel must be suitably qualified and/or experienced. Each site must have a suitably qualified and/or experienced Hazardous Materials Coordinator to coordinate hazardous materials assessments and organise reviews as necessary and a Hazardous Materials Approver to approve or reject the use of hazardous materials on site. (Note that the Hazardous Materials Coordinator and Approver may be the same person.) All new hazardous materials must be risk assessed and reviewed by the Hazardous Materials Approver, who must approve or reject the use of the material before the hazardous material is purchased or brought on to site.	At all times
8.5		Herbicides must only be used by suitably qualified and/or experienced personnel.	As required
8.6	Storage and Handling	All explosives, hazardous chemicals, corrosive substances, toxic substances, gases, dangerous goods, flammable and combustible liquids (including petroleum products and associated piping and infrastructure) must be stored and handled in accordance with the relevant legislative requirements and Australian Standards including but not limited to the provisions of:	At all times

DANGEROUS GOODS AND HAZARDOUS MATERIALS			
		• AS 3780:2008 – The storage and handling of corrosive substances • AS 1940:2004 – The storage and handling of flammable and combustible liquids. • AS 3833:2007 - Storage and handling of mixed classes of dangerous goods in packaged and intermediate bulk containers	
8.7	Hazardous materials storage design	All structures used for storing and handling hazardous materials must be: • designed in accordance with any legislative storage requirements, best practice guidance (such as industry design standards) and specifications as set out in the SDS • suitable for use with the materials and be designed to minimise the risk of an incident • built as designed and be fixed to prevent inadvertent movement. The plant and structure must be installed, tested and used in accordance with the design specifications • designed to contain and stop the spread of an incident (such as fire) • designed to eliminate ignition sources in the area • designed with appropriate emergency provisions (such as fire protection) • designed such that incompatible materials do not share the same bunding and the risk of interaction where there is shared ventilation or drainage systems are controlled. • protected from vehicles or other equipment that may impact upon the integrity of plant or structure by bollards, crash barriers or other suitable protective barriers • designed to have sufficient safe access to allow for delivery/movement of hazardous materials by mobile plant (such as forklifts) • sufficiently lit to enable clear visibility of signage and information in the area Storage facilities for fuels and oils must have primary and secondary containment along with product handling procedures for transfer and use. Any liquids stored on site that have the potential to cause environmental harm must be stored in, or serviced by, an effective containment system that is impervious to the materials stored and managed to prevent the release of liquids to waters or land.	At all times
8.8	Site layout	Hazardous materials plant and storage must be sufficiently separated from boundaries, protected places, adjacent occupancies where hazardous materials are stored, and other onsite hazardous materials storage or process areas, in accordance with legislation and best practice documentation (such as industry design standards). Hazardous materials plant and storage areas must be restricted to authorised personnel who have appropriate knowledge and training. Unauthorised access must be prohibited.	At all times
8.9	Hazardous materials storage facilities	Hazardous materials must be contained appropriately and incompatible goods must be segregated. Storage must be carried out in accordance with storage instructions provided in the SDS, on labels and in legislation, and in accordance with applicable technical standards or other relevant product information. Hazardous materials signage must be erected at appropriate positions corresponding to the quantity, type and location of hazardous material stored and handled at the site as required by legislation. This may include at the storage area and other locations on site (such as HAZCHEM signage at the entrance to the site). Where hazardous materials are contained in enclosed systems (such as pipework), there must be a suitable system in place to alert personnel to the presence, identity and warning information pertaining to the material	At all times

DANGEROUS GOODS AND HAZARDOUS MATERIALS			
		(such as inductions or site maps). The location of all dangerous goods and hazardous materials storage facilities must be recorded. Records of the location of all such facilities including date of establishment and decommissioning (where applicable), lot/plan and GPS coordinates must be provided to Origin Energy in a format compatible with in Origin Energy GIS.	
8.10	Secondary Containment	Secondary containment facilities (such as bunds or drip trays) for hazardous materials: • must be supplied for all tanks, vessels or areas where spills, leaks or other losses of containment of hazardous materials may occur (such as filling or transfer areas). This includes providing drip trays for liquid line containment breaks (such as during shutdowns or other maintenance activities) where there is a risk of liquid remaining in the line • must be constructed from a material that is compatible with the spilt hazardous material and be sufficiently impervious to retain spillage • must be designed and constructed to minimise the risk of any spilt hazardous materials spilling outside the premises • must be designed and constructed to minimise the risk of leakage, spillage or contaminated fire water from contaminating the surrounding soil or entering any watercourse or water drainage system • must not be shared between incompatible dangerous goods or goods that might react dangerously with each other • must have a design capacity as required in the relevant technical standard for the class of dangerous good. • Must be designed to minimise rainfall collection within the system Where portable bunding units (such as bunded pallets) are used to temporarily store flammable or combustible liquids, the portable bunding must be built from materials that are resistant to fire and that are sufficiently impervious to, and compatible with, the liquids being contained. Where portable bunding units (such as bunded pallets) are used to permanently store hazardous materials the portable bunding must be built from material that is compatible with the materials being stored. The potable bunding units must be inspected periodically to determine their integrity.	At all times
8.11		All chemical tank storages and all fuel tank storages must be bunded so that the capacity of the bund is sufficient to contain at least 110% of the largest storage tank. All chemical drum storages and all fuel drum storages (i.e. a storage containing multiple drums or containers) must be bunded so that the capacity of the bund is sufficient to contain at least 25% of the maximum design storage volume within the bund.	At all times
8.12	Hazardous liquid wastes	Management of hazardous liquid wastes such as radiography or cleaning chemicals and waste oils should comply with relevant regulatory requirements. Management measures should include: • safe storage prior to collection and transport off-site for reuse, recycling, treatment or disposal by a licensed waste transporter to locations approved by relevant regulatory authorities • storage areas must be suitably designed to contain any spills and prevent contamination of soil or water (e.g. bunded or otherwise contained in accordance with statutory requirements) • contaminated soils (e.g. loading bay drain/pig trap contents, oil/fuel spills), are required to be managed	At all times

DANGEROUS GOODS AND HAZARDOUS MATERIALS			
		according to their concentration of contaminants and their leachability.	
8.13	Receipt of Hazardous Materials	The Contractor must develop site-specific procedures for the receipt of hazardous materials. These procedures must provide instruction in how to identify, assess and control incompatible materials. Hazardous materials that arrive on site and do not comply with the containment and labelling requirements of the relevant transport regulations must not be accepted on site or measures must be taken to ensure compliance is achieved.	At all times
8.14	Storage of Hazardous Materials	The Contractor must develop site-specific procedures for storing hazardous materials. • Quantities of hazardous materials should be kept to a minimum, commensurate with their usage and shelf life. • Safety Data Sheets of stored hazardous materials must be readily accessible and stored in the site office or administration building. • Permanent and temporary containers that hold hazardous materials must be labelled with the relevant safety and risk phrases. • The volume and types of hazardous materials stored must be known, current and documented and must not exceed the design capacity of the storage area. • Hazardous materials that may degrade in storage and thus become more dangerous must be identified and managed. • Storage and containment areas (including secondary containment) must be inspected for signs of loss or damage and any deficiencies must be addressed. The areas must be regularly inspected, including a 12-monthly documented inspection. • Hazardous materials no longer in use must be identified and assessed to determine if they should be removed from site. • Dangerous goods must not be held in transport storage areas for longer than five consecutive working days. Where they are required to be stored for longer periods, they must be moved to permanent hazardous materials storage areas. • Hazardous materials storage areas must be kept clear of combustible material, vegetation and refuse by a minimum of three metres.	At all times
8.15		Fuels and chemicals must not be stored within 200m of any wetland, lake or spring, within 100m of any watercourse or waterway nor within 50m of drainage feature; where topography would cause material to flow into the drainage feature. Fuel and chemical storage tanks must be located above ground.	At all times
8.16		A register of all hazardous chemicals and dangerous goods must be maintained at each location and the site master register kept in the site office or administration building.	At all times
8.17		Routine visual monitoring and recording of chemicals and fuel storage facilities must be undertaken to assess effectiveness of containment systems.	At all times
8.18	Transportation	Transportation of hazardous materials must be in accordance with the relevant regulations and Australian Standards. Dangerous goods that are to be transported by road or rail must be contained, packaged, labelled, consigned and transported in accordance with the relevant transport regulations.	At all times

DANGEROUS GOODS AND HAZARDOUS MATERIALS			
8.19	Spill Response	An appropriate spill kit, including containment and recovery equipment, personal protective equipment and relevant operator instructions/emergency procedure guides for the management of wastes and chemicals associated with the activities must be kept and maintained at all construction sites. Appropriate spill response equipment for hazardous materials must be identified and must be readily accessible in areas where hazardous materials are stored. Spill kits should be strategically located throughout the construction sites. Spill response equipment must not be stored inside the secondary containment facility (i.e. inside bunding).	At all times
8.20		All personnel responsible for using the spill kits must be trained in the use of that particular spill kit	At all times
8.21		All activities within 50m of and in a watercourse, waterways or drainage feature must include adequate spill response equipment to be kept at the work area with employees trained in how to deploy the spill equipment. This must be documented in the Emergency Response Plan for the site.	At all times
8.22		All plant maintenance and refuelling sites are to contain a spill kit, and construction personnel on site are to be trained in its use as part of the site induction training. The spill kit should be capable of dealing with both large and small spills.	At all times
8.23		Spill response procedures must meet or exceed the requirements of the Australia Pacific LNG Emergency Response Plan for the Development Area.	As Required
8.24		In the event of any spill or leak to the environment or damage to bund or containment area, action should be taken immediately to contain and minimise the spread of the spill, spill response procedures initiated to clean up the site and the incident immediately reported to the Australia Pacific LNG Environmental Representative. Access to the site should be restricted, such as using flagging.	As Required
8.25		All spills to land or water or any event where environmental harm has been, or may be caused must be reported to the Australia Pacific LNG Environmental Representative. Note that the following incidents will be reported to the regulator by Origin Energy: • Release of any volume of contaminants to water • Release of greater than 200L of hydrocarbon, 1000L of brine, 5000L of sewage or treated sewage effluent to land or 5000L of CSG water to land and • Release of any volumes of contaminants to land or water where potential serious or material environmental harm has occurred or may occur	As required
8.26	Temporary and Mobile Bunding	Temporary bunding, drip trays or impermeable matting must be used to prevent spillage from any in field refuelling or maintenance of plant and equipment, or any other activity that could result in spillage of a chemical, fuel, lubricant or other contaminant to soil.	At all times
8.27	Refuelling	Refuelling of plant and vehicles must be conducted in designated areas away from sensitive receptors and at least 100m away from waterways, watercourses, water holes, lakes or wetlands. All in field refuelling must include the use of a temporary bund or absorbent mat to contain any spills.	At all times
8.28		Refuelling must utilise auto shut off valves.	At all times
8.29	Vehicles, Plant and Equipment	All vehicles, plant and equipment must be maintained in accordance with manufacturer's specifications and kept in good working order.	At all times
8.30		Routine maintenance and inspections of earthmoving equipment must be conducted.	At all times

DANGEROUS GOODS AND HAZARDOUS MATERIALS			
8.31		All scheduled maintenance activities must be undertaken at designated workshop areas. Any in field maintenance or refilling should utilise small volumes to limit the quantity of material that could be potentially spilt.	At all times
8.32	Prohibited materials and uses	The following hazardous materials must not be used at Origin sites: • asbestos containing materials (being fixed, installed, reused or reinstated). • Scheduled carcinogens The following processes must not be undertaken at Origin sites: • abrasive blasting with the following materials: - those containing more than 1 per cent crystalline silica. - those containing greater than 0.1 per cent of any of the following: antimony, arsenic, cadmium, cobalt, lead, nickel or tin. - any recycled material that has not been treated to remove respirable dust. • wet blasting using material that contains chromate, nitrate or nitrite. • spray painting or spray coating using lead carbonate, carbon disulphide or tetrachloroethane.	At all times

6.9. Waste Management

<table>
<tr><th colspan="2">WASTE MANAGEMENT</th></tr>
<tr><td>Objectives</td><td>

Maximise waste recycling and reuse.
Minimise contamination of the site
Appropriately manage waste generated on-site
Avoid wastes entering the site
Minimise waste generated from the site

</td></tr>
<tr><td>Targets</td><td>

No unauthorised discharge of contaminants or wastes to land or water
Minimise the quantity of wastes disposed to a landfill
Dispose of all waste appropriately
Zero complaints relating to waste management
All treated sewage effluent released to land from STPs greater than 21 EP must be in accordance with the contaminant release limits in the table below:

<table>
<tr><th>Quality Characteristic / Contaminant</th><th>Unit</th><th>Limit Type</th><th>Release Limit</th></tr>
<tr><td>5-day Biochemical Oxygen Demand (BOD)</td><td>mg/L</td><td>maximum</td><td>20</td></tr>
<tr><td>Electrical Conductivity</td><td>µS/cm</td><td>Monitor only</td><td>NA</td></tr>
<tr><td>pH</td><td>-</td><td>range</td><td>6.0-8.5*</td></tr>
<tr><td rowspan="2">E. coli</td><td>cfu/100 mL</td><td>80th percentile*</td><td>1000</td></tr>
<tr><td>cfu/100 mL</td><td>maximum</td><td>10000</td></tr>
</table>
Note: 80th percentile based on at least 5 samples collected at not less than 30 minute intervals

Treated sewage effluent released to land from STPs greater than 21 EP in Spring Gully only must be in accordance with the contaminant release limits in the table below:

<table>
<tr><th>Quality Characteristic / Contaminant</th><th>Unit</th><th>Limit Type</th><th>Release Limit</th></tr>
<tr><td></td><td>mg/L</td><td>mean</td><td>1000</td></tr>
<tr><td>pH</td><td>-</td><td>range</td><td>6.5-9.0</td></tr>
<tr><td>Faecal coliforms</td><td>cfu/100 mL</td><td>mean</td><td>10000</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th colspan="4">WASTE MANAGEMENT</th></tr>
<tr><th>REF</th><th>HEADING</th><th>ACTIONS</th><th>TIMING</th></tr>
<tr><td>9.1</td><td>Origin Energy HSEMS – Environmental Effects and Management Directives</td><td>The Contractor must comply with all relevant requirements of Origin Energy HSEMS – Environmental Effects and Management Directives, as amended from time to time, including:
Material and Waste ORG-HSE-DVE-020</td><td>At all times</td></tr>
<tr><td>9.2</td><td>Australia Pacific LNG Waste Management Plan</td><td>The Contractor must comply with all relevant requirements of the Australia Pacific LNG Upstream Waste Management Plan (Q-1000-15-MP-0001).</td><td>At all times</td></tr>
<tr><td>9.3</td><td>Waste Management Areas</td><td>The Contractor must establish a designated waste management area, in a location approved by the Australia Pacific LNG Environmental Representative, at each site for sorting the wastes into the various waste streams, segregating regulated wastes and waste storage prior to transport off-site.
The Contractor’s waste management areas must be bunded or have a suitable containment system in place for the type of waste to be stored to ensure wastes are contained and do not cause environmental harm including surface water and groundwater contamination.</td><td>Prior to commence-ment of construction</td></tr>
<tr><td>9.4</td><td>Preferred waste management strategies</td><td>Australia Pacific LNG preferred waste disposal, recycling and reuse fate of potential waste streams are listed below. See also Appendix A Waste Matrix for detailed requirements for waste types.
<table>
<tr><th>Waste Type</th><th>Classification</th><th>Preferred Treatment Method</th></tr>
<tr><td>Aluminum cans</td><td>General</td><td>Recycling</td></tr>
<tr><td>Batteries (cadmium and nickel/cadmium (NiCad), lead acid, lithium and other)</td><td>Regulated</td><td>Recycling</td></tr>
<tr><td>Paper</td><td>General</td><td>Recycling</td></tr>
<tr><td>Cardboard</td><td>General</td><td>Recycling</td></tr>
<tr><td>Printer cartridges</td><td>Regulated</td><td>Recycling</td></tr>
<tr><td>Plastics – bottles, drums and other containers</td><td>General (unless contaminated with a regulated waste)</td><td>Recycle</td></tr>
<tr><td>General municipal waste</td><td>General</td><td>Treatment/Landfill</td></tr>
<tr><td>Organic waste</td><td>General</td><td>Recycle</td></tr>
<tr><td>Concrete</td><td>General</td><td>Recycle</td></tr>
<tr><td>Timber (untreated)</td><td>General</td><td>Reuse and Recycle</td></tr>
<tr><td>Treated timber</td><td>Regulated</td><td>Reuse</td></tr>
<tr><td>Green waste</td><td>General</td><td>Reused onsite</td></tr>
<tr><td>Spent chemicals, including laboratory waste (solvents, etc.)</td><td>Regulated</td><td>Recycle</td></tr>
</table>
</td><td>At all times</td></tr>
</table>

WASTE MANAGEMENT

Waste Type	Classification	Preferred Treatment Method
Oily waste	Regulated	Recycle
Scrap Metal (steel, aluminium, brass, copper, lead, other non-ferrous metal, stainless steel and zinc)	General	Recycle
Used Filters – Oily filters	Regulated	Recycle
Clinical/biological	Regulated	Treated
Contaminated water	Pending analysis	Treated
Septic, untreated or treated sewage effluent (not meeting irrigation specifications)	Regulated	Treated
Sewage Sludge and Residues	Regulated	Treated
Contaminated Soil	Regulated/Not a waste*	Regulated Landfill /Treated
High density polyethylene (HDPE) waste	General	Recycle
Hydrotest Water	Pending analysis	Treated
Rubber	Regulated	Recycle
Tyres	Regulated	Recycle
Textiles and rags	General (unless contaminated with a regulated waste)	Reuse/ Recycle
Other solid regulated waste	Regulated	Regulated Landfill
Biocides	Regulated	Treated
Concrete –solid form left over (including drilling cement returns)	General	Recycled
Cement - powdered	Regulated	Regulated Landfill
Completions Fluids/Frac Fluid/Frac Sands & Well Work Over fluids (Internal Transfer used within the drilling process)	Not a waste	Reused
Drilling Mud/fluid (used during the drilling process)	Not a waste	Reused
Drilling Mud/fluids (removed off site)	Regulated	Recycled
Drilling Solids/cuttings (over or under saturated)	N/A	Reused

WASTE MANAGEMENT

Waste Type	Classification	Preferred Treatment Method
Mud Additives- leftovers, spills of mud products, broken bags	Regulated	Treated
Spill Clean Up	Regulated	Regulated Landfill
CSG Waters (including drilling completion fluids, frac fluid, work over fluids, permeate and low point drain water)	General**	Recycled
Separator Solids (sludge) or (dry cake)	Regulated	Recycled
Weed washdown waters (hydrocarbon contamination)	Regulated (where contaminants which are regulated wastes are present)	Recycled
Grey water removed off site	Regulated (where contaminants which are regulated wastes are present)	Recycled

* small quantities of contaminated soil should be handled and disposed of as regulated wastes, management of contaminated soils from remediation of contaminated sites must be conducted in accordance with contaminated site cleanup requirements of the Environmental Protection Act 1994

** In order for CSG waters not to be considered a regulated waste under Section 65(3) of the Environmental Protection Regulation 2008 QLD the following triggers apply:

Groundwater or treated groundwater necessarily or unavoidably brought to the surface of the earth as part of an industrial process, if the groundwater—

(a) has a pH of at least 6 but not more than 10.5; and

(b) has an electrical conductivity of less than 15000 micro-Siemens per centimetre.

In the event the CSG Water exceeds these trigger limits the CSG Water must be considered a regulated waste and managed accordingly.

9.5	Waste Management Plan	The Contractor must develop a detailed waste management plan utilising the principles of the waste management hierarchy to demonstrate how the Contractor must meet or exceed the requirements of the Australia Pacific LNG Waste Management Plan. The Contractor must submit its waste management plan to the Australia Pacific LNG Environmental Representative for approval at least 20 days prior to construction. The waste management plan should include the following details as a minimum: • Waste streams and quantities • Management strategies to be employed for each waste stream, justification must be made where waste disposal option deviates from Australia Pacific LNG preferred fate as listed above and in Appendix A Waste Matrix • Roles and responsibilities • Training and awareness • Monitoring waste streams and management activities	At least 20 days prior to construction

WASTE MANAGEMENT			
		• Practices to encourage sustainable waste management practices in the supply chain • Practices to minimise waste including but not limited to using surplus materials prior to re-ordering and reducing packaging waste • Identify disposal and recycling facilities proposed to be utilised for management of wastes • Spill incident and response • Auditing including annual waste audits • Reporting requirements • Key performance indicators	
9.6	Training and Awareness	The Contractor must ensure that all site personnel must be trained in waste management and the waste hierarchy, waste streams produced from the Contractor's activities, how to minimise wastes, recognise which types of materials are recyclable, waste segregation, spill response and to be aware of their obligations to use recycling facilities provided on site including impacts of poor waste management. Waste management requirements must be included in site induction and toolbox training activities. Training programs should consider the "Queensland's Waste Reduction and Recycling Strategy 2010–2020" (Queensland Government, 2010).	At all times
9.7	General	Waste must not be burned or be allowed to be burned on the site.	At all times
9.8		Waste material must not be left or buried on site. Waste materials must not be buried in trenches.	At all times
9.9	Waste Handling and Storage	Wastes must not be stored within 100m of any waterway, watercourse, wetland or spring.	At all times
9.10		Where an identifiable chemical is present in waste, the SDS for that chemical must be easily accessible in the immediate vicinity of the waste storage area and at the administration office.	At all times
9.11		Minimum requirements for waste management areas are as follow: 1. General waste bins and containers (e.g. food scrap bins, recyclable bins, recyclable paper bins) are to be placed in easily accessible locations at all worksites. Sufficient waste receptacles must be provided for all waste streams on site. Recyclable waste should be stored separately from general waste, ensuring maximised segregation potential to minimise waste sent to landfill 2. Liquid and solid wastes will be segregated to allow for maximised recycling, bins will be colour coded for the waste stream, where practicable. Solid unregulated waste bins must comply with AS4123.7 2006 Bin Colours, markings and designation requirements. 3. Where a waste material or product does not have a specific receptacle, the receptacle used must be compatible with the waste and must then be labelled. 4. Spare receptacles must be made available to accommodate for unforeseeable events 5. Waste receptacles must be maintained in good condition to prevent leaks or spills. Defective containers must not be used for waste storage or transport 6. Containers used for waste storage (such as waste oil drums) must not be opened, handled, transported or stored in a manner that may rupture the container, cause it to leak or subject it to overpressure 7. The waste storage area must be of an adequate capacity to handle the volume of waste stored there without a	At all times

WASTE MANAGEMENT			
		risk to the environment 8. The waste storage area must be located in an easily accessible area to provide vehicle access to materials and waste storage areas for the collection and transport of wastes 9. The location of the waste storage area must also consider the proximity to facilities plant, offices and accommodation to minimise impact on production activities and personnel, neighbours and environmentally sensitive areas (e.g. impacts due to dust, windblown rubbish, pests, odour, visual amenity and noise) 10. All waste storage areas must have adequate fire fighting equipment suitable for the type of waste stored in that particular area 11. Suitably sized spill kits and spill containment systems relevant to the activities within the site must be available in the vicinity of the waste storage areas. Maintenance of spill kits must be kept up to date, ensuring that no equipment is missing from the kit. 12. Spills must not be cleaned by hosing or in any manner resulting in the further spread of the contaminant to land or water 13. All long term waste storage areas must have fencing to prevent wildlife access 14. All waste containers should be appropriately identified and clearly labelled (see Appendix A) as per AS4123.7 2006 15. All lids and seals must be maintained on waste storage receptacles to ensure that the waste does not cause an odour nuisance. Lids on general waste bins containing food scraps will have either a lock or a clasp to prevent access by wildlife 16. Maximum retention times for wastes that may produce odours should not exceed 7 days 17. Waste must not be burned or allowed to be burned on site	
9.12	Regulated waste management areas	The Contractor's waste management areas must include a dedicated section for regulated wastes which must be stored within sealed containers in accordance with Australian Standards and the following minimum requirements. To assist in the collection and transfer of regulated wastes, designated regulated waste bins, drums and skips must be used. Where possible these regulated waste storage containers should be located at the work location where the waste is being generated and then returned to the designated regulated waste storage areas for storage prior to offsite disposal or recycling. 1. Dedicated regulated waste storage areas must be provided to prevent the mixing of regulated wastes with other stored material or with incompatible hazard classes. Sufficient and adequate waste receptacles must be provided for all waste streams on site including but not limited to used chemicals, empty chemical/paint/solvent containers, used filters, oily rags, batteries. Wastes must only be deposited into designated areas within the applicable storage area. A dangerous goods segregation chart will be made available in every storage area containing dangerous goods. 2. The storage area for regulated wastes that are liquids must comprise an enclosure with an impervious surface, capable of containing a required volume for a spill event. Bunds must be designed in accordance with AS 1940-2004 or appropriate Australian Standard. Bunds containing liquid must be pumped out as required and disposed of appropriately relevant to the waste stream. 3. An inventory must be kept and maintained of all regulated waste stored. 4. Where practicable, all loading and unloading should take place within the containment area. Loading and unloading procedures must be undertaken in a manner that ensures wastes will not spill or containers break.	At all times

WASTE MANAGEMENT			
		5. Where vehicular access is required to a bunded area, such as load in and load out areas, the bund must be designed to prevent damage by vehicles accessing these areas as required. 6. Containers storing regulated wastes must be securely closed. 7. All bunding and containment systems must include an appropriate drainage and sump system to assist with the drainage and removal of any waste materials or products released into the containment system. 8. Inspections of the bunding and containment systems around the site are to be undertaken on a regular basis to assess the integrity of the system. 9. For liquid wastes being transferred or transported, portable bunds should be used where practical to reduce the potential for a release to the environment in the event of an incident. 10. Waste storage areas must be clearly placarded designating what wastes are to be deposited into the storage area and any specific directions/hazards. Signage must comply with the Australian standard AS1216-2006 where applicable. 11. Regulated waste stores must be able to be securely locked to prevent access by unauthorised persons. 12. All containers must be labelled at all times for clear interpretation of the contents. Bins should be colour coded for the waste stream 13. There must be adequate containment measures to prevent off-site migration of spills 14. Sufficient and appropriate clean-up equipment (spill kit) must be provided together with appropriate instructions and training. Spills must not be cleaned by hosing or activities resulting in the further spread of the contaminant to land or water 15. No liquid wastes, wash down waters or stormwater waste contaminated with hazardous wastes is to be disposed of via the stormwater drainage system 16. As soon as practicable remove and dispose of all regulated waste to a licensed waste disposal facility or recycling facility 17. Medical wastes must be stored in yellow and black biohazard waste bins. Clinical waste must be bagged in yellow bags with biohazard symbols and stored in rigid-walled, leak-proof secondary containers, in a bunded area with an impervious surface. If the waste may produce odours, it should be refrigerated. Clinical waste should be kept in a secure storage area inaccessible to unauthorised people and animals. For further details on managing medical wastes, see Appendix A 18. Storage areas should meet the requirements of the Origin Energy Hazardous Materials and Secondary Containment Directive (ORG-HSE-DVE-015).	
9.13	Labelling of waste receptacles	All waste receptacles must be labelled to clearly identify the contents. General waste receptacles labels must : • Clearly state the waste type • Use a san serif font (e.g. Trebuchet, Helvetica, Arial) • Have minimum font size of 150 and be visible from 20m away • Ensure that there are no other labels on the waste container except a label that refers to the current contents • Ensure the label is positioned so that it can be easily read • Do not cover the manufacturer's product label (should the original drum be used) with waste labels.	At all times

WASTE MANAGEMENT			
		Regulated waste receptacles labels must conform to the requirements for the general waste category label, plus include the EHP waste code. These labels must also comply with the Australian Standard AS1216-2006. Refer to Appendix C of the Australia Pacific LNG Upstream Waste Management Plan (Q-1000-15-MP-0001) for example labels. In the event that self adhesive labels are not practical, lockout tags may be utilised. Spray stencils may be utilised provided that the owner of the bin (generally the transport company) does not object. Refer to Appendix C of the Australia Pacific LNG Upstream Waste Management Plan (Q-1000-15-MP-0001) for example labels.	
9.13a	Spent dangerous goods waste labelling	Dangerous Goods that have been spent and no longer useful are classified as regulated waste. All Dangerous Goods wastes should be labelled in accordance with the Australian Standard AS1216:2006, where applicable. In order to determine whether a regulated waste is a former dangerous good, refer to the product specific SDS. Information obtained within the SDS is required to complete the Waste Transport Certificate in Part 1. All spent Dangerous goods waste labels must also include the following information where available: • Details of the content of the bin • Volume held in the vessel or waste container • Waste type (waste stream) • Regulated waste code • UN Number • Class • Date the waste was packed • Where the waste was generated • Details of who packaged the waste	
9.14	Inspections	Regular visual inspections must be conducted to determine compliance with the requirements of this plan. Evidence of inspection should be retained by the Contractor and provided to the Australia Pacific LNG Environmental Representative monthly or on request. This should include, but not necessarily be limited to: • Weekly inspection of designated site waste management areas to ensure that the waste material is appropriately separated, stored and labelled • Weekly inspection of waste containers and storage areas regularly to ensure they do not reach full capacity prior to collection from a waste disposal contractor • Litter and improperly disposed waste • Receptacle condition and labelling • Availability of Spill kits and Protective Personal Equipment (PPE) • Materials and Waste Inventory	At all times

WASTE MANAGEMENT			
9.15	Regulated waste tracking	An EHP Waste Transportation Certificate is not required for regulated wastes transfers **WITHIN** an area to which a Project Environmental Authority applies (that is within the development areas under an Australia Pacific LNG EA e.g. within Australia Pacific LNG Condabri gas field EA comprising PL265, PL266, PL267, PPL186 and ATP 702) including between adjoining areas to which another Project Environmental Authority applies **AND IF** the waste generator and receiver are the same entity (i.e. when the Contractor removes waste from a work site and transports that waste to the central project waste management area e.g. at the laydown yard, but NOT to landfill and NOT to another site outside the project EA area). An EHP Waste Transportation Certificate is not required for small quantities of regulated wastes transfers less than 205L total volume. In all others cases an EHP Waste Transportation Certificate is required for regulated waste transport. Waste tracking documentation and records must be kept and provided to the Australia Pacific LNG Environmental Representative monthly or on request.	At all times
9.16	Unidentified Wastes	The Contractor must assess all unidentified wastes to determine the appropriate management measures to use when handling, storing, transporting and disposing of the waste in accordance with the following process: 1. Unidentified waste must be temporarily stored as a regulated waste and at least 5 metres away from other materials and wastes in a secure area 2. A risk assessment must be performed on the waste to determine whether it is hazardous before the waste is handled 3. Personal Protective Equipment (PPE) must be worn at all times whilst handling unidentified wastes (gloves, safety glasses and protective clothing (long sleeved shirt and long pants) as a minimum) 4. Seek approval from Australia Pacific LNG Environmental Representative prior to taking samples for analysis by a NATA accredited laboratory 5. Following identification transport the waste by a licensed waste transporter to a licensed recycling or disposal facility at the earliest convenience 6. Conduct an investigation and risk assessment to determine where the unidentified waste originated from and how it came to be unlabelled. Implement measures place to prevent recurrence 7. Records must be kept for unidentified waste and provided with the monthly waste reports. Unidentified waste reports must include the following: • Contractor's Name • Site of waste generation • Date of waste generation • Date of chemical analysis • Contact details for NATA accredited laboratory that samples were sent to; • Waste volume • Waste type (once identified)	As required

WASTE MANAGEMENT			
9.17	Waste register and Waste Management Reports	The Contractor must maintain an up to date site register for all wastes generated onsite and report waste data in the "Australia Pacific LNG Site Waste Report Register" (i.e. "waste tracker" spreadsheet) as prescribed in the Appendix E of the Australia Pacific LNG Upstream Waste Management Plan to the Australia Pacific LNG Environmental Representative monthly (or on request). Monthly waste Management Reports must include the following details in the waste tracker spreadsheet: • Waste Generator • Date • Location (lot plan) • Site Activity (e.g. Gathering) • Transportation Company • Business Unit (i.e. Australia Pacific LNG) • Trackable waste (Y/N) • Internal / external transfer • Waste type • Volume • • WTC waste number* • Disposal Receiving Facility In addition to the waste tracker spreadsheet, the Contractor must submit the following on a monthly basis: • Form attachments (i.e. EHP Waste Transportation Certificate Part 1 and Part 3) • Results of any waste audit conducted in the period • Results of any compliance audit conducted in the period • Summary of any non-conformances or incidents pertaining to waste management • Unidentified waste reports * Regulated wastes only	Monthly
9.17a	Surplus materials	Surplus Materials shall be classified by the Sub-Project as: • Obsolete - where a design change has rendered Materials no longer required for incorporation into the Facilities • Damaged - where rectification of the damaged Material is not cost effective • Scrap and waste materials - scrap and waste materials that have no intended Project use include but are not limited to: – Weld coupons – Materials used for weld tests etc – Off cuts of pipe – Off cuts of cable – General recyclable waste (copper, steel, aluminium, timber, concrete)	At all times

WASTE MANAGEMENT			
		• Consumables - Excess tools and consumable materials used in the construction phase All Project materials must be managed in accordance with the Project Materials Management Plan: Disposal (Q-LNG01-95-AP-1061) and the Materials Management Procedure: Disposal (Q-LNG01-95-AP-0318).	
9.18	Waste Disposal and Transport	All waste removed from site must be sent to a recycling facility or disposal facility licensed to accept the waste under the provisions of the *Environmental Protection Act 1994* (QLD). Contracts with companies must encourage the opportunities for recycling wastes. For a list of authorised waste processing and disposal facilities please refer to Appendix D of the Australia Pacific LNG Upstream Waste Management Plan (Q-1000-15-MP-0001) and Approved Waste Processing and Disposal Facilities LNG Business Unit OEUP-Q1000-REG-ENV-003.	At all times
9.19	Regulated waste transport	Regulated waste may be transported by the Contractor **WITHIN** the area to which a Project Environmental Authority applies (that is within the development areas under an Australia Pacific LNG EA e.g. within Australia Pacific LNG Condabri gas field EA comprising PL265, PL266, PL267, PPL186 and ATP 702) including between adjoining areas to which another Project Environmental Authority applies **AND IF** the waste generator and receiver are the same entity (i.e. when the Contractor removes waste from a work site and transports that waste to the central project waste management area e.g. at the laydown yard, but NOT to landfill and NOT to another site outside the project EA area). The Contractor may transport small quantities of regulated wastes transfers less than 205L total volume. In all others cases regulated waste must only be removed from the site by a person who holds a current authority to transport such waste under the provisions of the *Environmental Protection Act 1994* (QLD). Regulated waste removed from site for recycling or disposal must be sent to a recycling facility or disposal facility licensed to accept the waste.	At all times
9.20	Waste Contractors	The Contractor must maintain up to date details of all waste sub-contractors undertaking waste management and transportation services including: • Name of the contractor • Business details including business address and contact details • Copies of relevant waste processing and disposal facility EHP approvals and licenses • Details on transportation vehicles including copies of their relevant regulatory licenses • A description of the waste services being provided • Records of relevant inductions and training specific to the Australia Pacific LNG waste management plan requirements, site waste management tasks including but limited to, waste handling and record keeping	At all times
9.21		The Contractor must audit waste sub-contractor compliance with the requirements of the Australia Pacific LNG Upstream Waste Management Plan (Q-1000-15-MP-0001) every 6 months.	6 monthly
9.22	Incident Response	Non conformances with waste management requirements and any waste spillages on site or in transit must be managed as an incident and reported to the Australia Pacific LNG Environmental Representative.	As required
9.23	Green Waste	Cleared vegetation must not be disposed of offsite (i.e. removed from the property), unless approved in writing by the Australia Pacific LNG Environmental Representative and a weed declaration has been completed. Vegetation must be stockpiled in a manner that facilitates spreading or salvaging and does not impede vehicle, stock or wildlife movements.	At all times
9.24		Weedy material must be to be managed in a manner consistent with the appropriate weed classification, regulatory requirements and the Australia Pacific LNG Upstream Biosecurity Management Plan (Q-LNG01-15-MP-0110).	At all times

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9.25	Waste Treatment	The only waste treatment permitted on site is stormwater and sewage treatment, unless otherwise approved in writing by the Australia Pacific LNG Environmental Representative and the relevant Environmental Authority.	At all times
9.26	Sewage Treatment	Notwithstanding the quality characteristic limits specified herein releases of effluent must not have any properties nor contain any organisms or other contaminants in concentrations that are capable of causing environmental harm.	At all times
9.26a		Prior to operation, the Contractor must develop an STP and sewage effluent management plan that includes, but is not necessarily limited to the following: • Requirements of the Australia Pacific LNG Sewage Treatment Plant Basis of Design (Q-LNG01-10-PH-0022) • Requirements set out in this CEMP and the relevant Origin Energy Environmental approval (e.g. Environmental Workpack) • Requirements of the relevant Environmental Authority • Site layout drawings, process flow diagrams, equipment datasheets and manuals • Maintenance requirements • Monitoring and reporting • Operator training and competency requirements • Contingency plans, trouble shooting and emergency response • Contact details for STP operators, site manager and technical support personnel The STP and sewage effluent management plan may be incorporated into Operations and Maintenance Manuals for the STP and must be submitted to the Australia Pacific LNG Environmental Representative for approval prior to commencement of commissioning. The Contractor must implement the requirements of the approved plan.	Prior to STP operation
9.27		Sewage pump stations must be fitted with a stand-by pump and a visible or audible high level alarm. All alarms must be able to operate without mains power.	At all times
9.28		All sewage treatment systems must be located above Q50 flood levels if to be in place for less than 5 years and Q100 levels if to be in place for more than 5 years.	At all times
9.29		All staff should be made aware of materials that are not permitted to enter the effluent system. This may include excessive quantities of detergents, cleaning chemicals or pesticides.	At all times
9.30	Sewage Effluent Irrigation	Sewage effluent may only be discharged to land in accordance with the relevant Environment Authority and the Australia Pacific LNG Land Release Management Plan (Q-LNG01-15-MP-0354). All sewage effluent release to land must comply with the water quality limits detailed above and in the relevant Environmental Authority. Prior to irrigation a four (4) month proving period is required. Following the completion of the proving period and prior to irrigation the Contractor must provide effluent sampling results that show at least four (4) consecutive weeks in compliance with the Environmental Authority release limits. If any sampling result indicates effluent does not comply with water quality limits it must be reported to the Australia Pacific LNG Environmental Representative IMMEDIATELY and a repeat sample taken for analysis. Effluent irrigation must cease if the Environmental Authority cannot be complied with and must not recommence until water quality limits are complied with. Spray irrigation must cease if spray drift moves beyond the site boundary or onto accommodation areas, for example as a result of high winds.	At all times

WASTE MANAGEMENT			
9.31		The daily volume of contaminants released to land must be determined or estimated by an appropriate method, for example a flow meter, and records kept of such determinations and estimates.	At all times
9.32		Lockable valves or removable handles must be fitted to all release pipes situated in public access areas.	At all times
9.33		Pipelines and fittings associated with the effluent irrigation system must be clearly identified.	At all times
9.34		When circumstances prevent the irrigation of treated sewage effluent to land, such as during or following rain events, waters must be directed to wet weather storage or alternative measures must be taken to store or lawfully dispose of effluent. The wet weather storage capacity must have a capacity to hold effluent for a minimum of three (3) days.	At all times
9.35		Sewage effluent may only be discharged to land in designated, fenced and delineated contaminant release areas specified by Australia Pacific LNG Environmental Representative. Within the designated area a risk assessment must be undertaken to determine the required buffer zone distances from a treated sewage effluent irrigation area to any sensitive receptor (including camps), watercourse, or environmentally sensitive areas. Buffer zone distances proposed by the risk assessment must be approved by Australia Pacific LNG. The following buffer distances should as a minimum comply with the following: • 30 metres for Class B recycled water • 50 metres for Class C recycled water.	At all times
9.36		Where not provided by Origin Energy, or as requested, prior to construction of a sewage treatment facility, the Contractor must complete a soil and site investigation assessment to determine the size of the irrigation field/absorption beds necessary to ensure that the receiving environment has the capacity to assimilate the contaminants. Land area and effluent application rates must be demonstrated to not to exceed nutrient and hydraulic demand. From this assessment the Contractor must nominate the minimum area of land required to be utilised for irrigation of treated sewage effluent, excluding any necessary buffer zones. All nominated locations and minimum areas of land must be determined using the Model for Effluent Disposal using Land Irrigation (MEDLI) program or recognised equivalent. A copy of the MEDLI program results must be submitted to the Australia Pacific LNG Environmental Representative no less than 80 business days prior to commencement of sewage effluent irrigation, which must provide the modelling results to the administering authority (EHP). If, the administering authority provides comments on the submission, the Contractor must a. implement that comment in the finalisation of the amended MEDLI program results; b. submit the finalised amended MEDLI program results within 40 business days after the administering authority provided comments; and c. implement the amended MEDLI program results.	MEDLI modelling report 80 business days prior to construction
9.37		Absorption beds and/or irrigation fields must be designed and constructed to avoid: • Sensitive areas • Soil erosion and damage to soil structure • Surface ponding or runoff of effluent	At all times

WASTE MANAGEMENT			
		• Impacts to ground water quality • Spray drift The application method must be approved in writing by the Australia Pacific LNG Environmental Representative. Flood irrigation is not permitted. Low pressure above ground sprays and subsurface drip systems are acceptable and the type depends on the health risk.	
9.38		All effluent application areas must include: • Clean water diversion bunds (lined or vegetated) must be constructed upslope of treated sewage effluent application areas to divert clean water away from application areas. Clean water must be diverted in such a manner as to prevent erosion. • Down slope interceptor drains to prevent effluent runoff from the application area • Be fully fenced to prevent unauthorised access. • Notices must be prominently displayed on areas undergoing effluent irrigation, warning that the area is irrigated with effluent and not to use or drink the effluent. These notices must be maintained in a visible and legible condition.	At all times
9.39		Effluent distribution pipelines must be buried in accordance with Australian Standards and acceptable engineering standards.	At all times
9.40		All effluent collection and treatment infrastructure must be adequately protected from accidental damage or impact by machinery.	At all times
9.41		All sewage treatment and land application plant and equipment must be installed, maintained and operated in a proper and efficient manner by suitably qualified and experienced personnel in accordance with manufacturer's requirements and good industry practice.	At all times
9.42		Sewage sludge may only be transported from site by a licensed contractor to a suitable, licensed facility.	At all times
9.43		For STPs less than 21 EP the release of contaminants to land must be carried out in a manner such that: • Vegetation is not damaged • Soil quality is not adversely impacted • There is no surface ponding or runoff to waters • There is no aerosols or odours • Deep drainage below the root zone of any vegetation is minimised • The quality of the shallow aquifers is not adversely impacted	At all times
9.44		For temporary facilities, waste from ablution blocks may be stored and periodically transported to an approved disposal site via an approved regulated waste transporter. Ablution blocks must have impermeable containment and temporary bunding in place during all waste transfers and pump outs. Secondary containment may be required, where advised by the Australia Pacific LNG Environmental Representative.	As required

WASTE MANAGEMENT			
9.45		Treated sewage must be sampled for analysis of water quality for each of the water quality parameters included in the contaminant release limits table at two locations: • immediately downstream of the STP and • wet weather storage tank discharge Effluent quality must be sampled at both locations at least weekly.	Weekly
9.46		If it is noted that ponding or runoff of sewage effluent is occurring from part of the effluent irrigation area, irrigation to that part of the area must cease immediately. In the event of untreated or improperly treated effluent to the environment, the following actions must be undertaken: • The release must be stopped and contained • The release must be isolated to prevent excess human contact (e.g. barriers) • The release must be cleaned-up as far as practicable (e.g. use of vacuum trucks) on the authorisation of Australia Pacific LNG Environmental Representative Any collected effluent must be transported by a licensed contractor off-site to an appropriate disposal facility or returned to inlet of STP on the authorisation of Australia Pacific LNG Environmental Representative.	As required
9.47	Oily waste	Oily wastewater must be processed through an oily water separator. The separated oil must be collected and transported to a licensed facility. Water will be stored in a water retention pond which must satisfy surface water discharge criteria prior to release.	At all times
9.48	Sludges	Sludge from stormwater collection and treatment systems must be collected, tested and treated prior to disposal.	As required
9.49	Spill Response	All site personnel must receive training in spill response procedures, relevant to their role and responsibilities.	At all times
9.50		*Not used*	

6.10. Protection of Vegetation (Flora)

PROTECTION OF VEGETATION (FLORA)			
Objectives		• To protect Flora species native to the site, particularly those identified as conservation significant flora. • To minimise disturbance to retained remnant vegetation. • To manage remnant native vegetation in a manner to minimise land degradation to prevent release of sediments and nutrients to declared catchments.	
Targets		• No unauthorised clearing outside of the required limits for construction. • Successful rehabilitation and reinstatement of vegetation, equal to or better that pre-construction status, except where permanent operational access is required.	
REF	**HEADING**	**ACTIONS**	**TIMING**
10.1	Origin Energy HSEMS – Environmental Effects and Management Directives	The Contractor must comply with all relevant requirements of Origin Energy HSEMS – Environmental Effects and Management Directives, as amended from time to time, including: • Biodiversity Management ORG-HSE-DVE-021	At all times
10.2	Australia Pacific LNG Terrestrial Ecology Management Guidelines	The Contractor must comply with all relevant requirements of the Australia Pacific LNG Terrestrial Ecology Management Guidelines including: • Australia Pacific LNG Threatened Flora Management Plan (Q-LNG01-15-MP-0108) • Australia Pacific LNG Threatened Ecological Community Plan (Q-LNG01-15-MP-0114)	At all times
10.3	Threatened Ecological Communities	The Contractor must comply with all relevant requirements of the Australia Pacific LNG Threatened Ecological Community management plan for any works within 200m of any identified EPBC listed Threatened Ecological Community. This includes: • Brigalow • Weeping Myall woodlands • Semi-Evergreen vine thickets of the Brigalow belt (north and south) and Nandewar Bioregions • The community of native species dependent on natural discharge of groundwater from the great artesian basin • Natural grasslands of the Queensland Central Highlands and the northern Fitzroy Basin • Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland • Coolibah – Blackbox Woodlands of the Darling Basin and the Brigalow Belt	At all times
10.4	Australia Pacific LNG Threatened Flora Species Management Plans	The Contractor must comply with all relevant requirements of the Australia Pacific LNG Flora Species management plans for any works within 200m of any identified *Environment Protection and Biodiversity Conservation Act 1999* (CTH) or *Nature Conservation Act 1992* (QLD) listed Flora. This includes: • *Acacia currani* (Curly-barked Wattle) Vulnerable • *Acacia lauta* (Tara Wattle) Vulnerable • *Bothriochloa biloba* (Lobed Bluegrass) Vulnerable • *Cadellia pentastylis* (Ooline) Vulnerable	At all times

PROTECTION OF VEGETATION (FLORA)			
		• *Calytrix gurulmundenis* (Gurulmundi fringe myrtle) Vulnerable • *Eriocaulon carsonii* (Salt Pipewort) Endangered • *Eucalyptus virens* (Shiny-leaved ironbark) Vulnerable • *Homopholis belsonii* (Belson's panic grass) Vulnerable • *Microcarpaea agonis* (Microcarpea) Endangered • *Philotheca sporadic* (The waxflower) Vulnerable • *Polianthion minutiflorum* (Small-Flowered Polianthion) Vulnerable • *Prostanthera sp. Dunmore* (Dunmore mint- bush) Vulnerable • *Pterostylis cobarensis* (Cobar greenhood orchid) Vulnerable • *Tylophora linearis* (Slender tylophora) Endangered • *Westringia parvifolia* (Westringia) Vulnerable • *Xerothamnella herbacea* (Herbaceous xerothamnella) Endangered	
10.5	*Nature Conservation Act 1992* (QLD)	The Contractor must comply with the provisions of the *Nature Conservation Act 1992* (NCA). The Contractor must comply with any requirements of any permits and approvals gained by Australia Pacific LNG in accordance with the requirements of the Nature Conservation Act. Where construction causes a requirement for clearing of plants protected under the NCA, clearing of plants must only occur in accordance with a clearing permit or an exemption under the NCA issued to Australia Pacific LNG by EHP, as advised in writing by the Australia Pacific LNG Environmental Representative.	At all times
10.6		*Not used*	
10.7	Ecology Assessments	Australia Pacific LNG will provide to the Contractor findings of field ecological assessments and searches of the EHP Flora Survey Trigger Map undertaken for proposed construction sites. The Contractor must take into account these findings when planning and undertaking all activities. The Contractor must ensure that all site personnel are made aware of the aspects of these assessments relevant to their roles and responsibilities.	At all times
10.8	Environmentally Sensitive Areas and Protected Species	The Contractor must ensure that all site personnel are made aware of the location of any category A, B or C Environmentally Sensitive Areas (ESA) and EPBC or NCA listed species prior to carrying out field based activities. This should include as a minimum pre-start meetings and design drawings and/or maps which outline ESA and location of protected flora species.	At all times
10.9	Threatened Species	NCA listed near threatened, vulnerable or endangered plants must not be removed without a permit (as provided by the Australia Pacific LNG Environmental Representative). Clearing within any area within 100m of a location marked on the EHP Flora Survey Trigger Map as a High Risk area is not permitted other than in accordance with either a valid exemption certificate or valid NCA threatened species clearing permit.	At all times
10.9a	Pre Clearance survey	The Contractor must ensure that prior to any clearing at a particular site a pre-clearance inspection is undertaken by a suitably qualified person to identify threatened flora within the approved disturbance area ONLY IF • clearing is required within 100m of marked a High Risk area on the EHP Flora Survey Trigger Map AND • there is no valid threatened flora permit or exemption certificate in place or the permit has expired AND there is no valid EVNT flora survey report OR	

PROTECTION OF VEGETATION (FLORA)			
		• the clearing area plus 100m buffer is not fully covered by a valid permit or exemption or valid survey report. Where required (by the above criteria or on request) the survey must be carried out in accordance with the Pre-Clearance Survey Technical Instruction (Q-LNG01-15-TI-0002) and report on survey findings submitted to the Australia Pacific LNG Environmental Representative for approval.	
10.10	Land Disturbance	Disturbance to land is only permitted to occur as approved in writing by the Australia Pacific LNG Environmental Representative. The Contractor must ensure that all vehicles, equipment, plant, materials and personnel remain within the designated construction area at all times and are not allowed within any "No-Go" or environmentally sensitive exclusion zones, unless authorised by the Australia Pacific LNG Environmental Representative. Siting of stockpile areas, camps, offices, waste management areas, vehicle parking areas, access tracks and any other construction related activities must be restricted to the defined construction area.	At all times
10.11		All vehicle movement with a site must remain on designated site access routes within the approved disturbance area.	At all times
10.12	Clearing	The Contractor should ensure clearing is restricted to the minimum necessary to carry out the required activities, within the Australia Pacific LNG approved construction area. Retention of vegetation, selective clearing, trimming is the first priority.	At all times
10.13		Any unauthorised clearing must be reported to the Australia Pacific LNG Environmental Representative immediately.	At all times
10.14		Any unexpected discoveries of NCA or EPBC listed threatened flora or ecological community must be reported to the Australia Pacific LNG Environmental Representative immediately and protective flagging, signage and/or barriers erected to prevent unauthorised clearing. Clearing of these areas must not be undertaken until the vegetation type is confirmed, necessary permits are obtained and works are directed to recommence in writing by the Australia Pacific LNG Environmental Representative.	At all times
10.15		Any unexpected discoveries of remnant vegetation that differs from Australia Pacific LNG provided field ecological assessment must be reported to the Australia Pacific LNG Environmental Representative immediately. Clearing of these areas must not be undertaken until the vegetation type is confirmed and works are directed to recommence in writing by the Australia Pacific LNG Environmental Representative.	At all times
10.16		Where topsoil stripping is not required, clearing should aim to retain the maximum amount of root stock within the construction area, where appropriate. Slashing may be undertaken as a means of vegetation clearing, particularly in sown pastures or at water courses. The Contractor should use suitable equipment to protect the root system of vegetation wherever practicable	At all times
10.17	Reporting disturbance	At the completion of clearing works the Contractor must undertake survey to a high degree of accuracy to measure the extent of the area ACTUALLY cleared or disturbed. This survey must be undertaken by a suitably qualified surveyor and take into account field ecological assessments provide by Australia Pacific LNG. Survey data must be provided to the Australia Pacific LNG Environmental Representative in electronic format compatible to the Australia Pacific LNG GIS system on request.	Following clearing, prior to site demobilisation
10.18		At the completion of clearing works the Contractor must report the extent of any EPBC or NCA listed Flora species ACTUALLY cleared or disturbed. This must include: • The area of any EPBC or NCA listed threatened flora disturbed • The number of individuals of any EPBC or NCA listed threatened flora disturbed, or for Least Concern plants an estimate of the number of plants disturbed accompanied by a description of the estimation methodology	Following clearing, prior to workpack completion

PROTECTION OF VEGETATION (FLORA)			
		• Scientific name • Common name • The location (GPS and lot/plan) • Date This data must be provided to the Australia Pacific LNG Environmental Representative in electronic format as a spreadsheet and as spatial data compatible to the Australia Pacific LNG GIS system at workpack completion or on request.	
10.19	Vegetation to be Retained and Protected	Protected or retained vegetation within and adjacent to the construction area, where there is significant natural, heritage or visual amenity values to protect, the vegetation must be marked with marker paint, pegs or posts, continuous bunting, flagging or marker tape to indicate that it should be avoided, as agreed with the Australia Pacific LNG Environmental Representative. All markings must be clearly visible to plant operators, especially for operators during clearing. Additional markings must be used when clearing in dense vegetation to clearly demarcate clearing limits including markings at eye level to operators of clearing equipment.	At all times
10.20		The Contractor should give consideration to retention of significant patches or individual trees within the approved construction area, where there are significant natural, heritage or visual amenity values. Where possible, large trees and trees with hollows should be avoided. Where a mature tree or isolated vegetation is retained onsite the tree or vegetation should be fenced and protective measures installed to ensure no root damage occurs. This area is called the tree protection zone (see below).	At all times
10.21		The Contractor must ensure that where construction areas are in or adjacent to sensitive environmental areas, site specific environmental management procedures including any direction from the Australia Pacific LNG Environmental Representative are adopted to minimise environmental impacts.	At all times
10.22		The Contractor should, where possible, trim branches in preference to tree removal. Pruning must be undertaken by suitably qualified personnel only. Where branches are trimmed an assessment of the tree's ability to survive should be conducted by a suitably qualified person and adequate area around the tree should be fenced to ensure no compaction of root zone.	At all times
10.23		Trees must be felled into the construction site or in slots between stands of trees to minimise damage to other trees during the clearing process. Machinery contact with standing trees on vegetated margins must be avoided.	At all times
10.24		The Contractor should give consideration to minimisation of wildlife habitat fragmentation by maintaining tree canopy connectivity where practicable, particularly at watercourses and roadside remnants.	At all times
10.25		*Not used*	
10.26	Tree Protection Zone	For all trees to be protected within the construction area no vehicles, equipment plant or materials are permitted to be stored under vegetation or within the Tree Protection Zone. The TPZ can be estimated by the following: TPZ radius = 12 x DBH (trunk diameter at 1.4m above ground). The TPZ radius should be no less than 2m. The TPZ is to be fenced or flagged for significant vegetation. Refer to Australian Standard AS4970 for additional definition of acceptable TPZ and suitable tree protection measures.	At all times

PROTECTION OF VEGETATION (FLORA)			
10.27	Rock	Where practicable, surface rock suitable for use as habitat should be stockpiled in an adjacent area and used in rehabilitation. Other than for authorised use in re-establishing habitat, rock is not permitted to be left stockpiled nor strewn at the surface at quantities greater than pre-disturbance and immediately adjacent areas (i.e. surface rock is acceptable to be replaced to recreate pre-disturbance conditions), unless authorised in writing by the Australia Pacific LNG Environmental Representative.	At all times
10.28	Timber	Where practicable vegetation that has been identified as suitable as a timber resource should be harvested for timber production, in accordance with requirements of the *Forestry Act 1959* (QLD).	At all times
10.29	Access tracks	New access tracks are not permitted within Category B or C Environmentally Sensitive Areas unless co-located with gas collection or CSG associated water pipelines, or in accordance with written authorisation from the Australia Pacific LNG Environmental Representative and the relevant Environmental Authority.	At all times
10.30		Clearing of remnant vegetation should not exceed 10 metres in width for the purpose of establishing tracks or 20 metres in width for dual carriageway roads, unless in accordance with written authorisation from the Australia Pacific LNG Environmental Representative and the relevant Environmental Authority.	At all times
10.31	Collocated trunklines	The construction of co-located trunklines must be undertaken in a manner to minimise width and total disturbance required for the right of way.	At all times
10.32	Special Least Concern Species	Certain Special Least Concern plant species (Schedule 3A of the Nature Conservation (Wildlife Management) Regulation 2006) may be salvaged and used for on-site revegetation purposes as directed in writing by the Australia Pacific LNG Environmental Representative. This includes only species in the Family: Cycadaceae, Orchidaceae, and Zamiaceae; and only species in the Genus: Brachychiton; Hydnophytum; Huperzia; Livistona; Myrmecodia; Platycerium; and Xanthorrhoea. Special Least Concern plants must not be sold unless in accordance with the required permit and written approval from the Australia Pacific LNG Environmental Representative.	At all times
10.33	Environmentally Sensitive Areas	Vegetation clearing for essential petroleum activities in Category B or C Environmentally Sensitive Area must not exceed the following areas: • 6 m in width for tracks not associated with a water or gas line (Endangered Regional Ecosystems only in Spring Gully) • For linear infrastructure, including provision for an access track: – 12m in width for a single water or gas line – 7m width for any additional water or gas lines The above limits do not apply in Spring Gully, refer to the Spring Gully Environmental Authority.	At all times
10.33a		Significant disturbance to land within the primary or secondary protection zone of Category A, B or C Environmentally Sensitive Areas must be minimised to the greatest extent practicable. Works within the primary or secondary protection zone of Category A, B or C Environmentally Sensitive Areas must not impact on the adjacent Environmentally Sensitive Areas.	At all times

PROTECTION OF VEGETATION (FLORA)			
10.34		Significant disturbance to land caused by construction activities must not involve clearing vegetation or placing fill: • in a way which significantly isolates, fragments or dissects tracts of vegetation resulting in a reduction in the current level of ecosystem functioning , ecological connectivity (i.e. stepping stone or contiguous bioregional / local corridor networks) and / or results in an increase in threatening processes (e.g. potential impacts associated with edge effects or introduced species) • on slopes greater than 10% for the petroleum activity(ies) other than for pipelines, roads, access tracks, powerlines and wells • in discharge areas	At all times
10.35		For each well site within the primary protection zone of, or in a Category B or C Environmentally Sensitive Area (ESA), all reasonable and practical measures must be taken to minimise the area cleared. As specified in the relevant Environmental Authority, all well sites or well leases must not exceed the maximum disturbance area specified in the definition of “essential petroleum activity” in relevant ESA and ESA protection zones.	At all times
10.36	MNES	All linear disturbance within sensitivity category 1-4 for MNES and the impact risk zone (within 200m from sensitivity category 1) must be: • limited to 12 metres in width for a single flow line • limited to 18 metres in width for trenches with one water gathering line and one parallel gas gathering line • limited to 25 metres in width for multiple trenches where there are three parallel gas or water gathering lines or a single large diameter water pipeline (500 mm or above) • limited to an additional 7 metres for each additional trench for water or gas lines The above limits do not apply in Spring Gully, refer to the Spring Gully EPBC referral documents - clearing within areas of MNES for gas gathering lines must not exceed 15m for spur lines and 20m for trunklines.	At all times

6.11. Protection of Fauna

PROTECTION OF FAUNA			
Objective (s):		To construct and operate the gas field in a manner that minimises impact to terrestrial ecological species and communities by: • Protecting flora and fauna species native to the site, particularly those identified as conservation significant fauna. • Minimising the disturbance to remnant vegetation, particularly of concern and endangered Regional Ecosystems and EPBC-listed threatened ecological communities. • Protecting significant fauna habitat values located within the gas fields, including watercourses and wetlands, significant habitat corridors and rocky outcrops.	
Targets		No unauthorised disturbance of Endangered, Vulnerable and Near Threatened flora and the habitat of Endangered, Vulnerable and Near Threatened fauna.	
REF	**HEADING**	**ACTIONS**	**TIMING**
11.1	Origin Energy HSEMS – Environmental Effects and Management Directives	The Contractor must comply with all relevant requirements of Origin Energy HSEMS – Environmental Effects and Management Directives, as amended from time to time, including: • Biodiversity Management (ORG-HSE-DVE-021)	At all times
11.1a	Australia Pacific LNG Fauna Management Procedure	The Contractor must comply with all relevant requirements of the Australia Pacific LNG Fauna Management Procedure (Q-LNG01-15-AP-0017).	At all times
11.2	Australia Pacific LNG Terrestrial Ecology Management Guidelines	The Contractor must comply with all relevant requirements of the Australia Pacific LNG Terrestrial Ecology Management Guidelines including: • Australia Pacific LNG Threatened Fauna Management Plan (Q-LNG01-15-MP-0113) • Australia Pacific LNG Upstream Phase 1 – Threatened Fauna Management Plan – Addendum (Q-LNG01-15-MP-0113_01)	At all times
11.3	Australia Pacific LNG Threatened Fauna Management Plan	The Australia Pacific LNG Threatened Fauna Management Plan (Q-LNG01-15-MP-0113) must be implemented for any works within 200m of identified presumed or confirmed *Environment Protection and Biodiversity Conservation Act 1999* (CTH) or *Nature Conservation Act 1992* (QLD) listed Fauna habitat. This includes: • *Limosa limosa* (Black-tailed godwit) Migratory • *Limosa lapponica* (Bar-tailed godwit) Migratory • *Numenius phaeopus* (Whimbrel) Migratory • *Actitis hypoleucos* (Common sandpiper) Migratory • *Tringa nebularia* (Common greenshank) Migratory • *Tringa stagnatilis* (Marsh sandpiper) Migratory • *Tringa glareola* (Wood sandpiper) Migratory • *Calidris ruficollis* (Red-necked stint) Migratory • *Calidris acuminata* (Sharp-tailed sandpiper) Migratory • *Calidris ferruginea* (Curlew sandpiper) Migratory	At all times

PROTECTION OF FAUNA			
		• *Philomachus pugnax* (Ruff) Migratory • *Pluvialis fulva* (Pacific Golden Plover) Migratory • *Rostratula australis* (Australian Painted Snipe) Vulnerable, Migratory • *Gallinago hardwickii* (Latham's snipe) Migratory • *Ardea modesta* (Eastern great egret) Migratory • *Ardea ibis* (Cattle egret) Migratory • *Plegadis falcinellus* (Glossy Ibis) Migratory • *Acrocephalus australis* (Australian reed-warbler) Migratory • *Nettapus coromandelianus* (Cotton Pygmy-Goose) Migratory • *Botaurus poiciloptilus* (Australasian Bittern) Endangered • *Hydroprogne caspia* (Caspian tern) Migratory • *Hirundapus caudacutus* (White-throated needletail) Migratory • *Apus pacificus* (Fork-tailed swift) Migratory • *Merops ornatus* (Rainbow bee-eater) Migratory • *Monarcha melanopsis* (Black-faced monarch) Migratory • *Rhipidura rufifrons* (Rufous fantail) Migratory • *Myiagra cranoleuca* (Satin flycatcher) Migratory • *Lathamus Discolor* (Swift Parrot) Endangered • *Anthochaera phrygia* (Regent honeyeater) Endangered/Migratory • *Erythrotriorchis radiata* (Red Goshawk) Vulnerable • *Pandion haliaetus/Pandion cristatus* (Eastern Osprey) Migratory • *Haliaeetus leucogaster* (White·bellied sea-eagle) Migratory • *Chalinolobus dwyeri* (large-eared Pied Bat) Vulnerable • *Nyctophilus corbeni* (South- Eastern long-eared Bat) Vulnerable • *Adclarkia dawsonensis* (Boggomoss Snail) Critically Endangered • *Dasyurus hallucatus* (Northern Quoll) Endangered • *Pteropus poliocephalus* (Grey-Headed Flying-Fox) Vulnerable • *Pedionomus torquatus* (Plains-wanderer) Vulnerable • *Geophaps scripta scripta* (Squatter Pigeon) Vulnerable • *Turnix melanogaster* (Black-breasted Button-quail) Vulnerable • *Delma torquata* (Collared Delma) Vulnerable • *Egernia rugosa* (Yakka Skink) Vulnerable • *Denisonia maculata* (Ornamental Snake) Vulnerable • *Furina dunmalli* (Dunmall's Snake) Vulnerable	

PROTECTION OF FAUNA			
		If any EPBC listed threatened fauna species which are NOT included in the current Australia Pacific LNG Threatened Fauna Management Plan are encountered within the disturbance area at any time during construction then work in the area where these fauna are present must cease, access to the area restricted with physical barriers and signage, and Australia Pacific LNG Environmental Representative notified immediately. Works must not recommence in the affected area until authorised by the Australia Pacific LNG Environmental Representative.	
11.4	*Nature Conservation Act 1992* (QLD)	The Contractor must comply with any requirements of any permits and approvals gained by Australia Pacific LNG in accordance with the requirements of the *Nature Conservation Act 1992* (QLD) including any Species Management Plans or Programs.	At all times
11.5	Species Management Program	The Contractor must comply with any requirements of Australia Pacific LNG Species Management Programs for tampering with animal breeding places: • Australia Pacific LNG Species Management Program for tampering with EVNT, Special and Colonial Animal Breeding Places (Q-LNG01-15-RP-0155) • Australia Pacific LNG Species Management Program for Tampering with Least Concern Animal Breeding Places (Q-LNG01-15-EA-0107)	At all times
11.6	Site Ecological Values	Australia Pacific LNG will provide to the Contractor findings of field ecological assessments undertaken for proposed construction sites. The Contractor must take into account these findings when planning and undertaking all activities. The Contractor must ensure that all site personnel are made aware of the aspects of these assessments relevant to their roles and responsibilities.	At all times
11.7	Training and Awareness	All workforce personnel must be informed of significant fauna habitats and conservation significant species and the importance of these areas/species and the need for disturbance to be minimised.	At all times
11.8		Staff and contractors must be educated about the risks of fauna injury and death and trained on what to do if they see an injured animal.	At all times
11.9		All site staff must participate in driver education programs that include avoiding of impacts to fauna.	At all times
11.10	Pre Clearing Inspection	Prior to clearing commencement, a fauna spotter catcher or suitably qualified person (i.e. ecologist) must undertake a thorough pre clearance inspection of the area to be cleared in accordance with requirements of Australia Pacific LNG Technical Instruction Fauna Protection – Clearing (Q-LNG01-15-TI-0026). For areas of remnant and regrowth native vegetation or know high risk areas the pre-clearance fauna inspection must be undertaken one to seven days prior to any clearing. For cleared land the pre-clearance fauna inspection may be undertaken directly prior to clearing. Pre-clearance inspection methodology and effort used must reflect the size, biodiversity and ecosystem attributes of the disturbance area and must as a minimum include intensive investigation of the ground layer (i.e. under logs, rocks, leaf litter) and low vegetation (i.e. under tree bark and tree stumps) and caves targeting amphibians, reptiles, bats and animal traces (i.e. scats, owl pellets, remains and tracks) and fauna habitat load reduction. Particular attention must be paid to the results of the ecology survey information provided by Australia Pacific LNG to ensure the pre-clearance inspection reflects the diversity of species expected at the site. Specific methodology and effort must be employed for detection of Endangered, Vulnerable, Near Threatened (EVNT) and other significant native fauna known to rely on the habitat in the disturbance footprint. Consideration must be given to seasonal and temporal variation in the visibility of fauna when undertaking the active search for fauna	Prior to clearing

PROTECTION OF FAUNA			
11.11	Special Least Concern, Special Native, Colonial Breeders	If the pre-clearance survey identifies any Special Least Concern, Special Native, Colonial Breeders (e.g. flying foxes) within 200m of the area to be disturbed, the Contractor must immediately notify the Australia Pacific LNG Environmental Representative and not commence works within 200m of the colony without the written direction of the Australia Pacific LNG Environmental Representative.	Prior to clearing
11.12	Endangered, Vulnerable and Near Threatened Animal Breeding Places	If the Contractor identifies any active EPBC or NCA listed Endangered, Vulnerable and Near Threatened Animal Breeding Places that will be disturbed by project activities the Contractor must advise the Australia Pacific LNG Environmental Representative in writing prior to disturbance of that animal breeding place of the location and type of each active animal breeding place, and how each animal breeding place is to the be managed in accordance with the Australia Pacific LNG Species Management Program for tampering with EVNT, Special and Colonial Animal Breeding Places (Q-LNG01-15-RP-0155) and the following hierarchy: 1. Establish and mark out a buffer surrounding the breeding place using continuous fencing or flagging to allow the breeding cycle to occur i.e. young have fully fledged or left the breeding place, as directed by a suitably qualified person. Clearing activities must not occur within the buffer zone around the nest until young are confirmed by a suitably qualified person to have left the breeding place. 2. Relocate the active and inactive nests/breeding place to adjacent undisturbed habitat and monitor the active nest to determine a return by breeding individuals. Capture young mammals and relocate to man-made breeding places constructed within similar microhabitats outside of the disturbance area but within the vicinity of where the animals were collected. If young reptiles, capture and relocate to adjacent undisturbed habitat. 3. Place active nests with young or eggs in the care of a licensed wildlife carer until ready for release to the wild. Once ready, release individuals within proximity to their original point of capture within similar habitat from which they were collected, on the advice of a suitably qualified person. 4. Destroy/terminate eggs by either quickly breaking the egg(s) and crushing its contents or reducing the temperature of the egg(s) to less than 4 degrees Celsius for at least 4 hours. Where it is proposed to disturb or destroy active nests which contain young or eggs, justify why this is unavoidable. **NOTE: Disturbance of any active Endangered, Vulnerable and Near Threatened Animal Breeding Places is only permitted with the written authorisation of the Australia Pacific LNG Environmental Representative.** NOTE: This plan to disturb Endangered, Vulnerable and Near Threatened animal breeding places must be prepared and approved by a suitably qualified person.	Prior to clearing
11.13	Least Concern Animal Breeding places	If the Contractor identifies any active NCA Least Concern or any other native animal breeding places that will be disturbed by project activities the Contractor must advise the Australia Pacific LNG Environmental Representative in writing prior to disturbance of that animal breeding place the location and type of each animal breeding place, and how each animal breeding place is to the be managed in accordance with the Australia Pacific LNG Species Management Program for Tampering with Least Concern Animal Breeding Places (Q-LNG01-15-EA-0107) and the following hierarchy: 1. Establish and mark out a buffer surrounding the breeding place using continuous fencing or flagging to allow the breeding cycle to occur i.e. young have fully fledged or left the breeding place, as directed by a suitably qualified person. Clearing activities must not occur within the buffer zone around the nest until young are confirmed by a suitably qualified person to have left the breeding place. 2. Remove or relocate a breeding place without eggs or young in accordance with the table below. 3. Remove or relocate a breeding place and place eggs/young with a wildlife carer/facility in accordance with the table below.	Prior to clearing

<table>
<tr><th colspan="4">PROTECTION OF FAUNA</th></tr>
<tr><td></td><td></td><td>4. Remove or relocate a breeding place and destroy/terminate eggs in accordance with the table below:
Authorised species management actions with respect to animal breeding places:
<table>
<tr><th>Species group</th><th>Breeding place status</th><th>Action</th></tr>
<tr><td>Least concern species</td><td>Contains young or eggs</td><td>Avoid unnecessary disturbance. Breeding place may be removed and eggs/young handed over to a licensed wildlife carer/facility. It is preferable to allow eggs to hatch and/or young to mature and move away from a breeding place. As a last resort, eggs may be destroyed°.</td></tr>
<tr><td>Least concern species</td><td>No eggs or young</td><td>Proceed with caution. Remove breeding place if applicable.</td></tr>
</table>
Where the removal or translocation of wildlife is required, the ‘take’ must be facilitated by a suitably licensed and experienced person.
° There are two acceptable methods for destroying or terminating eggs: quickly breaking an egg and crushing its contents; or reducing the temperature of the egg to less than 4 degrees Celsius for at least 4 hours.
NOTE: Disturbance of any active Least Concern Animal Breeding Places is only permitted with the written authorisation of the Australia Pacific LNG Environmental Representative.
NOTE: This plan to disturb least concern and other animal breeding places must be prepared and approved by a suitably qualified person.</td><td></td></tr>
<tr><td>11.14</td><td>Relocation of nests or tree hollows</td><td>Where large nests or tree hollows are identified as a potential breeding place for EPBC or NCA listed species the Contractor should relocate the nest or tree hollow to a nearby location which is not proposed to be disturbed, on the advice of a suitably qualified person and as agreed in writing with the Australia Pacific LNG Environmental Representative. Nest and tree hollow relocations must only be undertaken by or supervised by a suitably qualified person.</td><td>As required</td></tr>
<tr><td>11.15</td><td>Monitoring Relocation of animal breeding places</td><td>Where an animal breeding place has been removed and relocated to an adjacent area of habitat, the Contractor will ensure that the site is monitored by a suitably qualified person to determine the outcomes and success of this measure. Monitoring must occur within one month from the relocation and then based on the particular species, during the time of year when eggs/young are likely to be present for the duration that the Contractor is in control of the site. Results of monitoring must be provided to the Australia Pacific LNG Environmental Representative within 1 month or on request.</td><td>Within 1 month of nest relocation and as required</td></tr>
</table>

PROTECTION OF FAUNA			
11.16		The Contractor must record all fauna interactions in a Fauna Register. The Fauna Register must include the following: • Name of the fauna spotter catcher (i.e. authorised person that undertook the tampering) • Date and time of fauna interaction • Scientific and common name of fauna • Species status under the Nature Conservation (Wildlife) Regulation 2006 • Number of individuals • Details of tampering (e.g. relocation of vacant nest) • Justification for tampering and why avoidance was not possible • Activity being undertaken when fauna encountered (e.g. clearing in pasture, clearing in remnant vegetation, topsoil stripping, clearing aquatic habitat, vehicle strike, pre-clearance inspection, etc) • Capture location (Latitude, Longitude in degrees and decimal degrees format, infrastructure name, Property name or lot plan) • Microhabitat where fauna is found (see Appendix D for full list of microhabitats) • Fauna status (Alive, injured, deceased) • End point (Released un-injured, injured and taken to vet/carer, dead) • Release date and time • Release location (Latitude, Longitude in degrees and decimal degrees format) • Release location description • Wildlife Carer Details (where relevant) • Photos (All EVNT and special least concern relocations, all deceased and injured fauna) • Additional comments. The Fauna Register must be provided to the Australia Pacific LNG Environmental Representative in electronic format as a spreadsheet and as spatial data compatible to the Australia Pacific LNG GIS system monthly, or on request.	As required
11.17	Nest Boxes	To offset the loss of tree hollows within areas to be cleared the Contractor must install nest boxes as specified in the Environmental Workpack for the property in vegetation adjacent to the area to be cleared. Nest boxes/artificial breeding places must be installed prior to clearing where practicable but at least within 1 week of clearing. Nest boxes/artificial breeding places must be of an appropriate size to cater for affected fauna and made out of long lasting materials (e.g. marine ply or hardwood).	As required
11.18	Clearing	The Contractor must ensure that a suitably qualified and experienced person operating under a current, relevant Rehabilitation Permit is present the clearing front at all times throughout all clearing activities. An authorised person, i.e. spotter-catcher, is a person permitted by EHP to tamper and interfere with a protected animal or a protected animal's breeding place. The Contractor must comply with all requirements of the Australia Pacific LNG Technical Instruction Fauna Protection — Clearing (Q-LNG01-15-TI-0026) prior to and throughout clearing. The fauna spotter catcher must comply with all requirements of the Rehabilitation Permit and Damage Mitigation Permit.	At all times during clearing

PROTECTION OF FAUNA			
11.18a		The Fauna Spotter-Catchers are responsible for undertaking all reasonable measures to avoid and minimise impacts to fauna. This must include, but is not necessarily limited to: • Leading toolbox talks to increase staff awareness of relevant legislative and Code of Practice obligations to follow good fauna management practices • Review of site ecological survey data including preclearance survey report and project fauna management obligations including Species Management Plans and this CEMP • Participation in prestart briefings to communicate fauna potentially present at the site, methods of search, staging of clearing and recovery of fauna • Provide ongoing advice and direction on fauna habitat preferences and clearing/construction methodology to minimise harm to fauna • Active search of disturbance area ahead of clearing including searches for fauna that may be under direct threat from clearing operations and may not necessarily be able to escape quickly e.g. koalas, echidnas, nesting birds • Maintaining positive communication with clearing plant operators during clearing activities to enable fauna escape, stage clearing and identify and recover fauna during clearing • Completing searches of fallen vegetation for surviving fauna, including recently felled vegetation and pre existing wood piles • Inspect timber piles and direct dismantling of timber piles prior to mulching • Inspecting the ground and disturbed topsoil for subterranean fauna during topsoil stripping where fauna may be present • Recovering injured and deceased fauna. Assessing injuries and likelihood survival of injured fauna and seeking assistance from wildlife carer, veterinarian or undertaking humane euthanasia	At all times
11.19		If fauna are confirmed to be present onsite during clearing, clearing works should cease for a time determined by the field environmental advisor or fauna spotter catcher to enable the fauna to relocate freely.	At all times during clearing
11.20		Clearing must be conducted in a sequential manner and in a way that directs escaping wildlife away from the activity into adjacent natural areas and does not cross roads or into other areas of threat (e.g. trench).	At all times
11.21		Microhabitat feature such as rocks and fallen logs should be relocated adjacent to clearing area to provide habitat.	At all times
11.22		Mature trees that contain hollows must be retained wherever practicable. Where such trees cannot be retained the hollow should be left on the ground adjacent to the cleared area to provide habitat for ground-dwelling fauna, in a location agreed with the Australia Pacific LNG Environmental Representative.	At all times
11.23		Trees with hollows or potential nesting sites must be checked by an authorised fauna spotter catcher for the presence of arboreal fauna immediately prior to felling.	At all times
11.24		In selected areas where the risk of entrapment is considered to be greater than normal (particularly within State-significant wildlife corridors), temporary fencing should be used where practicable to exclude access to excavations by native wildlife.	As required
11.25	Fauna Handling	The Contractor must ensure that only authorised fauna spotter catchers handle or retrieve fauna in accordance with the conditions of the Rehabilitation Permit and Damage Mitigation Permit.	At all times

PROTECTION OF FAUNA			
		When required at any time the spotter catcher should capture, restrain, hold and release (to the adjacent undisturbed habitat) surviving adults.	
11.26		The decision to rehabilitate an animal must consider the ability for it to be successfully released and availability of appropriate natural habitat within the vicinity of where the animal was found. Where the removal of eggs/animals is required, the Contractor must engage a suitably qualified and licensed wildlife carer/facility to incubate all eggs removed and to raise young animals.	As required
11.27	Fencing	The Contractor must install demarcation to protect remnant vegetation, identified habitat or animal breeding places in close proximity to the construction area considering the risk of harm to areas to be protected. Demarcation must be clearly visible and should consist of continuous fencing, bunting, flagging, marker tape, distinctive marker posts or similar as agreed with the Australia Pacific LNG Environmental Representative.	At all times
11.28		Placement of temporary worksite fencing should take into account fauna movement. Unless otherwise instructed by the landholder, all fencing should be fauna friendly with no barbed wire in the top strand.	At all times
11.29	Clearing in Habitat Areas	The clearance footprint should be the minimum area, or width for gathering networks and access tracks, required to safely construct infrastructure through all patches of significant fauna habitat and must at no times exceed the maximum Australia Pacific LNG approved construction zone. Where possible, trimming of branches should occur rather than tree removal.	At all times
11.30	Injury to Fauna	Any animals injured by clearing activities must be immediately referred to an appropriate wildlife carer group or veterinarian (availability of services must be confirmed prior to clearing) and the Australia Pacific LNG Environmental Representative informed immediately. Animal transport shall be the responsibility of the spotter-catcher or a suitably qualified person nominated by the spotter-catcher.	As required
11.31		The Contractor must report any animal injuries or death to the Australia Pacific LNG Environmental Representative immediately.	As required
11.32	Traffic	All construction vehicles must remain on designated access roads and tracks and within the defined construction areas and associated work/accommodation sites. Actions to ensure this should include at a minimum workforce education, signs, boundary markers and fences, as appropriate.	At all times
11.33		Signage alerting drivers to the potential presence of fauna on roads must be erected in areas where the access routes are in proximity to areas of significant vegetation or fauna habitat.	At all times
11.34		Vehicle movements should be minimised, especially at dawn and dusk.	At all times
11.35	General	Firearms and dogs are prohibited on site at all times.	At all times
11.36		Where possible, mechanisms to facilitate safe fauna movement through construction sites should be implemented.	
11.37	Trenching / Excavation	The length of open trench at any time should be minimised and backfilling must be undertaken progressively.	At all times
11.38		All open excavations and trenches must be inspected twice daily (morning and evening) and immediately prior to backfilling to check for trapped fauna. Surveillance must occur along the entire length of the trench or excavated area and not merely those areas described as fauna habitats or sensitive areas. Fauna removal and relocation must be conducted by an authorised fauna spotter catcher. The Contractor must report to the Australia Pacific Representative the species and number of all fauna removed from	At all times

PROTECTION OF FAUNA			
		trenches or excavations monthly or on request.	
11.39		Pipe caps must be kept in place to prevent fauna from entering pipes following pipe stringing or on lengths of pipe where fauna would not be clearly visible and could become entrapped. Spare pipe caps of all required sizes must be available on site at all times.	At all times
11.40		The Contractor must implement measures to prevent fauna entrapment within any excavation or trench, including: • minimising the period of time the trench/excavation is open, particularly in fauna habitat areas • constructing escape ramps with slopes less than 45^{o} to provide exit path for fauna; ensure ramps are lightly compacted to provide surface suitable for fauna escape. Provide matting to assist fauna escape where required. • installing additional escape ramps at greater than normal frequencies in areas identified as known or potential wildlife habitat (e.g. native forest areas) • branches, hessian sacks, ramped gangplanks or similar to be used to create 'ladders' to enable fauna to exit the trench/excavation at intervals of <100m, ladders must be suitable for type of fauna likely to be encountered • provide fauna refuge suitable to type of fauna likely to be encountered in all excavations left open overnight • During construction, pipes must be strung with gaps to allow for fauna movement across the line of the pipe • Install appropriate fencing around open pits/ponds/trenches giving considerations to fauna movement.	At all times
11.41	Trench backfilling	The open trench or excavation must be checked for fauna immediately prior to backfill, and any trapped animals removed by an authorised fauna spotter catcher.	At all times
11.42	Ponds	Fencing must be installed to prevent the movement of native wildlife or domestic animals into any ponds.	At all times
11.43		The value of permanent and temporary water sources as possible habitat for aquatic protected wildlife must be assessed including impacts and mitigation strategies.	At all times

6.12. Mosquito and Midge Management

MOSQUITO AND MIDGE MANAGEMENT			
Objectives		To construct and operate the gas fields in a manner that manages mosquitoes for the purpose of public health and community well-being	
Targets		• No outbreaks of mosquito borne disease within the project area. • No environmental harm from mosquito management controls.	
REF	**HEADING**	**ACTIONS**	**TIMING**
12.1		Management of mosquitoes must be in accordance with Mosquito Management Code of Practice for Queensland for ponded waters associated with petroleum development.	At all times
12.2	Site Accommodation	All on-site workers accommodation must be air-conditioned and screened.	At all times
12.3		Design of workers accommodation should incorporate yellow or red lights in accommodation areas to detract midges, and white lights to divert midges.	At all times
12.4	Personal Protection	All project personnel must be advised of and educated on health management and responsibilities regarding mosquitoes and midges.	At all times
12.5		All site personnel must wear long sleeved protective clothing to reduce exposed skin surfaces.	At all times
12.6		Mosquito repellents must be made available to site personnel and used when needed.	At all times
12.7	Source Reduction	Disturbed areas must be landscaped and appropriately drained to reduce water retention and ponding.	At all times
12.8		Open water storage areas should be designed to be deeper than 0.6m to prevent waterborne insects breeding.	At all times
12.9		Stormwater drains must be constructed and maintained in a manner that does not lead to the creation of new mosquito breeding sites.	At all times
12.10		Sewage and wastewater disposal must be operated in a manner to avoid ponding and effluent irrigation rates must be managed to prevent the creation of temporary pools that may provide mosquito or midge habitat.	At all times
12.11		Weekly inspections and clearing of containers and vessels that may contain water must be undertaken.	Weekly
12.12	Chemical Control	Areas that cannot be managed with other controls may be treated as required with a chemical control agent.	At all times
12.13		At least 1 week prior to undertaking chemical control the Contractor must submit to the Australia Pacific LNG Environmental Representative for approval a treatment program that meets the Local Government Association of Queensland Mosquito Management Code of Practice 2002 developed by a suitably qualified person. All chemicals must be approved by the Australia Pacific LNG Environmental Representative prior to use. The treatment program must consider environmental impacts, environmental protection measures including timing of applications and include mapping that designates areas to be treated and identifies appropriate buffer zones to protect environmentally sensitive areas.	1 week prior to chemical treatment
12.14		Chemical treatments are not permitted to be undertaken within an area identified as a fauna breeding habitat around the time of breeding occurring.	At all times
12.15		Chemical control must be undertaken by a licensed operator.	At all times
12.16		All chemicals used must be registered and used in accordance with manufacturer's instruction. All chemical storage and handling must comply with the requirements of this CEMP.	At all times

MOSQUITO AND MIDGE MANAGEMENT			
12.17		A register of all chemical control treatments must be maintained and include: • Areas treated • Date and time of treatment • Equipment • Pilot/operator • Insecticide dose • Insecticide batch measure • Result of treatment	At all times

6.13. Weed and Pest Management

WEED AND PEST MANAGEMENT			
Objective		To construct and operate the gas fields in a manner that controls and prevents the introduction and spread of weeds and feral animals.	
Targets		• No spread of pest animal species. • No spread of weed species beyond those areas already infested. • No introduction of pest animal species. • No introduction of new weed species to previously non-infected areas.	
REF	**HEADING**	**ACTIONS**	**TIMING**
13.1	Australia Pacific LNG Biosecurity Management Plan	All activities must comply with the requirements of the Australia Pacific LNG Upstream: • Biosecurity Management Plan (Q-LNG01-15-MP-0110)	At all times
13.2	Origin Energy Weed Management Procedure and Origin Energy Vehicle Hygiene Procedure	The contractor must comply with all relevant requirements of: • Origin Energy Weed Management Procedure (OEUP-1000-PRO-ENV-005) • Origin Energy Vehicle and Mobil Plant Weed Hygiene Procedure (OEUP-1000-PRO-ENV-025)	At all times
13.3	Training and Awareness	All personnel entering the construction site or associated areas must be instructed on their responsibilities for declared weed management, cleaning procedures for vehicles and equipment, weed identification and weed reporting. Weed and pest identification must be included in inductions, training and toolboxes.	At all times
13.4		Construction personnel should be trained adequately in pest and disease management and hygiene procedures appropriate to pests and diseases known to occur on site, and the consequences of non conformance as described in the Australia Pacific LNG Upstream Biosecurity Management Plan (Q-LNG01-15-MP-0110), relevant to their role and responsibilities.	At all times
13.5	Pre commencement weed survey	Prior to commencement of construction works, the Contractor must conduct a site inspection to identify weed species present within the construction area and provide GPS coordinates and photographs of any weed infestations to the Australia Pacific LNG Environmental Representative.	Prior to clearing
13.6	Weed control measures	The Contractor must monitor, treat, remove and dispose of weed species (inclusive of all Weeds of National Significance, and all classes of State and Locally Declared species as per *the Land Protection (Pest and Stock Route Management) Act 2002 (QLD)*) within the Construction area prior to commencement and at all times throughout the construction period in accordance with the requirements of the Australia Pacific LNG Upstream Biosecurity Management Plan (Q-LNG01-15-MP-0110) and Australia Pacific LNG Environmental Technical Instructions. Photos must be taken prior to and after treatment applications to provide a visual assessment of the effectiveness of methods to reduce weed density.	As required
13.7	Rabbit Proof Fence	At least 20 business days prior to any requirement to create an openings in the Darling Downs Moreton Rabbit Board Fence, the Contractor must notify the Australia Pacific LNG Environmental Representative of this requirement, providing any necessary information to support application to the Darling Downs Moreton Rabbit Board in accordance with Section 52, Division 2 of the *Land Protection (Pest and Stock Route Management) Act 2002* (QLD). Australia Pacific LNG will secure these permits, the Contractor must only make openings as approved in writing by the Australia Pacific	20 business days prior to opening

WEED AND PEST MANAGEMENT			
		LNG Environmental Representative and in accordance with approval received from the Darling Downs Moreton Rabbit Board.	
13.8	Wild Dog Barrier Fence	At least 20 business days prior to any requirement to create an openings in the Wild Dog Barrier Fence, the Contractor must notify the Australia Pacific LNG Environmental Representative of this requirement, providing any necessary information to support application to the Chief Executive of the DAFF in accordance with Section 52, Division 2 of the *Land Protection (Pest and Stock Route Management) Act 2002* (QLD). Australia Pacific LNG will secure these permits, the Contractor must only make openings as approved in writing by the Australia Pacific LNG Environmental Representative and in accordance with approval received from the regulator.	20 business days prior to opening
13.9		All openings in wild dog and rabbit fences must be re-established immediately following construction. Any openings must be monitored to ensure no transport of pest species occurs through the fence.	As required
13.10	Vehicle and Equipment Hygiene	All vehicles, mobile plant, equipment, boats, materials, products livestock, load and personal apparel (e.g. footwear and clothing) are required to be free of soil and/or organic matter, that is likely to contain weeds, weed reproductive material or pathogens, when travelling to and from a site. All vehicles, machinery, plant and equipment and demountables must be declared clean in accordance with the Origin Vehicle Hygiene Procedure (OEUP-1000-PRO-ENV-025) before being allowed access to any Project site. All machinery, vehicles and equipment not accompanied by an approved Vehicle/Equipment Inspection Report must not be allowed onto site. It is the responsibility of the driver or machine operator to: • Ensure that a valid Vehicle and Mobile Plant Hygiene Inspection Report is within the vehicle at all times • Ensure that a valid Weed Hygiene Declaration is within the vehicle for any loads carried • Avoid coming into contact with any weeds, pathogens or pests where driving on unsealed roads or tracks, and to • Revalidate the Vehicle and Mobile Plant Hygiene Inspection Report if contact with weeds has occurred with passenger, vehicle or plant. The Vehicle and Mobile Plant Hygiene Inspection Report will remain valid as long as the vehicle/equipment complies with the following conditions: • The vehicle/equipment travels only on sealed or on formed roads and within designated weed managed areas. The Contractor must show on site plans, clearly delineate in the field and signpost any designated weed managed areas which satisfy the above description. These areas must be frequently inspected and maintained at all times to prevent weed encroachment • The vehicle/equipment does not pass through areas containing declared weeds • The driver/operator does not operate the vehicle/equipment after disembarking the vehicle and entering an area of declared weed infestation • The vehicle/equipment, if operating on unsealed roads, remains within a designated work area and does not cross a property boundary or other designated boundary A copy of the valid inspection report is to be kept within the vehicle at all times Vehicles/equipment must be directed to leave site immediately if they are found without a valid inspection report and must undergo inspection and washdown on leaving the site. A duplicate copy of the vehicle/equipment inspection report must be retained by the inspector and submitted to the Australia Pacific LNG Environmental Representative when a new book of vehicle/equipment inspection reports is issued	At all times

WEED AND PEST MANAGEMENT			
		or on request.	
13.10a		When leaving a weed contaminated site, it is the drivers responsibility to ensure that the Vehicle and Mobile Plant Hygiene Inspection Report is valid. If there is a reasonable expectation that Vehicle or Mobile Plant has travelled within an area known to be infested with weeds, the Vehicle/Mobile Plant will require an inspection and clean down prior to travelling in area not known to be infested. Inspections should be completed at the nearest suitable area. Mobile/temporary clean down facilities will be required in high risk areas. Brushes and plastic bags are to be used to contain any potential weed seeds or burrs to minimise potential weed dispersal. All weed material should then be disposed of at a designated weed disposal point.	At all times
13.11		Pipeline skids and sawdust bags and other items must be visually inspected prior to movement from one property to another.	At all times
13.12	Exemptions	The following activities do not require a vehicle or equipment inspection or an inspection report: • Any vehicle travelling exclusively to a major facilities administration area, camp and lay down areas along formed roads • Emergency vehicles and authorised vehicles responding to an emergency • Landholders/land managers travelling within their own properties or guests of those landholders/land managers where Origin Energy/Australia Pacific LNG maintains assets • Where other effective weed control measures can be demonstrated with specific plan – site specific weed management plans must be approved by the Australia Pacific LNG Environmental Representative.	As required
13.13	Vehicle/Equipment hygiene Inspectors	Only trained and authorised inspectors are permitted to conduct vehicle hygiene inspections and issue vehicle inspection reports. Only inspectors who have documented proof of assessed competency in RTD2312A – Inspect machinery for plant, animal and soil material and RTD2313A – Clean machinery of plant, animal and soil material or equivalent are to be considered trained and authorised inspectors. A register of trained and authorised inspectors must to be kept at each site. At any time an authorised person may declare a vehicle/equipment inspection report void if they deem the vehicle/equipment to be no longer clean.	At all times
13.14	Wash down / cleaning facilities	The Contractor, in consultation with the Australia Pacific LNG Environmental Representative should place temporary wash down facilities in strategic locations within the gas fields including in proximity to high risk weed outbreaks. All wash down facilities must be constructed and operated in accordance with the Queensland guideline for the construction of Vehicle and Machinery Wash down Facilities and the Australia Pacific LNG Upstream Biosecurity Management Plan (Q-LNG01-15-MP-0110) and Technical Instruction Weed Management – Temporary Wash Down Bays (Q-LNG01-15-TI-0023). The Contractor must monitor wash down sites weed establishment, and ensure that weed seed is trapped and disposed of properly. Wash down facility design and operation must prevent contamination of land and pollution of waters.	At all times
13.15		Machinery and vehicles should be cleaned washed down as appropriate for the particular pest or disease. Regular inspection of measures and infected/infested sites is also required. All parts of the vehicle and/or mobile plant are to be cleaned according to, but not limited to the following: • Identify areas that may require cleaning with compressed air rather than water, do these first • Ensure the area is free of obstructions/objects that may cause injury (logs, powerlines etc)	At all times

WEED AND PEST MANAGEMENT			
		• Place vehicle/mobile plant in a safe position and is stable and immobile • Stop engine, apply park brake, chock wheels and lower all implements or secure/chock them if they are required up for cleaning (e.g. slasher) • Examine the item for cleaning to determine extent of mud, dust and plant material build up • Identify any points that require specific attention (e.g. behind guards and protective plates, radiators, spare tyres etc) as these may be difficult to locate and access • Remove necessary guards/belly plates to access areas for cleaning • Clean under guards and underneath vehicle/mobile plant and then do the cabin, upper body and implements • Consider the cleaning of tool boxes and storage compartments • Move vehicle/machine with caution to avoid re-contamination; wash remaining mud on tyres/tracks • Carry out final inspection to ensure all areas have been cleaned • Replace guards (belly plates and other guards on mobile plant may need to be replaced prior to moving the mobile plant). All cleaning activities should be undertaken at facilities with effective environmental controls to prevent weed spread. Wash water, mud/silt and weed material must be managed and disposed of in a manner that prevents harm to the environment, and prevents the spread of weeds.	
13.16		Wash down points should be located close to infected/infested areas to reduce the risk of spreading infected/infected material in accordance with property specific weed management plans.	As required
13.17		Where works are required to be conducted in areas of confirmed high risk weed infestation, stringent wash down must be completed before leaving the area, removing all soil and vegetative material from cabins, trays, and under carriages. This may include removal by physical, mechanical or chemical means. On proceeding out of a priority or declared weed infested area, all equipment and vehicles must be thoroughly washed down and air-cleaned in accordance with Queensland Government, local shire requirements and Origin's Vehicle Weed Hygiene Procedure (OEUP-1000-PRO-ENV-025).	As required
13.18		The Contractor must provide facilities for employees to wash down/vacuum/brush clothing and boots prior to moving out of infected/infested areas. Temporary wash down facilities must comply with Technical Instruction Weed Management – Temporary Wash Down Bays (Q-LNG01-15-TI-0023). The Contractor should ensure that personnel check clothing (boots, socks, pants, pockets, cuffs) for any weeds, seeds, or burrs before entering a vehicle, and when entering and leaving site. The Contractor must ensure that in areas of declared weed infestations brushes and plastic bags are made available for removal and disposal of seed on their person after leaving the immediate area of the weed infestation. Personnel must remove all weed seeds prior to leaving the area adjacent to any declared weed infestation. All weed material is to be disposed of at the weed containment area or other designated weed disposal point.	As required
13.19	Disposal of weed material	Burial of weeds must in accordance with Technical Instruction Weed Management – Onsite Burial of Declared Weeds (Q-LNG01-15-TI-0024) and authorised in writing by the Australia Pacific LNG Environmental Representative. This approval application must at a minimum include details of weeds species, estimated quantity and location of weed burial site including property name, lot/plan and GPS coordinates of site. Any buried weeds must be at depth of no less than 2m. The Contractor must establish a weed containment area to contain priority weeds and waste materials known to	At all times

WEED AND PEST MANAGEMENT			
		contain weed material and seeds before disposal. Any weeds to be transported must be contained in sealed plastic bags or containers to prevent dispersal.	
13.20	Weed Control	Where weeds are detected within the work site, they must be removed or destroyed in accordance with the Australia Pacific LNG Upstream Biosecurity Management Plan (Q-LNG01-15-MP-0110) and Origin Energy Weed Management Procedure (OEUP-1000-PRO-ENV-005). The Contractor should prepare a plan of action outline weed control measures to be undertaken, and provide a copy to the Australia Pacific LNG Environmental Representative. Weed vegetation matter must be stockpiled separately to top soil, subsoil and vegetation.	At all times
13.21		Access routes must be clearly identified on maps and with signs in the field. Only the identified routes are permitted to be used.	At all times
13.22		Follow-up weed control for weeds should be undertaken following disturbances, such as fire.	At all times
13.23	Chemical control	All personnel undertaking chemical weed control measures must be trained and qualified to store and handle chemicals. All chemicals must be approved by the Australia Pacific LNG Environmental Representative prior to use. The Contractor must notify the Australia Pacific LNG Environmental Representative 10 business days prior to chemical control activities to notify landowner, chemical control must not proceed until written confirmation that notification requirements have been satisfied is received from the Australia Pacific LNG Environmental Representative.	10 business days prior to chemical control
13.24		Where weed or other pest and disease infestations are identified the infested area should be assessed and appropriate treatment measures initiated before any earth moving machinery or vehicles enter the area. No vehicle should proceed until the area has been pegged and recorded by GPS the location of any declared weed, or other pest / disease infestation and, where required, reported to the relevant authority by the Australia Pacific LNG Environmental Representative.	At all times
13.25		Restricted access to infested areas must be in place until all control measures are implemented. For any substantial outbreak of a declared plant detected in the approved construction area or access tracks the area must be isolated with no access permitted until the area is declared to be controlled for weeds.	At all times
13.25a	Weed Managed Areas	Weed Managed areas may include any property or site where the following conditions are met: • The boundary of the area is defined (e.g. signage, pegging, fences, flags, managed vegetative growth) • The area is checked by a suitably qualified person prior to each visit, or once every 3 months for the presence of weeds for infrequently accessed areas, or once every 28 days for the presence of weeds for frequently accessed areas • If weeds are identified, those weeds must be managed to prevent spread of weeds through treatment, and demarcation. Access to weed infested areas should be excluded until treatment/removal is completed. Records of inspection and control/treatment methods must be maintained in accordance with the Weed Management Procedure (OEUP-1000-PRO-ENV-005). Travel within a weed managed area is does not invalidate a Vehicle and Mobile Plant Hygiene Inspection Report, providing that the report is valid upon entry into the weed managed area.	At all times
13.26	Material Hygiene	All loads (including quarry materials (e.g. gravel, sand, soil), stock and domestic water, mulch, hay, seed, livestock) must have a valid “Weed Hygiene Declaration” for the load. The weed hygiene declaration should be completed by the supplier and provided to Origin Energy prior to unloading. Materials sourced from a borrow pit, and not transported through known areas of weed infestations may have the	At all times

WEED AND PEST MANAGEMENT			
		borrow pit inspected by an authorised inspector or suitably qualified person, and Weed Hygiene Declaration issued for a period of not more than one month. Origin Energy/Australia Pacific LNG employees reserve the right to ensure risk management practices have been taken to ensure product is free of weeds or weed reproductive material. Only suppliers of products that can demonstrate risk management practices to ensure the product is free of weeds or weed reproductive material shall be accepted. The Contractor must retain copies of "Weed Hygiene Declaration" forms for materials and provide to the Australia Pacific LNG Environmental Representative on request.	
13.27	Stock	All property fences and gates should be repaired and closed to prevent movement of stock between properties.	At all times
13.28	Plant and Animal Diseases and Pathogens	Plants and plant materials suspected of being affected by an Alert Plant disease must be immediately reported to the Australia Pacific LNG Environmental Representative. Advice will be sought from Biosecurity Queens land on diagnosis, containment and treatment. Animals suspected of being affected by a notifiable animal disease must be immediately reported to the Australia Pacific LNG Environmental Representative. Advice will be sought from Biosecurity Queens land on diagnosis, containment and treatment. If any plant or animal disease or pathogen is suspected, the following actions must be taken: • Stop work and notify Australia Pacific LNG Environmental Representative, exclude workers from site • Australia Pacific LNG Environmental Representative to report to Biosecurity Queensland if the disease is confirmed notifiable • Establish controlled site access and containment measures High risk sites or sites with known plant or animal diseases may require a site specific Management Plan developed to be approved by the Australia Pacific LNG Environmental Representative.	At all times
13.29	Tramp Ants and Fire Ants	The Contractor must ensure that all high risk items for tramp ant and fire ant species including soil, mulch and earth moving equipment are be inspected and declared pest free by an before entering site and records kept. Contractors must ensure a system is in place to provide evidence that plant or soil etc has not come from a fire ant or other tramp ant controlled area or is declared free of tramp ants. High risk materials (soil, bailed hay and straw, plants, mulch, green waste, construction materials, equipment) must be sourced from suppliers who have a DAFF Approved Risk Management Plan.	At all times
13.30		Any observation of tramp ant or fire ant species, or potential tramp ant for fire ant species must be immediately reported to the Australia Pacific LNG Environmental Representative who will in-turn report to Biosecurity Queensland.	At all times
13.31	Reporting	The Contractor must ensure that new weed infestations, suspected weed transfer, feral animal sightings and any suspected plant or animal diseases are documented, photographed, GPS location recorded and reported to the Australia Pacific LNG Environmental Representative monthly.	As required
13.32		Contractors performing weed spraying on-site are to report on area treated, presence and general abundance of weeds, and volumes of herbicide used on a monthly basis.	Monthly
13.33	Review	Where evidence of transferring of weeds off-site is found, ensure the outbreak is controlled and the procedure for vehicle washdown and transport is reviewed.	As required

WEED AND PEST MANAGEMENT			
13.34		Where the introduction of any new weed species has resulted from project activities, revision of the implementation of the weed management procedure and vehicle hygiene procedure must be undertaken in consultation with the Australia Pacific LNG Environmental Representative, taking into account the likely sources of the introduction and including procedures to prevent re-occurrence.	As required
13.35		Where the introduction of new any new feral animal species or spread of existing feral species has resulted from project activities, revision of the all project activities must be undertaken in consultation with the Australia Pacific LNG Environmental Representative, taking into account the likely sources of the introduction and including procedures to prevent re-occurrence.	As required
13.36	Cane Toads	Construction of permanent water-holding bodies on site should be in accordance with measures to mitigate use by cane toads including steep-walled water holding bodies and establishing vegetation around the perimeter where practicable. Shallow water, gently-sloped banks and sparsely vegetated banks should be avoided where practicable. The Contractor must ensure environmental staff onsite are trained to identify cane toads at all stages of development from eggs to adults.	At all times
13.37	Feral animals	The Contractor should give consideration and propose measures where appropriate to the control of feral animal movements along newly cleared construction areas which provide new access to sensitive environments.	At all times

6.14. Reinstatement and Rehabilitation

REINSTATEMENT AND REHABILITATION			
Objective		To ensure that rehabilitation completed at completion of construction is safe, stable, non-polluting and self sustaining and requires minimal additional management through operation of the site.	
Targets		• No erosion of facility and general infrastructure areas, pipelines and right of way including watercourse crossings and access road crossings following site reinstatement. • Land is returned to its previous condition or in a manner suitable for its intended land use. • No complaints from landholders regarding land reinstatement and productivity. • No harm to people or fauna from rehabilitation activities. • No exceedences of water quality objectives. • No contamination of land or water.	
REF	**HEADING**	**ACTIONS**	**TIMING**
14.1	Australia Pacific LNG Remediation, Rehabilitation, Recovery and Monitoring Plan	The Contractor must comply with all applicable requirements of the Australia Pacific LNG Remediation, Rehabilitation, Recovery and Monitoring Plan (Q-LNG01-15-MP-0107).	At all times
14.1a	Development Area Rehabilitation Plans	The Contractor must comply with all applicable requirements of the Australia Pacific LNG Rehabilitation Plans for the development area: • Australia Pacific LNG Rehabilitation Plan – Condabri (Q-4500-15-MP-0002) • Australia Pacific LNG Rehabilitation Plan – Combabula (Q-4200-15-MP-0006) • Australia Pacific LNG Rehabilitation Plan – Walloons (Q-4000-15-MP-1005) • Australia Pacific LNG Rehabilitation Plan – Spring Gully (Q-8200-15-MP-0010)	At all times
14.2	Rehabilitation - General	The Contractor must progressively reinstate and rehabilitate disturbed areas to be consistent with surrounding area as soon as practicable following completion of construction works in that area.	At all times
14.2a		Where a site or portion of a site is expected to be temporarily inactive for a period prior to completion construction or of rehabilitation the Contractor must stabilise disturbed areas prior to demobilisation and manage the site throughout the period of inactivity including: • Installation and maintenance of erosion and sediment control devices • Monitoring and control of weeds • Control of dust • Removal of wastes • Stabilisation of exposed soils • Site monitoring and maintenance throughout the shut down period, including post wet weather events.	Prior to temporary demobilisation and At all times
14.3		Disturbed areas not required for on-going operational activities and buried infrastructure must be reinstated and rehabilitated in accordance with the Australia Pacific LNG Remediation, Rehabilitation, Recovery and Monitoring Plan (Q-LNG01-15-MP-0107) and relevant development area Rehabilitation Plan.	At all times

REINSTATEMENT AND REHABILITATION			
14.4		At the completion of construction all wastes (including flagging and pickets used to identify sensitive environmental features) must be removed, temporary access routes closed and soils replaced. At the completion of construction, remove all buildings not required for ongoing operations (as agreed in writing with the Australia Pacific LNG Environmental Representative), rehabilitate vacated terraces and retain landscape plantings.	At all times
14.5		Progressive rehabilitation of significantly disturbed land caused by construction activities which is not required for the ongoing conduct of the petroleum activities must commence as soon as practicable, but not longer than three (3) months following the completion of construction works.	At all times
14.6		The location of areas where reinstatement or rehabilitation has commenced must be recorded via GPS and provided to the Australia Pacific LNG in a format compatible with the Origin GIS.	Within 20 business days of reinstatement
14.7		Revegetation must be consistent with the land use, plant density, floristic composition and distribution of the surrounding regional ecosystem types and within the province of the vegetation being cleared.	At all times
14.8		Rehabilitation of the gas fields should allow for the maximum re-establishment of native vegetation including the shrubby understorey and ground cover, providing habitat for small ground dwelling fauna species and restoration of landscape connectivity.	At all times
14.9		Rehabilitation of significantly disturbed land must include at least the following: • remediate any contaminated land (e.g. contaminated soils, decommissioned dams containing salt); • reshape all significantly disturbed land to a stable landform; • reprofile all significantly disturbed land to original contours, where practicable; • re-establish surface drainage lines; • reinstate the top layer of the soil profile; • establish groundcover to ensure that erosion is minimised; • establish vegetation of floristic species composition found in analogue sites; and • undertake rehabilitation in a manner such that any actual and potential acid sulphate soils in or on the site are either not disturbed, or submerged, or are treated to prevent and / or minimise environmental harm.	At all times
14.10		Following reinstatement access to disturbed areas must be restricted to facilitate rehabilitation. As a minimum site signage and markings (e.g. marker posts, flagging) must be installed to indicate areas of rehabilitation that must not be disturbed.	As required
14.11	Vegetation and Mulch stockpiles	Cleared vegetation not reserved for use in rehabilitation to provide habitat features must be mulched and stockpiled within the designated construction area or right of way for use in rehabilitation. Mulching must be in accordance with Australia Pacific LNG Technical Instruction - Mulching (Q-LNG01-15-TI-0017). Mulch stockpiles must not be wider than 10m and higher than 2m, unless authorised in writing by the Australia Pacific LNG Environmental Representative, and managed to reduce fine fuel loads at the base. On Australia Pacific LNG land vegetation stockpiles must be managed with a graded, slashed, ploughed or chemically controlled barrier. In a controlled burned event, the stock piles may be protected by forming a wet break at the base and allowing the fire to burn away from the piles.	At all times

REINSTATEMENT AND REHABILITATION			
14.12	Retention of habitat features	During clearing activities hollow timber, larger rocks and other selected habitat features must be relocated to a suitable adjacent location to provide microhabitat. Reserved habitat features should be identified by a GPS point and recorded in the Origin GIS.	At all times
14.13	Backfilling	Pipeline trenches must be backfilled immediately after pipe laying and rehabilitated as soon as practicable but not longer than three (3) months after completion. The Contractor must monitor rehabilitated buried transmission pipeline corridors and flowlines for subsidence and erosion at least every 20 business days for the first 120 business days after reinstatement (i.e. when PC is granted, or when all "Type B" environmental punch items are closed). The Contractor must remedy any observed subsidence and restore reinstatement or rehabilitation.	Following backfillling
14.14		During backfilling of excavations and trenches, soils should be replaced so that topsoil does not mix with subsoil, and where practicable the soil horizons are consistent with the soil horizons of the immediately surrounding area, in accordance with the Australia Pacific LNG Soil Assessment and Management Plan for the development area. Topsoil must not be used for pipe padding or backfilling excavations.	At all times
14.15		Backfilled excavations should be suitably compacted to prevent subsidence. Notwithstanding this, compaction must not impede rehabilitation and re-establishment of vegetation. A low crown of soil mounded over the trench may be necessary to compensate for potential subsidence of trench soil (except in cultivation areas). Regular breaks in the crown are required to prevent the impediment or channelling of surface drainage and should coincide with drainage and erosion control features.	At all times
14.16		Certified clean, weed and disease free backfill material may be used where subsoils are unsuitable for backfilling. Clearance certificates and analysis reports must be kept on records and provided to the Australia Pacific LNG Environmental Representative on request.	As required
14.17		Subsoil must not be used as the surface capping layer; surplus material may be respread prior to topsoil replacement or stockpiled in a location approved in writing by the Australia Pacific LNG Environmental Representative.	As required
14.18		Backfilled and rehabilitated sites must: • Be a stable landform • Exhibit no subsidence or erosion gullies for the life of the operational asset • Be re-profiled to a level consistent with surrounding soils • Be re-profiled to original contours and established drainage lines • Be visually consistent with the surrounding land features • Reinstate the land to the pre-disturbed land use and land suitability class (e.g. GQAL or SCL) • Be vegetated with groundcover as a minimum to ensure that erosion is minimised • Ensure long term maintenance requirements are no greater than that required for the land prior to its disturbance	At all times
14.19	Land Contouring	The construction area must be re-profiled to original or stable contours, re-establishing surface drainage lines and other land features. Site specific stabilisation measures may be necessary to prevent slumping or erosion. Disturbed watercourses must be reinstated to maintain the pre-construction stream gradient and hydrology. Disturbed wetlands must be reinstated to maintain the pre-construction surface water hydrological regime.	At all times

REINSTATEMENT AND REHABILITATION			
		Disturbed waterways must be reinstated to restore the profiles of the bed and banks to natural stream profiles and stability within five business days of completion of works (for ROW bank restoration applies to the pipe side of the ROW and to ROW where no bed level crossing is specified).	
14.20	Ripping	In areas to be reinstated, the ground surface must be ripped along contours (where practicable) prior to the re-spreading of the topsoil as follows: 1. Rip track and working side of the right of way only 2. Do not rip over backfilled trenches or bell holes 3. Where track runs over a trench or bell hole this section should not be ripped 4. Rip laydown areas, carpark, and similar areas where compaction of soils is likely to have occurred 5. Rip to 100mm depth 6. On right of ways running downslope to drainage lines lift tines every 50m for 5m 7. Do not rip in areas with deep sand profiles 8. Evidence of ripping of work side must be provided at handover stage Ripping should be undertaken in a manner which avoids impacts to trees roots if within the tree protection zone of retained vegetation.	At all times
14.21	Scarification	Where topsoils have been compacted in the course of construction (e.g. as a result of vehicle trafficking or where material storage on undisturbed in situ topsoils) the surface should be lightly scarified prior to seeding, ensuring no subsoil is ripped to the surface. Figure eight or zigzag rip lines may be appropriate in flat to low gradients to prevent rilling, avoid scarifying downslope.	At all times
14.22	Topsoil replacement	Stockpiled topsoil must to be spread over the area to be reinstated or rehabilitated following backfilling, re-contouring and compaction relief work. If in the event imported topsoil is required for rehabilitation works, it must be accompanied by certification that is contamination, weed and pest free.	At all times
14.23		Topsoil must be turned over and loosened prior to being spread in an even layer over the area to be reinstated and left rough (not smooth and compacted). Topsoil must be respread to a depth reflecting baseline conditions, or as necessary to facilitate revegetation.	At all times
14.24		Topsoil stockpiled for longer than 28 days must be evaluated prior to replacement to determine the need for soil ameliorants and apply as advised by a suitably qualified person. Where evaluation indicates analysis is required it must include pH, electrical conductivity, chloride, cations (aluminium, calcium, magnesium, potassium and sodium), exchangeable sodium percentage and soil fertility (including carbon, nitrogen, phosphorus, potassium, sulphur and micronutrients).	As required
14.25		Soil additives may be applied if rehabilitation is not initially successful to improve topsoils, stabilise the subsoils and support vegetation regrowth during stockpiling and rehabilitation.	At all times
14.26	Replacement of vegetation and mulch in areas of native vegetation	In areas of native vegetation, stockpiled mulch must be respread evenly over the area to be reinstated to assist in the distribution of seed stock and provide shelter for fauna. Mulching activities must comply with Australia Pacific LNG Environmental Technical Instruction – Mulching (Q-LNG01-15-TI-0017). Distribution of vegetation should be controlled to ensure that any erosion or subsidence that may occur is not be hidden from view during subsequent monitoring inspections.	As required

REINSTATEMENT AND REHABILITATION			
14.27		Native vegetation should be allowed to regenerate to reduce the barrier to fauna movement, especially by small ground-dwelling fauna. Revegetation must be consistent with the plant density, floristic composition and distribution of the surrounding regional ecosystem types and within the province of the vegetation being cleared.	As required
14.28	Placement of habitat features	Following construction, reserved logs, hollows and dead timber habitat features may remain adjacent to rehabilitated area, where agreed with the landowner.	As required
14.29	Nest Boxes	The Contractor must install nest boxes / other artificial breeding places within 1 week of the completion of clearing activities as set out in the Environmental Workpack and submit records of installation locations.	Within 1 week of clearing
14.30	Rehabilitation - Streams	Rehabilitation of stream crossings (including all waterways) including bed and banks must commence immediately following completion of works at the crossing as follows: • The waterway bed is retained with natural substrate or where approved by the Australia Pacific LNG Environmental Representative reconstructed with substrate comparable to the natural substrate size and consistency • Vegetation and cover is rapidly re-established so that the native plant community at the site can recover or be enhanced by using native species.	At all times
14.31	Revegetation – Pasture Establishment	Agricultural areas must be reinstated to pasture seeding with pasture species as specified in the Environmental Workpack and sourced from reputable local seed suppliers.	At all times
14.32	Revegetation – native vegetation	During reinstatement of areas of native vegetation a native seed mix comprising ground cover species appropriate to the regional ecosystem must be used as specified in the Environmental Workpack. Seed must consist of local provenance native grasses and groundcover species consistent with predevelopment vegetation sourced from reputable local seed suppliers. A sterile cover crop must also be included in the seed mix. Seeding of native areas must be undertaken irrespective of the respread mulch in those areas.	At all times
14.33		Revegetation/re-seeding efforts should be based on soil types, existing location vegetation characteristics and endemism of selected species.	As required
14.34		Where rehabilitation includes native vegetation and the area is not naturally regenerating, local indigenous species seed or tube stock may be planted, as agreed in writing with the Australia Pacific LNG Environmental Representative, sourced preferably from a local seed bank.	As required
14.35	Good Quality Agricultural Land	Where GQAL is temporarily disturbed by project activities, such land must be rehabilitated and returned to a use consistent with the surrounding area and pre-disturbance conditions.	At all times
14.36	Stock Routes	Ground disturbance to stock routes must be rehabilitated as soon as practicable following cessation of construction activities.	As required
14.37		The parts of the stock route network disturbed or affected by the works must be rehabilitated upon completion of the construction to a state that is safe for travelling stock and drovers, and the travelling public, and is consistent with the area's pre-disturbance condition.	As required
14.38	Reinstatement of Access Tracks	Public and private access tracks utilised during construction must be reinstated to their pre-construction condition or as otherwise agreed with the relevant landholder or authority. New access tracks to be retained at the request of the landowner must be confirmed with the Australia Pacific LNG Environmental Representative.	As required

REINSTATEMENT AND REHABILITATION			
14.39		Temporary access tracks and roads not required for operations or to be retained by landowner must be closed and reinstated to a condition compatible with the surrounding land use. Any wheel ruts must be graded and erosion control measures must be installed or re-established as required. No control measures requiring on-going maintenance and access are permitted to remain post reinstatement and rehabilitation.	As required
14.40	Rehabilitation of temporary surface water diversion channels	The Contractor must restore diversion works and minimise the risk of on-going erosion and scour issues within diversion channels.	As required
14.41	Well Leases	Well lease pads must be rehabilitated to 0.2ha within 12 months of completion of workover.	At all times
14.42	Chemical and Fuel Stores	A visual inspection of decommissioned and rehabilitated chemical and fuel store area must be conducted, and any contaminated soil found present must be removed and managed in accordance with EHP guidelines. Soil samples must be taken and analysed (for appropriate parameters for the materials stored) at all decommissioned and rehabilitated chemical and fuel store areas to confirm that no land contamination is present at reinstatement. The location of all decommissioned and rehabilitated chemical and fuel storage areas must be recorded via GPS and provided to the Australia Pacific LNG in a format compatible with the Origin GIS.	At all times
14.43	Dam Decommissioning	On cessation of the operation of any dam, the dam must be maintained to prevent environmental harm until the dam is decommissioned. At least 20 business days prior to the decommissioning of a dam the Contractor must assess the disposal options for any contaminated material including salts and dam liners in accordance with the waste management hierarchy and submit the result of that assessment and the recommended waste management plan to the Australia Pacific LNG Environmental Representative for approval. Decommissioned dams must be rehabilitated and the landform reprofiled such that it does not function as a dam and will be stable and sustainable, unless otherwise agreed in writing with the landowner. A minimum 250mm topsoil depth must be placed over decommissioned dams.	As required

7. Site Specific Requirements

Site specific environmental requirements will be provided to the Contractor via an Environmental Work Pack developed for each site. The Contractor must comply with all requirements of the site specific work pack, in addition to general requirements set out in this CEMP and related documents.

Prior to commencement of construction activities at a site the Contractor and the Australia Pacific LNG Environmental Representative will undertake a briefing and joint site inspection that must include, as a minimum:

- Review of scope of works proposed for the site, site familiarisation inspection
- Review of pre clearance site assessments, Environmental Sensitive Areas and site environmental values
- Review of all site specific environmental management requirements
- Review of the requirements of any site specific regulatory approvals
- Review of the site specific erosion and sediment control plan
- Review of all pre commencement hold points (see below) and agreement on timeline and approach to completion of each item
- Communication of any outstanding approval requirements
- Communication of any “no go” areas

7.1. Hold Points

The Contractor must comply with all hold points set out in the Environmental Workpack Hold Points List for the works. Works must not proceed until the relevant hold points have been approved by the Australia Pacific LNG Environmental Representative.

The Hold Point List will include requirements that must be complied with prior to, during and following construction. Hold points address requirements for external approvals, pre construction, site establishment, construction and completion.

8. Technical Instructions and Environmental Procedures

Detailed Technical Instructions or Environmental Procedures may be developed an issued from time to time to supplement the requirements of this CEMP and other related plans. Technical Instructions or Environmental Procedures provide further direction on specific requirements for implementing the measures required by this CEMP and related documents and do not generally alter the purpose or intent of a control measure.

The Contractor must comply with requirements of current Technical Instructions or Environmental Procedures provided by Origin Energy.

9. Compliance and Monitoring

9.1. Site Inspections and Compliance Assessment

The Contractor must develop and submit to the Australia Pacific LNG Environmental Representative as part of the Contractor's CEMP details of measures and tools to monitor compliance with Australia Pacific LNG Requirements. This should include checklists, audit plan and audit schedules.

9.2. Monitoring

The Contractor must undertake necessary site inspection and monitoring to demonstrate compliance with project environmental requirements including but not limited to the Australia Pacific LNG Upstream Construction Monitoring Plan (Q-4500-15-MP-1002) as amended from time to time, and as directed by the Australia Pacific LNG Environmental Representative.

All monitoring must be conducted by a suitably qualified person.

All instruments, equipment and measuring devices used for measuring or monitoring must be calibrated, appropriately operated and maintained in accordance with the manufacturer's specifications. Records of calibration must be made available on request.

All laboratory analyses and tests required to be conducted under the Australia Pacific LNG Monitoring Plan (Q-4500-15-MP-1002) must be carried out by a laboratory that has NATA accreditation for such analyses and tests, except as otherwise authorised by the Australia Pacific LNG Environmental Representative.

The method of water sampling must comply with that set out in the most recent version of the EHP "Monitoring and Sampling Manual 2009 – Environmental Protection (Water) Policy 2009 Version 2 September 2010" as amended from time to time.

The method of measurement and reporting of noise levels and background sound pressure levels must comply with the Department of Environment and Resource Management's "Noise Measurement Manual" 2000 or AS1055 as amended from time to time.

If monitoring conducted by the Contractor indicates a condition or contaminant level has caused, or has potential to cause, environmental harm, the Contractor must immediately advise the Australia Pacific LNG Environmental Representative and in consultation with the Australia Pacific LNG Environmental Representative take the necessary actions to rectify the condition or contaminant level so as to avoid or minimise environmental harm.

Records of inspection and monitoring data must be kept and provided to Australia Pacific LNG at the specified frequency or on request.

All records of monitoring must include

- the date on which the inspection/ sample was taken
- the time at which the inspection/ sample was taken
- the location at which the inspection/ sample was taken

An annual monitoring report must be prepared each year and provided to Australia Pacific LNG. This report must include but not necessarily be limited to:

- a summary of the previous 12 months monitoring results obtained under all monitoring programs required under this environmental authority and a comparison of the previous 12 months monitoring results to both the limits set by Australia Pacific LNG and to relevant prior results
- the date on which the samples were taken
- the time at which the samples were taken
- the monitoring point at which the sample was taken
- the release flow rate of any authorised discharges to waters from all release points

- the results of all monitoring and details of any non-conformance with Australia Pacific LNG requirements and the dates and times these non-conformance were reported to the Australia Pacific LNG Environmental Representative
- a summary of all records of quantities of releases required to be kept in accordance with Australia Pacific LNG requirements including the total volume of any authorised discharges to waters for the previous yearly period from all release points and the individual daily volume of any authorised discharges to waters from all release points
- details of all maintenance or work carried out on any discharge meter(s) and the impact (if any) on the release volume readings
- an evaluation / explanation of the data derived from any monitoring programs
- data analyses and interpretation to assess the nature and extent of any contamination and the level of environmental harm caused as a result of the contamination, and
- an outline of actions taken or proposed to minimise the risk of environmental harm from any condition or elevated contaminant level identified by the monitoring or recording programs.

The evaluation and explanation of data for the purposes of the annual monitoring report must be performed by a suitably qualified person.

10. Incidents, Non-Conformances, Corrective and Preventive Actions

The Contractor's CEMP must include procedures for dealing with actual and potential nonconformities and provide direction on taking preventative actions and corrective actions including incident response and management.

Contractors must satisfy the requirements for incident management as set out in this CEMP and the Origin Energy Incident Management Directive (ORG-HSE-DVE-006), Origin Incident Investigation Procedure (ORG-RSK-PRO-001), Origin Energy HSSE Incident Management Procedure (Q-LNG01-15-AP-0128) and Origin Energy HSSE Incident Notification Procedure (Q-LNG01-15-AP-8539).

Contractor procedures must define requirements for:

- Identifying, reporting and correcting nonconformities and taking actions to mitigate their environmental impact
- Investigating all incidents and non-conformity, determining the cause and taking action in order to avoid the recurrence
- Evaluating the need for action to prevent non-conformity and implementation of appropriate actions designed to avoid their occurrence
- Recording the results of corrective and preventive actions taken
- Review the effectiveness of corrective and preventive action.

10.1. Reporting Incidents and Non-conformances

All environmental incidents and non-conformities with Australia Pacific LNG requirements including the Environmental Workpack and Hold Points List for the works, this CEMP, the PCEMP, the Contract or any related documents must be reported in writing within 4 hours to the Australia Pacific LNG Environmental Representative and Australia Pacific LNG field Environmental Representative in accordance with Origin Energy HSSE Incident Notification Procedure (Q-LNG01-15-AP-8539).

An Environmental Incident is any occurrence that has resulted in or has the potential to result in adverse consequences to the environment including air, water, land, natural resources, flora, fauna, habitats, ecosystems and/or biodiversity. Incident types include but are not limited to:

- Spills to land or water
- Exceeding clearing limits or clearing outside the approved area
- Death or injury to native fauna

- Sediment release to land or water
- Non compliant discharge to land or water
- Weed dispersal
- Dust generation
- Exceeding noise limits or working hours
- Complaints regarding environmental amenity or nuisance
- Any noncompliance with any condition of approval or environmental legislation
- Any other unauthorised environmental harm.

In particular the Contractor must notify the Australia Pacific LNG Environmental Representative IMMEDIATELY of any of the following events which constitute notifiable breaches of EA conditions, as applicable to the Contractor's scope of works. All notifications of potential EA breaches should be accompanied by the Environmental Incident Regulator Notification Form (Q-LNG01-15-AQ-0088):

- Any noncompliance with EA conditions relating to significant disturbance to land
- Any unauthorised release of contaminants
- Releases of any volume of contaminants to water
- Releases of volumes of contaminants greater than 200L of hydrocarbons, 1000L of brine, 5000L of coal seam gas water or 5000L sewage or treated sewage effluent to land
- A potential or actual loss of structural or hydraulic integrity of a dam
- When the level of the contents of any regulated dam reaches the mandatory reporting level, or when a regulated dam will not have available storage to meet design storage allowance on 1 November of any year
- Any incident where there is a potential or actual loss of well integrity (e.g. when the annulus pressure during stimulation increases by more than 3.5 MPa from the pressure immediately preceding stimulation)
- Any detection of restricted stimulation fluids from stimulation fluid monitoring
- Any result from baseline bore, well or stimulation water impact monitoring that exceeds water quality objective for the environmental value of that water resource
- Any unauthorised event that has or could result in serious or material environmental harm

Reporting of incidents and non-conformances must include:

- The environmental authority number
- The tenure type and number where the emergency or incident occurred
- The name and telephone number of the Contractor's contact person
- The location of the emergency or incident (Property Name, Lot/plan, Pressure zone if applicable, Infrastructure ID or label as per workpack, GPS coordinates in decimal degrees)
- The date and time that the emergency or incident occurred
- The date and time when the incident was reported
- Details of the nature of the event and the circumstances in which it occurred
- The estimated quantity and type of any contaminants involved in the incident, and the area affected, and/or the number of individuals and species of fauna affected
- Description of the circumstances surrounding the incident including:
  - Activities occurring at the time the incident took place,
  - Equipment being used at the time the incident took place or that were involved in the incident

  - Controls in place at time of incident
  - Description of scene when incident occurred
  - Weather and environmental conditions
  - Contractor responsible for the site and relevant personnel present
- A description of the land use at the site of the emergency or incident (e.g. grazing, pasture, forest etc) and/or the name of any relevant waters and other environmentally sensitive features
- A description of the immediate and potential impacts from the emergency or incident
- A description of whether stock and/or wildlife were exposed to any contaminants released and measures taken to prevent access for the duration of the emergency or incident
- Any sampling conducted or proposed, relevant to the emergency or incident
- Photographs of the location where the incident occurred and surrounding environment
- Landholder details and details of any communication with the landholder
- Immediate actions taken to control the impacts of the emergency or incident and how environmental harm was mitigated at the time of the emergency or incident
- Whether further examination/root cause analysis is required and if so, the expected date by when this examination will be completed and reported as agreed with the Australia Pacific LNG Environmental Representative.

For all incidents which must be reported to the Administering Authority or as requested by the Australia Pacific LNG Environmental Representative, a written report must be provided to the Australia Pacific LNG Environmental Representative within 7 days (unless another timeframe is agreed) using Environmental Incident Regulator Report (Q-LNG01-15-AQ-0089) that includes the following:

- The information required above
- Root cause of the incident
- The confirmed quantities and types of any contaminants involved in the incident
- Results and interpretation of any analysis of samples taken at the time of the emergency or incident (including the analysis results of any impact monitoring)
- A final assessment of the impacts from the emergency or incident including any actual or potential environmental harm that has occurred or may occur in the longer term as a result of the release
- The success or otherwise of actions taken at the time of the incident to prevent or minimise environmental harm
- Results and current status of landholder consultation, including commitment to resolve any outstanding issues/concerns and
- Actions and/or procedural changes to prevent a recurrence of the emergency or incident.

10.2. Incident Investigation and Actions

Investigation is mandatory for all incidents with potential risk consequence of Moderate or higher occurring in a controlled jurisdiction. Incidents must be investigated in accordance with the Origin Energy LNG HSE Incident Management Procedure (OEUP-Q1000-PRO-SAF-106), Origin Energy HSSE Incident Management Procedure (Q-LNG01-15-AP-0128), Incident Management Process (ORG-RSK-REF-001) and Origin Incident Investigation Procedure (ORG-RSK-PRO-001).

Formal investigation of incidents with potential consequence rating of Low is not mandatory unless the incident is a breach of any condition of approval (notifiable or otherwise). For incidents where an incident investigation is not required it is necessary only to include a brief statement on probable root causes in the incident notification. Notwithstanding this, a full incident investigation must be conducted into any incident if requested by the Australia Pacific LNG Environmental Representative.

The investigation methodology that must be used is the Incident Cause Analysis Method (ICAM). Techniques from other industry standard methodologies such as TapRoot can be used at the discretion of the lead investigator to supplement the ICAM process.

Investigation level and timeframes are based on risk. For incidents with potential consequence rating, using the Origin Risk Matrix (ORG-RSK-TOL-001) of Moderate complete a Basic investigation within 14 days (unless alternative timeframe or level of investigation is agreed with the Australia Pacific LNG Environmental Representative). For incidents with a potential consequence rating using the Origin Risk Matrix (ORG-RSK-TOL-001) of Serious or higher, or for any breach of any condition of approval, complete a Full investigation within 30 days (unless alternative timeframe agreed with the Australia Pacific LNG Environmental Representative). Note that for incidents that must be reported to the regulator incident reports must be completed with 7 days, unless alternative timeframe agreed with the Australia Pacific LNG Environmental Representative.

Investigation reports and records must be provided to the Australia Pacific LNG Environmental Representative within the above timeframes for all environmental incidents.

Recommended corrective and preventive actions should be included in the investigation report (or notification for Low consequence rated incidents). Upon review and approval of the investigation report, recommended actions to correct underlying causes and the contributing factors to prevent the incident from occurring again are to be assigned to appropriate persons. Acceptance of the actions and timeframes should be sought from the action owner or appropriate Line Manager. All actions must be completed within the agreed timeframes and evidence of action completion provided to the Australia Pacific LNG Environmental Representative.

10.3. Complaints

The Contractor must notify the Australia Pacific LNG Environmental Representative of any complaints received from external stakeholders within 4 hours. Complaints will be investigated and managed by Australia Pacific LNG.

In the event that a complaint is received by the Contractor the following information must be recorded and provided to the Australia Pacific LNG Environmental Representative:

- Name, address and contact number for complainant.
- Time and date of complaint.
- Reasons for the complaint as stated by the complainant.
- Investigations undertaken in response to the complaint.
- Conclusions formed.
- Actions taken to resolve complaint.
- Any abatement measures implemented to mitigate the cause of the complaint.
- Name and contact details of the person responsible for resolving the complaint.

In the event of any complaint being received regarding the Australia Pacific LNG Project, the Contractor must assist Australia Pacific LNG in any required investigation, mitigation, monitoring or other response requirements.

11. Reporting

All non-conformances with the requirements of this plan must be reported to the Australia Pacific LNG Environmental Representative within 4 hours.

Any received complaints must be reported to the Australia Pacific LNG Environmental Representative immediately.

Records of field inspection, monitoring and visual observations must be provided to the Australia Pacific LNG Environmental Representative monthly, or on request.

The Contractor must report monitoring and other data as required by the CEMP and related documents to the Australia Pacific LNG Environmental Representative in the required format, timing and detail as specified by the Australia Pacific LNG Environmental Representative from time to time. Refer the Australia Pacific LNG Project Construction Environmental Management Plan (PCEMP) for further detail on reporting requirements.

12. CEMP Review

The Australia Pacific LNG CEMP will be reviewed annually or as required from time to time. Updates will be provided by the Australia Pacific LNG Environmental Representative.

13. Related Documents

The Contractor is responsible for ensuring that all requirements relevant to the Contractor's scope of works outlined in the documents below are complied with at all times and are included in the Contractor's CEMP and Contractor's design. his list may be added to or amended by Australia Pacific LNG from time to time.

The Contractor must also ensure that its employees and sub-contractors understand the content and importance of these documents.

The Contractor must comply with the latest version of these documents as provided by Australia Pacific LNG and updated from time to time. Note that draft documents may be provided in some instances for information only, and in some cases these documents require approval from the administering authority prior to implementation, the Contractor must only conduct works in compliance with approved documents issued by Australia Pacific LNG.

The Contractor must ensure that works comply with the requirements outlined in the following documents:

Table 5: Reference Documents

Document Number	Title
EPPG00853013	Environmental Authority Condabri Development Area (Q-4500-15-EA-1034)
EPPG00853213	Environmental Authority Combabula Development Area (Q-4200-15-EA-1015)
EPPG00885313	Environmental Authority Spring Gully Development Area (Q-8200-15-EA-1029)
EPPG00968013	Environmental Authority Walloons Development Area (Q-4000-15-EA-1012)
OEUP-1000-PRO-ENV-005	Origin Energy Weed Management Procedure
OEUP-1000-PRO-ENV-025	Origin Energy Vehicle and Mobile Plant Weed Hygiene Procedure
OEUP-Q8400-PLN-ENV-001	Australia Pacific LNG Environmental Management Plans for Spring Gully Gas Field
OEUP-Q1000-PRO-SAF-106	Origin Energy LNG HSE Incident Management Procedure
OEUP-Q1000-REG-ENV-003	Approved Waste Processing and Disposal Facilities LNG Business Unit
ORG-AUD-DVE-001	Origin Energy Assurance Directive
ORG-HSE-DVE-004	Origin Energy Management of Change Directive
ORG-HSE-DVE-005	Origin Energy Asset Integrity Directive
ORG-HSE-DVE-006	Origin Energy Incident Management Directive
ORG-HSE-DVE-015	Origin Energy Hazardous Materials and Secondary Containment Directive
ORG-HSE-DVE-018	Origin Energy HSE Management System Standard 6 – Consultation and Communication
ORG-HSE-DVE-019	Origin Energy Environmental Effects and Management Directive: Environmental Noise
ORG-HSE-DVE-020	Origin Energy Product Stewardship, Conservation and Waste Management Directive: Material and Waste
ORG-HSE-DVE-021	Origin Energy Environmental Effects and Management Directive: Biodiversity Management
ORG-HSE-DVE-022	Origin Energy HSE Training and Competency Directive
ORG-HSE-DVE-024	Origin Energy Product stewardship, conservation and waste management Directive: Water Management
ORG-HSE-DVE-026	Origin Energy HSE Management System Standard 6 – Community Engagement
ORG-HSE-DVE-027	Origin Energy Environmental Effects and Management Directive: Greenhouse Gas and Energy Efficiency
ORG-HSE-DVE-035	Origin Energy Environmental Effects and Management Directive: Air emissions
ORG-HSE-DVE-036	Origin Energy Product stewardship, conservation and waste management Directive:

Document Number	Title
	Land Management
ORG-HSE-POL-01	Origin Energy Health, Safety and Environmental Policy
ORG-HSE-SYS-001	Origin Energy Health, Safety and Environment Management System
ORG-RISK-DVE-001	Origin Energy Risk Management Directive
ORG-RSK-DVE-006	Origin Energy Incident Management Directive
ORG-RSK-PRO-001	Origin Energy Incident Investigation Procedure
ORG-RSK-REF-001	Incident Management Process
ORG-RSK-TOL-001	Origin Energy Risk Matrix
Q-1000-15-MP-0001	Australia Pacific LNG Upstream Waste Management Plan
Q-1805-15-MP-0001	Australia Pacific LNG Environmental Management Plans for Condabri Gas Field
Q-1805-45-MP-0001	Australia Pacific LNG Condabri CSG Water Management Plan
Q-4000-15-MP-1003	Australia Pacific LNG Environmental Management Plans for Talinga/Orana Gas Field
Q-4000-15-MP-1005	Australia Pacific LNG Phase 1 Walloons Rehabilitation Plan
Q-4000-15-MP-1006	Australia Pacific LNG Phase 1 Walloons Rehabilitation Monitoring Plan
Q-4100-15-MP-0001	Australia Pacific LNG Talinga CSG Water Management Plan
Q-4100-15-MP-014	Australia Pacific LNG Phase 1 Soils Assessment and Management Plan - Talinga-Orana Gas Field (Gas wells and Flowlines)
Q-4200-15-MP-0001	Australia Pacific LNG Environmental Management Plans for Combabula Gas Field
Q-4200-15-MP-0005	Australia Pacific LNG Phase 1 Combabula Rehabilitation Monitoring Program Plan
Q-4200-15-MP-0007	Australia Pacific LNG Phase 1 Combabula Gas Field Phase 1 Stage 1 (Overview) SAMP
Q-4200-15-MP-006	Australia Pacific LNG Phase 1 Combabula Rehabilitation Plan
Q-4200-15-MP-1005	Australia Pacific LNG Phase 1 Soil Assessment and Management Plan - Combabula / Reedy Creek Gathering (Gas Wells and Flowlines)
Q-4200-15-MP-1007	Australia Pacific LNG Phase 1 Soil Assessment and Management Plan - Combabula /Reedy Creek FCSs and Trunkline
Q-4200-45-MP-0001	Australia Pacific LNG Combabula CSG Water Management Plan
Q-4201-15-MP-0002	Australia Pacific LNG Phase 1 Soil Assessment and Management Plan - Combabula Gas Processing Facility
Q-4240-15-MP-0001	Australia Pacific LNG Phase 1 Reedy Creek Facility Soil Assessment and Management Plan
Q-4301-15-MP-0001	Australia Pacific LNG Phase 1 Soil Assessment and Management Plan- Orana Facilities
Q-4500-15-AP-1001	Australia Pacific LNG Emergency Response Plans: Condabri Central
Q-4500-15-MP-0002	Australia Pacific LNG Phase 1 Condabri Rehabilitation Plan
Q-4500-15-MP-1001	Australia Pacific LNG Phase 1 Erosion and Sediment Control Plan – Gas Fields
Q-4500-15-MP-1002	Australia Pacific LNG Upstream Construction Monitoring Program
Q-4500-15-MP-1003	Australia Pacific LNG Phase 1 Condabri Soils Assessment and Management Plan
Q-4500-15-TS-1001	Australia Pacific LNG Phase 1 Condabri Rehabilitation Monitoring Plan
Q-8200-15-MP-1058	Australia Pacific LNG Phase 1 Spring Gully Development Area Soil Management Plan
Q-8200-15-TR-1021	Australia Pacific LNG Phase 1 Topography, Geomorphology and Soils Assessment
Q-LNG01-10-MP-0005	Australia Pacific LNG Phase 1 Groundwater Monitoring Plan
Q-LNG01-15-AL-0102	Environment Protection and Biodiversity Conservation Act 1999 approvals for controlled actions for the Gas Fields (approval number 2009/4974)

Document Number	Title
Q-LNG01-15-AP-0013	Australia Pacific LNG Land Contamination Procedure
Q-LNG01-15-AP-0017	Australia Pacific LNG Phase 1 Fauna Management Procedure- Gas Fields
Q-LNG01-15-AP-0128	Origin Energy HSSE Incident Management Procedure
Q-LNG01-15-AP-8539	Origin Energy HSSE Incident Notification Procedure
Q-LNG01-15-AQ-0088	Environmental Incident Regulator Notification Form
Q-LNG01-15-AQ-0089	Environmental Incident Regulator Report
Q-LNG01-15-AQ-0130	Threatened Plant Salvage Plan
Q-LNG01-15-AQ-0131	Threatened Plant Clearing Record
Q-LNG01-15-AQ-0132	Topsoil stripping record
Q-LNG01-15-AQ-0133	Testpit Record
Q-LNG01-15-AQ-0134	Slurry Management Record
Q-LNG01-15-EA-0045_01	Australia Pacific LNG Environmental Impact Statement 2010
Q-LNG01-15-EA-0062	Australia Pacific LNG Fire Management Strategy
Q-LNG01-15-EA-0063	Australia Pacific LNG Environmental Impact Statement 2010 – summary of commitments
Q-LNG01-15-EA-0107	Australia Pacific LNG Phase 1 - DEHP - Extension Of Protected Plant Class Exemption And Generic Species Management Program
Q-LNG01-15-MP-0045	Australia Pacific LNG Noise Constraints Plan for the Gas Fields
Q-LNG01-15-MP-0071	Australia Pacific LNG Upstream Greenhouse Gas and Energy Efficiency Strategy
Q-LNG01-15-MP-0085	Australia Pacific LNG Upstream Noise Management Plan - Gas Field Operations
Q-LNG01-15-MP-0107	Australia Pacific LNG Remediation, Rehabilitation, Recovery and Monitoring Plan
Q-LNG01-15-MP-0108	Australia Pacific LNG Threatened Flora Management Plan
Q-LNG01-15-MP-0109	Australia Pacific LNG Environmental Constraints Planning and Field Development Protocol
Q-LNG01-15-MP-0110	Australia Pacific LNG Upstream Biosecurity Management Plan
Q-LNG01-15-MP-0113	Australia Pacific LNG Threatened Fauna Management Plan
Q-LNG01-15-MP-0113_01	Australia Pacific LNG Phase 1 - Threatened Fauna Management Plan Addendum
Q-LNG01-15-MP-0114	Australia Pacific LNG Threatened Ecological Community Management Plan
Q-LNG01-15-MP-0354	Australia Pacific LNG Phase 1 Land Release Management Plan
Q-LNG01-15-MP-0540	Australia Pacific LNG Gathering Implementation Emergency Response Plan – Condabri
Q-LNG01-15-MP-0542	Australia Pacific LNG Gathering Implementation Emergency Response Plan – Reedy Creek
Q-LNG01-15-MP-0543	Australia Pacific LNG Gathering Implementation Emergency Response Plan – Spring Gully
Q-LNG01-15-MP-1001	Australia Pacific LNG Project Construction Environmental Management Plan
Q-LNG01-15-MP-1005	Australia Pacific LNG Construction Environmental Management Plan
Q-LNG01-15-MP-2000	Australia Pacific LNG Regulatory Approvals Plan
Q-LNG01-15-RP-0009_01	Coordinator General's Report on the Environmental Impact Statement (November 2010)
Q-LNG01-15-RP-0155	Australia Pacific LNG Upstream Phase 1 Species Management Program for Tampering with EVNT, Special and Colonial Animal Breeding Places – Gas Fields

Document Number	Title
Q-LNG01-15-TI-0002	Australia Pacific LNG Phase 1 - Technical Instruction - Pre-Clearance Survey
Q-LNG01-15-TI-0011	Gathering Implementation – Environmental Technical Instruction - Construction Site Dewatering
Q-LNG01-15-TI-0012	Gathering Implementation – Environmental Technical Instruction - Beneficial use of Associated water
Q-LNG01-15-TI-0012_01	Australia Pacific LNG Phase 1 - Technical Instruction - Record of Supply of Associated Water
Q-LNG01-15-TI-0012_02	Gathering Implementation – Environmental Technical Instruction - Plan for Beneficial Use of Associated Water
Q-LNG01-15-TI-0013	Gathering Implementation – Environmental Technical Instruction - Soil Conservation - Topsoil Management - Depth Assessment, Stripping and Stockpiling
Q-LNG01-15-TI-0014	Gathering Implementation – Environmental Technical Instruction - Soil Conservation – Treatment of Dispersive Soils
Q-LNG01-15-TI-0015	Gathering Implementation – Environmental Technical Instruction – Assessment of Ground Cover
Q-LNG01-15-TI-0016	Gathering Implementation – Environmental Technical Instruction - Soil Conservation – Soil Binders
Q-LNG01-15-TI-0017	Gathering Implementation – Environmental Technical Instruction - Mulching
Q-LNG01-15-TI-0018	Gathering Implementation – Environmental Technical Instruction - Sediment Basin Dewatering
Q-LNG01-15-TI-0019	Gathering Implementation – Environmental Technical Instruction - Stream Crossing Plans
Q-LNG01-15-TI-0020	Gathering Implementation – Environmental Technical Instruction - Rehabilitation
Q-LNG01-15-TI-0021	Gathering Implementation – Environmental Technical Instruction - Weed Management – Mother of Millions
Q-LNG01-15-TI-0022	Australia Pacific LNG Phase 1 - Technical Instruction - Weed Management – Parthenium
Q-LNG01-15-TI-0023	Gathering Implementation – Environmental Technical Instruction - Weed Management – Temporary wash down bays
Q-LNG01-15-TI-0024	Gathering Implementation – Environmental Technical Instruction - Weed Management – Onsite burial of declared weeds
Q-LNG01-15-TI-0025	Gathering Implementation – Environmental Technical Instruction - Soil Movement Across Property Boundary
Q-LNG01-15-TI-0026	Australia Pacific LNG Phase 1 - Technical Instruction - Fauna Protection – Clearing
Q-LNG01-15-TI-0027	Gathering Implementation – Environmental Technical Instruction - Fauna Protection – Stripping topsoil
Q-LNG01-15-TI-0028	Gathering Implementation – Environmental Technical Instruction - Fauna Protection – Construction in Gilgai Areas
Q-LNG01-15-TI-0029	Gathering Implementation – Environmental Technical Instruction - Nest Box Installation
Q-LNG01-15-TI-0032	Gathering Implementation – Environmental Technical Instruction - Slurry management
Q-LNG01-15-TI-0033	Gathering Implementation – Environmental Technical Instruction - Monitoring Water Feature Crossings
Q-LNG01-15-TI-0034	Gathering Implementation – Environmental Technical Instruction - Protection of Fauna - Special Least Concern and Colonial Breeders
Q-LNG01-15-TI-0042	Gathering Implementation – Environmental Technical Instruction – Weed Management – Opuntia spp. and Related Pear Species

13.1. Project Construction Environmental Management Plan

This CEMP must be read in conjunction with the Project Construction Environmental Management Plan (PCEMP). The PCEMP provides a framework to ensure the Project is undertaken in accordance with all applicable conditions of approval. The Contractors CEMP must meet or exceed the requirements of this CEMP and also the PCEMP, which includes additional Project information not covered in this CEMP. The items included in the PCEMP are outlined in the table below.

Table 6: PCEMP Reference Items

Item	PCEMP Section
Environmental Policy	2.1
Statutory Requirements and External Approvals	3
Legislation, Policies, Standards and Guidelines	3.2
Relevant State and Commonwealth Approvals	3.3
External Approvals	3.4
Environmental Objectives and Performance Criteria	5
Roles and Responsibilities	6
Competency and Training	7
Communication	8
Documentation	9
Incident and Risk Management	10
Emergency Response	11
Compliance and Monitoring	12
Internal and External Audit	12.3
Management Review	14
Related Documents	Appendix A
Reporting	Appendix B

Appendix A: Waste Matrix

Waste	Treatment and/or disposal options	Regulatory requirements	Labelling	Waste Bin	SDS (Y/N)
Recyclable Waste					
Aluminium Cans	Segregate into dedicated recycling bins - cans to be empty and crushed prior to disposal and sent for recycling.	N/A	"ALUMINIUM CANS ONLY"	Commingle bins (yellow lid)	N
Glass	Glass jars and bottles will be disposed of into the appropriate recycling bins for recycling. Light globes and broken glass will be disposed of in the general waste bins.	N/A	"GLASS ONLY"	Commingle bin (yellow lid)	N
Recyclable Plastics	Recyclable plastics will be placed in the appropriate recycle bins.	N/A	"RECYCLABLE PLASTICS ONLY"	Commingle bin (yellow lid)	N
Paper	Office paper to be printed and copied doubled sided where possible and once used disposed into the dedicated paper recycling bins.	N/A	"PAPER ONLY"	Blue bins	N
Organic Waste	Food scraps that are compostable will be segregated from general waste in the kitchen and stored in a sealed skip bin in order to transport to a local composting facility. This will reduce the volume of waste sent to landfill.	N/A	"COMPOSTABLE WASTE ONLY-NO GENERAL WASTE"	Green Lid bins or Sealed skip bins	N
Cardboard	Cardboard that cannot be reused will be disposed of in the dedicated cardboard recycling bins. Waxed cardboard cannot be recycled and will be disposed of in the general waste bins.	N/A	"CARDBOARD ONLY"	Blue bins	N
Glycol	Accumulate in closed top polypropylene and store separately from all other materials – do not mix with other materials. Containers should be stored in a containment area where any leakage will be contained and where the possibility for damage to the container is minimised.	Regulated Waste	"USED GLYCOL ONLY" Refer to SDS	Sealable Polyethylene drums	Y
Concrete	Where excess concrete has been generated, it will be re-used onsite where practical or poured into a hole to set, allowing for offsite recycling. Where practical, the waste generator will source concrete from recycled concrete suppliers ensuring that this does not jeopardise any other environmental best practice (e.g. the spread of weeds).	N/A	"CONCRETE ONLY"	N/A	N

Waste	Treatment and/or disposal options	Regulatory requirements	Labelling	Waste Bin	SDS (Y/N)
Concrete Returns	Mix Bury Cover Procedure with drilling by products, crush up on site with gravel if possible- Origin environmental approval required	N/A	"CONCRETE RETURNS ONLY"	N/A	N
Fax/Printer/ Photocopier Toner Cartridges	Cartridges to be disposed of in dedicated boxes. Once full, sealed, and labelled boxes are to be sent for recycling.	Regulated Waste	"USED CARTRIDGES ONLY"	Boxes provided by waste company	Y
Lead Acid Batteries	Batteries are relatively easy to crack. Special precautions should be undertaken to ensure batteries are not broken. Extreme care should be taken. Batteries should be accumulated in bins, drums and/or pallets provided by the contractor and must be lead-proof or bins specifically designed in the transportation of batteries to prevent breakages and contain leaks. Batteries must be segregated into bunded regulated waste storage area. Batteries that can be safely stored on pallets within the regulated waste storage area should be done so. Batteries placed in drums should be placed to prevent short circuiting within the drum. The storage and handling of spent batteries should be undertaken in accordance with the Australian Standard *AS*3780.8. Contracts with companies will be established to encourage the opportunities for recycling batteries. Batteries will be transported by a licensed contractor to a recycling facility where possible, remaining waste to be transported to a licensed regulated waste landfill	Regulated Waste Vehicle licensed to transport regulated waste, to a licensed battery recycling facility.	"LEAD ACID BATTERIES ONLY" In accordance with *AS*1216:2006	Polyethylene drums and pallets	Y
NiCad Batteries	Used nickel cadmium batteries should be handled with extreme care because they are filled with alkali and contain potentially hazardous materials. Special precautions should be taken to ensure that these batteries are not broken. Batteries must be segregated into bunded regulated waste storage area. Batteries that can be safely stored on pallets within the regulated waste storage area should be done so. Batteries placed in drums should be placed to prevent short circuiting within the drum. The storage and handling of spent batteries should be undertaken in accordance with the Australian Standard *AS*3780.8. Contracts with companies will be established to encourage the opportunities for recycling batteries.	Vehicle licensed to transport regulated waste, to a licensed battery recycling facility.	"NiCad BATTERIES ONLY" In accordance with *AS*1216:2006	Polyethylene drums	Y

Waste	Treatment and/or disposal options	Regulatory requirements	Labelling	Waste Bin	SDS (Y/N)
	Batteries will be transported by a licensed contractor to a recycling facility where possible, remaining waste to be transported to a licensed regulated waste landfill.				
Dry Cell Batteries	Disposed of in polyethylene drums and stored in a bunded regulated waste storage area, to be sent for recycling.	Vehicle licensed to transport regulated waste, to a licensed battery recycling facility.	"DRY CELL BATTERIES ONLY" In accordance with *AS*1216:2006	Polyethylene drums	Y
Empty Drums	A drum must be completely empty to be recycled or disposed of. To be exempt from Regulated waste regulations, a container must meet the regulatory definition for an empty container as follows: A container or an inner liner removed from a container that has held regulated waste is empty if: All waste has been removed that can be removed using all practices commonly employed to remove materials from that type of container, e.g. pouring, pumping and aspiration. Triple rinsed Drum punctured Contracts with companies will be established to encourage the opportunities for re-using and recycling drums. Drums will be transported by a licensed contractor to a recycling facility where possible, remaining empty drums will be transported to a licensed regulated waste landfill.	N/A	"EMPTY DRUM"	N/A	N
Waste Oils	Stored in secure, labelled drums. All drums will be sent for recycling by a licensed contractor. Oily wastes will be stored separately to maximise recycling opportunities. Drums will be sealed, labelled and stored within appropriately bunded areas in accordance with AS1940:2004 and located within the waste management areas. Spill kits will be strategically located throughout the waste storage area. The oils will be taken from the site, filtered and demineralised, propane de-asphalted and distilled to produce re-refined base oil suitable for use as a lubricant, hydraulic or transformer oil. Waste oils will be transported by a licensed contractor to a recycling facility where possible.	Vehicle licensed to transport regulated waste to a facility licensed to recycle waste oil	"WASTE OILS"	Labelled designated ICB's	Y (see Oils listed on site SDS register)

Waste	Treatment and/or disposal options	Regulatory requirements	Labelling	Waste Bin	SDS (Y/N)
Oil Filters	Oil well drained from filters into suitable containers and filters disposed of into dedicated scrap metal storage, and sent for recycling. Liquids separated into a waste oil storage drum. Drums will be sealed, labelled and stored within appropriately bunded areas in accordance with AS1940:2004 and located within the waste management areas	Must be transported to a facility licensed to recycle scrap metal	"USED OIL FILTERS - SCRAP METAL" for filters.	Designated bins	Y (see Oils listed on site SDS register)
Scrap Metal	Scrap metal wastes will be disposed of into the dedicated scrap metal bin, for recycling by a scrap metal contractor. Contaminated metal is not to be disposed of in the scrap metal bin. Scrap ferrous metal - Scrap metal will be managed via a third party licensed recycling contractor. The product will be removed from the site, shredded and either re-smelted or used in the smelting process. Any grade of steel can be recycled to top quality new metal. Scrap non-ferrous metal - Scrap metal will be managed via a third party licensed recycling contractor. The product will be removed from the site, shredded and crushed into bales for resale. It is then smeltered to produce a molten product and forged. There is very little property differences between recycled and virgin non ferrous metal.	Must be transported to a facility licensed to recycle scrap metal	"SCRAP NON-FERROUS METAL ONLY" OR "SCRAP FERROUS METAL ONLY"	Labelled designated bins will be provided when required	N
Timber untreated (including timber pallets)	All timber waste will be segregated and stored within the waste management area. Untreated timber may be recycled, whereas timber treated with arsenic must be sent to a regulated landfill. Timber will be re-used onsite and/or mulched onsite for rehabilitation purposes, where possible (when not treated with arsenic). Contracts with companies (for the supply of materials) will be established encouraging sustainable waste management practices. Contracts with companies will be established to encourage the opportunities for timber recycling. If the timber can no longer be re-used onsite it will be transported by a licensed contractor to a recycling facility	N/A for untreated Treated- Vehicle licensed to transport regulated waste to a regulated landfill	"UNTREATED TIMBER FOR RECYCLING" OR " CCA TREATED TIMBER (REGULATED WASTE)"	Skip bins	N

Waste	Treatment and/or disposal options	Regulatory requirements	Labelling	Waste Bin	SDS (Y/N)
Green Waste	Vegetation cleared on site will be re-used by mulching to aid site rehabilitation and erosion and sediment control following site earthworks. Soil stockpiles will be located within cleared areas and away from drainage lines	N/A	"GREENWASTE FOR REHAB ONLY"	N/A	N/A
High Density Polyethylene Pipe and lining	Off cuts of High Density Polyethylene (HDPE) pipe are generated during both construction and normal operations. Polyethylene pipe off cuts will be segregated from other waste streams in a clearly labelled skip bin to maximise storage potential. All HDPE pipe waste and lining waste will be segregated and stored within the waste management areas. These waste streams will be transported by a licensed contractor to a recycling facility.	Must be transported to the supplier if possible, or a facility licensed to recycle polyethylene pipes	"RECYCLABLE POLYETHYLENE PIPE OFFCUTS ONLY"	Skip bins	N
Fluorescent Lamps	Used lamps are to be stored in a clearly labelled fluorescent lamp recycling drums or the replacement tubes packaging and sent for recycling by a licensed contractor or return to the supplier where possible.	Must be transported to the supplier if possible, or a facility licensed to recycle fluorescent light bulbs. Vehicle must be licensed to transport regulated waste.	"SPENT FLOURESCENT LIGHT BULBS ONLY"	Labelled designated bins will be provided when required	Y
Tyres	Remove metal rims before stacking tyres together away from other waste. Metal rims sent to scrap metal storage area. Once skip has filled with tyres, they will be shredded onsite. Tyres contain approximately 75% void space and introduce safety hazards such as methane build up if not shredded.	Must be transported by a contractor licensed to transport regulated waste to a facility licensed to recycle used tyres	"RECYCLABLE TYRE WASTE ONLY"	Skip bins in a bunded regulated waste storage area	N

Appendix B: Document History

Summary of amendments includes only matters considered material. Changes to formatting of correction of typographical errors have been omitted.

Table 7: Document Revision History

Rev	Date	Details	Summary of key amendments
3	12/01/14	Approved for Use	Minor amendments to improve clarity of intent and corrections of typographical errors Addition of document reference numbers where absent 6.1 Air Quality 1.3: deleted 6.1 Air Quality 1.6: revised 6.3 Water Management: 3.4 deleted 6.3 Water Management: 3.7 deleted 6.3 Water Management: 3.11 revised to reflect self assessable codes 6.3 Water Management: 3.15 revised to reflect self assessable codes 6.3 Water Management: 3.18 deleted 6.3 Water Management: 3.30a new 6.3 Water Management: 3.32 revised 6.3 Water Management: 3.35 revised 6.3 Water Management: 3.37 revised 6.3 Water Management: 3.39 revised 6.3 Water Management: 3.48 revised 6.3 Water Management: 3.50, 3.50a revised 6.3 Water Management: 3.50c number added 6.3 Water Management: 3.51 deleted 6.3 Water Management: 3.52 deleted 6.4 Land Management: 4.13 deleted 6.4 Land Management: 4.28 revised 6.4 Land Management: 4.29 revised 6.5 Soil Management: 5.2 revised 6.5 Soil Management: 5.16 revised 6.5 Soil Management: 5.18 revised 6.6 Erosion and Sediment Control: 6.5 deleted 6.6 Erosion and Sediment Control: 6.7 revised 6.6 Erosion and Sediment Control: 6.22a revised 6.8 Dangerous Goods and Hazardous Materials: 8.11 revised 6.8 Dangerous Goods and Hazardous Materials: 8.27 revised

Rev	Date	Details	Summary of key amendments
			6.9 Waste Management: 9.10 revised 6.9 Waste Management: 9.13 revised 6.9 Waste Management: 9.13a revised 6.9 Waste Management: 9.17 revised 6.9 Waste Management: 9.18 revised 6.9 Waste Management: 9.50 deleted 6.10 Protection of Flora: 10.4 revised, removed delisted flora species 6.10 Protection of Flora: 10.6 deleted 6.10 Protection of Flora: 10.7 revised 6.10 Protection of Flora: 10.9a revised 6.10 Protection of Flora: 10.9a revised 6.10 Protection of Flora: 10.19 revised 6.10 Protection of Flora: 10.25 deleted 6.10 Protection of Flora: 10.32 revised 6.10 Protection of Flora: 10.33 revised 6.11 Protection of Fauna: 11.3 revised, removed delisted fauna species 6.11 Protection of Fauna: 11.10 revised 6.11 Protection of Fauna: 11.16 revised 6.11 Protection of Fauna: 11.17 revised 6.11 Protection of Fauna: 11.18 revised 6.11 Protection of Fauna: 11.40 revised 6.13 Weed Management: 13.14 revised 6.13 Weed Management: 13.18 revised 6.14 Reinstatement and Rehabilitation: 14.2a revised 6.14 Reinstatement and Rehabilitation: 14.10 revised 6.14 Reinstatement and Rehabilitation: 14.12 revised 6.14 Reinstatement and Rehabilitation: 14.13 revised 6.14 Reinstatement and Rehabilitation: 14.19 revised 6.14 Reinstatement and Rehabilitation: 14.29 revised 6.14 Reinstatement and Rehabilitation: 14.30 revised 6.14 Reinstatement and Rehabilitation: 14.31 revised 6.14 Reinstatement and Rehabilitation: 14.32 revised 6.14 Reinstatement and Rehabilitation: 14.42 revised 10 Incidents, Non-Conformances, Corrective and Preventive Actions: revised 13 Document References: Table 3 updated

Rev	Date	Details	Summary of key amendments
2	23/4/14	Approved for Use	2.2 Definitions: new 6.3 Water Management: Targets revised 6.3 Water Management: 3.6 revised to align with EA 6.3 Water Management: 3.9 deleted 6.3 Water Management: 3.13 revised to improve clarity 6.3 Water Management: 3.14-15 revised to reflect updated self assessable codes 6.3 Water Management: 3.17 revised to align with EA 6.3 Water Management: 3.19 revised to clarify staging requirements for ROW clearing in gathering implementation 6.3 Water Management: 3.21 revised to include provision for clean water passage through site 6.3 Water Management: 3.23 revised to provide clarity on requirements 6.3 Water Management: 3.24 revised to align with EA 6.3 Water Management: 3.23 revised to include sample collection 6.3 Water Management: 3.31-35 revised to align with EA 6.3 Water Management: 3.37 revised to include provision for clean water passage through site 6.3 Water Management: 3.42-43 revised to align with EA 6.3 Water Management: 3.48 new, includes exemption of CSG water from regulated waste requirements 6.3 Water Management: 3.50a revised to reflect exemption of CSG water from regulated waste requirements 6.3 Water Management: 3.50b new, includes exemption of CSG water from regulated waste requirements 6.3 Water Management: 3.54-57 new, added to align with EA 6.4 Land Management: 4.12 revised 6.4 Land Management: 4.18 revised 6.5 Soil Management: 5.1 revised to include additional document references 6.5 Soil Management: 5.5 revised to align with ESCP 6.5 Soil Management: 5.8 revised 6.5 Soil Management: 5.9 revised 6.5 Soil Management: 5.12 revised 6.5 Soil Management: 5.14 revised 6.5 Soil Management: 5.17 revised to align with EA and TI 6.5 Soil Management: 5.19 revised 6.5 Soil Management: 5.22 revised 6.5 Soil Management: 5.36 revised 6.6 Erosion and Sediment Control: 6.3 revised 6.6 Erosion and Sediment Control: 6.5 revised 6.6 Erosion and Sediment Control: 6.6 revised to align with EA 6.6 Erosion and Sediment Control: 6.12 revised

Rev	Date	Details	Summary of key amendments
			6.6 Erosion and Sediment Control: 6.18 revised 6.6 Erosion and Sediment Control: 6.24 revised 6.6 Erosion and Sediment Control: 6.27 revised 6.6 Erosion and Sediment Control: 6.30 revised 6.6 Erosion and Sediment Control: 6.33 revised 6.7 Fire Management: 7.15 revised 6.8 Dangerous Goods and Hazardous Materials: 8.1 revised to update document references 6.8 Dangerous Goods and Hazardous Materials: 8.9 revised 6.8 Dangerous Goods and Hazardous Materials: 8.10 revised to align with EA 6.8 Dangerous Goods and Hazardous Materials: 8.21 6.8 Dangerous Goods and Hazardous Materials: 8.25 revised to align with EA 6.8 Dangerous Goods and Hazardous Materials: 8.26 revised 6.9 Waste Management: Targets revised to align with EA 6.9 Waste Management: 9.4 revised to align with WMP 6.9 Waste Management: 9.12 revised to align with WMP 6.9 Waste Management: 9.13 revised to align with WMP 6.9 Waste Management: 9.13a new to align with WMP 6.9 Waste Management: 9.15 revised to reflect changes to internal regulated waste tracking and transport 6.9 Waste Management: 9.17a new to align with WMP 6.9 Waste Management: 9.18 revised 6.9 Waste Management: 9.19 revised to reflect changes to internal regulated waste tracking and transport 6.9 Waste Management: 9.20 revised to align with WMP 6.9 Waste Management: 9.30 revised to align with EA 6.9 Waste Management: 9.38 revised to align with EA 6.9 Waste Management: 9.43 revised to align with EA 6.9 Waste Management: 9.44 revised 6.10 Protection of Flora: 10.6 document reference updated 6.10 Protection of Flora: 10.9a revised 6.10 Protection of Flora: 10.14 revised 6.10 Protection of Flora: 10.16 revised 6.10 Protection of Flora: 10.26 revised 6.10 Protection of Flora: 10.27 revised 6.10 Protection of Flora: 10.33 revised to align with EA 6.10 Protection of Flora: 10.33a new to align with EA 6.10 Protection of Flora: 10.36 new to align with EPBC approval

Rev	Date	Details	Summary of key amendments
			6.11 Protection of Fauna: 11.1a new 6.11 Protection of Fauna: 11.3 revised 6.11 Protection of Fauna: 11.5 document reference updated 6.11 Protection of Fauna: 11.12 revised 6.11 Protection of Fauna: 11.13 revised 6.11 Protection of Fauna: 11.18 revised 6.11 Protection of Fauna: 11.18a new 6.11 Protection of Fauna: 11.39 revised 6.11 Protection of Fauna: 11.40 revised 6.13 Weed Management: 13.10 revised 6.13 Weed Management: 13.10a new 6.13 Weed Management: 13.12 revised 6.13 Weed Management: 13.15 revised 6.13 Weed Management: 13.19 revised 6.13 Weed Management: 13.26 revised 6.14 Reinstatement and Rehabilitation: 14.1a document reference updated 6.14 Reinstatement and Rehabilitation: 14.19 revised to align with EA 6.14 Reinstatement and Rehabilitation: 14.20 revised to reflect TI 6.14 Reinstatement and Rehabilitation: 14.21 revised 6.14 Reinstatement and Rehabilitation: 14.28 revised 6.14 Reinstatement and Rehabilitation: 14.30 revised 6.14 Reinstatement and Rehabilitation: 14.43 new 7.1 Hold Points: section renumbered 8 Technical Instructions and Environmental Procedures: new 10 Incidents, Non-Conformances, Corrective and Preventive Actions: whole section revised 13 Document References: Table 3 various document references updated
1	26/10/12	Approved for Use	Minor amendments to improve clarity of intent and corrections of typographical errors Addition of document reference numbers where absent Roles and Responsibilities: Australia Pacific LNG Environmental Representative altered 5.1 Air Quality: 1.2 amended 5.2 Noise and Vibration: Targets updated to reflect 5 December 2011 Condabri Environmental Authority 5.2 Noise and Vibration: 2.2 document reference update Australia Pacific LNG Noise Management Plan for the Gas Fields (Q-LNG01-15-MP-0085) 5.2 Noise and Vibration: 2.8 amended 5.3 Water Management : Targets updated to include site runoff quality limits 5.3 Water Management : 3.2 document reference update Australia Pacific LNG Land Release Management Plan (Q-LNG01-

Rev	Date	Details	Summary of key amendments
			15-MP-0354) 5.3 Water Management : 3.31a, 3.34 & 3.35 insertion of requirements for Contractor's Hydrotest Water management plan, update of requirements for hydrotest water management Hydrotest Water Treatment and Disposal 5.3 Water Management : Requirements for CSG water use, hydrotesting and trench dewatering updated 5.5 Soil Management: 5.17 added 5.6 Erosion and Sediment Control: 6.2 amended 5.6 Erosion and Sediment Control: 6.3 requirement for sediment basin dewatering procedure added 5.9 Waste Management: 9.12, 9.13 amended 5.10 Protection of Vegetation (Flora): 10.3 & 10.4 lists updated 5.10 Protection of Vegetation (Flora): 10.6 Nature Conservation Act 1992 Least Concern Plants Class Exemption (Q-LNG01-15-EA-0050) inserted 5.10 Protection of Vegetation (Flora):10.9a inserted 5.11 Protection of Vegetation (Fauna): 11.3 list updated 5.11 Protection of Vegetation (Fauna): 11.5 document references for Species Management Programs provided 5.11 Protection of Vegetation (Fauna): 11.10, 11.12 & 11.13 amended 5.13 Weed Management: 13.31 reporting period amended 5.14 Reinstatement and Rehabilitation: 14.1a inserted 5.14 Reinstatement and Rehabilitation: 14.2a inserted 5.14 Reinstatement and Rehabilitation: 14.13 amended to include inspection frequency 9.1 Reporting Non-conformances: amended
0	9/9/11	Approved For Issue	NA