

Framework Environmental Management Plans



Terrestrial environmental aspects of the Development will be managed primarily through the development and implementation of Environmental Management Plans (EMPs). A consolidated overarching Environmental Management Programme will be developed to bring together all the individual EMPs, in accordance with recognised standards and applicable Commonwealth and Western Australian legislation. The consolidated Environmental Management Programme will be submitted to the relevant authorities for approval prior to the commencement of works.

Offshore Environment Plans (EPs) follow different requirements to onshore EMPs as the former are drawn up in accordance with the Petroleum (Submerged Lands) (Management of Environment) Regulations 1999. An outline of the offshore EP requirements is included in **Appendix F**.

All EMPs will be drawn up in accordance with the management actions presented in **Table 13-1** of this Draft PER, and any ministerial conditions set as part of the approval process. The plans will describe the procedures proposed to prevent, monitor and manage possible environmental impacts.

Individual framework construction EMPs are presented in **Table G-1** to **Table G-17** and include the following:

- Sea Turtle Management Plan
- Marine Pest Management Plan
- Waste Water Management Plan
- Waste Management Plan
- Greenhouse Gas Management Plan
- Noise Management Plan
- Blasting Management Plan
- Erosion and Sediment Control Management Plan
- Groundwater and Surface Water Protection Plan
- Onshore Spill Response Plan
- Terrestrial Vegetation and Flora Management Plan
- Terrestrial Fauna Management Plan
- Weed Management Plan
- Dust Management Plan
- Cultural Heritage Management Plan
- Traffic Management Plan
- Rehabilitation Management Plan.

The framework EMPs for the construction phase will be developed further once detailed design information is available and the construction contractors are commissioned. The Greenhouse Gas Management Plan will be specifically developed for the operation phase and many of the plans, for example, the Waste Management and Cultural Heritage Management Plan, will be amended for operations. Framework plans are outlined in **Table G-1** to **Table G-17**.

Table G-1 Framework Sea Turtle Management Plan

Sea Turtle Management Plan Format	
Management Issues	<ul style="list-style-type: none"> • Vibration caused by terrestrial blasting may impact on development of turtle eggs at Holden Point beach. • Impacts from marine blasting may result in injury or mortality of foraging sea turtles in the vicinity • Impacts on sea turtles resulting from dredging and dredge spoil disposal. • Artificial lighting on nesting beaches can lead to reduced nesting attempts. Hatchlings will move towards these lights rather than the ocean.
Objectives	To minimise the impact of blasting activities, permanent structures, vessel movements and lighting on turtles including nesting and hatchling activity.
Performance Indicators	Performance indicators will be developed consistent with relevant regulatory, local and Development requirements.
Management Strategies	<p>A Blasting Management Plan will be developed and implemented (refer to Table G 7). This will include the following measures in relation to impacts on sea turtles from terrestrial blasting:</p> <ul style="list-style-type: none"> • Smaller, more frequent blasts will be planned using sequential explosive charges to minimise cumulative impacts of the explosions. • Blasting will only be undertaken during daylight hours. <p>The Blasting Management Plan will also include the following measures in relation to impacts on sea turtles from marine blasting:</p> <ul style="list-style-type: none"> • Marine fauna activities will be taken into consideration when blasting, drilling and/or dredging, especially during sensitive periods for fauna. • Procedures will be developed to ensure a marine mammal and sea turtle watch is maintained in the blast area before blasting activities commence. <p>A Dredging and Dredge Spoil Disposal Management Plan will be developed and implemented (refer to Appendix I). This will include the following measures in relation to sea turtles:</p> <ul style="list-style-type: none"> • Prior to commencement of dredging activities, the dredging contractor and crew will receive induction that describes the location of sensitive sea turtle habitat in relation to proposed dredging activities. • The use of sea turtle deflection devices will be considered for use on trailer suction hopper dredges. These devices are not considered feasible for application to cutter suction dredges. An alternative to turtle deflectors which will also be considered are jetting systems. These systems force water and marine fauna (in particular sea turtles) away from the drag head, thereby avoiding any direct contact. Upon commencement of dredging, the jetting system will be switched on, prior to engaging the dredge pumps. When the dredging operation stops, the dredging pumps will be switched off prior to switching off the jetting system. • Prior to commencement of sea disposal activities, the dredging contractor will check for the presence of marine mammals and sea turtles within 300 m radius of the dredge vessel. • Disposal activities may only commence if no marine mammals or sea turtles have been observed within 300 m of the dredge vessel for ten minutes immediately preceding commencement of disposal operations. • Should any marine mammals or sea turtles be observed within 300 m of the vessel prior to and during disposal activities, disposal activities must stop and may not recommence until <ol style="list-style-type: none"> i) the animal/s are seen to move >300 m from the vessel ii) the animals have not been seen for >20 minutes duration or iii) the vessel moves to a location >300 m from the observed animals. • The dredging contractor will document any incidents that occur during disposal operations that result in injury or mortality of marine mammals or sea turtles. Details of the incident including time and date of incident, cause of injury/ mortality and the species (if known) will be recorded and reported to the Department of Environment and Conservation and the Department of the Environment and Heritage. • Sightings of sea turtles will be maintained in the vessels daily log book. <p>Measures to reduce light emissions onto the beach to the west of Site A and onto the water from the standalone jetty will be implemented, as far as reasonably practicable. These measures may include:</p> <ul style="list-style-type: none"> • Minimising lighting to ALARP in nearshore areas while maintaining safe construction and operating conditions. • Minimising light spill, particularly where white lights such as fluorescent lights are used.
Monitoring	<p>The beach at Holden Point, Site A, will be monitored during the 2006 sea turtle nesting season (approximately December 2006 until April 2007) to assess the level of sea turtle nesting activity. Additional mitigation strategies will be developed, in consultation with the DEH and DEC, and included in the Sea Turtle Management Plan if monitoring results show there is significant turtle activity at the beach at Holden Point .</p> <p>Monitoring of the beach at Holden Point during construction in the turtle-nesting season for nests and hatchlings.</p>
Reporting	<ul style="list-style-type: none"> • Reports will be compiled on the number of turtles that nest on the beach west of Site A.

Table G-2 Framework Marine Pest Management Plan

Marine Pest Management Plan Format	
Management Issues	The potential for the introduction of marine pest species.
Objectives	To minimise introduction of pest species into marine waters.
Performance Indicators	Performance indicators will be developed consistent with relevant regulatory, local and Development requirements.
Management Strategies	<p>Application of the <i>Quarantine Act 1908</i> and Regulations 2000 (Cwth) and the AQIS ballast water management requirements for international shipping (July 2001) are a compulsory requirement for all vessels entering or leaving Australian waters. Where the potential risk is considered to be high, one or more of the following options for management of ballast water will be implemented:</p> <ul style="list-style-type: none"> • no discharge of 'high risk' ballast tanks in Australian waters • tank-to-tank transfers • full ballast water exchange at sea (that is, beyond 12 nm from the coastline). <p>Construction/installation vessels, including dredges, considered high risk with an overseas last port of call will be inspected prior to arriving on site. Inspections will include a focus on residual sediment on dredges and flotsam in the well around the cutter boom and head of cutter section dredges or ballast tanks.</p> <p>Undertake further investigation of marine pests during the operational stages of the Development.</p>
Monitoring	Monitoring of the Marine Pest Management Plan will be undertaken against key performance indicators.
Reporting	Reporting procedures consistent with regulatory, local and Development requirements will be developed.

Table G-3 Framework Waste Water Management Plan

Waste Water Management Plan Format	
Management Issues	The discharge of waste water may result in marine physical and ecological effects including reduced water quality and toxicity effects to marine biota.
Objectives	To comply with applicable legislation and guidelines. To minimise the potential for adverse impacts on water quality.
Performance Indicators	Performance indicators will be developed consistent with relevant regulatory, local and Development requirements
Management Strategies	<ul style="list-style-type: none"> • The residual total hydrocarbon in water concentration of waste water discharge will be less than 5 mg/l as an annual average for water discharged to Mermaid Sound. • Other measures employed to reduce the potential for environmental impact associated with waste water disposal are process design, procedures for chemical selection, dosing rates and operational maintenance and control of production equipment. • Woodside will put in place reduction targets and mitigation measures should the results of monitoring and/or investigations indicate a potential or actual unacceptable impact. • Pluto treated waste water composition will be determined and Whole Effluent Toxicity (WET) testing will be undertaken as soon as first water becomes available and periodically thereafter. Routine monitoring to ensure discharged waste water meets specified criteria. • Construction amenities will be regularly inspected and maintained, and effluent will be disposed of offsite at an appropriate facility. • During operation, approved sewage systems will be provided at Site B. • An appropriate monitoring and maintenance schedule for the sewage treatment system at Site B will be developed and implemented. • The oil-in-water meter will be regularly tested and calibrated as per acceptable standards to ensure its accuracy. • The concentration of total hydrocarbon in waste water discharged to Mermaid Sound will be measured daily. • A contingency plan will be developed to manage waste water in cases where unexpected volumes and/or quality of waste water are produced.
Monitoring	<p>Monitoring of waste water will occur at source prior to commingling and at the discharge point. Waste water will be monitored in accordance with regulatory requirements.</p> <p>A comprehensive monitoring programme will be put in place to confirm the prediction of no significant impact to nearshore communities and to ensure contaminants are not bio-accumulated by marine organisms. This will include agreed 'trigger values' for initiation of further studies and remedial actions as necessary.</p> <p>Monitoring will confirm that a high level of ecological protection is being achieved at the edge of the agreed mixing zone. The concentration of total hydrocarbon in waste water discharged to Mermaid Sound will be measured daily.</p> <p>Routine monitoring to ensure treated waste water meets the Environmental Quality Management Framework (EQMF) social use values at end of pipe or within a distance, from point of discharge, agreed with the relevant authorities.</p>
Reporting	Reporting procedures consistent with regulatory, local and Development requirements will be developed.

Table G-4 Framework Waste Management Plan

Waste Management Plan Format	
Management Issues	<p>Waste will comprise the following main streams:</p> <ul style="list-style-type: none"> • Solid waste including earth works (construction phase only), domestic and green waste. • Liquid waste, including sanitary wastewater. • Hazardous waste, for example, insoluble salts, used oils and greases. <p>Waste, if inappropriately managed, has the potential to contaminate groundwater and surface water and pose a risk to human health.</p>
Objectives	<p>To minimise environmental impacts associated with waste generation.</p> <p>Maximise waste reduction, recycling, reuse and recovery.</p> <p>Compliance with the <i>Environmental Protection Act 1986 (WA)</i> and <i>Health Act 1911 (WA)</i> (Part IV).</p> <p>To minimise impacts on existing waste facilities.</p>
Performance Indicators	<p>Performance indicators will be developed consistent with relevant regulatory, local and Development requirements.</p>
Management Strategies	<ul style="list-style-type: none"> • Implementation of waste hierarchy: reduce, reuse, recycle and recover waste. • Inductions will provide details on waste management requirements for all waste streams. • Recycling bins will be located in strategic locations around site to facilitate segregation of waste, diverting recyclable solid waste streams from landfill. • All domestic waste will be stored in clearly marked skips and waste containers will be provided through out construction and operational sites. • Green waste will be segregated from other waste streams. The material will be mulched and reused on site if practicable. • Excavated soil will be either stored within the site boundary to enable reuse, reused locally where possible or disposed of at a 'clean fill' area at a licensed landfill facility. • Waste reduction at source will be included in tenders for supply and construction contractors. • Contractors will be required to place a high emphasis on housekeeping and all work areas will be required to be maintained in a neat and orderly manner. • All hazardous waste materials will be documented and tracked, segregated from other waste streams and stored in suitable containers. • All hazardous materials will be handled and stored in accordance with the corresponding MSDS and Australian Standards. • Hazardous materials storage facilities and handling equipment will be designed and constructed to prevent and contain spills. • Recyclable hazardous wastes will be segregated from other waste materials while non-recyclable hazardous wastes will be disposed of at an approved facility. • Appropriate controls on the AOCWS to enable isolation of spill events to prevent contamination of large volumes of liquid, and facilitating extraction of specific contaminated liquids.
Monitoring	<p>Undertake visual inspections for litter/general waste (and clean up if required).</p> <p>Inspect waste storage and disposal facilities to ensure they are functioning effectively.</p>
Reporting	<p>Waste inventory catalogue held on file documenting disposal volumes and types and disposal locations.</p> <p>Reporting procedures consistent with regulatory, local and Development requirements will be developed.</p>

Table G-5 Framework Greenhouse Gas Management Plan

Greenhouse Gas Management Plan Format	
Management Issues	<p>Release of greenhouse gases from the Development may contribute to the greenhouse effect.</p> <p>Minimisation of greenhouse gas release will minimise loss of gas and improve plant efficiency.</p>
Objectives	<p>Reduce venting, flaring and combustion of hydrocarbons to as low as reasonably practicable.</p>
Performance Indicators	<p>Performance indicators will be developed consistent with relevant regulatory, local and Development requirements</p>
Management Strategies	<p>Ensure greenhouse gas and energy efficiency of design by:</p> <ul style="list-style-type: none"> • Inclusion of greenhouse gas emissions in all key design decisions and technology selections where relevant. • Energy efficiency review of the design • Maximising facility reliability, thereby reducing the likelihood that gas will require flaring due to process upset. <p>Ensure efficient operation of the Pluto LNG Development by:</p> <ul style="list-style-type: none"> • Minimising venting and flaring of hydrocarbons and fuel gas consumption by using procedural solutions to reduce venting, flaring and combustion of hydrocarbons to as low as reasonably practicable. • Minimising releases by ensuring equipment is correctly maintained.
Monitoring	<p>Monitor and report emissions and periodically assess opportunities to further reduce greenhouse gas emissions over time. Information obtained will be used to enable reporting of emissions, performance reviews and setting reduction targets in line with Woodside's corporate initiatives.</p>
Reporting	<p>Greenhouse gas quantities emitted will be reported to Woodside for inclusion in the Woodside's Greenhouse Challenge reporting procedures and in Woodside's public Health, Safety, Environment and Community Report.</p>

Table G-6 Framework Noise Management Plan

Noise Management Plan Format	
Management Issues	<p>Noise during construction will be highly variable. Due to the distance from residential areas, noise impacts on the local community are not expected to occur.</p> <p>Noise from the construction phase of the Development will be generated by:</p> <ul style="list-style-type: none"> • general civil or earthworks operations • blasting • construction works on site • traffic of vehicles, excavators and other machinery. <p>The following noise sources will dominate received noise levels during the operation phase:</p> <ul style="list-style-type: none"> • compressor suction • discharge and recycle piping • air coolers.
Objectives	<p>To minimise the impacts of noise on the amenity of the surrounding areas during the construction and operation phases of the Development to ALARP</p> <p>Construction activities undertaken in accordance with AS 2436-1981 'Guide to Noise Control on Construction, Maintenance and Demolition sites'.</p> <p>Construction activities undertaken in accordance with Western Australia's Environmental Protection (Noise) Regulations 1997.</p>
Performance Indicators	<p>Noise levels close to 45 dBA at the Hearson Cove beach shelter.</p> <p>No noise complaints lodged.</p>
Management Strategies	<p>Construction</p> <p>For construction work outside the hours of 7am to 7pm, and for Sundays and public holidays, Woodside will:</p> <ul style="list-style-type: none"> • Advise all nearby occupants or other sensitive receptors who are likely to receive noise levels which fail to comply with the standard under Regulation 7, of the work to be done at least 24 hours before it commences. • Submit a Noise Management Plan to the EPA at least seven days before the commencement of construction, with the plan requiring approval by the CEO. <p>A Traffic Management Plan (Table G-16) will be developed and implemented to control vehicle operations and potential impacts on human receptors.</p> <p>Operation</p> <ul style="list-style-type: none"> • Measures to be considered include low noise air-cooling fans and acoustic lagging on compressor suction, discharge and recycle piping. • Detail design will ensure noise levels from flaring are below the Woodside absolute standard for noise emissions of 115 dB(A) at ground level. • Minimising flaring of hydrocarbons by using procedural solutions to reduce flaring to as low as reasonably practicable.
Monitoring	Maintain and monitor the noise control strategies to determine effectiveness.
Reporting	Develop reporting procedures consistent with regulatory, local and Development requirements.

Table G-7 Framework Blasting Management Plan

Blasting Management Plan Format	
Management Issues	<p>Blasting on the site has the potential to result in:</p> <ul style="list-style-type: none"> • increased dust emissions • unacceptable noise levels • restriction of public access to surrounding areas • vibration • behavioural changes, physical injuries or mortality to terrestrial and marine fauna.
Objectives	<p>To ensure the safety of construction personnel and members of the general public during blasting operations.</p> <p>To minimise the noise and vibration impacts associated with blasting.</p> <p>To minimise impacts to terrestrial and marine fauna.</p> <p>To comply with Western Australia's Environmental Protection (Noise) Regulations 1997.</p> <p>To comply with AS 2187.2-1983.</p> <p>Comply with <i>Explosives and Dangerous Goods Act 1961</i> (WA), the Explosives and Dangerous Goods (Dangerous Goods Handling and Storage) Regulations 1992 and Explosives and Dangerous Goods (Explosives) Regulations 1963.</p>
Performance Indicators	<p>No risk of exposure to public during blasting activities, including no public access to beach west of Site A.</p> <p>No complaints in relation to noise, dust and vibration.</p> <p>No terrestrial fauna, seabird, sea turtle or marine mammal injury or mortality.</p>
Management Strategies	<p>Measures to mitigate impacts on the terrestrial environment from blasting activities which will be determined by the blasting contractor may include:</p> <ul style="list-style-type: none"> • Explosives will be used in a manner that will minimise damage or defacement of landscape features and other surrounding objects including the following practices: <ul style="list-style-type: none"> – increasing the depth of material cover – the use of blankets to minimise upward release of energy and fly rock – optimising charge sizes and spacings to avoid unnecessary energy releases. • Blasting will be scheduled for daylight hours to avoid impacts during peak activity times (dusk, night, dawn) for nocturnal fauna. • Use of sirens and signage to inform construction personnel and members of public that blasting will take place. • Public access to the beach at Site A will be restricted during blasting activities. Warning signs will be placed on the beach, and an observer will monitor the beach from a safe location (either on the beach or a nearby boat) to prevent boats landing or to stop blasting until the beach is cleared. • Blasting will only be used where absolutely necessary and will be carried out in a manner to reduce noise disturbance to a minimum. • Use of explosives will be restricted to authorized personnel who have been trained in their use. • Local residents near the trunkline corridor will be notified of construction activities in advance. <p>Measures specific to mitigate impacts on the marine environment from blasting may include:</p> <ul style="list-style-type: none"> • Marine fauna activities will be taken into consideration when blasting, drilling and/or dredging, especially during sensitive periods for fauna. • Procedures will be developed to ensure a marine mammal and sea turtle watch is maintained in the blast area before blasting activities commence. • To minimise injury to seabird species dead fish on the surface of the water after a blast will be collected to prevent bird injuries or mortality from successive blasts. <p>A Noise Management Plan (Table G-6) will be developed and implemented.</p>
Monitoring	Monitoring of the Blasting Management Plan will be undertaken against key performance indicators.
Reporting	Reporting procedures consistent with regulatory, local and Development requirements will be developed.

Table G-8 Framework Erosion and Sediment Control Management Plan

Erosion and Sediment Control Management Plan Format	
Management Issues	<p>Erosion may occur as a result of:</p> <ul style="list-style-type: none"> • vegetation clearing • earthmoving activities • wind or water action on cleared areas and/or stockpiles • alteration of existing drainage patterns <p>Sedimentation could occur in drainage lines as a result of:</p> <ul style="list-style-type: none"> • vegetation clearing • earthmoving activities • blasting • run-off during wet periods.
Objectives	<p>To ensure that the effects of erosion and sedimentation on the environment and biological communities are minimised.</p> <p>Minimise soil disturbance, degradation and erosion.</p> <p>Minimise turbidity impacts on marine and surface waters.</p> <p>Compliance with <i>Soil and Land Conservation Act 1945</i> (WA).</p>
Performance Indicators	<p>No accelerated erosion and run-off during and post construction works.</p> <p>No visible increase in turbidity of marine or surface waters.</p>
Management Strategies	<ul style="list-style-type: none"> • The total area to be disturbed will be restricted to the minimum area required for the Development. • Runoff control measures will be implemented. • Sediment/silt fences will be installed to trap sediment runoff downstream of construction areas. • Stormwater drainage will be installed at all major storm water outlets within Site B and A. • Movement of vehicles will be restricted to designated roads/tracks, and will adhere to onsite speed limits. • Where installation of sediment traps is not possible, provide temporary sediment control, such as silt fences or interceptor ditches. • Erosion and sediment control structures will be routinely inspected and maintained to ensure they remain effective, including the removal of accumulated silt as required. • Minimise steepness and length of slope of created landforms. • Areas susceptible to slope instability will be stabilised. • Provide adequate drainage system for permanent hard standing. • A Rehabilitation Management Plan (Table G-17) will be developed and implemented.
Monitoring	<p>Visual monitoring of all sites and access routes to be undertaken.</p> <p>Monitoring of the effectiveness of sedimentation and dust control measures undertaken regularly during and post construction works.</p>
Reporting	<p>Reporting procedures consistent with regulatory, local and Development requirements will be developed.</p>

Table G-9 Framework Groundwater and Surface Water Protection Plan

Groundwater and Surface Water Management Plan Format	
Management Issues	<p>Impacts from a reduction in groundwater and surface water quality and quantity may occur as a result of:</p> <ul style="list-style-type: none"> • vegetation and soil disturbance during construction • interruption of drainage lines • groundwater interception • leakage and spillage from fuel and chemical storage, handling and distribution systems during construction and operation • sewage and grey water disposal from onsite facilities • disposal of hydrotest water during operations • contaminated stormwater runoff • disturbance of acid sulfate soils (if they exist) • pressure on potable water supplies.
Objectives	<p>To maintain the existing quality of water resources.</p> <p>To minimise the potential for ground and surface water contamination.</p> <p>To minimise pressure on existing water resources.</p> <p>Compliance with relevant legislation, including meeting ANZECC guideline criteria.</p>
Performance Indicators	No measurable changes to downstream water quality during construction and operation.
Management Strategies	<ul style="list-style-type: none"> • Hierarchical drainage water management system designed to segregate clean water and treat potentially contaminated water. • Strict storage procedures will be maintained for environmentally hazardous materials. • Strict procedures will be implemented to prevent the leaks or spills of hydrocarbons. • Measures will be employed to reduce the risk of flooding such as bunding or raising of site elevation. • Consideration will be given to treatment of surface water runoff through sediment or evaporation ponds for nutrient removal via bioremediation of waters. • Where considered necessary, re-vegetation of bare soil embankments with suitable native species will be undertaken to reduce erosion and exposure of bare soils. • Should detailed geotechnical investigations and further desktop assessment indicate that Acid Sulphate Soils (ASS) are likely to be present within the Development area, a site investigation will be conducted to consider the specific location or locations of disturbance; the nature of disturbance; volume of material to be disturbed and maximum depth of disturbance. • Unnecessary soil compaction and vegetation removal will be avoided to reduce surface flows from site. • Should further desktop ASS assessment and any follow up investigations indicate that ASS are present, then a detailed ASS Management Plan will be developed, which will include measures to eliminate the potential impacts of ASS. • Chemicals used as inputs into the hydrotest water will be chosen to ensure that the most appropriate environmental and technical solutions are achieved for the Development. • A Pipeline Flooding and Hydrotesting Procedure and a Pipeline Pre-commissioning Procedure will be developed. • Ensuring use of water for hydrotesting, dust suppression, potable supplies is correctly permitted and approved. <p>An Erosion and Sediment Control Plan will be developed and implemented as per Table G-8.</p> <p>An Onshore Spill Response Plan (Table G-10) will be developed and implemented.</p> <p>A Waste Water Management Plan (Table G-3) will be developed and implemented, and will include the separation of contaminated stormwater and the appropriate disposal of sewage and grey water.</p>
Monitoring	<p>A water monitoring programme will be developed and implemented at Site B and Site A.</p> <p>Determine depths to groundwater from geotechnical investigations and design a monitoring program accordingly.</p>
Reporting	Reporting procedures consistent with regulatory, local and Development requirements will be developed.

Table G-10 Framework Onshore Spill Response Plan

Spill Protection and Response Plan Format	
Management Issues	Accidental spills have the potential to contaminate groundwater and surface water and pose a risk to human health.
Objectives	<p>To ensure effective management measures are deployed in the event of a spill.</p> <p>Minimise impacts on soils, surface and groundwater.</p> <p>Compliance with the <i>Environmental Protection Act 1986</i> (WA), Environmental Protection (Unauthorised Discharges) Regulations 2004 and <i>Health Act 1911</i> (WA) (Part IV and IV).</p>
Performance Indicators	Performance indicators will be developed consistent with relevant regulatory, local and Development requirements
Management Strategies	<ul style="list-style-type: none"> • Site inductions prior to construction activities will include correct materials handling procedures, spill management and spill response procedures. • Prior to the commencement of construction activities, appropriate and specific strategies and actions will be identified for spill events. Responsibilities for action, notification and reporting will also be identified. • Appropriate equipment, such as spill clean up kits and Material Safety Data Sheets, will be available onsite in easily accessible locations. • Spills will be cleaned up immediately to avoid contamination. • Fuel and chemical storage and handling (including refuelling) areas will be regularly inspected. • Vehicles and equipment will be appropriately maintained. • Notification of appropriate authorities and compliance with reporting requirements in the event of a spill.
Monitoring	Monitoring of the effectiveness of spill contingency measures undertaken regularly during and post construction works.

Table G-11 Framework Terrestrial Vegetation and Flora Management Plan

Vegetation and Flora Management Plan Format	
Management Issues	<p>Construction activities have the potential to negatively impact on terrestrial vegetation and flora by:</p> <ul style="list-style-type: none"> permanently removing or temporarily disturbing native vegetation disturbing significant vegetation communities and habitats either directly or indirectly through off-site impacts removing or disturbing Priority 3 flora species introducing and/or spreading weed species (refer to Table G-13).
Objectives	<p>To minimise the amount of vegetation that is permanently cleared.</p> <p>To minimise the effects of construction on Priority flora species.</p> <p>To prevent disturbance of vegetation and flora adjacent to work areas.</p>
Performance Indicators	No disturbance to vegetation outside of the approved construction area.
Management Strategies	<ul style="list-style-type: none"> Pluto LNG Development design will avoid significant vegetation communities and habitats wherever possible. The working area will be clearly marked on all construction drawings and physically flagged on the ground to ensure only the minimum area required is cleared The boundaries of the working area will be verified by an environmental advisor prior to the works to ensure that significant vegetation communities and habitat are avoided as intended in the design. Vegetation communities of conservation significance in proximity to working areas will be clearly marked and access to these areas will be prohibited. Access for vehicles and machinery will be along designated access tracks and parking areas. The DEC will be consulted regarding the development of suitable management procedures for Priority flora. All personnel will be required to undertake an induction which will include details on the importance of vegetation and flora protection. <p>Dust control measures will be incorporated into the Dust Management Plan (refer to Table G-14).</p> <p>Fire control measures will be incorporated into the Vegetation and Flora Management Plan.</p> <p>A Rehabilitation Management Plan will be developed and implemented as given in Table G-17.</p> <p>A Weed Management Plan will be developed and implemented as per Table G-13.</p>
Monitoring	Visual and photo monitoring of vegetation disturbance adjacent to the working areas and close to high conservation areas (including Priority flora and drainage lines) will be undertaken during clearing and construction.
Reporting	Reporting procedures consistent with regulatory, local and Development requirements will be developed.

Table G-12 Framework Terrestrial Fauna Management Plan

Fauna Management Plan Format	
Management Issues	<p>Construction activities have the potential to impact on terrestrial fauna by:</p> <ul style="list-style-type: none"> increasing activity levels, vehicle movement, noise and dust habitat removal and fragmentation capture in open excavations introduction and spread of introduced species and diseases.
Objectives	<p>To minimise impacts on terrestrial fauna and habitats.</p> <p>To minimise impacts on fauna species of conservation significance.</p> <p>To minimise death of fauna as a result of capture in open excavations or vehicle strike.</p> <p>To prevent the spread of introduced species.</p>
Performance Indicators	No disturbance of habitats outside of the approved working areas.
Management Strategies	<ul style="list-style-type: none"> Inductions will provide details on terrestrial fauna management requirements. The working area will be clearly marked on all construction drawings and physically flagged on the ground to ensure only the minimum area required is cleared. The boundaries of the working area will be verified by an environmental advisor prior to the works to ensure that sensitive fauna habitats are avoided as intended in the design. Vegetation clearance during trunkline construction is undertaken in a manner designed to allow fauna to move away from the site. Traffic is kept to designated tracks and drivers will abide by the allocated speed limit to minimise fauna fatality or injury by moving vehicles (Table G-16). All domestic animals will be prohibited from the Development area. Measures will be in place to protect the Pilbara olive python, including relocation of Pilbara olive pythons found during earthworks by trained handlers. <p>A Sea Turtle Management Plan (Table G-1) will be developed and implemented.</p>
Monitoring	<p>Inspections of open excavations to remove trapped fauna.</p> <p>Monitoring of habitat disturbance in and adjacent to the working areas will be undertaken for the duration of the works.</p> <p>Sightings of threatened species will be recorded.</p> <p>Inspections for introduced animals will be undertaken, and observations will be reported to the Site Supervisor. Follow-up actions will be recorded.</p>
Reporting	Reporting procedures consistent with regulatory, local and Development requirements will be developed

Table G-13 Framework Weed Management Plan

Weed Management Plan Format	
Management Issues	The use of earthmoving equipment, vehicles, and construction materials from elsewhere in the region and Australia has the potential to introduce weeds and exotic species that currently do not occur in the area. Vegetation clearing and soil disturbance creates suitable conditions for the establishment and spread of weed species. Once weed species become established they compete with native vegetation and they may adversely affect native fauna.
Objectives	To prevent the introduction and spread of weed species.
Performance Indicators	No new weed species introduced into the Development area. No spread of existing weed species into new areas from the Development area.
Management Strategies	<ul style="list-style-type: none"> Identify and assess controllability of existing weed infestations. Establish and maintain plant, vehicles and equipment hygiene to prevent introduction and transfer of weeds. Monitor weeds during site preparation works/construction and operations. Implement weed control methods to manage any new weed infestations during construction and operations, where they can be effectively controlled. Organic packaging material will be checked, removed and sent to an approved facility for disposal. Construction workforce will be trained in weed identification and awareness. Systems will be established for reporting of new weed infestations.
Monitoring	A weed monitoring and treatment programme will be implemented prior to the commencement of construction activities and will continue for the duration of the Development. The programme will identify appropriate treatment and control techniques for weed species encountered in the Development area. Regular inspections of vehicles, equipment, construction materials and fill will be undertaken to monitor the success of preventative measures. Carry out periodic weed inspections.
Reporting	Reporting procedures consistent with regulatory, local and Development requirements will be developed.

Table G-14 Framework Dust Management Plan

Dust Management Plan Format	
Management Issues	<p>During construction works dust will be generated as a result of:</p> <ul style="list-style-type: none"> vehicular movements on unsealed roads/tracks clearing of vegetation earthmoving activities vehicle movements on unsealed tracks drilling and blasting operation of mobile crushing plant machinery operating along the gas export trunkline construction corridor wind action on cleared areas and/or stockpiles. <p>Dust emissions may adversely affect vegetation and fauna, human health and safety, and public amenity. Erosion may increase dust generation and the impacts described above.</p>
Objectives	To ensure that the effects of dust generation on the environment and communities are minimised.
Performance Indicators	No complaints lodged. No visible dust crossing site boundaries.
Management Strategies	<ul style="list-style-type: none"> The area disturbed will be the minimum required for construction. Exposed surfaces such as stockpiles and cleared areas, and the duration that these areas are exposed, will be minimised. Dust suppression techniques and/or watering of unsealed roads, access routes, exposed ground surfaces and stockpiles will be implemented. General housekeeping practices will be undertaken to ensure there is no accumulation of waste materials, within the construction area, that may generate dust. Rehabilitation of vegetation will be undertaken in temporarily disturbed areas to minimise dust generation. During the site induction the workforce will be made aware of dust generation and control measures. Ensure that vehicles, machinery and loads are properly maintained and covered to minimise dust emissions. The construction contractor will be made aware of the requirements to minimise ambient dust levels. <p>A Rehabilitation Management Plan will be developed and implemented (Table G-17).</p> <p>A Traffic Management Plan (Table G-16) will be developed and implemented which will ensure stringent controls on vehicle speeds and restricting travel to designated roads/tracks during construction activities.</p>
Monitoring	Visual monitoring of all sites and access routes and construction sites to be undertaken. Monitoring of the effectiveness of erosion control measures to be undertaken regularly during and post construction works.
Reporting	Reporting procedures consistent with regulatory, local and Development requirements will be developed.

Table G-15 Framework Cultural Heritage Management Plan

Cultural Heritage Management Plan Format	
Management Issues	Loss or impairment to existing Aboriginal heritage assets through disturbance to Aboriginal heritage sites.
Objectives	<p>Identify all Aboriginal heritage sites through archaeological and anthropological heritage surveys with relevant Traditional Owners.</p> <p>Use the results of the heritage surveys to design footprint that will avoid damage to cultural heritage sites as far as possible.</p> <p>Manage and minimise the disturbance of environments that are of cultural significance.</p> <p>Comply with the <i>Aboriginal Heritage Act 1972 (WA)</i>.</p>
Performance Indicators	<p>No disturbance/inadvertent intrusion to cultural heritage sites and objects outside the Development area.</p> <p>Provide effective permanent protection and management for preserved cultural heritage sites.</p>
Management Strategies	<p>A detailed Cultural Heritage Management Plan (CHMP) will be developed and implemented in consultation and collaboration with Indigenous groups and the State Government.</p> <ul style="list-style-type: none"> • Disturbance to sites will be minimised as far as possible. Where disturbance to sites cannot be avoided, archaeological material will be relocated to designated conservation areas wherever practicable; site destruction is always a last resort. • Any proposed disturbance to cultural heritage sites will be subject to application under Section 18 of the Aboriginal Heritage Act. • Aboriginal sites near work areas will be managed to prevent avoidable impact. • A cultural heritage induction be included within the Pluto LNG Development site access inductions. • Initial site preparation works will be monitored by Aboriginal representatives. • Any archaeological discoveries during site preparation work will be reported to the regulatory authority in accordance with reporting and mitigation measures identified in the CHMP, state government policy and the expectations of the Indigenous groups. • Indigenous representatives will be involved in all stages of mitigative relocation. • Access to conservation areas by Indigenous groups will be maintained, subject to operational and occupational health, and safety constraints.
Monitoring	<p>Monitoring of the CHMP implementation will be undertaken against key performance indicators identified in the CHMP.</p> <p>Monitoring of the activities and impact of the site preparation workforce on the social and cultural environment will be undertaken.</p> <p>Archaeologists and representatives from relevant Indigenous Groups to monitor ground disturbance associated with laying the trunkline.</p>
Reporting	<p>Archaeological and ethnographic heritage survey reports and site records prepared will be submitted to DIA and Indigenous groups.</p> <p>Any archaeological discoveries during earthworks will be reported to the regulatory authority in accordance with reporting and mitigation measures identified in the CHMP, State Government policy and the expectations of the Indigenous groups.</p> <p>Initial ground disturbance will be monitored by representatives from the Indigenous groups of the area and archaeologists.</p>

Table G-16 Framework Traffic Management Plan

Traffic Management Plan Format	
Management Issues	Road closures due to transport of construction components and trunkline construction. Delays to emergency vehicles during construction phase. Increased traffic volumes on road network during construction and operation phases. Structural damage to municipal roads from heavy vehicle movements. Excess levels of dust produced from heavy vehicle movement. Threat to terrestrial fauna from increased vehicle movements. Impacts from increased noise levels from vehicle movements.
Objectives	To ensure site traffic is managed in such a way so as not to adversely impact on community, road users, road infrastructure and sensitive habitats. To minimise dust generation through traffic movements.
Performance Indicators	No complaints lodged. Zero-incidents safety record.
Management Strategies	<ul style="list-style-type: none"> • Emergency access will be provided for at all times. • Identify existing traffic volumes on the public road network. • Determine the traffic flow as a result of construction activities. • Identify construction periods which will result in lessened impact on existing public road network traffic. • Monitor the impact of heavy vehicles on the public road network. • Identify the location of truck lay-up areas to be used outside of their usage periods. • Advise on the access restrictions imposed on each vehicle type. • Provide nominated personnel responsible for each traffic management activity. • Assessment of intersections suitable for the movement of pre-assembled units and provision of advice on changes to accommodate these. • The coordination of all activities on the road network with Main Roads WA and the Shire of Roebourne. • Transport slow moving heavy machinery and vehicles to site outside of road network peak periods. • Internal site traffic will be restricted to designated routes to maximise the safety potential and reduce the likely impact on the natural environment. • A speed limit of 40 km/hr on access roads, 10 km/hr within the site, and 5 km/hr will be implemented when passing personnel. <p>A Dust Management Plan (Table G-14) will be developed and implemented. A Terrestrial Fauna Management Plan (Table G-12) will be developed and implemented. A Noise Management Plan (Table G-6) will be developed and implemented.</p>
Monitoring	Monitor the impact of heavy vehicles on the road network.
Reporting	Reporting procedures consistent with regulatory, local and Development requirements will be developed.

Table G-17 Framework Rehabilitation Management Plan

Traffic Management Plan Format	
Management Issues	Successful regeneration of mangroves. Effective rapid rehabilitation strategies are required to stabilise and restore the land following construction activities so that erosion and establishment of weed species are prevented.
Objectives	To maximise rehabilitation success, by: <ul style="list-style-type: none"> • Minimising the effects of vegetation clearance. • Ensuring that the area is suitably rehabilitated with reference to the control of erosion and sedimentation.
Performance Indicators	Rehabilitation work commenced immediately following construction activities. Soils stabilised prior to the wet season.
Management Strategies	<ul style="list-style-type: none"> • A site specific rehabilitation strategy will be developed prior to the commencement of construction activities. The strategy will include a rehabilitation timetable and rehabilitation methods proposed for each aspect of the Development. The following are examples of actions that will be included in the strategy: <ul style="list-style-type: none"> – Rehabilitation and stabilisation will be undertaken following completion of the construction activities. – Vegetative matter and topsoil cleared from the working areas will be stockpiled for use in rehabilitation.
Monitoring	Rehabilitation works will be monitored following completion of construction activities.
Reporting	Reporting procedures consistent with regulatory, local and Development requirements will be developed.