Section 18

# ENVIRONMENTAL MANAGEMENT

# 18. Environmental Management

## 18.1 Approach

This Environmental Management Plan (Planning) (EMP(P)) was developed to provide advice on the environmental measures to be considered and included during the design, construction and operation of the Project. The EMP(P) provides a common approach to environmental management issues and sets the underlying requirements for further environmental management.

The EMP(P) is based on information about the existing environment, potential impacts and proposed mitigation measures from each of the EIS chapters.

## 18.2 Structure of the EMP

The EMP provides:

- An outline of statutory obligations;
- The reporting and administrative protocols to ensure the management strategies and monitoring program are implemented;
- Sustainability planning;
- Environmental management strategies to minimise potential environmental impacts;
- An outline of a recommended environmental monitoring program; and
- Details of the corrective and non-conformance procedures to be employed.

## 18.3 Statutory Obligations

The EIS and EMP have considered the implications of environmental impacts of the Project under various Commonwealth, state and local government legislation, guidelines and policy.

The Proponent must comply with the general environmental duty not to undertake activities that cause or are likely to cause environmental harm unless all reasonable and practical measures are taken to prevent or minimise the harm (s319, EP Act). There is also a duty on all persons to notify of any actual or threatened serious or material environmental harm that becomes known during the design, construction or operation phases (s320, EP Act). All people involved in the delivery of the Project must adhere to these overriding duties.

Section 17 outlines the legislation relevant to the environmental management of the Project. Table 18-1 outlines a number of standards, guidelines and policies that may be relevant to the environmental management of the Project.

Prior to any construction works being undertaken, appropriate approvals must be obtained.

**Table 18-1: Standards, Guidelines and Policies that may be relevant to the Environmental Management of the Project**

| Issue | Standard/Reference |
|---|---|
| Air quality | AS 3580–Methods for sampling and analysis of ambient air<br>EPA Air Measurement Manual 1997 |
| Noise and vibration | AS 1055.1/2–Acoustics–description and management of environmental noise<br>AS 1259–Sound level meters<br>AS 2436–Guide to noise control on construction, maintenance and demolition sites<br>AS 2659.1–Guide to the use of sound measuring equipment – portable sound level meters<br>AS 2702 – Acoustics – methods for measurement of road traffic noise<br>EPA Noise Measurement Manual 2000 |
| Soil | AS 4479.1 Analysis of soils–Part 1: pre-treatment of potentially contaminated soil samples for heavy metal and metalloids analysis<br>AS 4482.1 Guide to the sampling and investigation of potentially contaminated soil–Part 1: non-volatile and semi-volatile compounds<br>Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland 1998<br>Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils in Queensland 1998<br>Soil Erosion and Sediment Control – Engineering Guidelines for Queensland Construction Sites IE Australia 1996<br>*State Planning Policy 2/02 – Planning and Managing Development Involving Acid Sulfate Soils* |
| Waste and dangerous goods | AS 1216 Classification, Hazard Identification and Information Systems for Dangerous Goods<br>AS 1678 Emergency Procedure Guides—Transport<br>AS 1940 Storage and Handling of Flammable and Combustible Liquids<br>AS 2187 Storage, Transport and Use of Explosive Substances (SAA Code)<br>AS 2508 Safe Storage and Handling Information Cards for Hazardous Materials<br>AS 2931 Selection and Use of Emergency Procedures Guides for Transport of Dangerous Goods<br>AS 3780 Storage and Handling of Corrosive Substances<br>Environmental Code of Practice for the Management of Used Lubricating Oil 1997<br>Waste Management Strategy for Queensland |
| Water quality | AS2031 Selection of containers and preservation of water samples<br>Australian Water Quality Guidelines for Fresh and Marine Waters ANZECC 2000<br>EPA Water Measurement Manual<br>EPA Water Quality Sampling Manual<br>Waterwatch Queensland Technical Manual DPI 1994<br>APHA/AWWA Standard methods for the examination of water samples |

## 18.4 Implementation

### *18.4.1 Responsibilities*

Specific environmental responsibilities relating to the Project design and the development of the EMP are detailed below.

#### Proponent Responsibilities

- Review the Drainage Design and the Erosion and Sediment Control Design;
- Review and approve the Environmental Design Report;
- Review and approve the Cultural Heritage Management Plan;
- Approval of the Contractor's EMP submitted by the Construction Contractor; and
- Ensure that the Construction Contractor is audited for environmental compliance of the EMP at least once during construction works.

#### Design Environmental Responsibilities

- Undertake the environmental design and incorporate all design requirements specified in this EMP;
- Prepare specifications which outline the environmental requirements for the construction phase; and
- Undertake the application for any approvals required for construction.

#### Construction Contractor Environmental Responsibilities

- Develop a Construction EMP (EMP(C)) in accordance with any supplementary specifications and this EMP;
- Undertake the application for any licences and approvals required during construction;
- Ensure that all personnel engaged on the works are aware of environmental responsibilities and obligations and have received environmental training;
- Develop and obtain Department of Primary Industries approval for a Fire Ant Risk Management Plan;
- Ensure that landscaping treatments (i.e. mulch, seedlings) are available; and
- Consult with the community throughout construction on works, which may affect their daily activities.

#### Construction Team Responsibilities

Each member of the construction team is responsible for environmental compliance. The general duty of care to the environment applies to all personnel and management teams. All members within the chain of command should be identified, along with their roles and responsibilities, including environmental responsibilities. The Contractor will also be required to provide an Environmental Officer who will be responsible for the day to day environmental aspects of the construction works. The Contractor is also responsible for any subcontractors engaged in works at the site, and must ensure that these subcontractors are aware of environmental responsibilities.

### 18.4.2 Controlled Document

The EMP shall be maintained as controlled documents to ensure that all relevant parties are kept abreast of any changes in the procedures and actions that could potentially affect the environment.

All controlled documents issued to staff and contractors shall be recorded on a Document Register. The name and date that the document was issued shall also be recorded for future reference. This register would be of particular use when revisions or amendments are made to controlled documents.

This control shall ensure that appropriate documents are available for operations essential to the effective functioning of the EMP and that all obsolete documents are promptly removed from all points of issue or use.

### 18.4.3 Monitoring, Reporting and Auditing

A regular program of monitoring and reporting shall be implemented by the Construction Contractor to ensure that the requirements of the EMP are being met. This should involve auditing of activities and regular inspections of works accompanied by regular reports to the appropriate agencies identifying areas of non-compliance with licences, permits and approvals. Should an area of non-compliance be identified, actions should be agreed upon to ensure compliance and minimise the potential for non-compliance in the future. Regular monitoring to determine the effectiveness of management measures should also be undertaken. More specific monitoring and reporting requirements are outlined for each element in Section 18.6.

The EMP and its associated plans should be reviewed at least every six months by the Construction Contractor. The purpose of this review is to update the documents to reflect knowledge gained during the course of operations, inclusion of new technologies and changed community expectations. Any changes are to be developed and implemented in consultation with relevant authorities. All stakeholders are to be made aware of any updates as necessary.

The EMP and its associated plans will also be subject to periodic audits by internal and external stakeholders, including the members of the Joint Venture, to encourage continual improvement of onsite environmental practices.

### 18.4.4 Environmental Incident Reporting

An 'environmental incident' is defined as an event that caused or had significant potential to cause environmental harm under the Environmental Protection Act 1994. A non-conformance to the EMP should be considered an incident when the previously mentioned criterion is met. An incident reporting system should be established by the Construction Contractor prior to works commencing to allow for the tracking and identification of problems within construction and operation activities. All personnel should be trained in the use of incident reports and should use these reports when an incident is identified on the project site. The incident report should include the time the incident was noticed, an estimate of the time it occurred, any actions required and whether or not the incident has been rectified so the incident report can be closed off. The Construction Contractor will be required to immediately notify the Proponent of an incident that has caused environmental harm as a result of construction activities. All incident reports will be required to be submitted to the Proponent within three days of their occurrence.

### *18.4.5 Corrective Actions*

The Construction Contractor will be required to maintain a corrective actions register in order to record and track action progress onsite. Corrective actions may be in response to observed non-conformances to the EMP, community complaints or in order to rectify an environmental incident.

### *18.4.6 Communication*

#### Project Management Meetings

Regular project management team meetings will be used as a means of identifying all issues at the site, including Occupational Health and Safety and Environmental Management. Details of the meeting program shall be included in the EMP.

#### Site Induction

Site induction training will be one method of communication of the environmental management procedures which will operate at the site. This initial training will provide an opportunity for management to present the EMP to personnel and answer any questions.

#### Toolbox Talks

Toolbox training will be one method utilised at the construction sites to present new information or reiterate information to project personnel. The toolbox talks will also provide an opportunity for site personnel to provide feedback regarding implementation of environmental management procedures.

#### Community Complaints

There is potential for complaints to arise during construction activities. As such, a formal complaints management system should be implemented by the Construction Contractor that will monitor complaints, and identify and track any corrective actions required (see Section 18.4.5). This may include monitoring of an area in response to a complaint to identify whether activities are exceeding regulated limits.

A contact telephone number should be provided which will allow the community to discuss complaints regarding the project. Discussions between the Proponent, the Construction Contractor and other contractors should develop a complaints management system suitable to all undertaking works at the site.

### *18.4.7 Environmental Training*

It is essential that all staff involved on the site are aware of environmental responsibilities and requirements of the project, including meeting the requirements of the EMP and conditions of approvals. Training in environmental requirements and responsibilities should be provided as part of the induction process. An information sheet on environmental management should be produced and made available at the project site office. Other measures that may be implemented include information posters at the site office and contacts details for reporting environmental incidents.

### *18.4.8 Decommissioning Program*

A decommissioning program will be finalised during detailed design when project boundaries, areas of disturbance, the location of construction camps and haul roads are confirmed. The purpose of the program will be to define rehabilitation targets developed in consultation with project stakeholders and outline the process by which they are to be achieved. The program will, as a minimum:

- Incorporate a staged approach to the rehabilitation of disturbed areas in order to minimise dust generation, soil erosion and soil structure degradation.
- Stipulate the preferential use of native species local to the area where stock can be practicably sourced.
- Encourage the functionality of riparian vegetation as corridors for fauna movement.
- Include provision for continued weed control.
- Incorporate agreed rehabilitation measures for individual landowners directly affected by construction activities (to be developed during community consultation).
- Identify any opportunities for the reuse or recycling of materials and infrastructure associated with the decommissioning of construction camps.
- List suppliers and contractors that are to be used for decommissioning works, with preference given to local businesses.
- Have an allocated budget.

## 18.5 Sustainability Planning

Overall sustainability planning is general recommendations that can be implemented to improve the sustainability throughout all phases of the Project.

Key Objective: To ensure that sustainability of the Project in terms of environmental, social and economic factors is incorporated throughout all phases of the Project so that the ability of future generations to meet their own needs is not compromised.

Issues: Unsustainable depletion of renewable resources (e.g. water)
Depletion of non-renewable resources
Efficiency of fuel and resource usage and associated financial and environmental costs
Sourcing of materials and resources/use of recycled and local products
Waste and reuse
Detrimental social impacts
Impact on ecosystem values and services
Climate change impacts

Some of the mitigation measures contained in the EMP incorporate general sustainability principles such as the re-use of fill, recycling water where feasible, reducing the clearing of vegetation, management of topsoil, and the use of local quarries where possible.

The Project has also been designed for heavy utilisation over a long life, leading to robust design standards and the selection of durable materials. The relatively high costs of fuel and materials provide a strong economic incentive to design and operate the Project to minimise fuel and resource usage and operational costs.

It is recommended that consideration be given to the following initiatives to improve the overall sustainability of the Project.

## Sustainability Program

The formulation of a sustainability program would ensure the most effective implementation of sustainability principles. An effective program would require senior management to approve a framework or statement for how sustainability would be addressed in the design, construction and operation of the Project. The statement or framework would give direction and set the ground rules for sustainability. It would be communicated to the staff and would outline:

- The importance and relevance to the Project of minimising fuel resource use and other wider sustainability issues;
- The expectations of the leadership team for staff and contractors in regards to sustainability (reinforced through staff inductions);
- The processes that would be used to identify, pursue and report back on opportunities;
- Any sustainability initiatives that would be implemented; and
- Any information relevant to sustainability that would be collected and made available (such as the amount of fill re-used or water recycled).

The program could include opportunity for staff to identify and implement sustainability measures. The program would need to allow for new opportunities to be identified during design and construction of the Project and if the opportunities prove feasible, for actions to be taken that can deliver the identified outcomes.

A broad range of opportunities might be identified, including choice of equipment or technology, data collection, approach to the problem, or changes in behaviour.

The sustainability program could include workshops to identify opportunities could be conducted (such as risk assessment workshops for the identification of strategies for adaptation to climate change) or incentives to encourage more sustainable practices.

## Sustainable Sourcing of Resources and Products

- Choose natural resource sourcing options that do not deplete the viability of existing uses or ecosystem values and services;
- Reduce travel impacts and increase benefits to the local communities by sourcing local materials and products where possible. Increase benefits to the local communities by sourcing labour locally;
- Use recycled materials and resources where possible and recycle materials and resources where possible.

## Fuel and Resource Use Efficiency

- Minimise operational and environmental costs by implementing design features and operational choices that maximize fuel and resource use efficiency.

## Green Power

- Renewable energy could be purchased to offset some of the greenhouse gas emissions arising from construction. For example, the greenhouse gas emissions from electricity purchased from the grid could be offset by the purchase of 100% Green Power.

## Construction Camps and Site Offices

Construction camps and site offices could incorporate a number of measures to improve liveability and reduce total resource use. Given the size and expected life of the construction camps, these measures may be very cost effective. These measures for the camps and offices could include:

- Passive design features such as orientation of buildings, vents to improve natural ventilation, large eaves, and insulation;
- Use of large shade structures;
- Increased ceiling height to allow for the use of ceiling fans;
- Extra windows to increase natural light;
- Energy efficient lighting and appliances;
- Water efficient appliances and water treatment system to allow for water recycling;
- Solar hot water systems if feasible;
- Selection of materials and products with low ecological impacts (recycled content, low embodied energy, natural materials); and
- Green space and gardens.

Specific sustainability features of the construction camps and site offices are outlined in the following table.

**Table 18-2: Sustainability Features and Initiatives for Construction Camps and Site Offices**

| Sustainability Outcome | Design Features and Initiatives |
|---|---|
| Improve liveability of site offices and construction camps, including water and energy efficiency measures | The specific types of initiatives could include:<br>• Ceiling height of 2.9 m to improve natural ventilation;<br>• Additional ceiling fans to reduce reliance on air conditioning units;<br>• Vents to improve natural ventilation;<br>• Energy efficient T5 fluorescent lights throughout the office;<br>• Additional windows to reduce reliance on artificial lighting;<br>• 75 mm insulation in ceiling and walls;<br>• Electricity smart meters to record electricity consumption data;<br>• Rainwater collectors;<br>• Reverse cycle inverter air-conditioning units;<br>• Marmoleum flooring (or some other natural product);<br>• Energy efficient kitchen appliances (for instance a 4 star rated fridge);<br>• Solar hot water systems;<br>• Water efficient bathroom fixtures (e.g. low flow taps and water |

| Sustainability Outcome | Design Features and Initiatives |
|---|---|
| | efficient showerheads);<br>• Water efficient kitchen fixtures;<br>• Low Volatile Organic Compound (VOC's) used to paint inside of site office;<br>• Onsite Waste Water Treatment Plants to treat all water from toilets, showers, lunch rooms; treated water used for dust suppression and construction water;<br>• Extensive native garden plantings;<br>• Motion sensors linked to lights or daylight sensors that reduce the amount of artificial lighting;<br>• On-site recycling program. |
| Reduce energy consumption through the behaviour of staff, contractors and sub-contractors and through identifying and purchasing equipment and machinery | Educate staff, contractors and sub-contractors through an induction course and statement from Project leadership. Reinforce with ongoing workshops and toolbox sessions to investigate opportunities to reduce energy consumption and fuel use.<br>Have awards specific to behaviour or approaches, and to new equipment, materials, or machinery.<br>Openly and regularly report on any initiatives identified (newsletter, bulletin board, office display) consumption statistics. Collect and report on fuel and electricity usage.<br>Introduce a 'resource efficiency' checklist in management, accounting and procurement systems to ensure that resource use is considered in decision making.<br>For example:<br>• Turn off idle machinery;<br>• Techniques for operating equipment that reduce fuel consumption;<br>• Revise work and/or travel schedules to minimise on site vehicle movements;<br>• Consider the purchase of more fuel efficient vehicles;<br>• Consider the use of solar photovoltaic at the construction camps to generate electricity (install on a temporary basis and re-use on future sites);<br>• Encourage increased use of fans and passive design features over air-conditioning; and<br>• Turn off appliances and lights when not in use. |

## 18.6 Environmental Management Strategies

The following EMP has been developed to address particular environmental issues relevant to the Project during the design and pre-construction, construction and operation phases. The EMP aims to provide criteria and indicators to measure the environmental performance of the Project, as well as mitigation controls to reduce potential impacts.

Each table provides details of the specific measures to be addressed during the Project, along with the responsibilities and timing requirements of each of the measures.

### 18.6.1 Erosion and Sediment Control

Key Objective: To ensure that erosion and sedimentation impacts associated with construction and operation are minimised.

Issues: Erosion from batters and exposed or disturbed soil surfaces;
Sedimentation of drainage lines and receiving waters;
Disposal of contaminated soils.

Performance Criteria: No measurable or observable degradation of water quality downstream of the multi-user corridor from the exposure of erosive or contaminated soils.

All water exiting site during construction is to have passed through best practice erosion, drainage and sediment controls.

All exposed soil surfaces are rehabilitated or otherwise stabilised to a level sufficient to negate erosion during operation.

Successful completion of a Drainage Erosion and Sediment Control Plan and Site Management Plan/Remedial Action Plan (contaminated soils) prior to construction commencement.

Measures stipulated within the Drainage Erosion and Sediment Control Plan and Site Management Plan/Remedial Action Plan implemented within designated timeframes.

**Table 18-3: Erosion and Sediment Control Management Measures**

| Management Objectives | Actions | Responsibilities | Timing |
|---|---|---|---|
| Preparation of an Erosion and Sediment Control Plan | • A site specific Drainage Erosion and Sediment Control Plan should be prepared during detailed design. This plan should:<br>– Include particular focus on vegetation clearing and earthwork activities within known high risk areas as deemed by soil type and slope (see Map 6 – Topography and Landform and Map 8 – Soils in the Map Folio).<br>– Discuss control measures associated with different construction phases, i.e. vegetation clearing, earthworks, track-laying and rehabilitation.<br>– Specify the location of drainage lines, receiving waters and project boundaries.<br>– Show anticipated site drainage patterns and structures to ensure | Principal Contractor | Detailed Design |

| Management Objectives | Actions | Responsibilities | Timing |
|---|---|---|---|
| | natural flows are maintained, particularly during known wet season months.<br>– Specify the planned locations of large area-dependent controls such as sediment basins and holding dams (if deemed necessary) so that consideration of these may be included during the land acquisition phase.<br>– List what erosion and sediment control materials are to be available on site, e.g. sediment fencing, flocculants, sand bags, rocks of varying size, etc.<br>– Incorporate the actions listed below. | | |
| Minimise potential for erosion and sedimentation | • Where practicable construction will take place in dry season;<br>• Demarcation of approved clearing areas;<br>• Minimise the amount of time soil is left exposed;<br>• Restrict the area of vegetation and soil disturbance during the construction works to the smallest possible areas;<br>• Instruct all site workers in the implementation and management of erosion control measures and drivers to minimise damage to the local environment;<br>• Where possible, existing access tracks are to be used to avoid creation of new ground and soil instability problems;<br>• Sediment or silt barriers shall be used where required;<br>• Erosion control structures shall be installed in the following areas:<br>– Down slope of disturbed soil<br>– Around soil stockpiles; and<br>– At discharge point from construction sites and roads; | Contractor | Construction |

| Management Objectives | Actions | Responsibilities | Timing |
|---|---|---|---|
| | • Soil and construction stockpiles shall be placed away from drainage lines or stormwater paths;<br>• Stormwater runoff shall be managed to minimise the potential for erosion;<br>• Diverting flow over stable areas and away from disturbed areas;<br>• Uncontaminated sediment is to be removed from all sediment control devices and incorporated in fill batters or mounds on site. Contaminated sediment shall be disposed of to an approved stockpile area of disposal area;<br>• Areas where construction or site works have been completed shall be stabilised and rehabilitated within at least one week of completion;<br>• Access to recently revegetated areas shall be restricted to allow for new vegetation to become established. | | |
| Manage Acid Sulfate Soils (ASS) | • Refer to Queensland Acid Sulfate Soil Technical Manual – Soil Management Guidelines to determine appropriate measures to treat excavates ASS;<br>• All fill material imported from offsite to be procured from a licensed quarrying facility and certified free of ASS. | Contractor | |
| Manage contaminated land | • A Management Plan for contaminated soils shall be prepared identifying the measures required to treat contaminated soils and to prevent impacts from disturbance to any contaminated sites. It will be incorporated into the EMP(C);<br>• Maintain hazardous manifest on site and update regularly;<br>• Storage areas consist of compacted base and bunding to contain spillage, and roofed;<br>• Storage of hazardous material away from vulnerable receptors (e.g. residences, watercourses); | Contractor | During construction |

| Management Objectives | Actions | Responsibilities | Timing |
|---|---|---|---|
| | • Removal and appropriate disposal of residual stocks of hazardous materials;<br>• A rail safety officer shall be nominated and an emergency response plan provided, along with prescribed placarding, HAZCHEM cards and fire extinguishers. | | |
| Maintenance | • Inspection of sediment control measures after heavy rainfall events;<br>• Ensure regular removal of sediment from control structures;<br>• Maintain structures until potential for erosion has ceased;<br>• Stockpile management. | Contractor | Daily and/or as required |
| Monitoring | • Regular inspections of temporary and permanent erosion structures;<br>• Visual inspections of stockpiles;<br>• Inspect batters after rainfall events and repair as required;<br>• Monitor success of landscape plantings and implement corrective actions as required;<br>• Visual inspections of waterways for sedimentation. | Contractor | Daily and after heavy rainfall events |
| Reporting | • Regular reporting of compliance with Erosion and Sediment Control Plan;<br>• Photographic records maintained. | Contractor | Monthly |

### *18.6.2 Soil Degradation*

Key Objective: To ensure that soil degradation impacts associated with construction and operation are minimized

Issues: Disruption of hydrological and hydraulic regimes

Loss of good quality agricultural land and fertile topsoil

Increased risk of soil salinity and degradation

Performance Criteria: No measurable or observable disruption of the hydrological and hydraulic regimes of the area as a result of construction activities

All fertile topsoil excavated is separated and a reused option is identified and implemented

All saline and sodic soils are identified prior to construction and no measurable increase in soil salinity as a result of the construction activities

**Table 18-4: Soil Degradation Management Measures**

| Management Objectives | Actions | Responsibility | Timing |
|---|---|---|---|
| Minimise disruption of hydraulic and hydrological regimes | Bulk earthworks and excavation and filling activities to be conducted outside of wet season | Contractor | Construction |
| Minimise loss of good agricultural soil | Separate fertile topsoil material from bulk excavation and fill material<br>Investigate options for reuse of topsoil material | Contractor | Construction |
| Minimise impact on soil salinity | Identify and manage highly saline and sodic soils within the project corridor | Contractor | Prior to construction |

### *18.6.3 Water Quality Management*

Key Objective: To ensure that activities do not adversely impact on water quality of the creeks during construction and operation phases.

Issues: Runoff control and management;
Erosion and sediment control;
Fuel, oil and chemical storage and handling;
Degradation of water courses.

Performance Criteria: No measurable or observable degradation in water quality of local creek and drainage systems as a result of construction activities.

No measurable or observable decrease in the quality of groundwater as a result of construction activities.

Conformance of water quality parameters to any approval conditions stipulated by the EPA or other government departments, or in the absence of such conditions, follow a 'no-worsening' methodology.

Successful completion of a Drainage Erosion and Sediment Control Plan and Stormwater Management Plan prior to construction commencement.

Measures stipulated within the Drainage Erosion and Sediment Control Plan and Stormwater Management Plan implemented within designated timeframes.

**Table 18-5: Water Quality Control Management Measures**

| Management Objectives | Actions | Responsibilities | Timing |
|---|---|---|---|
| Preparation of an Erosion and Sediment Control Plan and a Stormwater Management Plan (SMP) | • A site specific Erosion and Sediment Plan should be prepared during detailed design;<br>• A site specific Stormwater Management Plan should be prepared during detailed design. | Principal Contractor | Detailed Design |
| Prevent erosion and sediment runoff | • See Table 18-3. Erosion and Sediment Control Management Measures;<br>• If possible, undertake construction works during the low rainfall period;<br>• Divert stormwater away from exposed surfaces and stockpiles;<br>• Isolate and remediate areas of existing erosion and/or identified dispersive soils to prevent further damage;<br>• Implement grass filter strips and artificial structures to prevent overland runoff;<br>• Utilise already disturbed areas wherever possible. | Contractor | During construction |
| Protect the aquatic environment | • Construction within waterways, to be scheduled, as far as possible, during dry season;<br>• Bridge structures for creek crossings to be designed to AS5100 Bridge design – Scope and General Principles;<br>• Installation of sediment control devices to prevent sedimentation of waterways;<br>• No flushing of spills into drainage channels;<br>• A Weed Management Plan will be developed to control the release of weed and pathogens.<br>• Riparian vegetation, flow-dependant ecosystems and wetlands to be left undisturbed wherever possible. | Contractor | During construction |
| Manage contaminated runoff | • All vehicles and equipment should be maintained in accordance with manufacturer's recommendations and checked regularly for possible fuel, oil and chemical leaks;<br>• Major vehicle and plant maintenance | Contractor | During construction |

| Management Objectives | Actions | Responsibilities | Timing |
|---|---|---|---|
| | and wash down should be completed off site at an appropriate facility;<br>• The use of fertilisers during revegetation works at the site shall be the minimum necessary to promote establishment and shall be incorporated to minimise the likelihood of fertiliser being carried offsite to watercourses;<br>• Refuse from the site is to be disposed of into industrial type bins with a regular collection service;<br>• Temporary chemical storage areas and wash down facilities are to be located away from watercourses and drainage channels and will be appropriately bunded in accordance with relevant Australian Standards. Provisions are to be in place to ensure an abductor truck can access the site to pump out the bunded area if required. | | |
| Manage stormwater | • Permanent and temporary sedimentation and pollution control measures shall be adopted at locations specified in the SMP;<br>• Divert clean stormwater around disturbed areas of the site;<br>• Divert dirty runoff through treatment measures such as grass swales and sediment filters prior to release;<br>• Adopt Best Practice stormwater quality management devices. | Contractor | During construction |
| Storage and handling of waste | • All fuel, chemicals and other hazardous materials that may be kept on site will be stored in bunded or sealed areas at least 100 m away from waterways and drainage lines;<br>• Any waste, concrete washings or similar construction materials shall be disposed of in bunded areas for containment and treatment;<br>• Treated effluent discharge to be positioned away from drainage lines and sewage system regularly maintained by a licensed operator. | Contractor | During construction |

| Management Objectives | Actions | Responsibilities | Timing |
|---|---|---|---|
| Spill Control | • Spills shall be contained and cleaned up immediately;<br>• Spill control training shall be provided to personnel involved in chemical and fuel handling;<br>• Spill containment kit shall be available on site at all times;<br>• No flushing of spills into drainage channels;<br>• Ensure contaminated absorbent materials are disposed of appropriately and receipts from the disposal sites are kept and are readily available for inspection by the EPA<br>• Install oil and grit separators in areas of vehicles or plants maintenance<br>• Refuelling of equipment away from watercourses and drainage lines | Contractor | At time of spill |
| Maintenance | • Undertake regular inspections of drainage lines;<br>• Regularly inspect stormwater quality treatment devices. | Site Foreman | During construction |
| Monitoring | • Undertake a baseline water quality monitoring program at a location upstream and downstream of the creek crossings;<br>• Define water quality monitoring requirements for construction phase;<br>• Undertake monthly water quality monitoring or as required by the SMP and EMP(C);<br>• Visual inspections of waterways for sedimentation.<br>• Undertake water quality monitoring following any significant rainfall event. | Contractor | During construction |

| Management Objectives | Actions | Responsibilities | Timing |
|---|---|---|---|
| Reporting | • Prepare incident reports should a breach in measures be identified;<br>• Regular reporting on water quality in compliance with the EMP(C) and SMP;<br>• Compare monitoring results to guidelines specified in ANZECC 2000 and the Qld EPA Water Quality Guidelines. | Contractor | At time of incident and as required by SMP and EMP(C) |

### *18.6.4 Air Quality*

Key Objective: To ensure that activities do not adversely impact on the existing air quality.

Issues: Generation of vehicle and dust emissions within locality of construction; Complaints from residents and from other sensitive receptors; Exceedances of the *Environmental Protection (Air) Policy*.

Performance Criteria: No reportable incidents of environmental nuisance with respect to the release of dust/particulate matter as defined under the Environmental Protection (Air) Policy 1997.

All air quality-related complaints are recorded and responded to within 48 hours of notification to the Construction Contractor.

Successful completion of a Dust Management Plan prior to construction commencement.

Measures stipulated within the Dust Management Plan are implemented within designated timeframes.

**Table 18-6: Air Quality Management Measures**

| Management Objectives | Actions | Responsibilities | Timing |
|---|---|---|---|
| Preparation of an Air Quality sub-plan | • An Air quality sub-plan for Air quality shall be developed as part of the EMP(C). It should outline:<br>– Disturbed areas and soils stockpiles that are likely to generate dust;<br>– Proposed measures to reduce dust generation;<br>– Monitoring/inspection requirements; and<br>– Complaints recording and handling process. | Principal Contractor | Detailed Design |
| Minimising Dust Generation | • Cover any truckloads of earth material to prevent dust generation; | Contractor | During construction |

| Management Objectives | Actions | Responsibilities | Timing |
|---|---|---|---|
| | • Cover stockpiles if they are to be left for extended periods;<br>• Onsite water tanker using stormwater or recycled water to wet dusty areas<br>• Minimise bare earth surface area;<br>• Revegetate wherever possible:<br>– Provide shake down areas for vehicles;<br>– Provide an on-site wheel wash using non-potable water;<br>• Limit construction vehicle speeds within the construction site and on unsealed roads;<br>• Notify potentially impacted local residents if construction may lead to excessive dust generation;<br>• Clean dirt from public roads using brooms or a street sweeper;<br>• Cease works if excessive dust generation from construction activities occurs (e.g. from high winds, etc.) until emissions can be controlled. | | |
| Fumes and emissions from construction activities | • Maintain machinery in good working order;<br>• Maintain construction vehicles in good working order;<br>• No burning on site. | Contractor | During construction |
| Maintenance | • Water down dusty surfaces;<br>• Regularly maintain vehicles and equipment;<br>• Sweep road where dirt has been transported off site. | Contractor | During maintenance |
| Monitoring | • Air quality monitoring will be undertaken on a monthly basis or as required by the EMP(C);<br>• Dust monitoring will be undertaken on a monthly basis or as required by the EMP(C);<br>• Visual inspection of any dust generating activities;<br>• Conduct daily visual checks to assess the effectiveness of dust control measures;<br>• Develop and maintain a complaints management system. | Contractor | As Required |

| Management Objectives | Actions | Responsibilities | Timing |
|---|---|---|---|
| Reporting | • Maintain a record of complaints;<br>• Report the result of any monitoring on a monthly basis;<br>• Report the results of any monitoring as a result of a complaint;<br>• Compare monitoring results to recommended guidelines specified in the *Environmental Protection (Air) Policy*. | Principal Contractor | As Required |

### *18.6.5 Traffic and Access Management*

Key Objective: To ensure that construction activities do not adversely impact on the existing road network or access arrangements during construction and operation

Issues: Disruption to traffic on local roads;
Degradation of private, Local Council and Department of Main Roads managed roads;
Accidents.
Interrupted local access
Reduced Property functionality

Performance Criteria: All relevant stakeholders are informed of impending road and stock route closures and diversions prior to them coming into place.

No incidents or complaint from stakeholders regarding project activities due to lack of consultation

Property access for local landowners is maintained at all times unless otherwise agreed to in consultation with an affected landowner.

Successful completion of a Traffic Management Plan and road condition survey prior to construction commencement.

No motor vehicle, pedestrian, stock or rail accident to occur as a result of a condition stipulated within the Traffic Management Plan or as a result of a construction activity not detailed within the Traffic Management Plan.

**Table 18-7: Traffic and Access Management**

| Management Objectives | Actions | Responsibilities | Timing |
|---|---|---|---|
| Preparation of Traffic Management Plan (TMP) | • A Traffic Management Plan will be prepared prior to construction and will cover:<br>– Temporary road closures and traffic detours;<br>– Road deviations – designed to DMR or LG standards;<br>– Traffic signing – DMR Manual of | Principal Contractor | Prior to Construction |

| Management Objectives | Actions | Responsibilities | Timing |
|---|---|---|---|
| | Uniform Traffic Control Devices;<br>– Traffic barriers and lighting;<br>– Traffic controllers for daily operations;<br>– Speed restrictions through construction site;<br>– Provision for pedestrians and cyclists;<br>– Maintain satisfactory and safe access to property;<br>– Maintain local connectivity or minimise impact;<br>– Temporary traffic signals; and<br>– Temporary electronic message signs. | | |
| Manage Traffic Volumes and Flows | • Construction traffic leaving and entering the site shall be restricted to daylight hours, where possible;<br>• Traffic control should always be utilised if construction activities will interfere with traffic operations;<br>• Schedule deliveries outside peak hours (where possible);<br>• Avoid using school bus routes and heavily populated areas, where practicable<br>• Road works signs shall be installed during the railway construction period;<br>• Small tracks and minor farm access roads should not be used without permission from landowner;<br>• There should be no use of undesignated roads by construction crew;<br>• All gates are to be left in manner as found, gates are not to be left open and unmanned if numerous trips are to be undertaken;<br>• A haulage management plan should be prepared to ensure that haulage occurs on approved routes only;<br>• Provision of regular use of water carts | Contractor | During construction |

| Management Objectives | Actions | Responsibilities | Timing |
|---|---|---|---|
| | or sealing of access where close to residences or sensitive receptors to minimise dust generation. | | |
| Health and Safety | • Daily toolbox meetings are to incorporate traffic Management Objectives.<br>• Equipment (PPE) at all times i.e. fluorescent vests, hard hats, etc.<br>• There should be no use of undesignated roads by construction crew.<br>• Speed limits will be installed near construction areas.<br>• Traffic controllers on the road. | Contractor | During construction |
| Road Closures and Detours | • Install signs advising of road closures and detours.<br>• Stakeholders directly impacted by road closure to be consulted | Contractor | During construction |
| Maintain Property Access | • Minimise disturbances through monitoring and management of construction activities<br>• Keep the local and wider community informed of changes through ongoing community engagement and appropriate 'advertising';<br>• Ensure that construction activities do not impede access to residences and commercial properties;<br>• Organise alternative access arrangements when existing access conditions cannot be maintained.<br>• Allow for both pedestrian and vehicle under/overpasses in the design in existing residential properties and areas | Proponent/ Contractor | Prior to construction/ construction |
| Avoid reduced functionality of properties | • Ensure appropriate engagement with affected property owners to minimise the impact on site functionality.<br>• Due consideration of remediation on those sites and properties that may significantly lose functionality. | Proponent/ Contractor/ Rail Manager | Prior to and During Construction |
| Damage to existing roads | • Enforce speed restrictions for construction traffic;<br>• Divert heavy construction vehicles | Contractor | During construction |

| Management Objectives | Actions | Responsibilities | Timing |
|---|---|---|---|
| | away from central access ways that lead through residential and populated areas;<br>• Monitor road conditions throughout construction phase. | | |
| Maintenance | • Repair any damage to the road from construction vehicles. | Contractor | During/post construction |
| Monitoring | • During construction, traffic management procedures should be regularly reviewed;<br>• Regular audits in accordance with this EMP and the TMP, with implementation of the recommendations and corrective actions;<br>• Daily toolbox meetings to incorporate traffic Management Objectives. | Contractor | During construction |
| Reporting | • Daily or Weekly reports (as appropriate) shall be completed on site and reviewed by the Construction Manager. | Principal contractor | As required |

### *18.6.6 Flora and Fauna*

Key Objective: To minimise the impacts of construction and clearing on the surrounding environment

Potential Impacts: Death or injury of native fauna.

Introduction of new or spread of existing fire ant populations.

Loss of significant vegetation, including habitat trees.

Performance Criteria: No clearance of vegetation outside of designated clearing boundaries.

No death of native fauna or livestock as a result of construction activities, including vegetation clearing and earthworks.

Successful establishment of rehabilitation works incorporating species native to the local area and encouraging functionality of riparian vegetation as corridors for fauna movement.

Successful completion of an approved Fire Ant Risk Management Plan prior to construction commencement.

**Table 18-8: Flora and Fauna**

| Management Objective | Action | Responsibility | Timing |
|---|---|---|---|
| Minimise impacts from vegetation clearing | • Prior to construction a clearing application in accordance with the Regional Vegetation Management Code for the Brigalow Belt and New England Tablelands Bioregions must be submitted to DNRW that shows exact areas and locations of vegetation impacted. The approval process includes a referral to Forest Products to make an assessment of millable timber;<br>• Higher priority should be given to the preservation of significant species, such as Bluegrass, Brigalow, Acacia species and Semi-evergreen Vine Thicket in areas where the need for clearing is subjective, e.g. along boundaries.<br>• Priority should also be given to the preservation of all RE's, in particular, Endangered, and Of Concern RE in areas where the need for clearing is subjective;<br>• Identify clearing boundaries on design drawings;<br>• Existing mature trees and tree stands should be retained where they do not interfere with the safety of the railway;<br>• Clearly mark clearing limits on site with flagging tape or spray paint prior to clearing, for Endangered and Of Concern regional ecosystem, as a minimum.<br>• Implement a staged approach to clearing to allow for the removal of tree hollows, pre-clearing trapping (if necessary) and evacuation of fauna from the area in response to disturbance. | Detailed Designer/ Contractor<br><br>Detailed designer<br><br>Detailed designer<br><br>Contractor<br><br>Fauna Manager<br><br>Fauna Manager | Detailed design<br><br>Detailed design<br><br>Detailed design and duration of construction<br><br>During construction<br><br>Detailed design and duration of construction |

| Management Objective | Action | Responsibility | Timing |
|---|---|---|---|
| Minimise impacts to threatened fauna | • A Fauna Management Plan shall be developed addressing specific measures for the protection of threatened species identified in the EIS and their preferred habitat;<br>• Measures should include replacement of ground habitat features such as fallen logs, top soil, leaf litter to restore essential habitat features for ground dwelling fauna such as Ornamental snake, Dunmall's snake, golden-tailed gecko, short-necked worm skink, Yakka skink, etc.;<br>• Consideration should be given in design to the provision of dry and wet passage for movement of fauna along riparian corridors;<br>• Trees on the site boundary that contain tree hollows should be retained where possible;<br>• Specific design measures identified within the fauna management plan should be communicated to the design team during preliminary design;<br>• An audit should be conducted of the detailed design against measures specified within the fauna management plan. | Fauna manager<br>Designer<br>Design team<br>Proponent | Preliminary design<br>Preliminary design<br>Preliminary design<br>Detailed design |
| Minimise potential impact to Boggomoss snail | • Ground-truth all riparian areas intercepted by the alignment for a comparison of habitat characteristics with known Boggomoss snail sites.<br>• Where potential significant habitat for Boggomoss snail occurs within the corridor, preference should be given to structures that cause least ground and creek bank disturbance.<br>• Specific measures for the protection of this species should be included in the Fauna Management Plan, such as the removal, retention and replacement of topsoil and leaf litter after construction disturbance. | Fauna Manager/ Detailed Designer | Detailed design |

| Management Objective | Action | Responsibility | Timing |
|---|---|---|---|
| Reduce impacts to all native fauna | • Identify opportunities for fauna sensitive design to allow uninterrupted surface flows across landscape and movement of small ground dwelling fauna across the rail corridor, in accordance with the Fauna Management Plan.<br>• Set back of abutments so as to leave areas on each side of the creek that are above permanent water level;<br>• Set back of abutments to leave areas wide enough to allow landscaping and bank stabilisation;<br>• Provide landscaping features that guide and protect fauna;<br>• Maintain existing fauna corridor functions at each creek;<br>• Minimise disturbance to bed and banks of creeks to reduce risk of aquatic flora and fauna impact;<br>• Ensure a fauna survey is undertaken by a qualified fauna manager on the day of, and prior to, any clearing of trees. Tree identified as containing fauna are to be marked and not cleared until fauna have left or, if necessary been removed by a licensed fauna manager;<br>• During work activities, avoid contact with all fauna species, particularly native and significant (protected under National or State legislation);<br>• Minimise areas of bare ground under each bridge; | Detailed designer<br><br>Fauna Manager<br><br>Contractor | Detailed design<br><br>Pre-construction<br><br>During construction |
| Manage the breeding of mosquitoes and midges | • Avoid detention of water within and surrounding the site that could provide mosquitoes and midges breeding sites | Contractor | During construction |
| Manage Fire ants | • Develop a liaison with the Department of Primary Industries and approved Fire Ant Risk Management Plan; | Contractor | During construction |

| Management Objective | Action | Responsibility | Timing |
|---|---|---|---|
| Revegetate and rehabilitate disturbed areas | • Contact local conservation group for the collection and retention of local seed for use in revegetation or rehabilitation;<br>• Disturbed areas in environmentally sensitive locations, such as riparian vegetation, creek banks, steep slopes and dispersive/erodible soils are to be rehabilitated with tube stock and monitored for a recommended period of 12 months to ensure the effectiveness of rehabilitation (i.e. weed control and soil stabilisation);<br>• Removed vegetation should be mulched and re-used on site. | Contractor | Recommended 6 to 12 months prior to clearing |

### *18.6.7 Weed Management*

Key Objective: To prevent the introduction and spread of Declared Plants and environmental weeds.

Issues: Increase in number of weed species and infestation extents.

Performance Criteria: No introduction of new weed species as a result of construction activities.

No measurable increase in existing weed species as a result of construction activities.

Successful removal of Class 1 and 2 weed species within the multi-use corridor in accordance with the Land Protection (Pest and Stock Route Management) Act 2002.

Successful completion of a Weed Management Plan prior to construction commencement.

**Table 18-9: Potential impacts: Weed Infestation Leading to Loss of Native Species**

| Management Objective | Action | Responsibility | Timing |
|---|---|---|---|
| Preparation of a Weed Management Plan (WMP) | A Weed Management Plan will be prepared prior to construction and will:<br>• Incorporate the performance criteria listed above.<br>• Cover construction, rehabilitation and operation periods.<br>• Fulfil statutory and non-statutory obligations under the Land Protection (Pest and Stock Route Management) Act 2002, Land Act 1994, the National Weeds Strategy, the Queensland Weeds Strategy and any local government strategies available at the time of construction.<br>• Specify the location and extent of known infestations of weed species declared under the Land Protection (Pest and Stock Route Management) Act 2002 or local government weed strategies at the time of construction.<br>• Stipulate an allocated budget for weed removal during rehabilitation works.<br>• Include the specific actions outlined in this table. | Principal Contractor | Prior to Construction |
| Educate staff | • Superintendents and supervisors should be briefed on the recognition and treatment of weeds. | Principal/ contractor | During construction |
| Minimise the spread of weeds | • Soil containing weeds is to be stockpiled at least 25 m away from watercourses and native vegetation. Sediment fences should be erected down slope from stockpiled soil;<br>• Temporary weed wash down bays are to be established at the construction camp and construction site office;<br>• Prior to arrival at the project area, all vehicles, equipment and portable infrastructure (including trailers, generators, workshop and accommodation huts, etc.) will be washed down (spray cleaned);<br>• Cleaning procedures need to remove soil and organic matter from the surface of vehicles, equipment and portable infrastructure, including undercarriage and running gear;<br>• Proof of inspection, such as 'wash down tickets' from state operated facilities is required for all vehicles coming from known areas of weed infestation, before permission is granted to enter | Contractor | During construction |

| Management Objective | Action | Responsibility | Timing |
|---|---|---|---|
| | uninfected tenure areas;<br>• If the vehicle is not considered clean by a trained weed inspector, it shall be rewashed and reinspected before certification;<br>• A weed wash down sticker is to be placed on the windscreen of vehicles that have been certified weed free;<br>• Vehicles and machinery certified weed free shall be noted in the Weed Register to be updated regularly and located at the Site Office;<br>• Only approved access tracks and roads are to be used for access to the rail corridor;<br>• Vehicles and construction equipment that has accessed the preferred alignment and leaving the preferred alignment shall be washed down upon leaving and entering. | | |
| Minimize spread of weeds | • Conduct regular weed management and monitoring | Contractor | operation |
| Prevent the introduction of new weeds | • Implement and undertake appropriate wash down and weed hygiene measures for vehicles, earth-moving machines or construction machines leaving the site;<br>• Minimise site disturbance by avoiding unnecessary clearance of vegetation during construction (e.g. construction of creek crossings)<br>• All fill and soil materials to be declared weed-free or sourced from a weed-free area prior to arriving onsite. | Contractor | During construction |
| Treat existing weed colonies | • Implement the most appropriate weed control method (biological, physical, chemical or ideally a combination of all three types of control);<br>• Specifically target existing Class 1 and 2 weed species including *Opuntia stricta* (prickly pear) and *Parthenium hystophorus* (*parthenium*) within the study area. | Contractor | During construction |
| Monitoring | • Existing and new weed infestations will be monitored so that the effectiveness of weed control practices can be assessed and continually improved. | Contractor | Before and During Construction |

| Management Objective | Action | Responsibility | Timing |
|---|---|---|---|
| Reporting | • Regular reporting on the results from any monitoring and implementation of the Weed Management Plan.<br>• Significant Class 1 or 2 infestations should be reported to the Department of Primary Industries and Fisheries – Biosecurity Queensland for inclusion in the Annual Pest Assessment (state-wide mapping of all declared species) and Pest Info database. | Contractor | Monthly and as necessary |

### *18.6.8 Noise and Vibration*

Key Objectives: To minimise the level and time of noise disturbance.
To comply with legislative requirements.
To minimise impacts on sensitive receptors.

Potential impacts: Exceed of Environmental Protection (Noise) Policy
Complaints from residents and other sensitive receptors

Performance Criteria: No recorded incidents of noise from construction activities causing environmental nuisance at a noise sensitive place as defined under the Environmental Protection (Noise) Policy 1997.

No damage caused to off-site property as a result of vibration from construction activities.

All noise and vibration-related complaints are recorded and responded to within 48 hours of notification to the Construction Contractor.

**Table 18-10: Noise and Vibration**

| Management Objective | Action | Responsibility | Timing |
|---|---|---|---|
| Preparation of a Noise and Vibration sub-plan | • A Noise and Vibration sub-plan shall be developed as part of the EMP(C). It should outline:<br>– Legislative and policy requirements regarding noise and Vibrations;<br>– Activities that are likely to generate noise and vibrations<br>– Proposed measures to reduce noise and vibration generation;<br>– Monitoring/inspection requirements; and<br>– Complaints recording and handling process | Principal Contractor | Detailed Design |

| Management Objective | Action | Responsibility | Timing |
|---|---|---|---|
| Comply with legislative and policy requirements including:<br>• Guide to Noise Control on Construction, Maintenance Demolition Sites (AS 2436-1981)<br>• Noise Management in the Construction Industry: A Practical Approach (Worksafe)<br>• Environmental Protection (Noise) Regulations. | Implement best practice noise and vibration management measures which include:<br>• Implementation of the recommendations given in AS 2436-1981 *Guide to Noise*;<br>• *Control on Construction, Maintenance and Demolition Sites*;<br>• Restriction of construction hours:<br>– Monday to Friday, 7:00 am to 6:00 pm;<br>– Saturday, 7:00 am to 12:00 pm if inaudible on residential premises,<br>– otherwise: 8:00 am to 12:00 pm; and<br>– Not on Sundays or public holidays;<br>• High noise and vibration generating activities may only be carried out in continuous blocks, not exceeding 3 hours each, with a minimum respite period of one hour between each block;<br>• No more than four consecutive nights of high noise and/or vibration generating work may be undertaken over any seven day period, unless otherwise approved by the relevant authority;<br>• Maintain equipment to ensure operating efficiently within manufacturer's specifications;<br>• Use plant and equipment designed with inbuilt attenuation;<br>• Install appropriate temporary noise attenuation infrastructure, where necessary (based upon advice from acoustic consultants). | Contractor | During construction |
| Plan worksites and activities to minimise noise and vibration. | • Construction camps, office and maintenance site shall be located at least 1.5 km from noise sensitive areas;<br>• Loading and unloading of materials/deliveries is to occur as far as possible from sensitive receivers;<br>• Select site access points and roads as far as possible way from sensitive receivers;<br>• Dedicated loading/unloading areas to be shielded if close to sensitive receivers;<br>• Plan traffic flow, parking and loading/unloading areas to minimise traffic movements within the site. | Detailed designer/ contractor | Pre-construction/ construction |

| Management Objective | Action | Responsibility | Timing |
|---|---|---|---|
| Shield sensitive receptors from noisy activities | • Use structures such as site sheds and earth bunds to shield residential receivers from construction noise;<br>• Consider site topography when situating plant. | Detailed designer/ contractor | Pre-construction/ construction |
| Consider occupation health and safety | • Educate personnel on OH&S requirements in relation to noise;<br>• Ensure personnel wear safety equipment;<br>• All employees, contractors and subcontractors are to receive an environmental induction that covers:<br>– All relevant project specific and standard noise and vibration mitigation measures;<br>– Relevant licence and approval conditions;<br>– Permissible hours of work;<br>– Any limitations on high noise generating activities;<br>– Location of nearest sensitive receivers;<br>– Construction employee parking areas;<br>– Designated loading/unloading areas and procedures;<br>– Site opening/closing times (including deliveries). | Contractor | During construction |

| Management Objective | Action | Responsibility | Timing |
|---|---|---|---|
| Minimise the extent and impact of vibrations on the surrounding community | • Comply with Australian Standard AS 2670.2 – Evaluation of Human Exposure to Whole Body Vibration (1990);<br>• Adhere to the hours of normal operation, with work conducted between 7 am and 7 pm on any day which is not a Sunday or a public holiday;<br>• Prior warnings are to be provided to potentially effected premises where vibration levels are expected to be in excess of the nominated levels in Annexes of AS2670.2-1990 including how long the activity is expected to last;<br>• Limit the use of excavation machinery around buildings and areas of significance (cultural heritage);<br>• Undertake a dilapidation survey focusing on the vicinity of locations where vibration generating construction activities (e.g. bridges, earthworks requiring explosives) are proposed;<br>• Prior to commencement of any activity, the Contractor should undertake a condition survey of any structure within the zone of influence which is defined as within a radius of three times the safe distance;<br>• Carry out monitoring at the nearest vibration sensitive receptor on commencement of and during piling or use of vibratory equipment;<br>• If vibration complaints are received, the following control measures may need to be implemented:<br>– Use smaller machinery;<br>– Minimise the use of vibration in compaction equipment; and<br>– Use static rolling where possible. | Detailed designer | Detailed design stage |

| Management Objective | Action | Responsibility | Timing |
|---|---|---|---|
| Manage Complaints | • Establish a community liaison group. Inform the community about activities likely to generate noise and vibration;<br>• Provide the community with avenues (such as a response line) to express their views;<br>• Develop and maintain a complaints management system. | Contractor | During construction |

### *18.6.9 Waste Management*

Key Objective: To manage waste in a manner that does not cause environmental harm and encourages sustainable practice in accordance with the Protection (Waste Management) Policy 2000.

Issues: Inappropriate disposal of waste.

Unnecessary waste generation.

Performance Criteria: Successful completion of a Waste Management Plan prior to construction commencement.

Bins for each waste type (including recyclables) are available onsite for use from construction commencement.

No incidents or complaints occur as a result of poor waste management practices.

All waste minimisation, reuse and recycling opportunities are identified and implemented where practicable.

**Table 18-11: Waste Management**

| Management Objective | Action | Responsibility | Timing |
|---|---|---|---|
| Prepare a Waste Management Plan | • A Waste Management Plan will be prepared prior to construction and will:<br>– Incorporate the construction, operation/maintenance and decommissioning phases<br>– Utilise the waste management hierarchy as defined in Queensland waste management legislation<br>– Detail waste types, temporary storage, treatment and disposal<br>– Identify waste management responsibilities of personnel. | Principal Contractor | Detailed Design |

| Management Objective | Action | Responsibility | Timing |
|---|---|---|---|
| Maximise the amount of waste reused | • Mulch cleared vegetation and investigate reuse option, e.g. stabilize disturbed areas on site, sell to landscape supplier or as biofuel;<br>• Unbroken timber pallets and crates to be returned to manufacturer for reuse;<br>• Reuse topsoil for revegetation areas or sell to landscape supplier;<br>• Crush concrete, Sleepers and ballasts and (where appropriate) use as aggregate or drainage material, or use on other construction projects, or sell to landscape supplier;<br>• Process and vehicle wash water to be stored in sedimentation ponds and reused for dust suppression or vegetation establishment. | Contractor<br><br>Contractor | During Construction<br><br>Operation |
| Maximise the recycling of waste | • Investigate opportunities for steel, metal and cables to be sold to scrap metal merchant;<br>• Tyres, batteries and empty fuel or chemical containers to be separated and stockpiled in concrete or compacted hardstand areas with a bund for transport off site;<br>• Paper, packaging and office waste (used cartridges and toners, etc.) to be stored in dedicated recyclable bins;<br>• Engage licensed sub-contractors to collect and recycle the different types of recyclable wastes. | Contractor | During Construction |

| Management Objective | Action | Responsibility | Timing |
|---|---|---|---|
| Dispose of non-reusable and non-recyclable wastes appropriately | • Contaminated materials (i.e. spill clean up materials, oily rags, used filters, etc.) to be stored in dedicated MGB for transport off site;<br>• Engage a licensed sub-contractor to dispose of contaminated wastes in accordance with Queensland waste legislation;<br>• Dispose of food scraps and non-recyclable packaging and office waste in general waste skip;<br>• Remove putrescibles wastes from site weekly;<br>• Engage a licensed sub-contractor to dispose of wastes to a licensed landfill;<br>• Sewage to be stored in holding tanks for transport off site;<br>• Engage a sub-contractor to collect and dispose liquid wastes to a licensed treatment facility. | Contractor<br><br>Contractor | During Construction<br><br>Operation |

### *18.6.10 Land Acquisition*

Key Objective: Minimise impacts on land owners as a result of land acquisition during construction and operation activities.

Issues: Minimise physical fragmentation of property;
Protect property viability;
Minimise potential residential isolation;
Protect community cohesion.

Maintain property values

Performance Criteria: All affected landowners are consulted regarding property acquisition before and during construction.

Property viability is successfully maintained on those properties where resumption is necessary.

No incidents of complaint from stakeholders regarding project activities due to a lack of consultation.

**Table 18-12: Land Acquisition Management Measures**

| Management Objective | Action | Responsibility | Timing |
|---|---|---|---|
| Minimise physical fragmentation | Undertake regular community engagement to inform the community how they will be affected and how they will be protected. | Proponent | Design and for the duration of construction. |
| | Ensure that appropriate design measures are put in place to minimise the incidence and impact of physical fragmentation. | Proponent/Detailed Design Contractor | Design |
| Protect property viability | All appropriate property resumptions to be undertaken with an emphasis on maintaining property viability. | Proponent | Design and for the duration of construction. |
| | Remediation for those sites and properties that may significantly lose functionality. | Proponent/Rail Manager | Design and during construction |
| Minimise potential residential isolation | Ensure that local access roads are maintained and replaced where necessary. | Proponent/Contractor/Rail Manager | During construction and operation |
| | Minimise potential disturbances through the use of community consultation and appropriate 'advertising'. | Proponent | Design and for the duration of construction. |
| Protect community cohesion | Ensure the key stakeholders, including land owners, government agencies, community groups and the socially disadvantaged are consulted at all stages of the construction to ensure that their interests are catered for. | Proponent/ Contractor/ Rail Manager | Prior to and for the duration of construction. |

### *18.6.11 Population and Community*

Key Objective: Recognise population impacts and provide a means for identifying and addressing population issues

Issues: Reduced availability of appropriate housing
Uncertainty within the local community regarding potential social changes
Importation of external construction workforce

Performance Criteria: No incidents of complaint from stakeholders regarding project activities due to a lack of consultation.

Successful completion and implementation of a Community Engagement Plan and Housing Strategy prior to construction commencement.

**Table 18-13: Population and Community Management Measures**

| Management Objective | Action | Responsibility | Timing |
|---|---|---|---|
| Provide effective and regular communication with directly affected landowners | Prepare Community Engagement Plan for Construction Phase.<br>Ensure directly affected landowners are kept aware of all aspects of the construction Communication to include start up dates, impending construction activities, access requirements and blasting schedules.<br>Plan to include mechanism to address landowner issues in a timely and efficient manner | Contractor | Detail Design |
| Population impacts | Accurate prediction population impacts and recognition of such impacts in local and regional planning initiatives | Proponent and other relevant state agencies | Detail Design |
| Minimize impacts on local housing markets | A housing strategy should be prepared for the construction workforce.<br>Strategy should ensure sufficient on-site accommodation is provided to ensure minimal impact on local housing market.<br>Strategy to include consultation with local governments and the community prior to finalization | Contractor | Detail Design |
| Provide means for identifying and addressing issues of community services and facilities | Forum to include regular meetings with state agencies, Councils and communities.<br>Forum to include changes to the availability and cost of housing and accommodation, adequacy of existing community services and facilities, issues of existing social capital and community networks.<br>Initiate forum for the early identification and mechanism for resolution of issues | Proponent | Detail Design |
| Provide means for addressing potential social impacts of construction workforce | Initiate forum for the early identification and mechanism for resolution of issues associated with the need to import large workforce for the construction of the Project. | Proponent/ Contractor | During construction |

| Management Objective | Action | Responsibility | Timing |
|---|---|---|---|
| Encourage regular and ongoing communication between the Project and the urban and rural communities | Community Engagement Plan to include regular meetings with state agencies, Councils and communities encouraging the regular identification emerging community issues and facilitating their resolution. | Proponent | During construction |
| Monitoring and reporting | Establish Communication Register, including communication activities, resident's complaints and complaints resolution. | Contractor | During Construction |

### *18.6.12 Business and Employment*

Key Objective: Provision of regional services and employment opportunities during construction and operation

Issues: Economic exclusion of local businesses
Exclusion of regional labour force from employment opportunities

Performance Criteria: Materials are preferentially sourced from local businesses in addition to consideration of cost and ability to supply.

Establish local employment goals (including Indigenous and non-Indigenous) during the detailed design phase to fulfil during construction.

**Table 18-14: Business and Employment Management Measures**

| Management Objective | Action | Responsibility | Timing |
|---|---|---|---|
| Recognise local businesses | Establish a Local Business Register so that the local businesses can register their interest in supplying goods and services for the construction and operation of the Project. | Contractor | Prior to construction |
| Support local businesses | Consider adoption of Queensland Government Local Industry Policy for the construction phase and for relevant operational phase activities (such as maintenance programs). | Contractor | During construction |
| Support local communities through employment | Consideration should be given to the employment of local residents to reduce the size of the imported workforce and therefore demand for housing and accommodation. | Contractor | During construction |

| Management Objective | Action | Responsibility | Timing |
|---|---|---|---|
| Provide on-site training | On-site training should be provided. Consider adopting the Queensland Government's Building and Construction Contracts – Structured Training Policy, known as the '10 Percent Training Policy', ensuring structured training occurs for apprentices, trainees or cadets. | Contractor | During construction |
| | Consider equal employment opportunity practices to encourage local residents and local Indigenous people to be presented with the employment opportunities that arise during construction and operation of the Project. | Contractor | During construction |