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8.1 INTRODUCTION

This draft Environmental Management Plan (EMP) has been prepared to support an application by Waratah Coal for environmental approval for its project. This EMP is part of the EIS prepared for the Galilee Coal Project (Northern Export Facility)under Part 4 of the *State Development and Public Works Organisation Act 1971* (SDPWO Act). This EMP is intended to be a master plan which will be addressed in more detail as the design of the project progresses.

8.2 PURPOSE

The EMP proposes a range of measures to protect the identified environmental values potentially affected by the development of the project. The measures proposed in this document will be used by the administering authorities to establish the approval conditions for the project. Waratah Coal is committed to the preparation of specific EMPs for each core project component (i.e. mine and rail) to ensure compliance with best environmental management practices throughout the life of the project.

This EMP is a live, interactive document that will be updated in accordance with best practice environmental management practices, standard operating procedures, any Works Approvals and Licence conditions, and in consultation with key project stakeholders. This draft EMP has been specifically prepared to provide environmental measures for Waratah Coal and its contractors to follow for the construction and operation of the rail and related infrastructure to ensure that:

- activities associated with the project's development do not adversely affect adjacent environmental and heritage values or the local community; and
- any potential environmental impacts of the development are managed in accordance with legislative requirements and best environmental management practices.

8.3 EMP STRUCTURE AND ENVIRONMENTAL ELEMENT PLANS

8.3.1 STRUCTURE

The EMP is comprised of an overall environmental management framework and specific management sections to address relevant environmental factors, and to mitigate potential impacts of the proposed activities. The EMP has been prepared based on current knowledge of potential impacts derived during the EIS process and will continue to be refined as part of ongoing discussions with administering agencies. Due consideration will also be given to conditions of licences and approvals gained by the project. .

The EMP establishes the blueprint for how environmental issues will be managed throughout the construction and operational phases of the project and is based on the environmental issues identified through the impact assessment process. The EMP serves to guide best practice environmental management in line with relevant legislation and Waratah Coal's corporate goals for the development of the project. The EMP framework incorporates the identified management strategies required to minimise potential impacts to environmental values, and defines the monitoring and corrective actions necessary to mitigate impacts. The EMP framework also demonstrates continuous improvement throughout the life of the project.

Each element follows the following structure:

Element – Aspect of construction or operation to be managed (as it affects environmental values);

Operational Policy – The operational policy or management objective that applies to the element;

Performance Criteria – Measurable performance criteria (outcomes) for each element of the operation;

Implementation Strategy – The strategies, tasks or action program (to nominated operational design standards) that would be implemented to achieve the performance criteria;

Monitoring – The monitoring requirements to measure actual performance (i.e. specified limits to pre-selected indicators of change);

Auditing – The auditing requirements to demonstrate implementation of agreed construction and operation environmental management strategies and compliance with agreed performance criteria;

Reporting – Format, timing and responsibility for reporting and auditing of monitoring results; and

Corrective Action – The action (options) to be implemented in the case of a performance requirement not being reached and the person(s) responsible for action (including staff authority and responsibility management structure).

8.3.2 ELEMENTS

The EMP includes the following elements.

- geology and soils;
- land contamination;
- hydrology and water quality;
- groundwater;
- terrestrial flora;
- terrestrial fauna;
- aquatic flora and fauna;
- weed management;
- pest management;
- air quality;
- noise and vibration;
- waste;
- hazard and risk;
- transport;
- cultural heritage;
- visual amenity; and
- land rehabilitation.

8.4 PROJECT CHARACTERISTICS

The key characteristics for the rail and supporting infrastructure are briefly described in the section below. A full description of the project characteristics can be found in Volume 3, Chapter 1.

8.4.1 RAIL EASEMENT

The corridor runs from the mine to the coal stockyards located in the APSDA and is approximately 468 km in length. Waratah Coal are seeking approval for a 500 m wide corridor between the mine and coal terminal (T4-T7). The final corridor will decrease to be approximately 60 - 80 m during operation. The final operating corridor will consist of the railway infrastructure, service road, drainage and supporting infrastructure including power, communications and potentially a water pipeline.

The rail traverses the Barcaldine, Isaacs and Whitsunday Regional Council administrative areas.

A brief description of the corridor follows:

- APSDA to Bogie River (5 km – 44 km): the route starts at the APSDA at the rail loop and then crosses under a new Bruce Highway overpass. The rail then departs the coast in a south-westerly direction before crossing the foothills between Mount Aberdeen and Mount Abbot;
- Bogie River to Bowen River (44 km – 103 km): the route crosses Sandy Creek before steeply climbing towards Peter Gorden Range where it crests and then travels downhill passing to the west of Collinsville, running west of the boundary of Xstrata Mining Lease. In this section the route will pass underneath two high voltage transmission lines stemming from Collinsville Power Station, as well crossing the Bowen and Bogie Rivers and Sandy and Pelican Creeks;
- Collinsville to Bowen Development Rd (103 km – 166 km): initially the route trends steeply uphill from the Bowen River into the Leichardt Range, towards the upstream reaches (or head) of the Suttor River where the route traverses over undulating terrain towards the Bowen Development Road. In this section the alignment crosses the North Queensland Gas Pipeline (near the Bowen River), as well as a 4.5 km stretch of the Bowen River Floodplain;
- Bowen Development Rd to Suttor River (166 km – 234 km): as the rail line descends steeply through the Leichardt Ranges it heads in a south-west direction through open forested country and grasslands before crossing the downstream channels of the Suttor River. In this section the railway will cross the Suttor Development Road and Bowen Development Road, both requiring road-over-railway bridges. The route will also pass within 10 km of the township of Mount Coolum;
- Suttor River to Gregory Development Rd (234 km – 285 km): this section sees the route deviate to the south around the heart of the Suttor River Catchment before crossing the Gregory Development Road (road under rail bridge) near the Twin Hill Mines;
- Gregory Development Rd to Belyando River (285 km – 393 km): the route continues in a south-west direction across relatively flat terrain with easy rolling grades avoiding most of the widespread Belyando Floodplain and the Epping Forest National Park. The route avoids most of the extensive Belyando flood plain and passes more than 10 km from the Epping Forest and Mezappa National Parks. The alignment will have major bridge crossings over Lestree Hill Creek, Middle Creek, and Mistake Creek in this section; and

- Belyando River to China First Tenement (393 km – 468 km): the route continues south-west where it crosses the confluence of the Belyando River and its downstream tributaries. At this point the crossing of the extensive Belyando Floodplain is less than 5 km. The corridor then continues in a southerly direction as it parallels the existing Galilee Basin Exploration Permit- Coal (EPCs), crossing Sandy Creek in bridge, leading into the loading balloon at the mine site.

8.4.2 RAIL DEVELOPMENT

The heavy haul railway will be of single standard gauge track configuration and accommodate initially up to 6 x 3.5 km long passing loops. The exact length of the railway (currently estimated at 468 km) will not be finalised until the specific route and train loadout facilities at the mine and inloader at the coal terminal have been established.

The track will be of 68-75 kg/m Australian Standard (AS) plain carbon continually welded rail mounted on monoblock pre-stressed concrete sleepers, spaced 600 mm apart. These will be supported by a layer of deep clean ballast around 510 mm deep (measured from the top of the sleepers) with shoulders of 400 mm. Further refinement of track parameters will be conducted throughout the final design phase.

The corridor has been selected to accommodate 1 in 200 (0.5%) and 1 in 80 (1.25%) maximum loaded and unloaded grades, respectively, with no horizontal curves sharper than 1,000 m. It is expected that significantly flatter geometry beyond these limits can be achieved between the mine site and Leichhardt Ranges where the topography is relatively flat. The alignment has been modelled subject to curve compensation (0.034%) to ease grades around tight horizontal bends.

8.4.3 ROLLING STOCK

Currently two rolling stock configurations are being considered based on major coal transportation systems used in China and North American. Both train configurations are expected to deliver similar annual payloads, which is significantly more than the existing capacities of coal freight systems in Queensland.

Standard gauge coal wagons with a range of 25 - 36 t axle loads are not in daily operation as yet, but are common in iron ore operation. At this point in time, only prototype 36 t axle load coal wagons have been built. Wagon design is assumed on the basis of an enlarged AutoFlood III Aluminium Hopper Car, or alternatively C80 Gondola Car.

Motive power will be of standard diesel-electric locomotives, for example the General Electric Evolution Series locomotive, or DF Series Chinese locomotive manufactured by China Nanche Group Ziyang Diesel Locomotive Co. Ltd. Use of electric traction, although assessed, does not provide a cost efficient solution for this project.

It is expected that initially between six to seven trains per day will be needed to deliver 40 Mtpa of product coal to the coal terminal (T4-T7) at Abbot Point. The initial capacity of the current design is estimated to be less than ten train sets. An allowance of six passing stations, spaced approximately 75 km apart on average, will be required along the route to meet the annual carrying capacity of 40 Mtpa.

Each train will be approximately 3.2 km in length, using distributive power and Electronically Controlled Pneumatic air brakes for optimal fuel performance. The effective length of the receiving and departure tracks in compliance with the length of the train and a safe stopping distance is estimated at 3.5 km.

8.4.4 SUPPORTING INFRASTRUCTURE

Marshalling yards for the maintenance, servicing and refueling of rolling stock will be located at the coal terminal (Abott Point) end of the railway. This will be of sufficient capacity to hold the entire rolling stock fleet and provide for the following functions:

- holding lanes for trains awaiting departure;
- storage bays for rolling stock awaiting repair or taken out of cycle on rotation;
- lanes for disconnecting and making of trains;
- wagon maintenance workshop;
- locomotive maintenance and refueling facility;
- roll by inspection facilities;
- Central Control Terminal (CCT);
- equipment and fuel storage;
- infrastructure maintenance facilities;
- security Facilities;
- water and wastewater handling and treatment;
- cleaning and decontamination of rolling stock;

- oil and sediment control traps; and
- staff and administration facility.

8.4.5 KEY PROJECT ACTIVITIES

The key activities that this EMP will apply to are:

- construction activities and services;
- site preparation and general earthworks including vegetation clearing, topsoil stripping with storage or spreading and overburden removal;
- blasting of hardrock;
- electricity supply;
- communication and signaling;
- track and structure construction;
- light vehicle roads and heavy vehicle haul access roads;
- explosives storage and magazines;
- site rehabilitation and stabilisation;
- all other activities not described separately, but which are directly associated with or facilitate or support the described activities; and
- actions to prevent environmental harm because of any of the described activities.

8.5 WARATAH COAL'S ENVIRONMENTAL OBJECTIVES

The key objectives of this EMP are to:

- implement a system for compliance with the following requirements:
  - relevant legislative requirements;
  - licences, approvals and permits;
  - obligations and commitments from Waratah Coal's EIS;
  - project environmental policy and environmental management system; and
  - non-legislative requirements and commitments (such as International Standard for Environmental Management Systems (ISO) 14000, best practice environmental management, design and sustainability principles);
- establish design, mitigation and management measures to achieve the environmental objectives in relation to the predicted impacts for design and construction and operations;
- ensure that project design processes incorporate leading practice environmental design and sustainability principles in order to minimise the potential impacts of construction and operation on the environment and local community;
- ensure that construction and operations are undertaken in a way which minimises potential impacts on the environment and community; and
- develop, implement and monitor measures that minimise pollution and optimise resource use.

The objectives and performance criteria relate to environmental protection, prevention of pollution and continuous improvement. The overarching objectives include:

- compliance with the project's EPBC Approval;
- compliance with all environmental laws relevant to construction and operation activities and honour commitments made in Waratah Coal's EIS;
- addressing environmental related community issues arising from the construction and operations activities;
- taking all reasonable steps to minimise the likelihood that an event causing serious environmental harm, as defined under the EP Act, will occur;
- ensuring that Environmental Best Practices are implemented; and
- compliance with relevant environmental approvals.

Waratah Coal's construction and operational environmental performance will be measured using a number of environment related Performance Criteria. Performance Criteria are listed separately for each Environmental Element and will be used as strategic indicators for the ongoing assessment of performance during the construction and operations phase of the project. Assessment of Waratah Coal's compliance with Performance Criteria will be reported, reviewed and monitored on a regular basis via documented management system review, monthly reports and site meetings.

8.6 OBLIGATIONS, COMPLIANCE AND CONTINUAL IMPROVEMENT

Commitments and obligations which will guide Waratah Coal's environmental management processes have been derived from the following sources:

- commitments made during the EIS process;
- relevant State and Commonwealth legislation and conditions of relevant legislative approvals;
- Waratah Coal's EPBC Referral;
- Waratah Coal's CHMP; and
- various national and international standards.

Copies of the relevant legislation, guidelines, standards and approvals will be held in hard copy or electronically in the project office and will also be available in relevant site offices.

8.6.1 LEGAL OBLIGATIONS

Waratah Coal is committed to complying with the laws of Federal, State and Local Governments where relevant and implement best practice management to ensure that the potential for events of serious or material environmental harm are minimised as far as reasonably practicable.

A Project-specific Environmental Legislation Register will be compiled during the project's Final Design Phase to cover construction and operations of this project. The Register will also provide a summary of non-legislative requirements such as relevant codes and standards and other guidelines which may affect the project. This EMP and any subordinate plans will be developed with due regard to this register.

To aid compliance with Waratah Coal's legislative requirements, legal obligations will be identified and incorporated into work-site documentation. These documents will include suitable references or descriptions of the legislative requirements, whether forms, reports or actions as required aiding Waratah Coal's compliance and onsite management.

8.6.2 LICENSES, APPROVALS AND PERMITS - ENVIRONMENTAL OBLIGATIONS

An Environmental Approvals and Obligations Register will be developed during the Final Design Phase of the project once the Environmental Authority for the project has been granted. This register will document environmental requirements relevant to the project which arise from a number of sources; including the EIS, approvals, and licence requirements. This register will include a summary of how each obligation is met through this EMP or other associated management plans.

The Construction Environmental Manager will be responsible for managing the approvals process, ensuring all the required authority approvals are obtained, checking that approvals are up-to-date and that conditions are enacted during construction on a monthly basis. Project personnel, in particular the Construction Manager and the Operations Manager, will be responsible for liaising with the Construction Environmental Manager in timely planning of activities that require approval prior to commencement.

Where relevant, timelines for obtaining approvals are incorporated into the wider project running schedule to allow adequate time to prepare, submit and receive identified legislative approvals.

8.7 ENVIRONMENTAL MANAGEMENT FRAMEWORK

8.7.1 PLANNING FOR ECOLOGICALLY SUSTAINABLE DEVELOPMENT

The project has set environmental, social and economic goals for sustainability. This EMP supports these goals by the following management actions during the design and, construction and operational stages:

- adopt and integrate good management practices for design and construction of all aspects of the project, including:
  - avoidance or minimisation and mitigation of impacts on ecological processes and habitat values adjacent to construction works;
  - the implementation of a water management strategy for conservation and reuse of water;
  - developing an energy efficiency strategy which includes cost-effective energy efficiency measures (such as power demand management during construction, natural lighting and ventilation in appropriate locations, fleet management to enhance fuel efficiencies);
  - waste minimisation, management and recycling;
  - wise use and re-use of natural resources (such as rock and other spoil);

  - avoidance, minimisation and mitigation of impacts on people, cultural values, communities and community facilities, businesses and other employment; and
  - the achievement of community benefits in the vicinity of project worksites;
- comply with all applicable laws, regulations, standards and guidelines for protection of the environment;
- adopt the best management practices available to prevent or minimise adverse environmental impact;
- describe monitoring and reporting procedures required to identify impacts on the environment;
- describe incident response protocols and procedures, including:
  - lines of authority or responsibility and extent of jurisdiction for categories of incidents;
  - an integrated emergency response arrangement and procedures between the emergency services, Queensland Police, hospitals, and traffic management authorities; and
  - an integrated environmental incident management group;
- provide project employees and contractors with adequate and contemporary training in safety, hazard and risk management, environmental procedures and social obligations; and
- support the role and function of the local Community Consultation Committees.

8.7.2 ROLES AND RESPONSIBILITIES

All personnel managing or working on the project shall be responsible for environmental management and continuous improvement in performance. All staff will be made aware of their responsibilities during the Project Induction process as outlined in Section 8.7.4 of this EMP.

All personnel associated with the project shall be required to comply with the requirements of all applicable environmental legislation, regulations, codes of practice (as well as project standards), procedures and work instructions. An outline of the environmental responsibilities of key personnel and contractors throughout the life of the project are shown in Table 1.

Table 1. Personnel roles and responsibilities

SPECIFIC ROLE	RESPONSIBILITIES
Construction or Operations Manager	• incorporate the EMP actions and requirements into the project specific procedures; • appoint / nominate the Site Environmental Officer (SEO); • review the performance of the EMP on a quarterly basis; • review any environmental non-conformances, remediation and preventative actions; • allocate project resources to manage environmental issues; and • ensure suppliers and contractors comply with environmental requirements.
Project Engineers and Superintendents	• implement the EMP on site; • report to the SEO on environmental issues and non-conformances; • ensure that site personnel are aware of their environmental obligations; and • take corrective action to resolve non-conformances.
Systems Manager (Quality, Environmental, OH&S)	• ensure that audits of the EMP are carried out and reported to the SEO and Construction / Operations Manager; • provide advice and support in relation to environmental issues; and • review the Final EMP to ensure compliance with AS/NZS ISO 14001.

SPECIFIC ROLE	RESPONSIBILITIES
Construction Environmental Manager	• be suitably qualified and have demonstrated experience in construction or operations environmental management; • act freely and independently to take all steps necessary to avoid or minimise adverse environmental impacts, including recommending to the Construction or Operations Manager that activities cease due to inadequate environmental performance; • report to the Construction or Operations Manager on the performance of the EMP and improvement opportunities; • ensure that the EMP is effectively established, implemented and maintained at the project level; • review and update the EMP and associated documentation; • be present on site during any critical construction activities and provide support to the project team to enable them to meet their environmental commitments; • arrange for environmental inspection and audit programs to be completed; • implement an appropriate environmental awareness training program and assist site personnel to complete the training program; • ensure that environmental records and files are maintained; • ensure community complaints and non-conformances are recorded and appropriately considered and acted upon; • liaise with relevant local authorities regarding works; • liaise with the general public and key stakeholders, as required; and • oversee environmental monitoring requirements, as required by approvals, licenses and permits.
Site Environmental Officer (SEO)	• be on site during all construction or operations activities; • undertake daily and weekly site inspections and audits, as required by the EMP; • conduct site specific environmental awareness training; • investigate and report on any environmental incidents and ensure that appropriate action is taken; • complete construction inspection checklists and report to the Construction Environmental Manager; and • undertake environmental monitoring requirements, as required by approvals, licenses and permits.
Contractors	• comply with legal and contractual requirements; • comply with management / supervisory directions; • participate in awareness training as directed by management; • notify project management prior to commencement of key activities; and • regularly report on activities and environmental performance.
All Personnel	• comply with the relevant Acts, Regulations, Codes of Practice and Standards; • comply with the Environmental Policy and Procedures; • promptly report to management any non-conformances and / or breaches of the system; and • participate in awareness training as directed by management.

8.7.3 GENERAL CONTRACTOR REQUIREMENTS

Each construction or operations Contractor will provide an EMP demonstrating their ability to manage their environmental impacts. The Contractor's EMP will identify how the Contractor will achieve the requirements of this EMP by defining their management strategies.

As part of the EMP, the construction or operations Contractor is required to ensure compliance with all conditions, licenses, permits, consents and approvals relating to the construction or operational phases of the project. Conditions of license will be made available to contractors at the time of tendering for work packages.

In some instances, contractors will be required to submit a specific Contractor's Management Plan that provides a list of procedures and contingency plans relating to a specialised construction activity.

8.7.4 INDUCTIONS

All personnel associated with the project shall undergo basic environmental management training as part of the initial safety and environmental induction to inform them of their responsibilities. Personnel will be provided with more intensive training according to their role and accountability. The training will be modular and will include information on management systems, waste management, ground disturbance procedures, and other items outlined in this EMP.

8.7.5 TRAINING OF PERSONNEL

All employees shall receive appropriate environmental training to ensure they are aware of their responsibilities and are competent to carry out their work in an environmentally acceptable manner.

Environmental requirements shall be explained to employees during a site induction. Ongoing instruction shall be provided via modular training packages and toolbox meetings. All inductions and ongoing instruction shall be recorded on a project register to ensure all staff are inducted and receive the appropriate training.

All employees (including subcontractors) shall receive awareness instruction in the following areas:

- environmental policies;
- EMP and related documents;
- site environmental objectives and targets;
- understanding the regulatory requirements applying to the project and their consequent responsibilities as a member of the project team;
- potential consequences of departure from procedures;
- emergency procedures and responses; and
- identification of their legal obligations.

Personnel performing tasks that carry higher than standard environmental risks (for example, tree clearing) shall receive additional induction and training in a modular format to further inform them of particular requirements, risks and controls. The other option is that they must be certified as having completed induction and training processes and / or have gained appropriate experience, before undertaking such tasks.

8.7.6 COMMUNICATIONS

8.7.6.1 Internal Communications

'Toolbox' meetings shall be regularly held by each crew during construction and operational activities. During these meetings, concerns and questions raised by personnel shall be addressed and any environmental incidents that occurred previously, discussed. In addition, new environmental management procedures or information shall be discussed to ensure effective implementation. If requested by personnel; or believed to be necessary by the Construction or Operations Manager, Project Engineers, Superintendents, Environmental Manager or SEO, specific environmental management procedures already communicated to personnel will be reiterated during these meetings.

Regular meetings shall be held between the Site Environmental Team, the Construction or Operations Manager, and Project Engineers (and / or Superintendents) to establish the progress of development, the schedule, and location of activities over the site.

8.7.6.2 External Communications

Waratah Coal acknowledges that one of the most important aspects of the delivery of the project will be the ongoing efficient and effective management of all interactions with the community and stakeholders. External communication requirements will be documented in the Communications and Stakeholder Management Strategy.

The Communications and Stakeholder Management Plan will be the guiding document for communication with stakeholders and is applicable to the construction and operations of the project. The document will guide community involvement on the design, construction and commissioning of the project, and closely interact with the functions of the EMP and other project management plans.

The key areas in which the EMP and the Communications and Stakeholder Management Plan interact include:

- the requirement to inform with the community and businesses on environmental planning and management documents (such as site environmental plans) to ensure their concerns are considered;
- the process of informing the community and local businesses about activities that may have an impact on surrounding communities (such as road works); and
- the management of environment-related complaints and comments.

8.7.7 PUBLIC COMPLAINT RESOLUTION

Waratah Coal will, when made aware of complaints made by the community, treat such complaints as environmental incidents and will investigate causes and develop resolutions in accordance with Section 8.7.7 and Table 2.

8.7.8 MONITORING

Monitoring, inspection and reporting of environmental aspects of construction or operation of the roject shall be undertaken by the SEO as specified in this EMP.

8.7.9 ENVIRONMENTAL INCIDENT RESPONSE

The EP Act (s.320) requires that any person who becomes aware of any event or incident that may cause or has caused environmental harm, to report the event or incident to the appropriate operational manager. Environmental incidents are defined as being any breaches or non-adherences to objectives and procedures prescribed in the EMP and environmental management procedures applied to the project by Waratah Coal. These incidents are to be reported to the SEO by the person responsible for the incident or the first person at the site of an incident. The SEO shall notify the Construction or Operations Manager, who will consider whether the incident resulting may be a breach of statutory conditions and be responsible for any resulting notification. Waratah Coal may elect to notify authorities of incidents that are not breaches of statutory requirements.

Environmental incidents shall be assigned a level of severity, as defined below for this project:

- **LEVEL 1:** Minor non-adherence to procedure, and / or a negligible environmental impact;
- **LEVEL 2:** Minor non-adherence to procedure and minor environmental impact that requires little management to be rectified;
- **LEVEL 3:** Moderate breach of procedure and / or an environmental impact that requires management / mitigation to be rectified; and
- **LEVEL 4:** Extreme breach of procedure and / or environmental impact that could lead to a breach of environmental approval conditions.

The level of the environmental incident shall be determined by the relevant Project Engineer and SEO with advice from Waratah Coal's environmental consultants, if required.

The procedures may vary depending on the level of incident occurring. Contingency actions specific to incidents are described in the individual component management plans contained in this EMP and will be implemented concurrently with the actions listed in Table 3.

Table 2. Complaint resolution strategy

OPERATIONAL POLICY OBJECTIVE – COMPLAINT MANAGEMENT • PROTECT THE AMENITY OF RESIDENTIAL PROPERTIES ADJOINING THE PROJECT AREA.	
Performance Criteria	• residents in adjacent properties to be aware in advance of construction activities, including blasting schedules and safety procedures; • residents to believe the construction team respond promptly to identified issues and impacts; and • potential impacts relating to vegetation removal which may impact on visual amenity are reduced.
Implementation Strategies	• consult with Queensland Police, Queensland Ambulance, Queensland Fire and Rescue Service and Queensland Transport regarding road safety management during project construction; • ensure construction traffic management planning to prevent any safety concerns regarding shared use of roads; • communication program implemented to targeted residents in the immediate vicinity of pending works and the wider community including: • regular construction updates; • advice on blasting and construction schedules; • the results of monitoring required by the EMP; and • complaint responses system followed including promotion and provision of phone contact with construction management staff during hours of construction, and a follow up procedure which notifies complainants within 24 hours of the intended response to the issue raised.
Monitoring / Auditing	• follow up enquiries and complaints to assist in gauging community's perceived impacts from project on social and economic values and amenity; and • surveys undertaken with residents within close proximity of the construction areas on an annual basis to ascertain satisfaction with environmental management and complaint management procedures.
Reporting	• monthly report prepared and submitted to Waratah Coal to include details of monitoring results, audits, training and incidents; • communications register to include communication activities, residents' complaints and resolution of complaints. Regular reviews required; • the results of annual monitoring of community satisfaction with environmental and complaints management collated into report for submission to Waratah Coal; and • significant complaints and community issues reported to regulatory body/ies where required.
Corrective Action	• Appropriate actions implemented where community or residents report complaints or comments during construction as per communications procedures. Ensure all complaints are followed up and logged; • ensure that the appropriate personnel undertake adequate environmental awareness training. This training will cover the requirements of the EMP regarding community liaison, incidents and complaints; and • the Project Manager can request the cessation of works at any time should a breach of performance criteria of the EMP be occurring or is at risk of occurring.

Table 3. Environmental Incident Procedure

PROCEDURE	RESPONSIBILITY
Report incidents to the SEO as soon as practical.	Person responsible or first on the scene.
Determine the level of environmental incident and consult on determining a final incident classification with the Construction or Operations Manager.	Relevant Project Engineer and SEO.
Advise the Construction or Operations Manager within 24 hours of a Level 2 incident and as soon as practicable within four hours following a Level 3 incident.	Environmental Manager.
Cease immediately all work activities causing environmental incidents of Level 2 or higher and apply correct work procedures as detailed in component management plan contingency actions.	All personnel.
Take corrective actions to limit the impact of Level 4 incidents on the environment.	Construction or Operations Manager, SEO and Environmental Consultants (where necessary).
Complete and forward an Environmental Incident Report to the Construction or Operations Manager and Environmental Manager for Incidents of Level 2 or higher.	Relevant Project Engineer and SEO.
Review the causes, effects and preventative actions for all incidents and document any recommendations in the Environmental Incident Report.	Construction or Operations Manager, Environmental Manager, Project Engineers, SEO and Environmental Consultants (where necessary).
Implement the recommendations from Environmental Incident Reports as soon as practicable.	Construction or Operations Manager, Environmental Manager, Project Engineers, SEO and Environmental Consultants (where necessary).
Notify DERM immediately of Level 3 and 4 incidents.	Construction or Operations Manager.
Sign-off the Environmental Incident Report after agreement on new procedures to prevent re-occurrence of the incident and after any further remedial action has been reached.	Construction or Operations Manager and Environmental Manager.
Issue any new procedures arising from the Environmental Incident process to Project Engineers, Superintendents and the SEO; and also add them as addenda to the EMP.	Construction or Operations Manager and Environmental Manager.
Communicate these new procedures to the personnel via the Toolbox meetings described in **Section 8.7.5** Training of Personnel.	Construction or Operations Manager and Environmental Manager.

8.7.10 DOCUMENTATION

Waratah Coal will maintain an Environmental Management System (EMS) which will be managed and maintained in accordance with ISO 14001 standards. Documentation relating to environmental issues during construction and operations are comprised in this EMP, permits, Works Approvals, licences and Contractors' EMPs. This documentation shall be made available for viewing via an intranet site.

The relevant Project Engineer shall be responsible for issuing this documentation to contractor personnel and maintaining an inventory of documentation distribution. He / she shall be responsible for ensuring all document holders receive updates to the documents which may be made from time to time.

The documentation / forms will be generated as the following items:

- Ground Disturbance Permit;
- Construction Inspection Checklists; and
- Environmental Incident Reports.

Procedures for the use of such documentation shall be included in the site EMS.

8.7.11 MAINTENANCE OF THE EMP

The EMP will be updated periodically from the commencement of construction. This EMP will also be revised to incorporate stakeholder's requirements throughout the development of the project in relation to various environmental factors and changes to Federal and State legislation; best practice management, and recognised national and international standards. Any relevant changes will be communicated to relevant project personnel via 'Toolbox' meetings.

8.7.12 GENERAL ENVIRONMENTAL MANAGEMENT ACTIONS

Table 4 summarises the management actions discussed above.

Table 4. General environmental management actions

MANAGEMENT ACTIONS	TIMING	RESPONSIBILITY
Develop an Environmental Policy and implement all aspects of the policy during the life of the project.	Pre-construction Phase.	Construction or Operations Manager, SEO, Contractors.
Identify key personnel and contractors, and define their environmental responsibilities, during the project's Construction or Operations phases.	Pre-construction Phase.	Construction or Operations Manager, SEO, Contractors.
Provide environmental requirements to all employees (including construction and operation contractors), awareness training in the following areas: • environmental policies; • requirements of the EMP relative to their work; • site environmental objectives and targets; • regulatory requirements applying to the project; • responsibilities for compliance with regulatory requirements; • sensitive environmental features; • impacts and controls in the EMP relevant to their work; • potential consequences of departure from environmental procedures relevant to their work; • emergency procedures and responses; and • their legal obligations.	Pre-construction / Construction Phase.	Construction or Operations Manager, Contractors, SEO.
Provide competency training to personnel performing tasks that may cause significant environmental impacts.	Construction Phase / ongoing.	Construction or Operations Manager.
Require all construction or operations contractors to comply with all conditions, licences, permits, consents and approvals relating to the construction or operations phases of the project.	Pre-construction Phase.	Construction or Operations Manager.

MANAGEMENT ACTIONS	TIMING	RESPONSIBILITY
Employ the following methods to communicate to all employees and on site personnel, the requirements of the EMP: • internal: – meetings; – project reports; – performance assessments reports; – notice boards; – employee induction, training and toolbox sessions; and – sub-contractor co-ordination meetings. • external – meetings and correspondence with appropriate regulatory authorities; – discussions and consultation with key stakeholders; and – handling of and responding to complaints.	Construction Phase.	Construction or Operations Manager, SEO, Contractors.
Undertake the following audits: • annual systems audits of the EMS, including compliance procedures; • quarterly on site EMP compliance audits; • audits of environmental performance in accordance with the site audit programme; and • ongoing work area inspections and audits in accordance with the site audit program. Persons conducting compliance audits shall be accredited auditors.	Ongoing.	Construction or Operations Manager, SEO.

MANAGEMENT ACTIONS	TIMING	RESPONSIBILITY
Undertake the following: • produce reports in support of annual licences and permit renewal applications; • in the event of non-compliance with project licences and conditions undertake the following – authorise and undertake action to bring the matter into compliance within an effective timeframe – report the non-compliance and remedial action to the Coordinator-General and other relevant authorities within five business days to produce an Annual Environmental Review identifying the environmental performance of the project, which is to be submitted to DERM; • maintain records in accordance with the EMS; • internally report results of quarterly EMP and annual EMS audits, including any environmental monitoring results and compliance with the conditions of approval; • produce monthly Incident Report summarising any incidents occurring in the period, including comments on response procedures and preventative actions; and • produce monthly Complaints Reports summarising any complaints received by the contractor, Environmental Manager or Construction or Operations Manager in the reporting period, including comments on course of actions and responses.	Construction Phase.	Construction or Operations Manager, SEO.

8.8 ELEMENT PLAN

The broad environmental protection and commitments, which Waratah Coal has adopted and committed to for the project, have been summarised at the end of each chapter in the EIS. Those commitments reflect the intent of Waratah Coal to mitigate environmental harm whilst developing and undertaking the project.

This chapter identifies the environmental protection commitments pursuant to the EP Act, which assist to determine both the environmental approval conditions and the levels of impact from the project's rail activities on key environmental values. Those commitments are detailed in the element specific plans that follow.

8.8.1 ELEMENT 1 – GEOLOGY AND SOILS

8.8.1.1 Relationship to the EIS

The EIS has determined that the rail alignment traverses a number of soil units including areas of Tenosols, Chromosols, Kandosols, Vertosols and Sodosols and cracking clays. The soils present within the project area are generally suitable for grazing; however, some are prone to erosion and dispersion. The majority of the soils are also unsuitable as topsoils.

Much of the rail alignment is currently used for low (Class C/D) intensity cattle grazing. As a result of this historical and current land use of low intensity cattle grazing, there has been extensive tree clearing throughout the area, which is consistent with that of the adjoining land.

The main potential impacts of the proposed rail will include changes to agricultural land capability and increased risk of erosion in areas of construction and/or operation. In addition, some soils encountered will be sodic and/or dispersive which this may affect excavation conditions for portions of the rail. Further, areas of geological shear zones, faulting and/or with dykes were identified which may impact upon rail construction. Potential impacts to the topography, geology, soils and landform of the project, as well as management strategies and commitments to mitigate these impacts, have been identified. Further detailed investigations are required to fully evaluate a number of potential impacts. This will delineate areas of potential impacts and assess the appropriate scale of mitigation or management

8.8.1.2 Element Plan

The element plan is shown in **Table 5**.

Table 5. Geology and soils element plan

OPERATIONAL POLICY OBJECTIVE – GEOLOGY AND SOILS • MINIMISE ENVIRONMENTAL IMPACT BY PREVENTING SOIL LOSS AND EROSION	
Performance Criteria	• manage and mitigate the risks of soil erosion impacts from all work areas where vegetation is removed or the soil disturbed during construction works.
Implementation Strategies	• development of a soil and water management plan including Erosion and Sediment Control Plans (ESCPs), which comply with the International Erosion Control Association (IECA) Australasia's Best Practice Erosion and Sediment Control guideline which include measures such as: – consider construction sequence and timing to minimise exposure to rain and stream flows; – minimise areas of disturbance, particularly of dispersive material; – ensure suspended sediment levels in waters discharged are no, or marginally, higher than in receiving waters; – employ progressive site clearance and site rehabilitation techniques; – utilise sediment barriers and sedimentation ponds; – protect stockpiles of soil material with non-invasive quick-growing grass species; – protect areas from excess run-on flows; – shape landforms to take account of the erodibility of soil materials used; – use vegetation species common locally and appropriate to the soil materials for revegetation works; – rapid revegetation of disturbed areas; – diverting uncontaminated run off away from cleared / contaminated areas; – controlling runoff through sedimentation dams, drains and disposing to stable drainage lines; – bunding stockpiled material; – remove of loose, surplus excavated sand, gravel and clays to prevent excessive erosion; – confining traffic to defined roads and access tracks; – compacting high traffic areas; and – excavations backfilled and covered with topsoil; – control and divert surface water away from steep angle cuts and benches in quarries, dam wall excavations, road construction sites and erosion prone areas (cleared slopes) using cut-off and interceptor drains; – if practicable undertake construction activities during periods of low average monthly rainfall to minimise the impact of potential flooding and high intensity rainfall; – work should be scheduled to ensure that any temporary erosion control works are in place by the end of work each day (especially before weekends), if rain is imminent or when permanent erosion control works are not in place; – construction activities must be scheduled so that work in sensitive areas can be completed and rehabilitated as quickly as reasonably possible; – remediate bare areas as soon as practicable by backfilling, covering with topsoil, and revegetating; – rehabilitation work should be undertaken to coincide with vegetation growth periods and involve the use of appropriate non-invasive species;

	• during site stripping or excavation, topsoil should be stockpiled where appropriate for later rehabilitation or landscaping works; • ensure sufficient materials to appropriately implement erosion and sediment strategies on site at all times. These materials may include but are not limited to: rip rap, geotextiles, silt sausages, silt fences, sand bag check dams and coir logs; • undertake re-shaping / contouring of the land surface and batters to minimise slope changes and angles to reduce the potential of mass movement or failure where practicable; • add environmentally benign chemicals to sediment basins to aid flocculation and settling prior to disposal. This measure will be taken if sediment basins are incapable of removing and settling out suspended matter effectively and standards for suspended solids contents are exceeded; • construction of access roads with suitable scour protection and drainage for heavy vehicles; • discharge runoff and diverted water collected from interceptor drains and excavations within the construction areas, into sedimentation traps and detention basins; • sedimentation basins must be designed for a 24 hour storm event of a return period of one year for sediment retention and a one hour storm event of a return period of 100 years for flow. They are to be inspected and cleaned out on a regular basis and managed to ensure the required retention capacity is maintained; • minimisation of impact on water quality during clearing of vegetation by avoiding the use of blading and grubbing clearing methods, staging of works to reduce the impact on water quality at any one time, and the scheduling of clearing outside summer months when high intensity storms are more prevalent; • planning of construction works to provide for the progressive and timely stabilisation and rehabilitation of disturbed areas; • undertaking of finishing and landscaping requirements for on-going sediment and erosion control around the worksites following construction; • stockpiled topsoil should be used as soon as practicable to limit the deterioration in biological activity. For the same reason, stockpile heights should not exceed 2 m; • undertake site specific investigation to determine the erodibility potential of soils present at the location; • limit exposure time of soil to climate conditions (rain drop impacts and wind). This may require a staged approach to construction activities, with rehabilitation on completion of each stage; and • manage and minimise concentrated runoff to ensure that flow shear force does not exceed the resistance of soil. This may be achieved via implementing drainage management measures and maintaining vegetative cover.
Monitoring / Auditing	• regular inspection of sediment and erosion control structures and measures. During wet weather or when using large quantities of water in construction works, more frequent monitoring may be necessary; and • implement detailed monitoring programs to assess the impacts on the immediate construction site and sensitive receiving environments (i.e. water ways and aquatic ecosystems).
Reporting	• monthly report prepared and submitted to Waratah Coal to include details of monitoring results, audits, training and incidents; • immediate reporting to Project Supervisor and the SEO of any incident, spill or release of materials to the environment; and • incidents, complaints and any significant environmental harm reported to regulatory body/ies where required.

Corrective Action	• appropriate control measures implemented where unacceptable sediment or erosion is identified or may occur; • the ESCPs should be amended to account for changes in site conditions or treatment methods in the case of failure of a device; • necessary corrective action implemented following incident or complaint; • the Contractor will ensure that all appropriate personnel undertake adequate environmental awareness training. This training will cover the requirements of the EMP regarding soil management and erosion control; and • the Construction Manager can request the cessation of works at any time should a breach of performance criteria of the EMP be occurring or is at risk of occurring.

8.8.2 ELEMENT 2 – LAND CONTAMINATION

8.8.2.1 Relationship to the EIS

The EIS has determined that four lots along the rail were identified as having a high risk of containing a contaminated material, with one lot listed on the EMR for a Hazardous Contaminant (Arsenic). The primary land use for the four lots was listed as Transport Terminals and extractive uses.

A total of 52 lots were classed as rural land use and were ranked as medium risk. Searches of these lots on the EMR reported one lot as having the following Notifiable Activities (as listed in Schedule 3 of the EP Act):

- livestock dip or spray race operations;
- and petroleum product or oil storage.

During the site inspection of the rail alignment, additional cattle dips were observed. Preliminary Contaminated Land Site Investigation (PSI) data for these lots was extrapolated to assess the risk posed to the rail alignment; however, no sampling was undertaken.

The contaminants of concern associated with the above activities include arsenic, organochlorine (OC) and organophosphate (OP). Potential impacts from extractive industries include acidity and heavy metals associated with the particular deposit.

Where there is no complete pathway between a potential contaminant source and a receptor (in this case the project), there is low potential for risk from that contaminant source to the project. Therefore, unless the rail directly intersects the cattle dips and associated infrastructure, such as drying yards, there is a low potential for risk from these contaminant sources to the project. The laboratory results from samples adjacent to the rail, reported low arsenic concentrations which suggests a low potential for widespread arsenic impacts around this part of the rail.

8.8.2.2 Element Plan

The specific element EMP relating to the management of land contamination is shown in Table 6 and Table 7.

Table 6. Land contamination element plan (spills and clean-up)

OPERATIONAL POLICY OBJECTIVE – LAND CONTAMINATION (SPILLS AND CLEAN-UP) • PREVENTION OF SPILLS FROM OCCURRING AT PROJECT SITE. • CONTAIN, CLEAN UP AND, IF NECESSARY, REMEDIATION OF ANY SPILLS THAT DO OCCUR.	
Performance Criteria	• all fill used on site is 'inert' and must be free from contaminants; and • containment of all spills involving materials that may cause environmental and effective cleaned up and measures taken to prevent the incident from recurring
Implementation Strategies	**Contaminated Soil** • chemical storage will comply with MSDS requirements. MSDS for products kept on site will be readily available to employees and contractors; • smaller quantities of chemicals, fuels and oils will be stored in self bunded pallets, within a bunded area in the workshop, or in a bunded container on the site. Bulk quantities of fuel should be stored in double skinned tanks (self bunding); • waste products (e.g. oil / water separator waste, sludges and residues) should be contained within weatherproofed, sealed and bunded areas to ensure stability of the waste containment receptacles, and to prevent any leakages or spills causing environmental harm to soils, surface water or groundwater. Regular inspections will be conducted on the tanks, bunds and storage areas to ensure integrity; • obtain an approval and a disposal permit by DERM (Contaminated Land Unit) for the removal of contaminated soil, in accordance with the EP Act; • remove contaminated soils in accordance with a DERM approved Remediation Action Plan (RAP); • prepare and implement procedures for the remediation of contaminated soil spills that may occur during transport; • standard procedures for the storage, handling, disposal and spill response for potentially hazardous waste materials will be described in an Emergency Management Plan; • in the event of a large spill; sites will be investigated, managed, and remediated in accordance with the requirements of the contaminated land provisions of the EP Act and the QLD EPA Draft Guidelines; and • if, during any site earthworks or excavation; offensive or noxious odours, and / or evidence of gross contamination not previously detected is observed, site works are to cease in that area and action taken to immediately abate the environmental harm. The area will be isolated through high visibility fencing and appropriate signage so that other activities may continue elsewhere within the remediation site without representing additional risks.
Monitoring / Auditing	• recording of any spills that occur as an incident, as well as the follow up actions, any results and reporting to authorities.
Reporting	• the administering authority is to be notified in writing within two business days of detection of any gross contamination and advised of appropriate remedial action; • any environmental incidents involving spills recorded; including time of incident, persons involved, details of incident, mitigation measures, and actions taken to minimise the probability of recurrence. Immediate reporting to the project Environmental Adviser of any significant spills or potential risk of spills; and • incidents, complaints and any significant environmental harm reported to regulatory body/ies where required.

Corrective Action	• ensure that the appropriate personnel undertake adequate environmental awareness training. This training will cover the requirements of the EMP in regards to waste management, spill procedures, and the storage and handling of hazardous substances and materials with the potential to cause environmental harm; and • the Construction Environment Manager can request the cessation of works at any time should a breach of performance criteria (of the EMP) be occurring or is at risk of occurring.

Table 7. Land contamination element plan (fill)

OPERATIONAL POLICY OBJECTIVE – LAND CONTAMINATION (FILL) • ENSURE ALL FILL IMPORTED TO THE RAIL EASEMENT IS CLEAN AND FREE FROM ANY CONTAMINANTS	
Performance Criteria	• control the risk of transporting contaminates to the project site.
Implementation Strategies	• ensure that all fill material brought on to the site meets the requirements of: – National Environmental Protection (Assessment and Site Contamination) Measure; and – DERM (formerly Department of Environment) (1998) Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland ; • all fill material must be virgin excavated natural material (i.e. soil, aggregate); • ensure that the site source of the imported fill is not listed on the Environmental Management Register / Contaminated Land Register (EMR / CLR); • conduct visual inspections of the imported fill material to ensure that it contains no waste material; • obtain documentation from the fill provider, which must contain the following: – date of arrival on site; – volume / quantity of fill material; – provider; – source of fill material; and – documentation that the site of the fill material is not listed on the EMR / CLR.
Monitoring / Auditing	• auditing of EMP conducted quarterly (internally) and annually (externally).
Reporting	• report all non-compliance to the Site Supervisor; and • incidents, complaints and any significant environmental harm reported to regulatory body/ies where required.
Corrective Action	• ensure that the appropriate personnel undertake adequate environmental awareness training which covers the requirements of the EMP in regards to the sourcing, tracking and transportation of fill material; and • the Construction Environment Manager can request the cessation of works at any time should a breach of performance criteria (of the EMP) be occurring or is at risk of occurring.

8.8.3 ELEMENT 3 HYDROLOGY AND WATER QUALITY

8.8.3.1 Relationship to the EIS

The EIS has determined that streams in the study area were generally in good health. Nutrient and metal levels were elevated at some sites during both dry and wet season sampling. This effect was more pronounced in the upland catchments (Suttor) than the lowland catchments (Bowen/Bogie). The lower levels of nutrients and metals identified in the lowland catchments compared to the upland catchments are likely to be due to the more stable nature of the streams and sandy sediments.

8.8.3.2 Element Plan

The water resource management and water quality element specific element plans are shown in Table 8 and Table 9, respectively.

Table 8. Hydrology element plan

OPERATIONAL POLICY OBJECTIVE – HYDROLOGY • MAINTAIN ENVIRONMENTAL FLOWS IN THE WATERCOURSES THROUGHOUT CONSTRUCTION.	
Performance Criteria	• all legislative criteria as stated within the relevant Water Resource Plans are met throughout construction; and • no existing water users' entitlements are to be effected throughout construction.
Implementation Strategies	• all construction water will be contained in ponds and treated before release downstream; • all construction activities will be scheduled in such a way that the impacts of flooding on the construction of the rail will be minimised; • prepare flood management plans for both construction and operation; and • all drainage structures associated with the project, including those necessary for supporting facilities such as access roads, will be designed to the appropriate standards. All designs will incorporate an appropriate level of flood immunity, minimisation of impacts to upstream landholders and mitigation of the impacts of velocity and scour.
Monitoring / Auditing	• daily visual monitoring of flows in the watercourses to ensure that flows are maintained.
Reporting	• in the event that flows are impeded by construction works, the following organisations are to be notified immediately: – DERM; and – the relevant Regional Council.
Corrective Action	• ensure that the appropriate personnel undertake adequate environmental awareness training. This training covers the requirements of the EMP, in regards to the sourcing, tracking and transportation of fill material; and • the Construction Environment Manager can request the cessation of works at any time should a breach of performance criteria (of the EMP) be occurring or is at risk of occurring.

Table 9. Water quality element plan

OPERATIONAL POLICY OBJECTIVE – WATER QUALITY • MAINTAIN WATER QUALITY VALUES IN THE WATERCOURSES THROUGHOUT CONSTRUCTION.	
Performance Criteria	• water quality objectives are protected as required by the Environmental Protection (Water) Policy 2009.
Implementation Strategies	• development of soil and water management plans (including ESCPs, which comply with erosion and sediment control guidelines for Queensland Construction Sites (Witheridge and Walker, 1996) which include measures such as: – consider construction sequence and timing to minimise exposure to rain and stream flows; – minimise areas of disturbance, particularly of dispersive material; – ensure suspended sediment levels in waters discharged are no, or marginally, higher than in receiving waters; – employ progressive site clearance and site rehabilitation techniques; – utilise sediment barriers and sedimentation ponds; – protect stockpiles of soil material with non-invasive quick-growing grass species; – protect areas from excess run-on flows; – shape landforms to take account of the erodibility of soil materials used; – Use vegetation species common locally and appropriate to the soil materials for revegetation; – directional bunds and grades will be used to direct runoff water to appropriately-sized sediment retention ponds; – stockpiled top soil will be kept as far away as possible from the waterway and will be protected by bunded and lined enclosures and temporary grassing; – the bulk of the construction facilities will be located on farmland where most of the vegetation has already been cleared (minimising the need for further vegetation clearing); – rapid revegetation of disturbed areas; – diverting uncontaminated run off away from cleared / contaminated areas; – controlling runoff through sedimentation dams, drains and disposing to stable drainage lines; – bunding stockpiled material; – remove of loose, surplus excavated sand, gravel and clays to prevent excessive erosion; – confining traffic to defined roads and access tracks; – compacting high traffic areas; and – excavations backfilled and covered with topsoil; • the construction area footprint will be restricted as much as practical to minimise areas of disturbance; • key phase of the construction sequence will be timed to coincide with low rainfall periods as much as is practical;

	• a number of procedures shall be implemented to treat sediment laden water including: – filtering runoff from the site, using geotextile fabrics, vegetation and silt curtains (once the sediments are introduced into the waterway); and – use of sedimentation basins (i.e. settlement ponds) where sediment settles prior to discharge. Chemical flocculants can also be used to hasten settlement, especially when fine sediments are present. The use of flocculants (i.e. alum sulphate) will be managed in accordance with operating procedures including MSDS; • rate of stormwater flow within the construction area reduced by using energy dissipation techniques (i.e. whoa boys, rock rip-wraps, surface profiling); • diversion bunds and / or drains to limit off-site stormwater flowing across construction areas. Clean stormwater diverted around the construction areas; • stormwater collected within the construction areas, and where applicable, diverted into holding / settlement ponds for treatment and reuse; • the water detained in sediment ponds is to be reused on the construction site where possible; • sediment basins may require regular maintenance to maintain effective capacity. Sediment removed from sediment basins will be dewatered on site and used as construction fill material; • exposed soils stabilised by using materials such as mulch, biodegradable matting, and geotextile fabrics; • vegetation on banks or steep slopes will be cut just above base height to maintain the root mass; • vegetation clearing will be staged so that only the area required for construction works is initially cleared; and • the construction footprint area will be progressively reshaped and re-vegetated with native species as work phases are completed. **Chemicals** • fuel, oil and chemicals will be stored in accordance with Australian Standard 1940B-1993 The Storage and Handling of Flammable and Combustible Liquids, the Dangerous Goods Act 1975 and the Pesticides Act 1999; • large supply tanks will be located distant from water courses in appropriate bunded and lined enclosures; • oil containment booms and oil spill recovery equipment available when working on water; • any contaminated soil will be removed to a licensed facility prior to the filling phase; and • emergency response procedures will be developed, with chemical spill response kits available at all construction sites and staff trained in their use. **Site Water Management** • develop stormwater management plans specific to each section of the rail corridor; • rainwater tanks will be fitted to buildings for later use; and • grey water will be re-used where feasible.
Monitoring / Auditing	• in the event that an unplanned spill or incident occurs within the construction area or as part of associated activities of the project, targeted water quality monitoring will be carried out up and down stream to determine potential impacts from the event.

Reporting	• during and after rainfall, a visual inspection of the construction site undertaken to ensure that mitigation measures are in place and no major erosion is occurring. Additional monitoring may be required to determine the extent of stormwater runoff after pulse events; • immediate reporting to Supervisor of any incident, spill or release of materials to the environment; and • incidents, complaints and any significant environmental harm reported to regulatory body/ies where required.
Corrective Action	• contaminated waters (elevated turbidity, suspended solids etc) observed flowing from the construction site into nearby water courses, will be identified and the appropriate action taken by the SEO; • adverse impacts to downstream water quality shall be reported to the DERM and any impacts to potable water supply off- takes, reported to the relevant Regional Council; • rehabilitation will be conducted on areas where unacceptable sedimentation has occurred; • the Contractor will ensure that the appropriate personnel undertake adequate environmental awareness training. This training will cover the requirements of the EMP in regards to water quality management, sediment and erosion control, and spill management procedures; and • The Construction Environment Manager can request the cessation of works at any time should a breach of performance criteria of the EMP be occurring or is at risk of occurring.

8.8.4 ELEMENT 4 – GROUNDWATER

8.8.4.1 Relationship to the EIS

The EIS has determined that the rail alignment traverses both an undeclared groundwater area (westerly portion between KP04 and KP230 and the Highlands Groundwater Management Unit (eastern rail section from KP230 – KP447). The main potential impacts with respect to groundwater are related to shallow near surface groundwater that could be impacted by railway construction activities. The potential impacts include contamination from fuel / chemical / raw material storage; impacts to groundwater levels from quarries / sand extraction; impacts to neighbouring groundwater users from groundwater sourced water supplies; impacts to aquifers from blasting; and Impacts to shallow aquifers from bridge construction.

8.8.4.2 Element Plan

The element plan is shown in Table 10.

Table 10. Groundwater element plan

OPERATIONAL POLICY OBJECTIVE – GROUNDWATER • ENSURE PRESERVATION OF GROUNDWATER QUALITY AND QUANTITY DURING CONSTRUCTION.	
Performance Criteria	• minimisation of impacts on groundwater quality by ensuring all practical measures have been taken to prevent contamination as a result of construction activities.
Implementation Strategies	• bore drilling, construction and development methods will be in accordance with the Minimum Construction Requirements for Water Bores in Australia (Land and Water Committee, 2003); and • bores will be developed by licenced contractors and will be constructed in accordance with DERM policies and guidelines.
Monitoring / Auditing	• groundwater monitoring programme carried out to assess any changes in groundwater quality.
Reporting	• monthly report prepared and submitted to Proponent to include details of monitoring results, audits, training and incidents; and • incidents, complaints and any significant environmental harm reported to regulatory body/ies where required.
Corrective Action	• Groundwater Quality Monitoring Programme introduced in the event that any significant spill may affect the groundwater; • the Contractor will ensure that the appropriate personnel undertake adequate environmental awareness training. This training will cover the requirements of the EMP regarding groundwater monitoring and storage and handling of hazardous substances; and • the Construction Environment Manager can request the cessation of works at any time should a breach of performance criteria of the EMP be occurring or at risk of occurring.

8.8.5 ELEMENT 5 – TERRESTRIAL FLORA

8.8.5.1 Relationship to the EIS

The EIS has determined that the proposed rail contains potential habitat for 31 EVR flora species. As a result, a detailed survey is required to confirm the presence, absence, or potential presence of each of these flora species along the proposed rail corridor prior to alignment finalisation. It is anticipated that Threatened and Near Threatened flora species recorded during a detailed corridor survey will generally be able to be avoided by alignment refinement.

Potential direct and indirect impacts associated with construction of the rail corridor on Threatened and Near Threatened flora species include:

- direct loss of individuals through clearing activities;
- reduction in the long term viability of the local populations by removing individual plants, population reduction and increased spatial isolation of plant populations;
- direct loss of potential habitat; and
- potential effects on health and viability of plants outside the clearance footprint through:
  - increased edge effects and associated potential to increasing the abundance of weed species and fire intensity;
  - potential for dust to reduce the health of plants and associated vegetation retained outside the construction footprint; and
  - potential for temporary facilities, materials and equipment to damage plants and associated vegetation outside the construction footprint.

8.8.5.2 Element Plan

The element plan is shown in Table 11.

Table 11. Flora element plan

OPERATIONAL POLICY OBJECTIVE – TERRESTRIAL FLORA • IMPLEMENTATION OF VEGETATION CLEARANCE, STOCKPILING, RECYCLING OR DISPOSAL PRACTICES THAT MAXIMISE THE RE-USE OF NATIVE VEGETATION AND MINIMISE ENVIRONMENTAL HARM.	
Performance Criteria	• felled vegetation should be re-used on site wherever possible; • retained vegetation is not compromised by site clearing works, gross mechanical disturbance or impacts associated with sedimentation and / or pollutant export from the development area; and • weed invasion is prevented both within the construction site and in surrounding areas.
Implementation Strategies	**Supply of Relevant Site Plans** • clearing of plants must only occur in accordance with a clearing permit issued under the NC Act for Near Threatened, Rare, Vulnerable and Endangered species (as listed under the Nature Conservation (Wildlife) Regulation 2006), and species identified as critical and high priority under the DERM "Back on Track" species prioritisation methodology. As a result, a Significant Species Management Plan will be developed in consultation with DERM • relevant Constraints Plans detailing the staging of works, significant areas of exclusion (such as environmentally sensitive areas) and other relevant issues shall be provided to the Construction Manager, SEO and clearing contractor prior to any site preparation activities. Prior to the commencement of any vegetation clearance, the clearing contractor; in consultation with the Construction Manager and SEO, are to discuss all areas to be cleared on construction plans and in the field; • all areas to be cleared shall be clearly identified on the ground by the SEO prior to the commencement of any site preparation activities; • prior to clearing in remnant vegetation, a qualified botanist should inspect the site for Endangered, Vulnerable or Rare flora; • implementation of an on-site Vegetation Clearance Management system; and • vegetation clearing will be staged so that only the area required for construction works is initially cleared. **Identification of Exclusion Zones** • a Vegetation Clearance Management Plan will be developed for the project to prevent excessive clearing and impact to vegetation. Strategies include: – limit the clearing of riparian zones to the extent necessary for safety; – clearly identify areas that are to be cleared on Construction Drawings; – boundaries of areas to be cleared are to be clearly marked by tape and / or pegs and conform to limits on drawings; and – contractor to monitor vegetation clearing to ensure only approved areas are cleared; • within zones that are not to be cleared the following activities shall not be permitted: – storage and mixing of materials; – vehicle parking; – liquid disposal; – machinery repairs and / or refueling; – construction site office or shed; – combustion of any material; – stockpiling of soil, rubble or debris;

- any filling or excavation including trench line, topsoil skimming and / or surface excavation, unless otherwise approved by the Construction Manager; and
- unauthorised pesticide, herbicide or chemical applications.

Minimising Damage to Uncleared Areas

- all activities in areas to remain uncleared is to be carried out in such a manner as to minimise damage to the vegetation.

Sediment and Erosion Control

- as construction activities may impact on uncleared areas it is important to ensure sediment fencing is in place before site preparation and other earthworks commence. Prior to any site preparation operations, the SEO (or other suitably qualified personnel) is to undertake an inspection of all sediment fencing; and
- on completion of construction, progressive rehabilitation will be undertaken, by replacement of topsoil, contouring, re-vegetation with local native species, and mulching as soon as possible after disturbance.

Weed Management

- all mulch produced on site from cleared vegetation will exclude material from weed species. Mulch containing weed species material shall be treated separately and not used on site for revegetation works;
- revegetation works are to be completed under strict supervision to avoid unnecessary soil disturbance; and
- a weed management plan will be prepared that includes:
- use of wash-down facilities for vehicles and equipment entering and leaving the construction site and those areas proposed for vegetation clearance;
- all machinery, equipment and vehicles are required to be certified as "weed and vegetative matter free" prior to entering the construction site;
- weeds shall not to be used as mulch for landscape, and should be appropriately managed to prevent reseeding and / or colonisation;
- soil and landscaping material brought onto the site must be from a source that is clean and weed free;
- management methods for declared weeds must be consistent with recommendations in DERM Pest Fact sheets; and
- weed monitoring to ensure that new weed species are not introduced into the immediate area and eradicate any declared weeds.

Protection of Trees within Construction Zones

- contractor to provide fences and / or trunk girdles to prevent unintended physical damage to the root system, trunk, or canopy of native vegetation identified for retention, which may be impacted upon by clearing works;
- all works carried out on either foliage or root systems of trees in consultation with a qualified arboriculturist or horticulturist;
- develop translocation plans for suitable EVR species in consultation with a qualified arboriculturist or horticulturist; and
- all works to adhere to the Australian Standards (AS) 4373 – 1996 (Pruning of Amenity Trees).

	Vegetation Reuse • millable timber or timber suited to other commercial purposes will be salvaged and large woody debris suitable as aquatic or terrestrial habitat will be saved for placement in critical locations. As much of the remaining suitable material as possible will be mulched for use in rehabilitation and landscaping. **Vegetation Offset Strategy** • vegetation offsets will be provided for the loss of significant regional ecosystems as part of the Vegetation Offsets Strategy for the project. The strategy will provide offsets in accordance with the The Queensland Government Environmental Offsets Policy specific-issue offset policy 'Policy for Vegetation Offsets' to mitigate the clearing of 'Endangered' and 'Of Concern' REs; • as part of the strategy, the restoration of vegetation connectivity and generation of buffers for existing remnant vegetation will be sought wherever possible to improve the general connectivity of vegetation and habitat throughout the landscape; • a management plan will be developed to ensure the long term success of offset areas which will include measures for planting maintenance, weed and pest management, and development of a monitoring program; and • a landscaping and re-vegetation plan will be implemented after construction of the project and will involve targeted re-vegetation of riparian areas.
Monitoring / Auditing	• management of rehabilitated offset areas will be undertaken by appropriately skilled contractors for a period of two years to ensure successful plant establishment. This will involve planting maintenance, weed control, watering of planted stock, replacement of mulch if disturbed, and the replacement of plants if there are any deaths; • monitoring by Contractor of vegetation clearance, earthworks components, and the above Performance Objectives of the proposed works on a continual basis to confirm that specific controls have been implemented and appropriate work practices are being adopted to achieve the specified performance objectives; • disturbed areas are inspected monthly for weed growth, with appropriate weed control measures implemented when warranted; • regular inspection of cleared areas and contractor's methods during clearing to ensure compliance with the EMP; and • monitoring of re-vegetated areas to identify new infestations and eradicate any declared weeds found.
Reporting	• monthly report prepared and submitted to Waratah Coal to include details of monitoring results, audits, training and incidents; • immediate reporting to Project Supervisor and SEO of any incident which contravenes the objectives of the EMP; and • incidents, complaints and any significant environmental harm reported to regulatory body/ies where required.
Corrective Action	• appropriate control measures implemented where unacceptable sediment or erosion is occurring or may occur; • the Contractor will ensure that the appropriate personnel undertake adequate environmental awareness training. This training will cover the requirements of the EMP regarding vegetation clearing and weed management; and • the Construction Environment Manager can request the cessation of works at any time should a breach of performance criteria of the EMP be occurring or at risk of occurring.

8.8.6 ELEMENT 6 – TERRESTRIAL FAUNA

8.8.6.1 Relationship to the EIS

The EIS has determined that although no Threatened or Near Threatened species were observed during the field survey, twenty-seven species (including listed Migratory species) were; however, identified as potentially occurring within the vicinity of the proposed rail corridor based on the occurrence of their preferred habitat. A detailed survey is required to confirm the presence or absence and potential presence of each of these species along the proposed rail corridor prior to alignment finalisation.

Potential direct and indirect impacts on fauna are likely to include the following:

- loss of habitat such as mature vegetation, hollow-bearing trees and fallen logs, and therefore loss of nesting, refuge and foraging resources;
- mortality;
- habitat fragmentation and loss of connectivity (disturbance to fauna movement corridors);
- barrier effects; and
- edge effects.

8.8.6.2 Element Plan

The element plan is shown in Table 12.

Table 12. Fauna element plan

OPERATIONAL POLICY OBJECTIVE – TERRESTRIAL FAUNA • ENSURE THAT SITE CLEARING OPERATIONS ARE COMPLETED IN A MANNER THAT PROVIDES MAXIMUM PROTECTION OF THE HEALTH AND LIVELIHOOD OF NATIVE FAUNA.	
Performance Criteria	• the risk (of injury and death) to fauna is managed and minimised during site clearing operations; • retained habitat is not compromised by site clearing works, gross mechanical disturbance or impacts associated with sedimentation and / or pollutant export from the construction area; and • fauna species continue to utilise the retained habitat area post-development.
Implementation Strategies	• a Fauna Management Plan will be developed for the project which will provide further detail on the fauna management strategies; and • clearing shall be conducted in a sequential manner and in a way that directs escaping wildlife away from the activity and into adjacent natural areas. **Compliance with the Code of Practice** • the program undertaken in compliance with DERM guidelines and the Draft Queensland Code of Practice for the Welfare and Management of Wild Animals Affected by Land-Clearing, and the Modification or Destruction of Wildlife Habitats and Wildlife Spotter / Catchers (Australia Zoo Wildlife Warriors Worldwide Ltd, 2009). **Restoration of Habitat** • re-vegetation of cleared areas associated with the project; and • restore vegetation connectivity and generation of buffers for existing remnant vegetation wherever possible to improve the general connectivity of vegetation and habitat throughout the landscape. **Identification of Habitat Trees** • a DERM accredited spotted / catcher will be on-site immediately prior to vegetation clearance to inspect habitat trees (i.e. trees with hollows, fissures or with substantial food resource, mature trees or stag trees) to determine the presence of fauna and to implement a relocation plan for any fauna found. This spotter / catcher must also be present during vegetation clearing to relocate any native fauna;

- habitat trees must be identified prior to the selective clearing operations. (Habitat trees are defined as those trees that provide suitable foraging, refuge and nesting resources for arboreal and avian fauna and micro-bats). These include hollow-bearing trees, trees with fissures, trees with food resources (e.g. pollen, nectar, foliage, arthropods). Larger, old growth trees are also considered to be habitat trees as they are likely to provide greater amounts of foraging resources, cover, and a high number of potential hollows. Dead (stag) trees are also regarded as important habitat trees as they provide roosting and nesting resources.); and
- clearing must be conducted using a staged approach where the smaller non-habitat trees are removed in the first stage with the larger remaining habitat trees removed three to five days after the initial clearing. (This staged method provides a disturbance stimulus and provides fauna with time to leave the site thus maximising the chances of fauna survival while reducing the need for human intervention for translocation or rescue purposes).

Tree Hollows

- if any denning, roosting or nesting animals are observed within hollow limbs, but cannot be readily removed by an registered fauna spotter, DERM will be consulted to determine an appropriate strategy;
- prior to tree removal, an appropriately qualified ecologist should attempt to "flush out" any denning or nesting animals not observed during the initial hollow inspection. A second inspection of the relevant trees should be carried out post-felling, to relocate fauna disturbed by the clearing process or remaining within the felled timber to a suitable location determined in consultation with DERM.

Care of Injured Fauna

- prior to clearing appropriate local wildlife care and veterinary surgeons should be identified to assist with injured fauna;
- all injured animals are to be immediately removed and; if not able to be treated in situ and relocated immediately, taken to an appropriately qualified veterinary surgeon. Any orphaned or injured fauna discovered at a later stage during operational works are to be reported to DERM; and
- fauna rescue operations will be undertaken by an appropriately qualified ecologist (i.e. DERM accredited spotter-catcher).

Retention and Re-use of Hollow Logs

- habitat logs, branches and other shelters will be salvaged from vegetation clearing and replaced within the proposed re-vegetation areas to create habitat for small mammals and reptiles; and
- hollow logs should be relocated to cleared areas as habitat features.

Road Traffic

- to minimise impacts on wildlife the following mitigation measures will be incorporated in the proposed Construction Traffic Management Plan:
  - limit construction vehicle movements at times of optimal fauna activity – dawn, dusk and night;
  - reduce speed limits on haul routes (local and regional roads);
  - signage and education; and
  - wildlife rescue protocols.

Night Lighting

- lighting during construction and operation of the project should be targeted to the work area or amenity areas with minimal spill particularly to areas of potential habitat for nocturnal and light sensitive species.

Monitoring / Auditing	• monitoring of vegetation clearance, earthwork components and requirements of this EMP on a continual basis (as specified above), to confirm that specific controls have been implemented and appropriate work practices are being adopted. This will work towards achieving the specified Environmental Objectives until such time works is completed.
Reporting	• monthly report prepared and submitted to Waratah Coal to include details of monitoring results, audits, training and occurrence of any incidents; • immediate reporting to Project Supervisor and SEO of any incident, spill or release of materials to the environment; and • incidents, complaints and any significant environmental harm reported to regulatory body/ies where required.
Corrective Action	• ensure that the appropriate personnel undertake adequate environmental awareness training. This training will cover the requirements of the EMP regarding fauna management; and • the Construction Environment Manager can request the cessation of works at any time should a breach of performance criteria of the EMP be occurring or at risk of occurring.

8.8.7 ELEMENT 7 – AQUATIC FLORA AND FAUNA

8.8.7.1 Relationship to the EIS

The EIS has determined that impacts to surface water resulting from the works are expected to be minimal. Baseline aquatic ecology investigations were undertaken along the rail alignment. Several wetlands listed as Great Barrier Reef Wetland Protection or management areas were located within or adjacent to the rail. A total of 33 macro invertebrate groups, seven macro crustacea and 24 fish species were observed across the entire rail. Species richness was highest within the Bowen River Catchment. A number of turtles and other vertebrate species were also observed during field work. Stream Invertebrate Grade Number-Average Level (SIGNAL) scores indicated that most of the waterways crossed by the rail alignment were characterised by taxa that are tolerant of a level of pollution, Water quality at these sites has most likely been degraded as a result of surrounding agricultural land uses.

Construction works that have the most potential to impact on aquatic ecosystems include:

- impacts on vegetation and banks during bridge construction through their removal, causing sediment movement;
- disturbance and stockpiling of soils causing increased turbidity or suspended solids within the water column;
- piling and culvert works for stream crossings;
- use of potentially contaminated / low quality water for dust suppression and other site activities; and
- storage of oil, fuel and chemicals on site.

Management measures include the variations of design (such as bridge structures); development of an ESCP to reduce potential impacts resulting from the works; an assessment prior to construction of important perennial waterholes that may act as refugia during dry seasons; and finally, based on that assessment, move the rail alignment so as the project does not impact these locations.

If properly managed the impacts to surface water resulting from the works are expected to be minimal.

8.8.7.2 Element Plan

The element plan is shown in Table 13.

Table 13. Aquatic flora and fauna element plan

OPERATIONAL POLICY OBJECTIVE – AQUATIC FLORA AND FAUNA • MINIMISE AND MITIGATE, AS FAR AS IS PRACTICABLE, THE ADVERSE IMPACTS ON AQUATIC FAUNA AND FLORA, DURING CONSTRUCTION OF THE PROJECT. • MINIMISE THE OPPORTUNITY FOR AQUATIC WEED GROWTH AND INCREASES IN ABUNDANCE OR DIVERSITY OF OTHER PEST SPECIES.	
Performance Criteria	• no discharge of materials through stormwater runoff from construction and operational areas, with particular regard to suspended sediments, fuels, chemicals, and oils; • no waste materials (general and construction rubbish etc) entering waterways from construction and operational areas; • a program must be implemented to monitor and treat aquatic weeds that may enter the adjoining watercourses from a work site; and • no uncontrolled or untreated release of water or sediment from a work site.
Implementation Strategies	**Sediment and Erosion Control** • implementation and maintenance of the Water Quality Element, with particular reference to the management of stormwater, stockpiles and exposed soils. Measures include but are not limited to: • minimisation of the construction footprint at all phases; • timing of major earth works to coincide with low rainfall and low flow periods as far as practical; • staged clearing of vegetation; and • locating stockpiles of excavated materials away from the watercourses and with appropriate runoff and sediment control measures. **Weed Control** • implement and maintain a program to monitor and control terrestrial and aquatic weed growth; and • managing cattle access to the water. **Barriers to mobile fauna movement** • avoid isolating waterbodies to allow mobile fauna to move away from areas of impact.
Monitoring / Auditing	• implement and maintain the Weed Management Element, to determine the distribution of known declared weeds and, where practicable, control these infestations, in accordance with the *Land Protection (Pest and Stock Route Management) Act 2002*.
Reporting	• monthly report prepared and submitted to Proponent to include details of monitoring results, audits, training and incidents; and • incidents, complaints and any significant environmental harm reported to regulatory body/ies where required.
Corrective Action	• measures undertaken to protect the aquatic environment where unacceptable impacts or risk of environmental harm becomes apparent. • immediate reporting to the Construction or Operations Manager and Construction Environmental Manager of any incident which contravenes the objectives of the EMP. • the Construction Environment Manager can request the cessation of works at any time should a breach of performance criteria of the EMP be occurring or is at risk of occurring.

8.8.8 ELEMENT 8 – WEED MANAGEMENT

8.8.8.1 Relationship to the EIS

The EIS has determined that 16 significant weed species were identified as occurring within the project footprint. This included 8 species declared as Weeds of National Significance (WONS). The construction of rail infrastructure has the potential to spread existing significant, environmental, and other weeds. The rail construction also has the potential to introduce new weed species to the area.

Mitigation measures to minimise the potential impacts include; the development of a detailed Weed Management Plan that addresses the construction, rehabilitation and operation phases of the project, which should be prepared prior to construction. This Plan should include hygiene protocols to minimise the likelihood of introduction and spread of environmental, agricultural and declared weeds, including:

- the implementation of sediment control mechanisms to reduce the potential for the spread of weed species into sensitive areas;
- vehicle wash down procedures to avoid the potential for weed spread; and
- monitoring and weed inspections (monitoring across disturbed areas on a monthly basis is recommended during construction).

8.8.8.2 Element Plan

The element plan is shown in Table 14.

Table 14. Weed management element plan

OPERATIONAL POLICY OBJECTIVE – WEED MANAGEMENT • **DECLARED WEEDS AND INTRODUCED FLORA NOT PRESENT IN STUDY AREA ARE NOT INTRODUCED.** • **DECLARED WEEDS ALREADY PRESENT IN THE STUDY AREA ARE NOT SPREAD AS A RESULT OF PROJECT ACTIVITIES.**	
Performance Criteria	• obligations under the *Land Protection (Pest and Stock Route Management) Act 2002* are met; • all vehicles working off road have "weed and vegetative matter clean" certificates; • documentation available showing quarry sites inspected for weeds prior to extraction; • infestation of weed and pest species reduced; and • no additional weed and pest infestations or increase in distribution as a consequence of the construction activities.
Implementation Strategies	**Weed Management** • all mulch produced on site from cleared vegetation will exclude material from weed species. Mulch containing weed species material shall be treated separately and not used on site for revegetation works; • revegetation works are to be completed under strict supervision to avoid unnecessary soil disturbance; • a weed management plan will be prepared that includes: • use of wash-down facilities for vehicles and equipment entering and leaving the construction site and those areas proposed for vegetation clearance; • all machinery, equipment and vehicles are required to be certified as "weed and vegetative matter free" prior to entering the construction site; • weeds shall not to be used as mulch for landscape, and should be appropriately managed to prevent reseeding and / or colonisation; • soil and landscaping material brought onto the site must be from a source that is clean and weed free;

	• management methods for declared weeds must be consistent with recommendations in DERM Pest Fact sheets; and • weed monitoring to ensure that new weed species are not introduced into the immediate area and eradicate any declared weeds. **Wash-down facilities and "Clean" plant** • use of wash-down facilities for vehicles and equipment entering and leaving the construction and operations sites and those areas proposed for vegetation clearance; and • all machinery, equipment and vehicles shall be certified as "weed and vegetative matter clean" prior to entering the construction site. **Movement of vehicles / plant from weed infested areas** • movement protocol developed and implemented for vehicles and plant to ensure declared weeds are not spread.
Monitoring / Auditing	• the distribution of known declared weeds monitored and, where feasible, made to eradicate or contain these infestations in accordance with the *Land Protection (Pest and Stock Route Management) Act 2002*; and • employees / contractors working on site to report presence of declared weeds to the supervisor by the end of the working day.
Reporting	• notification to the Construction Environmental Manager by personnel of weed outbreaks or potential contamination; • monthly report prepared and submitted to Proponent to include details of monitoring results, audits, training and incidents; • immediate reporting to Supervisor and Construction Environmental Manager of any incident which contravenes the objectives of the EMP; and • incidents, complaints and any significant environmental harm reported to regulatory body/ies where required.
Corrective Action	• the Contractor will ensure that the appropriate personnel undertake adequate environmental awareness training. This training will cover the requirements of the EMP regarding vegetation clearing and weed management; and • the Construction Environment Manager can request the cessation of works at any time should a breach of performance criteria of the EMP be occurring or is at risk of occurring.

8.8.9 ELEMENT 9 – PEST MANAGEMENT

8.8.9.1 Relationship to the EIS

The EIS has determined that two common introduced species namely the Feral Cat and Pig were recorded from the study area with both species declared Class 2 animals under the *Land Protection (Pest and Stock Route Management) Act 2002* (LP Act). Management of these pests requires coordination and as such are subject to programs led by local government, community or landowners. Under the LP Act, landowners must take reasonable steps to keep land free of Class 2 pests.

Mitigation measures to minimise impacts form feral animals include the development and implementation of a Pest Fauna Management Plan.

8.8.9.2 Element Plan

The element plan is shown in Table 15.

Table 15. Pest management element plan

OPERATIONAL POLICY OBJECTIVE – PEST MANAGEMENT • PEST INFESTATIONS DO NOT INCREASE AS A CONSEQUENCE OF THE PROJECT AND EXISTING POPULATIONS OF INTRODUCED FAUNA ARE CONTROLLED.	
Performance Criteria	• no additional, or increase in distribution of pest infestations as a consequence of the construction activities at, or within the project area.
Implementation Strategies	**Site Management** • a pest management plan will be developed for the project and will include measures that: – ensure waste is managed appropriately; – where practicable, ensure water is not left to lie on sites for longer than seven days (i.e. avoid ponds of standing water; and – ensure stormwater treatment and sediment control devices are designed and managed as to not create breeding habitat for mosquitoes. • a mosquito and biting midge management plan will be developed in consultation with Queensland Health as part of the EMP and will include: – assessment of work areas to be undertaken prior to works and on an informal basis to identify potential breeding sites – any required specific area control plans based on assessment of potential breeding sites will conform to DERM Mosquito Management Code of Practice for Queensland; and – Queensland Health and the relevant local councils must be contacted for assistance in choosing a suitable method
Monitoring / Auditing	• presence of pests monitored as part of weekly site inspections; • all monitoring of waste will be carried out in accordance with the Waste Element; and • employees / contractors working on site to report presence of feral animals to the SEO.
Reporting	• monthly report prepared and submitted to Proponent to include details of monitoring results, audits, training and incidents; • immediate reporting to Supervisor and SEO of any incident which contravenes the objectives of the EMP; and • incidents, complaints and any significant environmental harm reported to regulatory body/ies where required.
Corrective Action	• appropriate control measures implemented where infestations occurring; • the Contractor will ensure that the appropriate personnel undertake adequate environmental awareness training. This training will cover the requirements of the EMP regarding pest management; and • the Construction Environment Manager can request the cessation of works at any time should a breach of performance criteria of the EMP be occurring or is at risk of occurring.

8.8.10 ELEMENT 10 – AIR QUALITY

8.8.10.1 Relationship to the EIS

Due to the short duration that potential impacts are expected to occur during construction, these impacts have not been predicted through air dispersion modelling. Rather they will be managed via dust management practices outlined in the EMP.

The major source of dust emissions have been identified during the operation of the rail. As such, only emissions from this source were estimated and modelled to assess air quality impacts.

The EIS has determined that air quality indicators (outlined in EPP (Air)), which have the potential to be affected by the project's rail activities, include:

- dust particles (as PM_{10}); and
- dust particles (as total suspended particulates(TSP)).

The above indicators, for this project, are categorised as pollutants of interest related to particulate matter. Results from the atmospheric dispersion modelling (for operation of the rail) indicate that:

- dust impacts drop very quickly with the distance from the rail, with predicted concentrations of TSP being well below the EPP (Air) objectives. Dust generated from coal wagons will not lead to exceedances of the guidelines at sensitive residential locations.
- the 24-hour PM_{10} guideline of 50 µg/m^3 could be exceeded for up to 60 m from the rail.
- no exceedance of the guidelines is expected at sensitive receptors.

The model results for predicted impacts are presented in Volume 3, Chapter 10, Section 10.2.3.4,

8.8.10.2 Element Plan

The element plan is shown in Table 16.

Table 16. Air quality element plan

OPERATIONAL POLICY OBJECTIVE - AIR QUALITY • ENSURE THAT EMISSIONS DO NOT ADVERSELY AFFECT ENVIRONMENT VALUES OR THE HEALTH, WELFARE AND AMENITY OF PEOPLE AND LAND USES BY MEETING STATUTORY REQUIREMENTS AND ACCEPTABLE STANDARDS. • MINIMISE EMISSIONS TO LEVELS AS LOW AS PRACTICABLE ON AN ON-GOING BASIS AND CONSIDER OFFSETS TO FURTHER REDUCE CUMULATIVE EMISSIONS. • MINIMISE AIRBORNE EMISSIONS THROUGH ALL REASONABLE AND PRACTICABLE MEASURES.	
Performance Criteria	• no excessive dust emissions during construction or operation of the rail; • no air quality related complaints from neighbouring properties; and • no adverse impacts to the environment associated with rail activity emissions.
Implementation Strategies	**Separation Distances and Buffer areas** • maximise the separation distance from construction activities to sensitive receptors, including crushing, screening, concrete batching haulage and significant dust generating activities; and • the determination and maintenance of adequate separation distances for particular activities would be dependent on the type of activity and levels of control proposed in detailed management plans, and would be further investigated as part of the project development and design. **Crushing and Concrete Batching** • enclosures around cement truck unloading bays (at least two sides for drive through plant and three sides for rear unload plant) or sealed transfer processes; • store aggregate within protected stockpile areas (e.g. two or three sided bins, with aggregate loaded to no more than 0.5m below bin wall height) where possible; • regular watering of aggregate stockpiles where necessary to control visible dust; • minimise drop heights for material deliveries / conveyor transfers; • regular cleanup of spills beneath conveyors, handling areas and on sealed areas;

- locate stationary dust generating activities (including concrete batching, rock crushing) as far as practical from sensitive receivers;
- maximise topographical - use natural landforms or stabilised earth mounds within which stationary equipment could be placed to protect operations from prevailing strong winds, where possible; and
- ensure appropriate dust controls and enclosures are incorporated, including semi enclosing the crushing plant and batching plants and including dry collection systems (fabric filters).

Transportation and wheel generated dust

- regularly inform truck drivers (including contractors) and machinery operators of designated vehicle access routes and other relevant practices applied for the project such as:
  - regularly maintain site vehicles and maintenance equipment to ensure efficient running of engines;
  - minimise vehicle speeds on unsealed road areas (<20-40 km/hr) to minimise wheel generated dust;
  - watering of unpaved roads and trafficked areas as required to prevent visible dust emissions travelling offsite from these areas;
  - use dust suppressants such as compacted road base, aggregate or chemical binding agents (subject to acceptability in water quality management practices);
  - regularly clean (sweep) mud and soil material tracked onto public roads at the site egress;
  - when travelling off site, cover truck loads of sand, aggregate, alluvium and spoil if dust could possibly be emitted during transport;
  - cover all materials transported off site;
  - ensuring truck loads transported around the site are no taller than the vehicle side walls as required to control visible dust; and
  - Site access hardening, including laying grates, gravel pads, paving or other hard surface at the site exit of sufficient length to remove soil and other material from vehicles. Geotextile fabric should be laid under loose material such as gravel to prevent movement and mixing with the soil surface, where possible.

Excavation and Stockpiling

- water sprays (hand held hoses or sprinklers) should be used during excavation activities where necessary to control visible dust;
- stockpiles or material stores should be kept damp by water sprays and/or covered and should be located as far from residences as possible where necessary to control visible dust;
- any stockpiles would be stored in sheltered locations where possible, with the slope of the upwind surface minimised;
- regular watering of spoil stockpiles prior to stabilisation;
- dust / wind fencing could be provided around stockpile areas, as necessary to control visible dust; and
- during landscaping works ensure exposed areas are minimised, stabilised and revegetated promptly.

Drilling and Blasting

- install dust collection devices on drill rigs (bag filters, water sprays);
- dry and fine material within the blasted area from drilling should be wetted down to suppress dust evolution;

	• blasting should be restricted when strong winds are blowing (particularly during dry weather) and when winds are blowing towards sensitive areas; and • blast design should consider restricting blast size to minimise dust emissions. **Diesel exhaust emissions** • develop and implement a TMP to manage the movement of construction vehicles entering and leaving the construction sites and queuing along local roads adjacent to residential dwellings; • minimise extended engine idling and queuing adjacent to residential dwellings; • regularly maintain diesel exhaust equipment and ensure compliance with appropriate design emission standards for in service vehicles; and • maintain diesel powered stationary plant to ensure appropriate levels of air emissions and consider fitting emission controls where required. **General Work Practices** • the construction programme would continue to be developed to minimise the size of exposed areas susceptible to wind erosion at any time; • worked areas would be stabilised as soon as possible after earthworks have been completed; • in work areas close to residents, dust emissions unable to be controlled by watering or other means should be ceased during excessively dry and windy conditions; • restrict areas that mobile plant and haulage vehicles can operate; • load and unload materials as far as practical from dust sensitive areas; and • regular inspection of site dust controls and their effectiveness. **Complaint handling** • a site activity log would be kept to assist with the retrospective investigation of community complaints. The log would record the type of activities occurring during day and night-time hours; • a complaint register would be prepared and maintained throughout the duration of construction and would incorporate commitments to investigation and close out of complaints within a reasonable timeframe; • findings from review of the complaints register, monitoring and site inspections would be incorporated into regular reporting (e.g., monthly), including actions taken control or ameliorate further such incidents; and • incident records, and actions taken to address air quality issues, would be used to further modify work or environmental management practices on site.
Monitoring / Auditing	• a detailed air quality monitoring plan would be prepared prior to construction commencing; and • perform estimating and reporting of annual greenhouse gas emissions to the relevant regulatory authority, as required, to assist with the ongoing management of energy efficiency programs
Reporting	• monthly report prepared and submitted to Waratah Coal to include details of air quality monitoring results, audits, training and the occurrence of any complaints; • immediate reporting to Project Supervisor and SEO of significant dust event that will require mitigation measures to be implemented; and • incidents, complaints and any significant environmental harm reported to regulatory body/ies where required.

Corrective Action	• air quality mitigation measures must be implemented as soon as is practicable upon receipt of valid complaints relating to nuisance dust; where air quality objectives are not being met; or where there is a significant change in activity being undertaken on site; • ensure that appropriate personnel are provided with adequate environmental awareness training regarding air quality management and the environmental management commitments relating to dust generation; and • the Construction Environment Manager can request the cessation of works at any time should a breach of performance criteria of the EMP be occurring or is at risk of occurring.

8.8.11 ELEMENT 11 – GHG EMISSIONS

8.8.11.1 Relationship to the EIS

National Greenhouse and Energy Reporting Act 2007 (NGER Act) establishes mandatory corporate and facility thresholds for greenhouse gas (GHG) emissions reporting. The EIS has determined that annual GHG emissions from the project will exceed the National Greenhouse and Energy Reporting Scheme (NGERS) corporate and facility thresholds. On this basis annual thresholds which will be exceeded are:

- GHG emissions (kt CO_2-e); and
- Energy usage (TJ).

The NGERS reporting thresholds are highlighted in Table 5, located in Volume 3, Chapter 10.3.1.

As a result, Waratah Coal will be required to report GHG emissions and energy consumption from the overall project. It is also expected that Waratah Coal will be required to assess the energy efficiency of the project, and identify measures to improve energy efficiency, under the Energy Efficiencies Opportunities (EEO) Program.

Other proposed legislations that may impact this project include the proposed national Carbon Pollution and Reduction Scheme (CPRS), Direct Action Plan and Carbon Tax. There are a lot of uncertainties at this stage on which will become the law eventually.

8.8.11.2 ELEMENT PLAN

The Element Plan is shown in Table 17.

Table 17. Greenhouse Gas element plan

OPERATIONAL POLICY OBJECTIVE – GREENHOUSE GAS ABATEMENT • **MINIMISE EMISSIONS TO LEVELS AS LOW AS PRACTICABLE ON AN ON-GOING BASIS AND CONSIDER OFFSETS TO FURTHER REDUCE CUMULATIVE EMISSIONS.** • **MINIMISE AIRBORNE EMISSIONS THROUGH ALL REASONABLE AND PRACTICABLE MEASURES** • **MINIMISE GREENHOUSE GAS EMISSIONS IN ABSOLUTE TERMS AND REDUCE EMISSIONS PER UNIT OF PRODUCT TO AS LOW AS REASONABLY PRACTICABLE.**	
Performance Criteria	• no adverse impacts to the environment associated with rail activity emissions.
Implementation Strategies	**Greenhouse Gases** • develop, implement and commit to a greenhouse gas (GHG) reduction strategy for the project; • designing a construction works program to source most construction materials from within or close to the project area to reduce fuel use and energy consumption associated with transport of materials; • maintaining construction plant and vehicles in good working order to maximise fuel efficiency; • using appropriately sized equipment for construction activities; • minimising waste generation from construction and using recycled materials, wherever possible, such as partial substitution of cement with fly ash, recycled aggregate excavated from the project area; • reuse of cleared timber (where possible); and • Waratah Coal will be a direct participant in the Government's emissions trading scheme.

Monitoring / Auditing	• Undertaking periodic energy audits with a view to progressively improve energy efficiency; • perform estimating and reporting of annual greenhouse gas emissions to the NGERS and EEO Program, as required, to assist with the ongoing management of energy efficiency programs; • perform ongoing internal measurements and monitoring emissions (such as key emission indicators (KEI)); • review annual energy use to identify potential energy efficiency opportunities on a regular and ongoing basis; • perform regular reviews for new technologies in identifying reduction emission opportunities and use of energy efficiency; this will be consistent with relevant Best Practice Environmental Management (BPEM) guidelines;
Reporting	• mandatory annual reporting prepared and submitted to Waratah Coal under the requirements of the NGERS and EEO Program; • mandatory reporting as required by the Government's emissions trading scheme (the CPRS) as it is currently proposed; • incidents, complaints and any significant environmental harm reported to regulatory body/ies where required.
Corrective Action	• ensure that appropriate personnel are provided with adequate environmental awareness training regarding energy efficiency; emissions management; and the environmental management commitments relating to energy efficiency and GHG emissions; and • the Construction Environmental Manager can request the cessation of works at any time should a breach of performance criteria of the EMP be occurring or is at risk of occurring..

8.8.12 ELEMENT 12 – NOISE AND VIBRATION

8.8.12.1 Relationship to the EIS

Sensitive receptors and monitoring locations were used to gather baseline information and predicted noise levels **(see Figure 1, Chapter 11, Volume 3)**.

The EIS has determined that predicted noise emissions for the use of the rail corridor easily comply with the QR criteria but exceed the night-time noise criterion (42dBA max LpA) at four residences (Abandoned house, Colinta Holdings, Bakara and Glenalpine). These residences are within 700 m of the proposed rail corridor (**Table 12, Chapter 11, Volume 3** refers to the predicted rail noise levels at residential locations).

No adverse vibration impacts would result at any residential locations during coal train pass-bys as the predicted levels comply with the vibration levels recommended to achieve human comfort **(refer to Section 11.5.2, Chapter 11, Volume 3)**.

With the recommended noise mitigation measures implemented, including those outlined in the table below, the noise impact of the proposed rail corridor will not be significant

Using the Construction Noise Management Plan recommended to be prepared and implemented, potential noise impacts during construction (including blasting, if required) will be minimised at noise sensitive locations.

8.8.12.2 Element Plan

The element plan is shown in **Table 18**.

Table 18. Noise and vibration element plan

OPERATIONAL POLICY OBJECTIVE – NOISE AND VIBRATION

- **PROTECT THE AMENITY OF NEARBY RESIDENTS FROM NOISE IMPACTS RESULTING FROM ACTIVITIES ASSOCIATED WITH CONSTRUCTION BY ENSURING THE NOISE AND VIBRATION LEVELS MEET STATUTORY REQUIREMENTS AND ACCEPTABLE STANDARDS.**
- **ENSURE THAT NOISE AND VIBRATION EMISSIONS, BOTH INDIVIDUALLY AND CUMULATIVELY, DO NOT ADVERSELY IMPACT ON LOCAL AMENITY.**

Performance Criteria

- construction noise must achieve the following criteria (DERM E1 Environmental Guidelines) at the stated times;

NOISE LEVEL DB(A) (DECIBEL) MEASURED AS	MONDAY TO SATURDAY		
	7 AM – 6 PM	6 PM – 10 PM	10 PM – 7 AM
	Noise measured at a Noise sensitive place		
$L_{Aeq, 1hr}$	RBL + 10 dB(A)	RBL + 5 dB(A)	RBL + 3 dB(A)
$L_{A1, adj, 10 mins}$	RBL + 15 dB(A)	RBL+ 10 dB(A)	RBL + 6 dB(A)
	Noise measured at a Commercial place		
$L_{Aeq, 1hr}$	RBL + 15 dB(A)	RBL + 10 dB(A)	RBL + 6 dB(A)

dB(A): the A weighted sound level (what the ear actually hears without background noise).

RBL: Rating background level. (The RBL represents the background noise level that is present for ninety per cent of the standard day, evening or night periods and is the level used for assessment purposes).

NOISE LEVEL DB(A) (DECIBEL) MEASURED AS	SUNDAYS AND PUBLIC HOLIDAYS		
	7 AM – 6 PM	6 PM – 10 PM	10 PM – 7 AM
	Noise measured at a Noise sensitive place		
$L_{Aeq, 1hr}$	RBL + 5dB(A)	RBL + 3dB(A)	RBL+ 0 dB(A) (Inaudible within any habitable room of a residence)
$L_{A1, adj, 10 mins}$	RBL + 10dB(A)	RBL + 10dB(A)	RBL+ 0 dB(A)
	Noise measured at a Commercial place		
$L_{Aeq, 1hr}$	RBL+ 10 dB(A)	RBL + 6 dB(A)	RBL+ 0 dB(A)

The E1 guideline uses an Lmax (adj, 15min) parameter to compare against the background + 10 (taken as the RBL+10 dB(A)) criterion. The LA10 parameter is commonly used in place of the Lmax(adj, 15min) parameter. The LA10 and Lmax(adj, 15min) represent the average maximum noise level measured over a 15-minute time period. The LA10 is the noise level exceeded for 10% of the time period.

L_{Aeq}: Time averaged A-weighted equivalent continuous sound pressure level

$L_{Aeq, 1hr}$: Average sound level over an hour of measurement

$L_{A1, adj, 10 mins}$: The A-weighted sound pressure level, adjusted for tonality and/or impulsiveness, and exceeded for 1% of the sample period of time which is 10 mins.

Construction noise could register as inaudible when the level is equal to or less than the rating background level (RBL) at the receiver location.

The *Ecoaccess Guideline: Noise and Vibration from Blasting* advises that blasting activities should be carried out in such a manner that if blasting may affect a noise-sensitive place, then:

- ground vibration from blasting must not exceed:
  - peak particle velocity of 5 mm per second for nine out of any ten consecutive blasts initiated, regardless of the interval between blasts; and
  - peak particle velocity of 10 mm per second for any blast.
- air blast overpressure levels from blasting must not exceed:
  - 115 dB (linear) peak for nine out of any ten consecutive blasts, regardless of the interval between blasts; and
  - 120 dB (linear) peak for any blast at the project area.

Implementation Strategies

Management Plans

- Noise and Vibration Management Plans (NVMP) will be developed by the Construction Contractor(s) prior to the commencement of construction activities; and
- the Plans would specify target noise limits, management measures to demonstrate how these limits will be met and how impacts to sensitive receivers will be managed to acceptable levels.

Construction hours

- as far as practicable, general construction activities will be in accordance with the EPP (Noise) and *Environmental Protection Regulation 1998*.

Noise Management

- construction works would be carried out in accordance with Australian Standard (AS 2436)– 1981, Guide to Noise Control on Construction, Maintenance and Demolition Sites, Standards Australia;
- prior to the commencement of site works, the community would be informed of the upcoming activities and likely duration;
- the construction programme would continue to be developed in consultation with the local community to schedule noisier activities (such as blasting) during least sensitive times of the day;
- rock breaking, rock hammering, blasting and any other activities which result in impulsive or tonal noise generation would only be conducted during normal operational hours;
- appropriate selection of construction processes / methodologies and equipment to minimise the generation of noise;
- employ respite periods for particularly noisy activities where possible; and
- maintain a site activity log, recording the type of activities occurring during various times of the day to assist with the retrospective investigation of community complaints relating to noise (or dust) complaints

Maximise shielding and distance to receivers

- maximise the offset distance between noisy plant and continuous operations (generators, compressors, crushers etc) and nearby noise sensitive receivers or ensure plant are screened utilising:
  - purpose built barriers;
  - materials stockpiles;
  - site sheds, buildings or other structures;
  - natural topographical barriers; and
- where possible, carry out loading and unloading of materials and equipment in areas as far away from noise sensitive areas as possible.

Plant and equipment worker education and awareness

- regularly educate workers and contractors (such as during toolbox / pre-start meetings) to maximise awareness of project noise goals; nuisance noise generating activities; and to encourage minimisation of the following activities, including:
  - unnecessary or overuse of horns;
  - use of compression air brakes adjacent to sensitive areas; and
  - efficient material handling procedures to reduce unnecessary loud banging sounds.

Plant and equipment

- equipment with directional noise characteristics (emits noise strongly in a particular direction) would be oriented such that noise is directed away from sensitive areas;
- avoid the coincidence of noisy plant working at the same time close together adjacent to sensitive receivers;
- acoustic enclosures or localised noise screens could be incorporated around fixed plant or over individual pieces of equipment as appropriate based on acoustic assessment for:
  - crusher and screening plant;
  - concrete batch plant; and
  - maintenance area / shed;
- all mechanical plants should be silenced by best practical means using current control technology and in accordance with manufacturers specifications;
- where practicable, plants with the lowest noise rating which meet the requirement of the task should be selected;
- where possible for works in close proximity to sensitive receivers, use electric motors in preference to diesel motors;
- where enclosures are fitted to equipment, ensure doors and seals are in good working order and that doors can be closed properly against the seals;
- if piling is required, use bored piles which are cast in-situ or screened drop hammers rather than untreated drop-hammer driven piles;
- ensure that internal combustion engines (all mobile and stationary equipment) are fitted with a suitable muffler in good repair;
- where appropriate, metal surfaces subject to impacts from heavy objects (such as rock dropping into empty truck trays, or metal grates on road ramps etc) should be lined with rubber impact protection to minimise impact noise;
- ensure that tailgates on trucks are securely fitted to avoid unnecessary "clanging" noise, particularly during movement of empty trucks;
- where using pneumatic equipment, select silenced compressors or use quieter hydraulic equipment;
- conduct regular inspections and effective maintenance of both stationary and mobile plant and equipment (including mufflers, enclosures); and
- equipment not being utilised as part of the work would not be left standing with engines running for extended periods.

Traffic noise management

- reduce the potential for impacts from construction traffic by:
  - establishing designated access route/s to the site and informing drivers of these routes, parking lots and acceptable delivery times;
  - undertaking regular site road maintenance (and inspections) to minimise impact noises from trucks travelling over irregularities in the road surface (such as pot-holes, washouts or ruts);

	– limiting vehicle speeds in critical areas both on and off site; – allowing for one-way traffic flow through the site to minimise the use of reversing alarms as much as possible and to minimise traffic delays; – the use of 'smart', reversing alarms; – limiting excessive acceleration from site exits; – ensure that vehicles required within compounds do not "queue" outside the worksite close to residential areas; – where practicable, entry and departure of heavy vehicles to and from the site are restricted to the standard daytime construction times where practicable; and – best available controls over engine noise emissions by maintaining the vehicle fleet in compliance with Australian Design Rule 28/01 for engine noise emissions, tested in accordance with the National Road Transport Commission document Stationary Exhaust Noise Test Procedures for In-Service Motor Vehicles. **Blasting overpressure and vibration** • blasting will be designed and managed by a blasting contractor, who would control blast overpressure and vibration in accordance with the project limits, through a detailed management plan. The plan must address Australian Standard AS 2187–2006 Explosives—Storage and Use Part 2: Use of Explosives; and would include the following types of measures to minimise impacts: – reducing maximum instantaneous charge of each blast; – changing drilling patterns, burden, blast hole diameter, deck loading, location, spacing and orientation of blast holes or using a combination of appropriate delays; – where possible orienting faces so that they do not face directly towards residences and keeping face heights to a minimum; and – consider weather forecasts in the ongoing management of blast impacts (allowing for the effects of adverse wind on the propagation of air blast to surrounding areas).
Monitoring / Auditing	**Environmental noise monitoring** • ongoing monitoring and review of the site noise management practices would be undertaken: – at the commencement of construction activities; – in response to a valid community complaint regarding construction noise; and – where review of upcoming construction schedule indicates a high likelihood for impact at nearest sensitive receiver locations; • the purpose of monitoring is as a proactive management tool to assist with: – investigating the likely sources of construction noise impact; – quantifying the extent of likely impact (through comparison with the project noise level goals); – identifying the need for further controls or modified site noise management practices; – establishing the effectiveness of noise mitigation implemented; – Ad hoc noise monitoring would also be undertaken in response to noise complaints or where new activities are initiated, as required. Where noise monitoring is required; in response to valid community complaints, investigations would be performed at a location representative of the nearest affected sensitive receiver, or a location representative of the complainant(s) dwelling; and • The time varying noise sources ($L_{Amax, LA10, LA1, LA90,}$ L_{Aeq}) would be reported and construction noise levels would be compared with the project noise level goals. **Blast Overpressure Monitoring** • blast overpressure and vibration monitoring will be continuously undertaken to ensure blasting levels remain within the approval criteria.

Reporting	• noise level measurements and investigations undertaken in response to community complaints would be summarised and included with other environmental reporting documentation (as required) and provided to DERM on request. Reporting would note: – the time of monitoring; – the type and location of activities occurring on site at the time of monitoring; – the location of monitoring positions with respect to site noise sources (also marked on a plan); – noise generating activities audible at the monitoring location; – other extraneous noise sources which could influence the noise level measurement; and – weather conditions prior to and during the monitoring (or complaint); • where site activities are identified as the probable cause of concern or complaint, action would be taken to minimise future events by revising noise management procedures (involving modification to work practices or further controls at source or at receiver) for the activities identified as contributing to the nuisance or high noise event; and • management measures outlined above would be revised and the updated commitments implemented to reduce potential for future impacts as a result of similar activities.
Corrective Action	• if complaints are received in relation to a short-term unavoidable event/s or emergency the community engagement and awareness of the possibility of such future activities would be improved; • where construction noise level investigations in response to community complaints show unacceptable project noise levels, revision to the noise mitigation measures and management commitments would be undertaken to further control noise impacts; • The project noise level goals would be used to assist with determining the need for further corrective actions; and • Where further source noise controls or mitigation in the sound transmission path are not possible,, controls at the receiver would be investigated. Detailed investigation of façade attenuation would be required as part of these investigations.

8.8.13 ELEMENT 13 – WASTE

8.8.13.1 Relationship to the EIS

The EIS has identified the range of wastes generated in carrying out the construction activities and described which wastes will be stored or transported for offsite disposal. The EIS has also recognised that improper storage or disposal of waste may impact the environmental values recognised in the Environmental Protection (Waste Management) Policy 2000, namely:

- the life, health and well-being of people
- the diversity of ecological processes and associated ecosystems
- the land use capability.

The major sources of waste generated from the rail construction activities and their treatment are described in Table 19.

Table 19. Waste stream management

WASTE STREAM	WASTE SOURCE	MANAGEMENT STRATEGY
green waste	vegetation clearing	suitable material to be used on site to provide fauna habitat; remaining material to be chipped and mulched, and reused during progressive rehabilitation and revegetation; and burning of green wastes will only occur as a last resort subject to obtaining permits and approvals.
building waste	initial construction of rail associated infrastructure and ongoing construction works	Waratah Coal will prefabricate materials off-site with transportation and drop-off at designated points along the rail alignment. By procuring construction materials to the specifications and quantities necessary, general building waste from the project will be considerably reduced.
sewage	contractor offices, crib room, accommodation facilities	sewage treatment systems will be commissioned at temporary workers accommodation in accordance with relevant state and Regional Council regulations; and regularly maintained port-a-loos will be used at remote worksite as required.
general waste	construction, rail site administration and management facilities	general waste to be collected in bins, stored in designated waste transfer areas and periodically removed from disposal to the nearest regional council landfill. Any waste paper, printing cartridges or packaging material will have a dedicated recycling bin on site. The waste will then be transported off site by a waste contractor for recycling.
petrols, oils, lubricants, other chemical wastes, industrial waste	routine servicing and shutdown overhaul of vehicles and equipment in workshops and maintenance facilities, refueling and fuel storage facilities.	stored in bunded areas then removed by licensed contractor for reuse, reprocessing, recycling or disposal; and liquid wastes will be stored in suitable containers within the bunded areas.

Potential impacts on environmental values resulting from improper treatment of waste generated in carrying out the activities can be reduced. In addition waste minimisation has been considered throughout the initial planning and conceptual design stages of the project and will continue during detailed design and construction. The following waste management hierarchy has been considered when selecting the waste management strategies for each waste stream:

- waste avoidance;
- waste re-use;
- waste recycling;
- energy recovery from waste; and
- waste disposal.

8.8.13.2 Element Plan

The element plan is shown in Table 20.

Table 20. Waste element plan

OPERATIONAL POLICY OBJECTIVE – WASTE • MINIMISE THE GENERATION OF WASTES, WHERE PRACTICABLE AND TO APPROPRIATELY CONTAIN, CONTROL AND DISPOSE OF ALL WASTE GENERATED	
Performance Criteria	• minimal waste generated during construction and operations; • no inappropriate disposal or management of waste; • no contamination of soil, air or water as a result of waste disposal activities; and • compliance with Waratah Coal waste management requirements and systems.
Implementation Strategies	• a waste management plan will be developed that includes: – opportunities and actions to be taken to implement the waste management hierarchy; – appropriate methods for disposal of waste in accordance with reasonable requirements of local governments and DERM will be implemented; – waste management procedures; – training and management; and – a monitoring and reporting program. • appropriate planning will be employed when ordering materials, including returning excess materials and used chemicals containers to the supplier; • preference will be given to materials that will result in no or low, levels of waste (including from the materials and the packaging); • waste streams will be separated into various components where these are produced; and • recyclable wastes will be collected and re-used or recycled. **Liquid Waste** • sewage and grey water will be either be collected for treatment and disposal off-site or treated on site and disposed of to effluent absorption beds or irrigation fields; • the liquid waste treatment method will be selected in consultation with a relevant local authority and DERM and the relevant environmental authority obtained; and • sewage effluent absorption beds and / or irrigation fields will be selected and designed to ensure that: • sensitive areas area avoided; • there is no ponding or runoff of effluent; and • the receiving environment has the capacity to assimilate the contaminants. **Hazardous Waste** • chemical wastes will be collected and stored in sealed containers and appropriately labelled for safe transport to an approved chemical waste depot or collection by a liquid waste treatment service; • storage, transport and handling of all chemicals will be conducted in accordance with all legislative requirements; • containment bunds and / or sumps will be drained periodically to prevent overflow and subsequent pollution of the surrounding land and / or water course; • all hazardous wastes will be appropriately stored in bunded areas away from watercourses and in accordance with legislative requirements; • hazardous wastes will be managed in accordance with the requirements of relevant legislation and industry standards;

	• a hazardous materials inventory will be prepared; • if a hazardous waste is released to waters or land immediate action must be taken to prevent further releases, to contain the hazardous waste from spreading to sensitive areas. Rehabilitation of contaminated areas must be undertaken to restore the environment to the condition prior to release; • MSDS for hazardous materials will be available at the construction site; and • hydrocarbon wastes will be collected for safe transport off site for reuse, recycling, treatment or disposal at approved locations. **Disposal** • disposal of all waste material that is unable to be reused or recycled onsite, within an approved land fill; • all wastes leaving the site will be tracked in accordance with the requirements of the Schedule 2 of the *Environmental Protection (Waste Management) Regulation 2000*; and • no vegetative waste is to be burnt on site without a 'Permit to Burn' issued by the Rural Fire Brigade and compliance with any other relevant statutory requirement. **Waste Transport** • ensure the movement of hazardous materials and regulated wastes occurs at non-peak times to minimise the possibility of traffic conflicts and associated risks; and • transport of wastes will be carried out by a licensed carrier, and in accordance with the DERM tracking system as defined in *Environment Protection (Waste Management) Regulation 2000*.
• Monitoring / Auditing	• regular inspection of on-site facilities to ensure waste is being generated, stored, handled, disposed and transported in accordance with this EMP; • registers and manifests maintained to track waste material. This documentation subject to internal or external audit, especially for any regulated waste material; • any discharges from site that could impact on the environment monitored in accordance with DERM's requirements; • records kept of any regulated waste removed from the site, including name and licence number of waste transporters, volume and description of waste transported, destination of waste and licence number of the waste treatment operator; • waste contractors to provide certification (licence) records verifying their registrations and points of discharge of waste; and • assessment of actual waste results and comparison with predicted impacts and mitigation measures. Provide baseline data to enable continuous improvement of waste avoidance, reduction and management measures throughout the project.
• Reporting	• monthly report prepared and submitted to Proponent to include details of monitoring results, audits, training and incidents; • any environmental incidents involving spills recorded; including time of incident, persons involved, details of incident, mitigation measures and actions taken to minimise the probability of recurrence. Immediate reporting to SEO of any large spills or potential risk of spills; and • incidents, complaints and any significant environmental harm reported to regulatory body/ies where required.
• Corrective Action	• ensure that the appropriate personnel undertake adequate environmental awareness training covering the requirements of the EMP regarding waste management; and • the Construction Environment Manager can request the cessation of works at any time should a breach of performance criteria of the EMP be occurring or is at risk of occurring.

8.8.14 ELEMENT 14 – HAZARD AND RISK

8.8.14.1 Relationship to the EIS

The EIS has determined that baseline Qualitative Risk Assessment (QRA) undertaken for both construction and operation of the rail have indicated that health and safety risk profiles varied from low to extreme. Once mitigation measures and design treatments are applied to the assessed hazards, the residual risks are either ranked as being low or moderate. The exception being the high risk ranking associated with the potential for collisions of trains and collisions at level crossings.

Notwithstanding the risk treatments proposed, the historical data suggests that there will always be an inherent level of high risk associated with level crossings.

Across the baseline QRA, no extreme or high ranking risks were detected outside the rail's boundary, however without QRA, offsite hazards associated with vehicle movements, were ranked high. Applied QRA control measures and design treatments downgraded the associated risk to moderate.

8.8.14.2 Element Plan

The element plan is shown in Table 21.

Table 21. Hazard and risk element plan

OPERATIONAL POLICY OBJECTIVE – HAZARD AND RISK • SAFELY MANAGE THE RISKS TO THE EXISTING ENVIRONMENTAL VALUES, INCLUDING SURROUNDING LAND USES ASSOCIATED WITH THE PROJECT.	
Performance Criteria	• compliance with relevant Standards, guidelines and legislation; • storage, use and disposal of any chemicals, fuels, solvents or other hazardous materials or substances which may cause pollution. This will managed in such a way as to not cause environmental harm; • containment of all spills involving materials that may cause environmental and effective cleaned up and measures taken to prevent the incident from recurring; and • recording and reporting of incidents accurately and describing the extent of spill that occurred.
Implementation Strategies	**Hazardous Materials or Dangerous Goods** • undertake storage and transport of materials according to relevant Australian Standards (AS), guidelines and legislation, including: – *Dangerous Goods Safety Management Act 2001*; – AS4452 The Storage and Handling of Toxic Substances; – AS1940 The Storage and Handling of Flammable and Combustible Liquids; – AS3780 The Storage and handling of Corrosive Substances; – MSDS; and – regional council requirements; • implement a program of regular equipment inspection and testing to ensure reliable performance; • operators will be trained in the safe operation of the system and emergency procedures in the event of fuel oil leakage; • spill containment equipment will be available at the unloading pad for use in the event of spillage; • a sump will be provided to collect any spillage and allow recovery; • ignition sources will be strictly controlled and limited to avoid a fire; • an approved fire protection system will be installed around new hydrocarbon storage areas; • The following measures will be taken to minimise the potential for the leakage of fuel oil from storage tanks: – adequate bunding will be constructed to contain spills, in accordance with AS 1940:2004;

  - tank level indicators will be installed on fuel oil tanks for monitoring of fuel oil levels;
  - maintenance of fuel oil tanks will be undertaken, to ensure safe and effective operation of all components; and
  - tanks will be designed in accordance with AS 1692: 2006 steel tanks for flammable and combustible liquids to minimise the potential for;
- undertake refuelling and maintenance activities in designated bunded areas to minimise the potential for soil and water contamination which may result from these activities. Prepare and implement spill response measures including:
  - a program of regular equipment inspection and testing to ensure reliable performance;
  - operators will be trained in the safe operation of the system and emergency procedures in the event of fuel oil leakage;
  - spill containment equipment will be available at the unloading pad for use in the event of spillage;
  - a sump will be provided to collect any spillage and allow recovery;
  - ignition sources will be strictly controlled and limited to avoid a fire; and
  - an approved fire protection system will be installed around new hydrocarbon storage areas;
- spill kits for contaminated material and protective clothing will be provided at each transfer and storage location for use in the event of any spillages or leaks;
- copy of up to date MSDS for each chemical / product used on site, will be available on site and readily available to all site personnel;
- appropriate signage provided using HAZCHEM coders which are to be visible at all times. Signage also listing contact details for the Safety Officer and SEO in case of an emergency;
- fire fighting equipment must be checked as per regulatory requirements and maintained at all times;
- records will be kept on the existing inventory, storage location, personnel training and disposal of waste for all chemicals, fuel and dangerous goods used on site;
- all relevant staff must be trained in appropriate handling, storage and containment practices for chemicals, fuel and dangerous goods;
- liquid chemicals and fuels storage in above ground tanks and chemicals and fuels stored in drums will be bunded in accordance with relevant Australian Standards;
- implement particulate and gas / vapour exposure standards and procedures that will apply to dust, fibres, mist and fume (i.e. particulates), and gas and vapour exposures in the workplace (with emphasis on inhalation as the primary route of exposure). The standards and procedures will cover:
- evaluation of particulate and gas / vapour hazards; and
- development of a control program to ensure that e and employees, contractors and the community will not suffer adverse health effects from particulates or gas / vapours, either used or generated by the project.

Emergency response

- develop an Emergency Response Action Plan to account for natural disasters such as storms, floods and fires will be developed for the construction, operation and maintenance phases;
- Emergency Response Action Plan is to be prepared in consultation with the Department of Community Safety, regional councils and Queensland Police;
- designated first aid and emergency rescue facilities and equipment will be available;
- stores, workshops and offices will be fitted with approved and certified fire detection (smoke detectors) and sprinkler systems;

- first aid and fire fighting equipment (hand held extinguishers and fire hoses) will be installed at strategic points within each building;
- develop a fire management plan for the site for construction and operation phases;
- fire fighting equipment and exit locations will be suitably signed and all work areas will be within the required distance to reach emergency exits;
- emergency exits will be planned to allow for the safe evacuation of the workforce and in accordance with Building Code of Australia;
- appropriately trained personnel will be available throughout the life of the project to provide first aid and emergency response to on site emergencies;
- the site will have a fire truck or suitably equipped water truck or trailer that can support fire response requirements. Site fire fighting capabilities also will be addressed in the Emergency Response Action Plan;
- fire drills will be undertaken on a regular pre-determined basis; and
- Waratah Coal will liaise with local State Emergency Services, local ambulance and hospital services with respect to emergency response planning, and the subsequent development of those plans.

Transportation, vehicle collision and driving conditions

- construction workers operating vehicles on-site will be trained and licensed to ensure so that these vehicles are driven in a safe and appropriate manner;
- speed control (signage) will be used at all work sites;
- all vehicles will be fitted with radios for two-way communication;
- watering of roads and access areas will be undertaken regularly to reduce emissions of wheel generated dust and improve visibility;
- adequate night lighting through the provision of lighting towers and vehicle headlights will be provided to ensure night operating and driving conditions are safe;
- vehicles carry HAZCHEM identification and response guidelines for use by emergency personnel attending the scene of the accident;
- tankers incorporate internal valves on all outlets to prevent spills, in the event of vehicle damage; and
- tankers to conform with the Australian Code for the Transport of Dangerous Goods by Road and Rail, (Department of Infrastructure and Transport, 1998) and AS 2809.4-2001.

Equipment

- construction vehicles and equipment will be operated within the manufacturer's specifications. All vehicles and equipment will be maintained and serviced on a regular basis. Records of maintenance and servicing will be retained on-site for the duration of the construction phase;
- machinery and equipment operators will be trained and carry their current licences, where necessary; and
- there will be specific and detailed standard operating procedures implemented that deal with high voltage.

Explosives and blasting

- a specialist explosives company will provide the ammonium nitrate, emulsion, detonators and boosters to be used during blasting operations. The Contractor's personnel will be licensed and trained in the transport, handling, mixing and use of explosive materials. The personnel will also have an established record of operation in the industry and will adhere to the Australian Explosives Manufacturer Safety Committee (AEMSC) Code of Practice;
- blasting operations will comply with the *Explosive Act 1999*;
- personnel in the vicinity of a blast will continue to wear Personal Protective Equipment (PPE) and all personnel will observe safe distances during blasting activities as defined by the Contractor;
- licensed transporters operating in compliance with the Australian Dangerous Goods Code will undertake the transport of dangerous goods to the construction site; and
- the transport of ammonium nitrate will be undertaken in compliance with the requirements of AS 1678.5.1.002-1998: Emergency procedure guide - Transport - Ammonium nitrate, Standards Australia.

Personal safety

- access to the construction site will be denied to any site staff / visitor not wearing the following mandatory PPE:
  - safety helmet;
  - steel cap boots;
  - safety glasses; and
  - high visibility vest;
- fall protection will be controlled through appropriate elevated work platforms and the proper use of harnesses..

Public risk

- a safety risk assessment will be undertaken of the project to identify areas of high risk to public safety. Exclusion zones will be developed to prevent public access to high risk areas, with fences and signs erected to delineate such areas.

Security

- fencing will protect the worksite from unauthorised public access; and
- prior to being given access to the project site, visitors will complete mandatory registration and an environmental, health and safety induction. The scope of induction will reflect those areas of the project site that the visitor will be permitted access.

Flooding

- construction activities will be phased to minimise potential flood impacts.

Monitoring / Auditing

- monitoring will be undertaken to assess whether project health and safety measures are being implemented and whether they are effective. Monitoring will involve the compilation and assessment of data relating to health and safety issues, such as reported near misses, accident reports and any health surveillance data (sickness data). Outcomes from this monitoring may trigger the need for additional safety and health risk control actions.

	• accident and near miss data will be monitored to identify where: – common themes occur; – PPE is being incorrectly used; – corrective actions are ineffective or have not been strictly implemented; – procedures / practices need to be reviewed; and – retraining may be required.
Reporting	• any environmental incidents involving spills recorded including time of incident, persons involved, details of incident, mitigation measures and actions taken to minimise the probability of recurrence. Immediate reporting to the project Environmental Advisor of any large spills or potential risk of spills; and • incidents, complaints and any significant environmental harm reported to regulatory body/ies where required.
Corrective Action	• in the event of a spill of hazardous substances, necessary work procedures and operation controls will be reviewed to ensure they are fit for purpose and revised where necessary; • ensure that the appropriate personnel undertake adequate environmental awareness training. This training will cover the requirements of the EMP in regards to the management of hazardous substances; and • the Construction Environment Manager can request the cessation of works at any time should a breach of performance criteria of the EMP be occurring or is at risk of occurring.

8.8.15 ELEMENT 15 – TRANSPORT

8.8.15.1 Relationship to the EIS

The EIS has determined that while the rail will have an impact during the construction phases, this will only be temporary and is likely to cease prior to nearby projects commencing. As such, the peak loading on the roads are unlikely to coincide and any overlap would be short term.

Once the rail is operational, it will largely generate no additional traffic loading on roads along the line. While occasional maintenance and service vehicles may access the railway, virtually all vehicle access will be restricted to operations near the mine and coal terminal. This will include the major traffic generator for the rail, being the marshalling yards, which will be directly accessed from the Bruce Highway. However, even at peak operation, the rail (independent of the mine and coal terminal) is likely to generate only a small number of vehicle movements per day.

8.8.15.2 Element Plan

The element plan is shown in Table 22.

Table 22. Transport element plan

OPERATIONAL POLICY OBJECTIVE – TRANSPORT • MANAGE CONSTRUCTION TRAFFIC AND TRANSPORT ISSUES TO MINIMISE POTENTIAL IMPACT ON THE COMMUNITY AND THE OPERATION OF THE ROAD NETWORK.	
Performance Criteria	• avoidance, mitigation and management of the potential construction traffic impacts on communities near the construction areas of the project; • minimisation, as much as possible, of potential traffic disruptions to the operation of the road network and the public transport (school buses) due to construction works; • maintenance of safe access near all project work areas for road users; • local and broader communities kept informed about the time and scale of changes in the traffic conditions on roads in the vicinity; • traffic flows near construction works monitored, as required; and • corrective measures implemented in response to traffic impacts subsequent to construction works.
Implementation Strategies	• transport of hazardous and dangerous materials during the construction phase will be undertaken in accordance with the DERM tracking system as defined in *Environment Protection (Waste Management) Regulation 2000*; • prepare a TMP in consultation with Department of Transport and Main Roads (DTMR), Queensland Police Force and the relevant regional council for all elements of the works to include measures to minimise the adverse effects on the road network and school bus routes. The plan would address the safety and convenience for all road users and consider the following: – keep one lane open at all times; – installation of proper signage to make drivers aware about road works and guide them through the work area; – measures to help ensure safety and manage the changes in traffic conditions (e.g. traffic controllers and / or variable message signage; – wet weather specific operational requirements including any management measures necessary to address potential environmental impacts of wet weather operations); – truck routes and construction site access; and – maintenance of traffic flows past worksites on all bus routes; • roadwork contractor will be advised to avoid the school pick up and drop off periods as a general measure; • control working hours and avoiding haulage tasks during peak traffic periods and during school drop-off and pick-up times. Where haulage in peak hours is unavoidable, such activities should be managed in accordance with specific traffic management plans provided to the relevant agencies in advance; • use of the established truck routes and arterial roads for the haulage of construction materials and spoil in order to minimise truck traffic on local roads; • minimise congestion effects by effectively staging of the construction work; • analyse the capacity of intersections and road links along the haulage routes in order to identify and mitigate against any operational impacts; • model the exit sign and construction traffic (on the major roads and intersections in the vicinity of the site) in order to predict the effect of temporary traffic arrangements; • provide signage and delineation past the work site, including any diversion routes; • implement measures to help ensure safety and manage the changes in traffic conditions (e.g. traffic controllers and / or variable message signage);

	• intersection configurations will be confirmed for all new intersections and any revised existing intersections. This will ensure the configurations adequately and safely cater for the future traffic volumes, and that the intersection performance criteria are met; • identify management and process controls as a means of mitigating or eliminating the hazards and risks associated with construction traffic and transport during construction; • consider drainage as well as the volume of traffic during and post construction to ensure that road designs are suitable to account for scour and load capacity; and • For construction and realignment of local roads, the appropriate industry and local government standards and codes of practice will be adopted in undertaking the works. **Heavy vehicle movement** • each haulage contractor will be required to prepare a Road Use Management Plan (RUMP) which addresses the following key items associated with the haulage of materials: – haulage routes; – safety management; – traffic management; – operations; – environmental controls; and – emergency plans; • control of heavy vehicle movements to avoid interference with major events; • avoidance of haulage tasks during peak traffic periods and during the school drop-off and pick-up times. Where haulage in peak hours in unavoidable, such activities managed in accordance with specific traffic management plans provided to the relevant agencies and appropriate Regional Councils in advance; • prepare dilapidation surveys prior to haulage operations to identify any pre-start improvement. A maintenance plan will be prepared to manage any impacts during construction and a post construction survey undertaken to confirm the need or otherwise for restoration following completion; and • use of the established truck routes and arterial roads for the haulage of construction materials and spoil in order to minimise truck traffic on local roads. **Local traffic** • notification to the local communities and local authorities where practicable about proposed changes to local traffic access and possible delays due to construction activities. There will also be a provision for clear signage of changed traffic conditions and alternative routes. **Workforce transportation and parking** • provision of sufficient parking to accommodate employees' vehicles and instructions given to commuting employees to use the providing parking facilities. This will help in avoiding traffic disruption due to road side parking; and • provision of buses and encouraging car pooling for transportation of construction workforce. **Emergency vehicles** • ensure at least one lane will be kept open on all roads during the construction period.
Monitoring / Auditing	• monitor the construction conditions and review traffic management arrangements as appropriate in order to address any negative impacts; and • monitoring of traffic flows and road network performance on a continual basis to confirm that specific controls have been implemented and appropriate work practices are being adopted to achieve the specified performance objectives.

Reporting	• monthly report on local traffic conditions, including any accidents involving construction traffic to Project Supervisor; • monthly report prepared and submitted to Waratah Coal to include details of local traffic conditions, including any accidents involving construction traffic, any monitoring results, audits, training and incidents; • immediate reporting to Project Supervisor and SEO of any incident which contravenes the objectives of the EMP; and • incidents, complaints and any significant environmental harm reported to regulatory body/ies where required.
Corrective Action	• investigation and implementation of additional traffic management and transport options where required; • ensure that the appropriate personnel undertake adequate environmental awareness training. This training will cover the requirements of the EMP regarding traffic management; and • the Project Manager can request the cessation of works at any time should they feel that the performance criteria of the EMP have been breached.

8.8.16 ELEMENT 16 – CULTURAL HERITAGE

8.8.16.1 Relationship to the EIS

CHMPs will be developed between Waratah Coal and the Wangan and Jangalingou, Jangga, Birri and any other relevant Indigenous bodies in order to address specific issues of concern. Along with an agreed Cultural Heritage Management Plan (CHMP), the Implementation Strategies outlined in the table below will minimise the potential for harm to areas and items of importance to local Aboriginal culture.

8.8.16.2 Element Plan

The element plan is shown in Table 23.

Table 23. Cultural heritage element plan

OPERATIONAL POLICY OBJECTIVE – CULTURAL HERITAGE • TO MANAGE THE KNOWN AND UNKNOWN COMPONENTS OF INDIGENOUS ARCHAEOLOGICAL RECORDS AND AREAS.	
Performance Criteria	• all known indigenous archaeological records, as identified within the EIS, are preserved and not impacted upon by the project; and • all unknown indigenous archaeological records found during the course of the project are reported to the appropriate Aboriginal party and Waratah Coal.
Implementation Strategies	• all site operations are to be carried out in accordance with the relevant CHMPs as agreed between Waratah Coal and the Aboriginal parties for the area.
Monitoring / Auditing	• auditing of the CHMP conducted quarterly (internally) and annually (externally).
Reporting	• the CHMP will contain provision for its review in the event of variation of any of the existing project components. The CHMP will also contain provision if additional project elements emerge that were not anticipated in the original project concept; or variation as required by the parties upon their review of the agreement on a regular basis for the duration of the agreement; or if particular issues arise at any time. The CHMP will also make provision for pro-active auditing by Waratah Coal of all aspects of its implementation; • report any findings of any indigenous archaeological items to the Site Supervisor in accordance with the CHMP; and • report any findings of any indigenous archaeological items to the SEO.
Corrective Action	• non-compliances with CHMPs will be investigated and findings of investigations incorporated into work procedures to ensure no repetition of non-compliances.

8.8.17 ELEMENT 17 – VISUAL AMENITY

8.8.17.1 Relationship to the EIS

The EIS has determined that the 447 km length of this rail alignment will result in the perception of having a major visual impact on the landscape. It was found; however, that this component of the project was for the majority having low visual impact in the existing landscape due to its considerable length avoiding most areas of development. All areas close to the rail alignment (less than 1 km) would experience moderate to high visual impact that would be difficult to buffer although for the majority of the length this zone is sparsely populated with the potential for limited observers.

8.8.17.2 Element Plan

The element plan is shown in Table 24.

Table 24. Visual amenity element plan

OPERATIONAL POLICY OBJECTIVE – VISUAL AMENITY • ENSURE THAT SITE REHABILITATION WORKS ARE UNDERTAKEN TO ASSIST IN THE RESTORATION OF THE VISUAL ENVIRONMENT OF THE EASEMENT AND ITS SURROUNDS.	
Performance Criteria	• disturbed areas are rehabilitated with native endemic vegetation.
Implementation Strategies	• waste generated during construction is collected and stored neatly on-site and removed as soon as possible; • rehabilitation of disturbed areas should be completed as site works are completed. Rehabilitation should incorporate a selection of indigenous and fast growing plant species that are endemic to the area; and • locate night lights as required for safety and security, but ensure lights are focussed on the areas required, with shields around the globes to limit extraneous light where necessary. Lighting of the site to conform with the following Australian Standards: • AS1158 Road lighting; and • AS 4282 Control of the obtrusive effects of outdoor lighting.
Monitoring / Auditing	• regular auditing undertaken to ensure compliance with objectives of the EMP.
Reporting	• report monitoring results to SEO.
Corrective Action	• implement contingencies where propagation or plantings are failing to germinate / grow.

8.8.18 ELEMENT 18 – LAND REHABILITATION

8.8.18.1 Relationship to the EIS

The EIS has determined that based on the results of soil sampling, the land within the rail footprint is generally considered class C and class D Good Quality Agricultural Land (GQAL). These land classes are described respectively defined as being "land that is suitable only for improved pastures or native pastures" or "non-agricultural land, being land not suitable for agricultural uses due to extreme limitations". Minor areas of class A (land suitable for cropping with minimal limitations) and class B (marginal for current or potential crops due to severe limitations) are located across the alignment.

As the land within the rail footprint will be effectively sterilised in the long term, opportunities for land rehabilitation are limited. However, areas used for construction access and lay down will be rehabilitated in accordance with the implementation strategies outlined in the table below.

8.8.18.2 Element Plan

The element plan is shown in Table 25.

Table 25. Land rehabilitation element plan

OPERATIONAL POLICY OBJECTIVE – LAND REHABILITATION • ENSURE THAT SITE REHABILITATION WORKS ARE DESIGNED TO LEAVE THE POST MINE LANDSCAPE COMPATIBLE WITH EXISTING SURROUNDING LAND USES.	
Performance Criteria	• no new weed species introduced and no expansion of existing weed infestations; • vegetation re-established similar to surrounding condition; • no significant change in drainage pattern; and • rail alignment stabilised with no significant erosion events; • disturbed areas are rehabilitated with native endemic vegetation where practicable.
Implementation Strategies	• rehabilitation of disturbed areas will be undertaken progressively; • rehabilitation areas will be deep ripped prior to topsoil spreading; • rehabilitation areas will be re-profiled to original or stable contours, re-establishing surface drainage lines and other land features where practicable; • topsoil application will only take place after subsoil re-spreading and compaction and will be evenly spread and left with a slightly rough surface; • driving vehicles on freshly topsoiled areas within the rail will be prohibited; • flagging used to identify clearing boundaries and sensitive features will be removed; • erosion and sediment control measures will be installed where necessary. Existing soil erosion measures will be reinstated to a condition at least equal to the pre-existing state; • cleared native vegetation will be spread over the rehabilitation areas (where practicable) to assist in the distribution of seed stock and provide shelter for fauna. Distribution of vegetation will be controlled to ensure that any erosion will be visible during inspections; • native ground cover and shrubs will be encouraged to re-vegetate where appropriate to minimise habitat barrier effects in significant habitat areas; • trees will be permitted to grow in proximity to infrastructure when infrastructure operability and safety is not affected; • environmental features such as rocks and dead timber will be replaced where appropriate; • re-vegetation activities will take place as soon as is practicable after the spreading of topsoil; • a reseeding plan based on soil types, existing local vegetation characteristics and landholder preferences will be developed; • seeding will be utilised in areas where rapid restoration is required e.g. watercourse crossings and areas of high potential; • where disturbed areas are to be re-planted or re-seeded, preference will be given to local native species. Non-invasive introduced species may be used where appropriate to provide environmentally acceptable short term surface stability; • vegetation will be allowed to regenerate naturally on cleared areas not required to be kept tree or shrub free for infrastructure protection and maintenance; • where applied, seed will be evenly spread over the disturbed area; • infrastructure warning signs will be erected within the rail alignment ; • all waste materials and equipment will be removed from the construction area in a progressive manner; • temporary access roads will be closed and rehabilitated to a condition compatible with the surrounding land use or as agreed with the landholder;

	• disused silt fences will be removed; and • fences or other barriers will be installed where appropriate and where approved by the landholder to minimise unauthorised access.
Monitoring / Auditing	• a photo record will be preserved before work commences for use during rehabilitation; • regular inspections will be undertaken during construction to monitor for erosion, presence of weeds, revegetation success and general stability of the rail corridor and infrastructure area; • significant areas will be monitored until the establishment of regrowth and if necessary appropriate reapplication of seed will be carried out if revegetation is not successful; • the success of restoration will be assessed by comparing the percentage cover and species diversity on the rehabilitated areas with that of adjoining land; and • monitoring will also include an assessment of the effectiveness of weed control measures.
Reporting	• report monitoring results to SEO.
Corrective Action	• implement contingencies such as: • limit access to the affected area; • re-seed rehabilitated sites, implement soil stabilisation techniques and establish drainage networks; and • undergo additional rehabilitation using alternate strategies.

8.8.19 ELEMENT 19 – ACID SULPHATE SOILS

8.8.19.1 Relationship to the EIS

The EIS has determined that, based on desktop assessment, Acid Sulphate Soils (ASS) may be encountered within the rail corridor alignment at or below 5 m AHD where the rail corridor crosses creeks and streams. Based on the outcome of these desktop studies, there is a requirement for field-based ASS investigations to be undertaken along the rail corridor at locations below 20 m AHD where the rail corridor crosses creeks and stream channels and where the alignment is identified as being in areas below 5 m AHD. Of particular focus during these investigations will be the eastern extent of the rail alignment in the vicinity of the proposed coal terminal.

Waratah Coal has committed to undertaking further ASS investigations during the Project's Final Design Phase. If required, Waratah Coal will develop an ASS Management Plan which will conform with the requirements of: the Queensland Acid Sulfate Soil Technical Manual; the State Planning Policy 2/02 (SPP2/02) – Planning and Managing Development Involving Acid Sulfate Soils; and the SPP2/02 Guidelines: Acid Sulfate Soil .

8.8.19.2 Element Plan

The Element Plan is shown in Table 26.

Table 26. Acid Sulphate Soil Element Plan

OPERATIONAL POLICY OBJECTIVE – ACID SULPHATE SOILS • MINIMISE ENVIRONMENTAL IMPACT BY MANAGING ACID SULPHATE SOILS	
Performance Criteria	• Minimise and manage the risks of impacts from ASS in accordance with Queensland Acid Sulfate Soil Technical Manual.
Implementation Strategies	• if investigations identify that an ASS Management Plan (ASSMP) is required for the project, as ASSMP will be developed which includes measures such as: – a description of the occurrence of ASS on the site, including; • vertical and spatial distribution of ASS; • a map of the site distribution of ASS; and • results of the preliminary ASS assessment; – an overview of the proposed works including: • the dewatering and drainage strategies; • the soil excavation strategy; • delineation of any clay and peat lenses and horizons that may affect dewatering or excavation of soil; • temporary storage of ASS, if proposed; and • reuse / disposal of excavated ASS; – a description of the management strategies to minimise impacts from the site works including: • strategies for preventing the oxidation of iron sulfides (including avoiding the disturbance of ASS by redesigning layout of the excavations and/or re-flooding of potential ASS to limit oxidation); • treatment strategies for ASS (including neutralisation of ASS, use of lime / limestone barriers, burial of potential ASS); • strategies for management of the watertable level on and off-site both during and post construction; and • containment strategies to ensure that all contaminated stormwater and acidic leachate associated with the oxidation of ASS is prevented from entering the environment both in the short and long-term; • during the construction phase, the following will be undertaken: – all soil testing will be carried out in accordance with legislative and guideline requirements for ASS – all construction activities that involve excavation of natural materials from a depth greater than 0.5 m below natural surface level will include specific ASS management requirements in the WMS for that activity. All WMS will be reviewed and authorised prior to works commencing. – prior to commencing excavation works the following will occur; • sufficient area is available at the designated treatment pad to stockpile all of the excavated material • sufficient quantity of ag-lime is available on site to treat 200% of the estimated excavation volume, unless otherwise established through approved testing methods • suitable plant and equipment is available on site to spread and mix the ag-lime through the excavated material; – during excavation of ASS material the following will be recorded daily: • details of source location, offset and depth. • volume of excavated material. • treatment location.

	• quantity of ag-lime added to treated ASS material. • Disposal / storage location. – spoil will be stored on site with adequate protection in accordance with an ESCP and stored away from drainage channels and water courses in accordance with the site's water quality management plan. – after treatment is completed, verification testing will be conduct. Lots / stockpiles which fail verification will be re-treated at liming rates determined from the verification testing. Additional verification tests will be conducted after re-treatment. – all neutralising agents will be handled and stored according to the specific MSDS for the product supplied by the manufacturer. MSDS sheets are to be retained onsite in the site offices.
Monitoring / Auditing	• regular inspection of will be undertaken during excavation, management and transport of PASS and ASS; • records are to be kept documenting the volume of ASS excavated and treated, and quantity of lime spread and mixed; and • verification testing outcomes of treated excavation lots.
Reporting	• monthly report prepared and submitted to Waratah Coal to include details of monitoring results, audits, training and incidents; • immediate reporting to Project Supervisor and the SEO of any incident or release of ASS to the environment; and • incidents, complaints and any significant environmental harm reported to regulatory body/ies where required.
Corrective Action	• appropriate control measures implemented where unacceptable risk of ASS exposure is identified or may occur; • necessary corrective action implemented following incident or complaint; • the Contractor will ensure that all appropriate personnel undertake adequate environmental awareness training. This training will cover the requirements of the EMP in regards to acid sulphate soil management; and • the Construction Environmental Manager can request the cessation of works at any time should a breach of performance criteria of the EMP be occurring or is at risk of occurring.

8.9 PROCESS MANAGEMENT

8.9.1 ENVIRONMENTAL DELIVERY STRATEGY

Waratah Coal will implement environmental management controls that will deliver outstanding environmental performance throughout the development and delivery of the project. Further, Waratah Coal will maintain an environmental management system in accordance with the intent of the environmental management standard ISO 14001.

8.9.2 FINAL DESIGN PHASE

The following will be implemented during the Final Design Phase:

- conduct of further investigations necessary to finalise the design and environmental management requirements;
- procurement documentation and evaluation that incorporates the environmental requirements of the project;
- design solutions that minimise the potential for environmental harm and maximise sustainable outcomes;
- planning and environment-related licences and permits obtained for all activities in an area as required prior to commencement of construction activities in that area;
- development of construction techniques that reasonably and practically minimise the potential for environmental harm;
- development of project environmental standards that maximise the environmental performance of the project;
- safety in design processes relevant to the environmental performance of the project during construction and operation;
- early and continuous review of the design against environmental design criteria and environmental documents; and
- detailed risk assessment and development of management controls for the construction phase.

Further investigations that are likely to be required include geotechnical investigations, contaminated soils investigations, location of public utilities and cultural heritage investigations. Some of these will require minor site disturbance such as drilling and minor excavation for testing purposes.

The design team will be fully briefed on the special environmental requirements for the final design phase.

8.9.3 CONSTRUCTION PHASE

The following occurs during the construction phase:

- the environmental design, developed during the design and pre-construction phase, is implemented;
- clear environmental management standards are communicated to and owned by personnel, consultants, subcontractors and suppliers;
- clear environmental accountabilities and responsibilities are established for all key management positions;
- inspection, monitoring, auditing and reporting are in place to establish performance against the requirements of this EMP and to facilitate improvement of the EMP; and
- all personnel are aware of and take ownership of their environmental responsibilities relevant to the work they are undertaking.

The following occurs during the commissioning phase:

- environmental risks associated with the risk of equipment failure during commissioning, as design and construction errors are identified and managed;
- specific environmental risks associated with commissioning are identified and addressed; and
- changeover of environmental roles, responsibilities and accountabilities from the construction team to the operations team are managed effectively.

8.9.4 OPERATIONS PHASE

The following will occur during the construction phase:

- clear environmental management standards are communicated to and owned by personnel, consultants, subcontractors and suppliers;
- clear environmental accountabilities and responsibilities are established for all key management positions;
- inspection, monitoring, auditing and reporting are in place to establish performance against the requirements of the EMP and to facilitate improvement of the EMP; and

- all personnel are aware of and take ownership of their environmental responsibilities relevant to the work they are undertaking.

8.10 SUMMARY

This draft Environmental Management Plan (EMP) has been prepared to support an application for an environmental approval for the project. As such, this EMP proposes a range of measures to protect the identified environmental values potentially affected by the development of the project. It is intended that the measures proposed in this document will be used by the administering authorities to establish the approval conditions for the project.

This EMP is intended to be a live, interactive document. As the project progresses, this EMP will be updated in accordance with best practice environmental management practices, standard operating procedures, any Works Approvals and Licence conditions, and in consultation with key project stakeholders.

Waratah Coal is committed to ensuring continuous improvements in environmental management are made across all of its operations and that all tasks are carried out in compliance with best environmental management practices throughout all project phases.