

18. Environmental Management Plans

Burnett Catchment Water Infrastructure - Burnett River Dam

18.1 Environmental Management

A number of recommendations have been made in this Environmental Impact Statement (EIS) in relation to management of environmental impacts. These recommendations will require actions to be taken during the design, construction and operation of the proposed dam.

In order to ensure that these recommendations are implemented, a Draft Environmental Management Plan (EMP) has been developed for the project.

An outline of the Draft EMP is provided in this EIS to demonstrate the commitment of Burnett Water Pty Ltd to ensuring that the recommendations of this EIS are implemented. Environmental Management strategies for individual project elements are described in Section 18.4 – Implementation Plans.

18.2 EMP Outline

An EMP is a management tool used to assist in minimising impact to the environment. The EMP is a dynamic document. It will be regularly updated to incorporate changes in environmental management procedures in the light of ongoing monitoring results, new techniques, legislation and environmental policies of the Proponent in consultation with the relevant authorities.

The implementation of the EMP will ensure that concepts and commitments given in the EIS are applied so that the potential impacts of the construction and operation of the proposed infrastructure on the environment are minimised. The EMP provides for ongoing environmental performance review and compliance monitoring.

18.2.1 Objectives

The objectives of the EMP are those embodied in the Inter-governmental Agreement on the Environment (IGAE) and the Principals of Ecologically Sustainable Development (ESD).

The Core Objectives are:

- To enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations;
- To provide for equity within and between generations; and
- To protect biological diversity and maintain essential ecological processes and life support systems.

The Guiding Principles are:

- Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
- The global dimensions of environmental impacts should be recognised and considered; and
- Decisions and actions should provide for community involvement regarding issues that affect them.

No objective or principle should dominate others. A balanced approach which takes into account all of these objectives and principles is required to pursue the goal of ESD.

18.2.2 Performance Criteria

Performance criteria are provided for individual elements of the EMP and are described in simple terms that are easily understood and measured, so as to assist in the development of appropriate corrective actions. The environmental performance criteria specified are the minimum acceptable standards which measures necessary to monitor and manage potential impacts on the environment should meet.

18.2.3 Management Principles

Describes the operational policy or management objective proposed for the each element of the EMP.

Burnett Catchment Water Infrastructure – Burnett River Dam

18.2.4 Monitoring

Measuring, monitoring and evaluating will be key activities of the environmental management plans. Monitoring shall mean the setting in place and operation of various procedures to monitor, measure and record the level of impact on the environment during the execution of the work.

The monitoring of environmental impact shall be carried out in accordance with the monitoring requirements for each element throughout the EMP, relevant legislation and the conditions of any permit, where relevant.

Monitoring procedures will be developed in accordance with standard protocols and the requirements of the Environmental Protection Agency, Department of Primary Industries, or other relevant agency. All equipment used for environmental monitoring will be calibrated and maintained to the standards recommended the supplier/manufacturer. Records of calibration and maintenance for each piece of monitoring equipment will be held on site.

Environmental monitoring samples, if taken, will be sent for analysis to a NATA registered laboratory where applicable. All records of laboratory analysis results and quality assurance will be auditable and available for inspection, on request, by regulatory agency officials or their representatives.

Environmental monitoring requirements for each phase of the development are detailed in **Section 18.4**.

18.2.5 Corrective Action

Where monitoring or audit indicates that performance criteria have not been achieved, corrective action shall be immediately implemented by the person deemed responsible by Project Management.

18.2.6 Responsibilities

Responsibility for implementing the plans will be determined by Project Management when construction and operational roles for staff and workers are defined.

If the nominated person is absent, then environmental responsibility will default to superior managers.

18.2.7 Reporting

Monthly environmental summary reports will be produced for the duration of the works. Copies of the reports shall be held on site and will be available for regulatory agency inspection, on request. The report shall include, but is not limited to the following:

- Record of inspections;
- A list of any performance criteria that have not been met, the corrective action taken and a description of the magnitude of any possible environmental impact;
- A register of complaints detailing:
 - The originator of the complaint
 - The complaint investigation
 - The validity of the complaint
 - The response of remedial action
- Results of any survey carried out.

An annual Environmental Summary Report will be prepared each calendar year by the Operator (for the first five years of operation), containing, in part, the following information:

- Summary of the monthly Environmental reports;
- Fluctuations in water storage levels;
- Releases;
- Water quality monitoring; and
- Operation of fishlock.

This report will be made available to the public.

Burnett Catchment Water Infrastructure - Burnett River Dam

18.2.8 Auditing

Aspects of the Project with a potential for environmental impact will be subject to periodic environmental audit. The audit objective will be to verify compliance with applicable Commonwealth, State and Local environmental permits, approvals and regulations.

The audit will also seek to verify the suitability of the environmental Implementation Plans outlined in this EMP (Section 18.4).

The audit will be internally reviewed by management and all recommendations raised will be addressed. Copies of audit reports and details of corrective actions, will be made available for regulatory inspection, on request.

18.2.9 Employment & Training

The Proponent is committed to providing employment opportunities for local residents. The Proponent is similarly committed to using local suppliers where possible.

The EM Program will only be successful where all those responsible for its implementation and review are thoroughly conversant with its content, interpretation and performance measurement. The Proponent is committed to providing training for its site workforce and ensuring that the contractual arrangements with the contractor specify the need for adequate training to be provided to all contracted members of the dam workforce.

Staff involved in environmental monitoring will be trained and competent in the operation, calibration and maintenance of the equipment. Sampling staff will also be trained and competent in sample collection, handling, storage and transport methodologies and techniques.

Records of staff training will be auditable and available for inspection, on request.

18.3 Regulatory and Other Compliance Documents

18.3.1 Commonwealth Legislation and Policies

Environment Protection and Biodiversity Conservation Act (EPBC Act) 1999 came into force on 16 July 2000. Under the EPBC Act, actions that have, or are likely to have, a significant impact or are a matter of national environmental significance require approval from the Commonwealth Environment Minister.

18.3.2 Environmental Protection Act 1994

The *Environmental Protection Act 1994* is the umbrella legislation for the regulatory management of the environment in Queensland. The Act requires the exercise of duty of care, which places the responsibility for protection of the environment on all persons during the conduct of all activities.

The Act provides the power to administering authorities to order actions to be taken to improve environmental performance, conduct audits and environmental evaluations of activities, approve environmental management programs, and impose penalties or prosecute persons for non-compliance with the requirements of the Act.

This Act is the primary legislative environmental tool in Queensland. The Act also allows for the preparation of Environmental Protection Policies (EPPs). The project will comply with the following EPPs:

- Environmental Protection (Water) Policy 1997.
- Environmental Protection (Noise) Policy 1997.
- Environmental Protection (Air) Policy 1997.
- Environmental Protection (Waste) Policy 2000.

The Act does not regard the construction of a dam as an Environmentally Relevant Activity (ERA). However, any contractor engaged in the construction of the dam would need to secure a licence under the Act for such ERAs as:

- Petroleum storage;
- Dredging activities which may be required in the bed of the Burnett River;
- Extraction of rock or gravel for construction purposes; and
- Concrete batching.

Burnett Catchment Water Infrastructure – Burnett River Dam

18.3.3 Integrated Environmental Management System

Under the *Environmental Protection Regulations 1998*, applicants for licences to carry out more than one ERA at a site may include an Integrated Environmental Management System (IEMS) (clause 42). The purpose of the IEMS is to set out the means by which the proponent will ensure that licence conditions will be met.

The IEMS must include the means by which the proponent will achieve the following:

- the monitoring of releases of contaminants into the environment and an environmental assessment of the releases;
- staff training and awareness of environmental issues;
- the conduct of environmental and energy audits;
- waste prevention, treatment and disposal;
- a program for continuous improvement; and
- reporting arrangements on the effectiveness of the environmental management of the activities (*Environmental Protection Regulations 42(2)*).

An IEMS is not mandatory and will be to the contractor to decide their preferred method of achieving correct licensing.

18.3.4 Environmental Protection (Waste Management) Regulation 2000

The Waste Management Regulations include:

- offences for littering, waste dumping, unlawful disposal of hypodermic needles and unlawful activities at waste facilities;
- a waste tracking system that tracks the movement of specific waste to ensure correct disposal;
- clinical and related waste management planning including segregation, storage and disposal;
- requirements for managing polychlorinated biphenyls (PCBs); and
- design rules for waste equipment.

Note also that waste management activities (including waste transport) are ERAs and therefore require licences or approvals under Sections 39 and 40 of the *Environmental Protection Act 1994*.

18.3.5 Water Act 2000

The Act provides for the sustainable management of water and other resources in Queensland, and provides also a regulatory framework for providing water and sewerage services and the establishment of water authorities. It establishes a new system for allocating and managing water, underpinned by a comprehensive water resource planning system which involves the development of catchment-based Water Resource Plans (WRPs).

In compliance with the Council of Australian Governments' (COAG) water reform objectives under the National Competition Policy, the new system for allocating and managing water under the *Water Act 2000* sets provisions to allow for transferable water allocations and market trading of water allocations in some catchments.

Planning objectives developed under the WRPs include Environmental Flow Objectives (EFOs) and Water Allocation Security Objectives (WASOs). WRPs remain in force for a period of 10 years, after which they may be amended – however the Minister has power to amend or replace a WRP if satisfied that these objectives are not being met or are no longer appropriate. A WRP is implemented through Resource Operations Plans (ROPs), which state how water will be sustainably managed and monitored to comply with the planning objectives of the WRP. Operators of water supply infrastructure must be holders of a Resource Operations Licence (ROL) with conditions that comply with the operating arrangements and supply requirements of the ROP for that area.

The *Water Act 2000* also deals at some length with the establishment of Water Authorities, their functions and powers, governance and procedures, obligations, customer service standards, etc, and specifically with the corporatisation of State Water Projects.

Burnett Catchment Water Infrastructure - Burnett River Dam

The *Water Act 2000* deals with matters related to water resource management which require an approval/ permit or a licence, including riverine protection, water bore drilling, trade waste disposal, referable dams and flood mitigation planning for dam owners.

18.3.6 Implications of Water Act 2000

A Resource Operations Plan (ROP) will have to be developed to define how water will be managed and monitored using the proposed infrastructure in compliance with the Water Resource (Burnett Basin) Plan 2000. As soon as the ROP is finalised, any Service Providers would be required to hold a Resource Operations Licence (ROL).

ROLs are dealt with in Chapter 2, Part 4, Division 3 of the *Water Act 2000*. A licence will state:

- (a) details of the licence holder;
- (b) the ROP to which the licence relates;
- (c) the water infrastructure to which the licence applies;
- (d) any conditions the holder must comply with.

Interim ROLs may be granted to Service Providers in an area where a ROP has not yet been approved. This is dealt with in Chapter 2, Part 5 of the *Water Act 2000*.

Chapter 3, Part 2 of the *Water Act 2000* deals with the registration of Service Providers, their general powers and powers to impose water restrictions. Part 3 then deals with the obligations of Service Providers, including planning, reporting and auditing obligations, customer service standards and obligations to provide water for purposes of fire fighting.

Chapter 3, Part 6 deals with Referable Dams and Flood Mitigation. Topics include failure impact assessments and safety conditions, which are mandatory for large dams (i.e dams with category 1 or category 2 failure impact rating) as defined under Section 483(1); and the requirement to prepare a manual of operating procedures for flood mitigation (subject to decision by the regulator).

18.3.7 State Policies and Legislation

18.3.7.1 Introduction

This EIS has been being formulated under the provisions of the *State Development and Public Works Organisation Act 1971* (Public Works Act). The Public Works Act requires that any department of the government or any board, body, authority or corporation, when undertaking a development that is likely to have environmental effects, must take such environmental effects into account. These effects are examined as part of a defined process established by the Public Works Act through an Environmental Impact Statement (EIS). This EIS is then used to gain licences and approvals from the various government agencies and departments through their relevant legislation. Major State legislative instruments under which approvals are required for either the construction or operation of the dam include the following:

- Water Act 2000*;
- Integrated Planning Act 1997*;
- Environmental Protection Act 1994*;
- Nature Conservation Act 1992*;
- Fisheries Act 1994*;
- Queensland Heritage Act 1992*;
- Forestry Act 1959*;
- Electricity Act 1994*;
- Transport Infrastructure Act 1994*;
- Acquisition of Land Act 1967*;
- Land Act 1984*;
- Native Title Act 1993*;
- State Coastal Management Plan 2001*; and

Burnett Catchment Water Infrastructure – Burnett River Dam

- Vegetation Management Act 2000.*

18.3.8 Other Queensland Legislation and Policies

Queensland legislation and policies include:

- State Development and Public Works Organisation Act 1971;
- Rural Lands Protection Act 1985;
- Cultural Records (Landscapes Queensland and Queensland Estate) Act 1987;
- Draft EPA Environmental Management Guidelines (1994);
- Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, May 1998;
- Queensland Heritage Act 1992; and
- National Greenhouse Strategy, Queensland Implementation Plan 1999

18.3.9 Guidelines

18.3.9.1 National

Commonwealth Legislation and Policies include:

- Intergovernmental Agreement on the Environment (IGAE);
- Environment Protection and Biodiversity Conservation Act 1999;
- National Waste Minimisation and Recycling Strategy; and
- National Greenhouse Strategy 1998.

Other relevant guidelines include:

- Australian Water Quality Guidelines for Fresh and Marine Waters 1992 (Australia and New Zealand Environment and Conservation Council) (ANZECC);
- National Health and Medical Research Council (NHMRC)/AEC National Guidelines for Control of Emission of Air Pollutants from New Stationary Sources 1985;
- National Environmental Protection Measure for Ambient Air (Air NEPM) 1997;
- The National Strategy for Ecological Sustainable Development;
- The National Strategy for the Conservation of Biological Diversity;
- The Queensland Government's proposals for Natural Resource Management;
- The National Pollutant Inventory;
- Soil Erosion and Sediment Control, Engineers Guidelines for Queensland ; and
- Landscaping and Urban Design Guidelines.

18.3.10 Australian and Industry Standards

Australian standards that are relevant to Environmental Management include:

- Explosives storage transport and use Part 1: Storage (AS 2187.1 – 1998)
This standard sets out requirements and precautions in the use of factory-made explosives and certain explosives mixed on sites;
- Explosives Storage transport and use Part 2: Use of explosives (AS 2187.2 – 1993)
This standard sets out requirements and precautions in the storage, transport and use of explosives;
- The Storage and Handling of Flammable and Combustible Liquids (AS 1940 – 1993)
This standard sets out the requirements for the design, construction and operations for the storage and handling of flammable and combustible liquids and includes matters relating to operations and management of emergencies; and
- Risk Management (AS 4360: 1999)
The standard provides a generic guide for the establishment and implementation of the risk management process involving establishing the context and the identification , analysis, evaluation, treatment, communication and ongoing monitoring of risks;
- The Storage and Handling of Corrosive Substances (AS 3780-1994)
The standard sets out the requirements and recommendations for the safe storage and handling of corrosive substances that meet the Class 8 classification of the Dangerous Goods Code.
- ISO 14000 International Standard for Environmental Management

Burnett Catchment Water Infrastructure – Burnett River Dam

Construction Implementation Plans

Table 18.1 Infrastructure

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Existing site access road not surfaced to carry heavy vehicles	<input type="checkbox"/> Resurface road	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> Operator
Existing access from Isis Hwy requires traffic through Dallarnil	<input type="checkbox"/> Construct new road north of Dallarnil to connect Highway with site access road <input type="checkbox"/> Consultation with DMR and Biggenden Shire re preferred access road route	<input type="checkbox"/> Traffic flow through Dallarnil not affected	<input type="checkbox"/> Complaint based	<input type="checkbox"/> Monitor traffic movements	<input type="checkbox"/> Operator in consultation with DMR and Biggenden Shire
Significant increase in traffic along Isis Highway	<input type="checkbox"/> Prepare Traffic Management Plan <input type="checkbox"/> Prepare Pavement Impact Assessment <input type="checkbox"/> Negotiate with DMR regarding contribution to maintenance of the road <input type="checkbox"/> Provide turning lanes on Isis Highway to access road, with appropriate road markings and signs	<input type="checkbox"/> Traffic flow on Isis Highway not affected by construction traffic	<input type="checkbox"/> Complaint based	<input type="checkbox"/> Monitor traffic movements <input type="checkbox"/> Improve traffic signage, road markings etc as required	Operator in association with DMR
Construction of bridge structure within river, potential for impact on the riverine environment	<input type="checkbox"/> Road design aims to minimise environmental impact <input type="checkbox"/> Undertake environmental assessment of proposed new road and bridge <input type="checkbox"/> Seek appropriate approvals <input type="checkbox"/> Prepare EMP for road construction	<input type="checkbox"/> Minimal impact on riverine environment <input type="checkbox"/> Authority and community approval	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> Operator / DMR

Burnett Catchment Water Infrastructure – Burnett River Dam

Table 18.2 Physical Environment

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Disturbance of contaminated sites	<input type="checkbox"/> Identify cattle dips <input type="checkbox"/> Identify mine sites requiring rehab <input type="checkbox"/> Identify other potential sites <input type="checkbox"/> Follow procedure in Section 5.4.4 of this document.	<input type="checkbox"/> Interview all landholders in inundation area to locate potential sites	<input type="checkbox"/> Quantify chemical levels for suspect sites and address according to EPA Contaminated Land Guidelines	<input type="checkbox"/> Rehabilitate and remove known sites from register to allow rezoning <input type="checkbox"/> Identify and remediate any other contaminated sites	<input type="checkbox"/> Proponent
Erosion associated with dam construction, road works and construction material extraction	<input type="checkbox"/> Reduce areas of bare soil exposed <input type="checkbox"/> Revegetate disturbed areas rapidly <input type="checkbox"/> Compact erodible soils while bare <input type="checkbox"/> Divert flows around construction area <input type="checkbox"/> Install sediment traps around areas to be disturbed. <input type="checkbox"/> Prepare erosion and sediment control plans for all works based on Soil Erosion and Sediment Control Handbook (Witheridge and Walker 1996)	<input type="checkbox"/> Increase in TSS levels downstream of construction site not to exceed 10% of background levels <input type="checkbox"/> At least 90% of coarse sediment to remain on site.	<input type="checkbox"/> Visual inspection of sediment traps daily <input type="checkbox"/> Daily monitoring of TSS downstream of construction site <input type="checkbox"/> Monitor sediment traps after rain	<input type="checkbox"/> Install stormwater retention structures if turbid water released for 3 successive days <input type="checkbox"/> Install extra sediment traps if 1 m ³ accumulates in any trap after rain	<input type="checkbox"/> Construction contractor

Table 18.3 Land Use and Planning

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Where noise and/or dust impacts on residences adjoining the haul roads	<input type="checkbox"/> Provide landscaping adjacent to those residences affected <input type="checkbox"/> Inform residents of potentially noisy activities	<input type="checkbox"/> Landscaping to a minimum width of 5 metres or as otherwise discussed with the affected resident <input type="checkbox"/> At least 24 hours notice given	<input type="checkbox"/> Ensuring planting occurs at the initial phase of the project prior to construction commencing ie during wet season. <input type="checkbox"/> Liaise with affected land owner to ensure that planting is satisfactory <input type="checkbox"/> Check for any plant dieback on a 6 monthly basis <input type="checkbox"/> Noise monitoring at noise sensitive locations	<input type="checkbox"/> Maintain landscaping works <input type="checkbox"/> Investigate complaints	<input type="checkbox"/> Operator

Burnett Catchment Water Infrastructure – Burnett River Dam

Table 18.4 Surface and Groundwater

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Surface Water Turbidity/ suspended solids increase during construction of dam	<ul style="list-style-type: none"> <input type="checkbox"/> Control erosion and scour to limit suspended sediment loads. <input type="checkbox"/> Minimise surface water runoff from construction areas. <input type="checkbox"/> Surface water from worked areas shall be treated to remove suspended solids. <input type="checkbox"/> Upstream surface waters shall be diverted away from work sites <input type="checkbox"/> Eg. Install bunding / silt curtains around areas to be disturbed; stabilise earth with geofabric. 	<ul style="list-style-type: none"> <input type="checkbox"/> Minimal soil erosion shall occur, beyond that which presently exists. <input type="checkbox"/> Long-term water quality downstream of dam meets water quality objectives. <input type="checkbox"/> Increase in TSS levels downstream of construction site not to exceed 120% of background levels <i>eg. turbidity not to exceed 24 NTU in downstream river pool when upstream pool is 20 NTU.</i> 	<ul style="list-style-type: none"> <input type="checkbox"/> Weekly visual inspection of infrastructure <input type="checkbox"/> Inspection during and immediately after rainfall-runoff events. <input type="checkbox"/> Upstream and downstream monitoring during and after significant rainfall-runoff events <input type="checkbox"/> Monitoring to occur both during works and during Hold Point between Year 1 and Year 2 	<ul style="list-style-type: none"> <input type="checkbox"/> Areas of excessive or unacceptable erosion or sedimentation shall be rehabilitated. <input type="checkbox"/> Where high levels of turbidity or suspended solids are detected in waters flowing from the site, the source will be identified and the Construction Contractor will take appropriate action to reduce the extent of the source to achieve compliance. 	<ul style="list-style-type: none"> <input type="checkbox"/> Implementation Construction contractor <input type="checkbox"/> Corporate Operator <input type="checkbox"/> Regulatory EPA, DNR
Chemical/ oil contamination of waters	<ul style="list-style-type: none"> <input type="checkbox"/> Minimise spillage on work sites <input type="checkbox"/> Fuel storage compliant with AS1940 <input type="checkbox"/> Minimise surface water runoff from construction areas. <input type="checkbox"/> Upstream surface waters shall be diverted away from work site <input type="checkbox"/> Procedures developed and implemented to prevent chemical and materials spills, and to control and clean up spills if they occur. 	<ul style="list-style-type: none"> <input type="checkbox"/> No spills or runoff <input type="checkbox"/> Where spills occur, these are cleaned up and disposed immediately and securely <input type="checkbox"/> Compliance with Water EPP <input type="checkbox"/> Meet relevant ANZECC guidelines <input type="checkbox"/> Spill response gear and kit to be kept on site for immediate response to spill <input type="checkbox"/> Evidence of personnel training 	<ul style="list-style-type: none"> <input type="checkbox"/> Weekly visual inspection of work sites for cleanliness and security of chemicals <input type="checkbox"/> Sampling of stormwater and receiving waters should a spill occur to assess level and extent of contamination. 	<ul style="list-style-type: none"> <input type="checkbox"/> Areas of unacceptable soil or water contamination or spillage will be cleaned up immediately, or for minor spills that can be temporarily secured, as soon as possible. <input type="checkbox"/> Where contaminated runoff is detected, the source must be determined and the area made secure and contaminants contained and recovered. 	<ul style="list-style-type: none"> <input type="checkbox"/> Construction contractor
Eutrophication and deoxygenation (nutrient and BOD concentrations when lake filling)	<ul style="list-style-type: none"> <input type="checkbox"/> Lake nutrient status monitoring <input type="checkbox"/> Stabilise areas to be flooded <input type="checkbox"/> Remove selected vegetation from inundation area <input type="checkbox"/> Catchment management plan to be implemented. 	<ul style="list-style-type: none"> <input type="checkbox"/> Maintenance of ambient concentrations and Water Quality Objectives met <input type="checkbox"/> DO exceeds 6 mg/L saturation 	<ul style="list-style-type: none"> <input type="checkbox"/> Monthly monitoring of lake water quality 	<ul style="list-style-type: none"> <input type="checkbox"/> Best practice operation prior to inundation. 	<ul style="list-style-type: none"> <input type="checkbox"/> Operator

Burnett Catchment Water Infrastructure – Burnett River Dam

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Potential Rock Acidity	<input type="checkbox"/> Identify sulfur content of rock material to be extracted <input type="checkbox"/> Handle and place rock and overburden according to management techniques and practices	<input type="checkbox"/> Manage quarry and rock dumps with appropriate stormwater management techniques and practices <input type="checkbox"/> Runoff or leachate not greater than pH 7.	<input type="checkbox"/> Frequently after rainfall-runoff events <input type="checkbox"/> Whenever leachate exits the site where overburden kept or disposed.	<input type="checkbox"/> Where acidic runoff or leachate is detected, the source must be determined and the area made secure and pH lime corrected prior to drainage to the river.	<input type="checkbox"/> Construction Contractor
Groundwater					
Development of groundwater mound around Dam	<input type="checkbox"/> None	<input type="checkbox"/> None	<input type="checkbox"/> Monitor waterlevels in select, existing privately owned bores adjacent to Dam for evidence of rising waterlevels	<input type="checkbox"/> None	<input type="checkbox"/> Catchment Management Authorities <input type="checkbox"/> Operator

Burnett Catchment Water Infrastructure – Burnett River Dam

Table 18.5 Air, Noise and Vibration

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Actions	Responsibility
Traffic Noise	<input type="checkbox"/> Implement speed limits in sensitive zones <input type="checkbox"/> Limited use of engine exhaust brakes <input type="checkbox"/> Road maintenance <input type="checkbox"/> Noise complaints record	<input type="checkbox"/> Sound pressure level at residences along access roads do not exceed: 40 dB(A) as 18 hr average	<input type="checkbox"/> Complaints register <input type="checkbox"/> Noise monitoring as needed if complaints warrant it, in accordance with EPP Noise	<input type="checkbox"/> Investigate and monitor progress of all noise complaints <input type="checkbox"/> Implement receptor specific noise controls (e.g. air conditioning)	<input type="checkbox"/> Construction contractor
Construction Noise	<input type="checkbox"/> Noise complaints record <input type="checkbox"/> Restrict working hours of noisy activities	<input type="checkbox"/> Sound Pressure Level at nearest residences not exceed 40dB(A) (daytime) and 35 dB(A) (night)	<input type="checkbox"/> Complaints register <input type="checkbox"/> Noise monitoring as needed if complaints warrant it, in accordance with EPP Noise	<input type="checkbox"/> Investigate and monitor progress of all noise complaints <input type="checkbox"/> Implement receptor specific noise controls (e.g. air conditioning)	<input type="checkbox"/> Construction contractor
Disturbance from blasting	<input type="checkbox"/> Limit blasting to daytime <input type="checkbox"/> Advise community of proposed blasting <input type="checkbox"/> Blasting to be undertaken in accordance with current best practice <input type="checkbox"/> Vibrations complaints record <input type="checkbox"/> Undertake structural integrity survey of buildings and infrastructure within zone of vibration influence	<input type="checkbox"/> No damage to buildings or infrastructure resulting from blasting <input type="checkbox"/> Peak particle velocity not to exceed 25 mm/s (if < 35 Hz) or 5 mm/s (if > 35Hz) Airblast overpressure does not exceed 115 dB	<input type="checkbox"/> Complaints register <input type="checkbox"/> Monitor vibrations at sensitive areas affected by blasting operations	<input type="checkbox"/> Investigate mitigation techniques	<input type="checkbox"/> Construction contractor
Vehicle and Machinery emissions	<input type="checkbox"/> Emission control in accordance with Australian standards	<input type="checkbox"/> No of complaints	<input type="checkbox"/> Air quality monitoring if warranted by complaints	<input type="checkbox"/> Stop use of equipment/ vehicle until problem solved	<input type="checkbox"/> Construction contractor
Dust Nuisance	<input type="checkbox"/> Implement speed limits in sensitive zones <input type="checkbox"/> Road watering <input type="checkbox"/> Dust complaint record	<input type="checkbox"/> No. of complaints <input type="checkbox"/> Dustfall at residences maintained below 120mg/m ² /d	<input type="checkbox"/> Complaints register <input type="checkbox"/> Dustfall gauges at key sensitive locations	<input type="checkbox"/> Initiate corrective dust control actions	<input type="checkbox"/> Construction contractor

Burnett Catchment Water Infrastructure – Burnett River Dam

Table 18.6 Aquatic Flora and Fauna

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Aquatic Habitats					
<input type="checkbox"/> Loss of snag material	<input type="checkbox"/> Leave some trees in new riparian zone	<input type="checkbox"/> Some trees left in riparian zone as snags	<input type="checkbox"/> Abundant snag material left	<input type="checkbox"/> Create large wood snag material to water edge	<input type="checkbox"/> Operator
<input type="checkbox"/> Loss of riparian zone	<input type="checkbox"/> Re-establish riparian zone in selected areas	<input type="checkbox"/> Re-vegetation sites selected, program established	<input type="checkbox"/> Program developed prior to operation <input type="checkbox"/> Program complete within 5 years of construction.	<input type="checkbox"/> Consult with DNR&M	<input type="checkbox"/> Operator
<input type="checkbox"/> Loss of aquatic habitat	<input type="checkbox"/> River crossing not to be constructed unless absolutely necessary	<input type="checkbox"/> Impacts to aquatic habitat limited	<input type="checkbox"/> Impacted areas to be assessed against a baseline seasonally	<input type="checkbox"/> Consult with leading aquatic ecologist	<input type="checkbox"/> Construction Contractor
<input type="checkbox"/> Loss of macrophyte communities	<input type="checkbox"/> Monitor macrophyte communities downstream of the construction site	<input type="checkbox"/> Stabilised macrophyte communities	<input type="checkbox"/> Macrophyte survey bi-annually	<input type="checkbox"/> Consult with leading scientists	<input type="checkbox"/> Construction Contractor
<input type="checkbox"/> Loss of aquatic habitat	<input type="checkbox"/> Retain select riparian vegetation as potential habitat for aquatic species	<input type="checkbox"/> Select stands of trees on the outer limit of inundation zone	<input type="checkbox"/> Visual presence of suitable habitat for aquatic fauna species	<input type="checkbox"/> Introduce creek bank habitat for aquatic species	<input type="checkbox"/> Construction Contractor
Aquatic Fauna					
<input type="checkbox"/> Construction practices prevent the 'natural' migration of fish species.	<input type="checkbox"/> Installation of temporary fish passage infrastructure such as a diversion channel.	<input type="checkbox"/> Free passage of migratory and significant fish species	<input type="checkbox"/> Fish and water movement flowing uninhibited	<input type="checkbox"/> Consult with leading fisheries scientists	<input type="checkbox"/> Construction Contractor
<input type="checkbox"/> Loss of aquatic fauna	<input type="checkbox"/> Monitor macroinvertebrates, platypus, lungfish	<input type="checkbox"/> Equilibrium in aquatic fauna populations	<input type="checkbox"/> Bi-annual fauna survey	<input type="checkbox"/> Consult with leading scientist	<input type="checkbox"/> Construction Contractor

Burnett Catchment Water Infrastructure – Burnett River Dam

Table 18.7 Terrestrial Flora and Fauna

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Flora					
<input type="checkbox"/> Clearing of vegetation to construct new access roads	<input type="checkbox"/> Construction equipment/ vehicles confined to the existing road network as far as practicable	<input type="checkbox"/> Limited new disturbance	<input type="checkbox"/> Access road inspection	<input type="checkbox"/> Limit access points to the construction site	<input type="checkbox"/> Construction Contractor
<input type="checkbox"/> Loss of riparian vegetation	<input type="checkbox"/> Riparian vegetation to be maintained as long as possible to maintain creek bank stability	<input type="checkbox"/> No visible signs of creek bank erosion within the inundation area	<input type="checkbox"/> Visible audit	<input type="checkbox"/> Implementation of erosion and sediment control devices	<input type="checkbox"/> Construction Contractor
<input type="checkbox"/> Loss of potential fauna refuges	<input type="checkbox"/> Re-establish in strategic locations within the inundation area veg suitable for use by local fauna	<input type="checkbox"/> Veg and fauna habitat re-established	<input type="checkbox"/> Site inspection	<input type="checkbox"/> Replanting and maintenance	<input type="checkbox"/> Dam Operator
<input type="checkbox"/> Reduction in community size of <i>Bertya</i> species	<input type="checkbox"/> Propagation of <i>Bertya</i> species and revegetation to Mt Yeatman and Mt Blandy	<input type="checkbox"/> Successful propagation	<input type="checkbox"/> Flora survey	<input type="checkbox"/> Consult with local flora consultant, EPA	<input type="checkbox"/> Construction Contractor
<input type="checkbox"/> Destruction to existing vegetation by construction equipment	<input type="checkbox"/> Restrict machinery and vehicle access to construction sites and existing road network	<input type="checkbox"/> Limited impact by construction equipment	<input type="checkbox"/> Daily visual audits of construction site	<input type="checkbox"/> Construction team aware of 'no go' areas	<input type="checkbox"/> Construction Contractor
<input type="checkbox"/> Potential introduction of exotic weeds to sensitive areas	<input type="checkbox"/> Wash down construction equipment prior to site access from a known weed area <input type="checkbox"/> Workforce weed awareness training/ material	<input type="checkbox"/> No reported incidence of exotic weeds	<input type="checkbox"/> Visual audit	<input type="checkbox"/> Consult with DNR&M	<input type="checkbox"/> Construction Contractor
Fauna					
<input type="checkbox"/> Loss of potential roosting sites - Powerful Owl	<input type="checkbox"/> Limited removal of roosting trees	<input type="checkbox"/> Stable populations of Powerful Owl	<input type="checkbox"/> Seasonal survey	<input type="checkbox"/> Placement of roosting boxes	<input type="checkbox"/> Construction Contractor
<input type="checkbox"/> Encourage fauna utilisation of site	<input type="checkbox"/> Scatter cleared material around the construction site outside inundation zone to encourage small mammals and reptiles	<input type="checkbox"/> Visible signs of fauna on site	<input type="checkbox"/> Visual audits	<input type="checkbox"/> Consult with local fauna consultant	<input type="checkbox"/> Construction Contractor

Burnett Catchment Water Infrastructure – Burnett River Dam

Table 18.8 Waste Management

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Actions	Responsibility
Waste from clearing of vegetative matter	<input type="checkbox"/> Log trees of merchantable size and species, to be identified and marked by forester <input type="checkbox"/> Other waste chipped on site to provide mulch for landscaping <input type="checkbox"/> Material unsuitable for chipping will be piled into windrows and burned <input type="checkbox"/> Some larger trees left near new FSL	<input type="checkbox"/> Waste tracking system	<input type="checkbox"/> Waste disposal records	<input type="checkbox"/> Investigate waste management system	<input type="checkbox"/> Construction contractor
Waste Oils	<input type="checkbox"/> Collect in appropriate banded areas <input type="checkbox"/> Reuse in power generation <input type="checkbox"/> Removal and reprocessing at waste oil reprocessing facility <input type="checkbox"/> Transport using licensed contractor <input type="checkbox"/> Use EPA waste tracking system	<input type="checkbox"/> Waste tracking system	<input type="checkbox"/> Waste disposal records	<input type="checkbox"/> Investigate waste management system	<input type="checkbox"/> Construction contractor
Waste soil sand and gravel	<input type="checkbox"/> Sell or make available for construction fill material at other sites <input type="checkbox"/> Make available as cover material for local landfills <input type="checkbox"/> Place in hard waste landfill <input type="checkbox"/> Dispose within impoundment	<input type="checkbox"/> Waste tracking system	<input type="checkbox"/> Waste disposal records	<input type="checkbox"/> Investigate waste management system	<input type="checkbox"/> Construction contractor
Waste concrete cylinders	<input type="checkbox"/> Use in landscaping as lawn and garden edging <input type="checkbox"/> Dispose at landfill	<input type="checkbox"/> Waste tracking system	<input type="checkbox"/> Waste disposal records	<input type="checkbox"/> Investigate waste management system	<input type="checkbox"/> Construction contractor
Waste packaging materials	<input type="checkbox"/> Reuse of timber where feasible <input type="checkbox"/> Transfer of cardboard and suitable plastics to appropriate recycling facility where feasible <input type="checkbox"/> Disposal at licensed landfill	<input type="checkbox"/> Waste tracking system	<input type="checkbox"/> Waste disposal records	<input type="checkbox"/> Investigate waste management system	<input type="checkbox"/> Construction contractor
Waste tyres	<input type="checkbox"/> Use EPA waste tracking system <input type="checkbox"/> Transport to recycling facility <input type="checkbox"/> Dispose of at licensed landfill <input type="checkbox"/> Transport using licensed contractors	<input type="checkbox"/> Waste tracking system	<input type="checkbox"/> Waste disposal records	<input type="checkbox"/> Investigate waste management system	<input type="checkbox"/> Construction contractor
Acids from concrete cleaning	<input type="checkbox"/> Use EPA waste tracking system <input type="checkbox"/> Transport to recycling facility <input type="checkbox"/> Dispose of at licensed landfill	<input type="checkbox"/> Waste tracking system	<input type="checkbox"/> Waste disposal records	<input type="checkbox"/> Investigate waste management system	<input type="checkbox"/> Construction contractor
Concrete batching washdown water	<input type="checkbox"/> Collect in banded area <input type="checkbox"/> Sedimentation ponds <input type="checkbox"/> Discharge to River	<input type="checkbox"/> No visual turbidity in effluent	<input type="checkbox"/> Daily visual inspection	<input type="checkbox"/> Effluent quality monitoring	<input type="checkbox"/> Construction contractor
Wastewater from on-site facility	<input type="checkbox"/> Transport to municipal wastewater treatment plant	<input type="checkbox"/> Waste tracking system	<input type="checkbox"/> Waste disposal records	<input type="checkbox"/> Investigate waste management system	<input type="checkbox"/> Construction contractor

Burnett Catchment Water Infrastructure – Burnett River Dam

Table 18.9 Hazard and Risk

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Spill of fuel or chemicals	<ul style="list-style-type: none"> <input type="checkbox"/> Construction activities to operate to approved EMP <input type="checkbox"/> Provide spill clean up kits and <input type="checkbox"/> Provide means and guidelines for responsible disposal <input type="checkbox"/> Storage to be bunded, with impervious flooring and appropriately signed – located away from drainage lines <input type="checkbox"/> Ensure that equipment, transfer hoses and valves that use fuel, oils or other chemicals are regularly maintained 	<ul style="list-style-type: none"> <input type="checkbox"/> No spills to reach waterways 	<ul style="list-style-type: none"> <input type="checkbox"/> Weekly inspection of chemical use areas for evidence of spills <input type="checkbox"/> Weekly visual inspection to maintain compliance with standards <input type="checkbox"/> Weekly inspect storage areas for any defects with bunding, floor, structure, hoses and valves etc <input type="checkbox"/> Visual inspection of equipment and components before use and on a monthly basis 	<ul style="list-style-type: none"> <input type="checkbox"/> Review disposal and cleanup guidelines when major spill occurs 	<ul style="list-style-type: none"> <input type="checkbox"/> Construction Contractor
Vehicle collision	<ul style="list-style-type: none"> <input type="checkbox"/> Upgrade roads where needed <input type="checkbox"/> Utilise Emergency Response Plan if collision with dangerous goods tanker 	<ul style="list-style-type: none"> <input type="checkbox"/> No increase in normal accident frequencies along transport routes 	<ul style="list-style-type: none"> <input type="checkbox"/> Log number of accidents attributable to construction vehicles <input type="checkbox"/> Assess this log every time an incident occurs 	<ul style="list-style-type: none"> <input type="checkbox"/> Consult DMR 	<ul style="list-style-type: none"> <input type="checkbox"/> Dam Owner
Highway congestion/disruption to local traffic	<ul style="list-style-type: none"> <input type="checkbox"/> Development of a Traffic Management Plan 	<ul style="list-style-type: none"> <input type="checkbox"/> Local traffic delay not significantly greater than normal 	<ul style="list-style-type: none"> <input type="checkbox"/> Maintain log of traffic complaints <input type="checkbox"/> Assess impact and need for modifications to Traffic Plan when complaints arise 	<ul style="list-style-type: none"> <input type="checkbox"/> Consult DMR 	<ul style="list-style-type: none"> <input type="checkbox"/> Dam Owner
Dam Wall collapse	<ul style="list-style-type: none"> <input type="checkbox"/> Ensure sound construction methodology and Sound planning to sequence stages to match seasons 	<ul style="list-style-type: none"> <input type="checkbox"/> Wall collapse or near miss do not occur 	<ul style="list-style-type: none"> <input type="checkbox"/> Maintain construction records <input type="checkbox"/> Review records weekly <input type="checkbox"/> Strict construction supervision and monitoring 	<ul style="list-style-type: none"> <input type="checkbox"/> Review operating construction practices and procedures 	<ul style="list-style-type: none"> <input type="checkbox"/> Dam Owner and Construction Contractor

Burnett Catchment Water Infrastructure – Burnett River Dam

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Landslide	<ul style="list-style-type: none"> <input type="checkbox"/> Ensure excavate with stable slopes 	<ul style="list-style-type: none"> <input type="checkbox"/> No landslide of significant consequence occurs 	<ul style="list-style-type: none"> <input type="checkbox"/> Maintain construction records <input type="checkbox"/> Review records weekly <input type="checkbox"/> Strict construction supervision and monitoring 	<ul style="list-style-type: none"> <input type="checkbox"/> Review operating construction practices and procedures 	<ul style="list-style-type: none"> <input type="checkbox"/> Dam Owner and Construction Contractor
Failure of diversion works	<ul style="list-style-type: none"> <input type="checkbox"/> Construct during low flow season <input type="checkbox"/> Sizing of coffer dams and diversion tunnels need to be optimised using the probability of flooding 	<ul style="list-style-type: none"> <input type="checkbox"/> Uncontrolled releases are minimised and manageable <input type="checkbox"/> Dates of actual construction 	<ul style="list-style-type: none"> <input type="checkbox"/> Maintain construction records <input type="checkbox"/> Review records weekly <input type="checkbox"/> Strict construction supervision and monitoring 	<ul style="list-style-type: none"> <input type="checkbox"/> Review operating construction practices and procedures 	<ul style="list-style-type: none"> <input type="checkbox"/> Dam Owner and Construction Contractor
Explosive accident in quarry or river bed	<ul style="list-style-type: none"> <input type="checkbox"/> Do not set off explosive within 60 m of concrete structures <input type="checkbox"/> Apply stringent Work Place Health and Safety practice <input type="checkbox"/> Adequate signage and security to warn and protect the public <input type="checkbox"/> Strict site supervision 	<ul style="list-style-type: none"> <input type="checkbox"/> No fly-rock incidents occur outside secure zones 	<ul style="list-style-type: none"> <input type="checkbox"/> Maintain Health & Safety records <input type="checkbox"/> Review records weekly <input type="checkbox"/> Hold safety management meetings weekly 	<ul style="list-style-type: none"> <input type="checkbox"/> Consult Health and safety Executive 	<ul style="list-style-type: none"> <input type="checkbox"/> Dam Owner and Construction Contractor
Major flood during construction resulting in 'wash out'	<ul style="list-style-type: none"> <input type="checkbox"/> Construction timed to occur during dry season. <input type="checkbox"/> Undertake weather monitoring. <input type="checkbox"/> Construction activities phased to minimise potential 'wash out impacts' <input type="checkbox"/> Concrete abutments constructed first that has no impact from flooding 	<ul style="list-style-type: none"> <input type="checkbox"/> Dates of actual construction 	<ul style="list-style-type: none"> <input type="checkbox"/> Maintain construction records <input type="checkbox"/> Review records weekly <input type="checkbox"/> Strict construction supervision and monitoring <input type="checkbox"/> Monitor and review weather patterns daily 	<ul style="list-style-type: none"> <input type="checkbox"/> Review flood warning procedures 	<ul style="list-style-type: none"> <input type="checkbox"/> Dam Owner and Construction Contractor
Uncontrolled fire destruction of buildings or vegetation	<ul style="list-style-type: none"> <input type="checkbox"/> Arrange fire events with Fire services <input type="checkbox"/> Supply fire safety equipment 	<ul style="list-style-type: none"> <input type="checkbox"/> No injury/loss of life to public 	<ul style="list-style-type: none"> <input type="checkbox"/> Log fire events and correspondence with Fire Authority <input type="checkbox"/> Monitor weather patterns throughout fire event <input type="checkbox"/> Check safety gear prior to fire event 	<ul style="list-style-type: none"> <input type="checkbox"/> Consult Fire Authority 	<ul style="list-style-type: none"> Construction Contractor

Burnett Catchment Water Infrastructure – Burnett River Dam

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Internal water pressure build up within dam construction causing structural failure	<input type="checkbox"/> Vertical drainage through the dam, <input type="checkbox"/> Backup drainage device <input type="checkbox"/> Rigorous construction supervision <input type="checkbox"/> Use experienced engineers during design and construction <input type="checkbox"/> Design according to category of installation determined by Failure Impact assessment according to ANCOLD standards. <input type="checkbox"/> Demonstrate to ANCOLD that designed to standards <input type="checkbox"/> Obtain ANCOLD approval to proceed <input type="checkbox"/> Submit construction reports to ANCOLD	<input type="checkbox"/> No structural failure occurs.	<input type="checkbox"/> Weekly monitoring of drain function <input type="checkbox"/> Yearly manual inspection of drains <input type="checkbox"/> 6 monthly checks on structural integrity <input type="checkbox"/> Perform core testing to determine concrete strengths by a NATA accredited laboratory after construction <input type="checkbox"/> Rigorous quality control of material supply during construction	<input type="checkbox"/> N/A	<input type="checkbox"/> Dam Owner, Construction Contractor and Operator

Table 18. 10 Social and Economic

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Pressure on local social infrastructure as a result of the construction workforce.	<input type="checkbox"/> Proponent to liaise with local councils about the availability of social infrastructure and possible mitigation measures <input type="checkbox"/> The Proponent has indicated a willingness to provide additional on site vans at local caravan parks in order to mitigate effects on accommodation <input type="checkbox"/> Provide training	<input type="checkbox"/> No reduction in access to services for residents <input type="checkbox"/> Adequate accommodation is available <input type="checkbox"/> At least 10 local people provided with training <input type="checkbox"/> N/A	<input type="checkbox"/> Department of Families to monitor <input type="checkbox"/> Contractor to liaise with local accommodation providers <input type="checkbox"/> Proponent to liaise with local training providers <input type="checkbox"/> N/A	<input type="checkbox"/> Proponent to Liaise with Human service providers <input type="checkbox"/> On site vans <input type="checkbox"/> Proponent to liaise with Department of Employment and Training. <input type="checkbox"/> N/A	<input type="checkbox"/> Government Proponent and contractor <input type="checkbox"/> Proponent and contractor <input type="checkbox"/> Proponent <input type="checkbox"/> N/A
Possible impacts on regionally important activities such as fruit picking.	<input type="checkbox"/> The Proponent has indicated a willingness to provide additional on site vans at local caravan parks in order to mitigate effects on accommodation <input type="checkbox"/> Provide training	<input type="checkbox"/> Adequate accommodation is available <input type="checkbox"/> At least 10 local people provided with training <input type="checkbox"/> N/A	<input type="checkbox"/> Contractor to liaise with local accommodation providers <input type="checkbox"/> Proponent to liaise with local training providers <input type="checkbox"/> N/A	<input type="checkbox"/> On site vans <input type="checkbox"/> Proponent to liaise with Department of Employment and Training. <input type="checkbox"/> N/A	<input type="checkbox"/> Proponent and contractor <input type="checkbox"/> Proponent <input type="checkbox"/> N/A
Enhance employment options for locals	<input type="checkbox"/> Provide training	<input type="checkbox"/> At least 10 local people provided with training <input type="checkbox"/> N/A	<input type="checkbox"/> Proponent to liaise with local training providers <input type="checkbox"/> N/A	<input type="checkbox"/> Proponent to liaise with Department of Employment and Training. <input type="checkbox"/> N/A	<input type="checkbox"/> Proponent <input type="checkbox"/> N/A
Increase in heavy vehicle movements leading to conflict between heavy vehicles and local traffic.	<input type="checkbox"/> These effects will be mitigated through the implementation of the Traffic Management Plan (outlined in section 4 of this report)	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A

Burnett Catchment Water Infrastructure – Burnett River Dam

18.5 Operational Implementation Plans

Table 18.11 Infrastructure

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
River crossing of Gayndah – Mt Perry Road inundated at FSL	<input type="checkbox"/> Investigate options for road realignment and bridge crossing <input type="checkbox"/> Realign the affected road section and/or provide new high level crossing	<input type="checkbox"/> Road and bridge not affected by Q50 flood <input type="checkbox"/> No significant change to current road length <input type="checkbox"/> Designed in accordance with DMR standards <input type="checkbox"/> Realignment minimises disruption/ impact on environmental values	<input type="checkbox"/> Design based on historical monitoring data	<input type="checkbox"/> N/A	<input type="checkbox"/> Operator in association with DMR
Inundation of local road crossings	<input type="checkbox"/> Realign roads around affected area <input type="checkbox"/> Provide new crossings if necessary	<input type="checkbox"/> All properties have reasonable dry weather <input type="checkbox"/> Flood immunity of roads should not be decreased	<input type="checkbox"/> Design based on historical monitoring data	<input type="checkbox"/> N/A	<input type="checkbox"/> Operator in consultation with Shire Councils
Telephone lines inundated	<input type="checkbox"/> Consultation with regional telecommunication supplier re preferred options <input type="checkbox"/> Realign network	<input type="checkbox"/> Telephone poles not in standing water <input type="checkbox"/> Existing flood immunity not diminished	<input type="checkbox"/> Design based on survey data	<input type="checkbox"/> N/A	<input type="checkbox"/> Operator in association with Telstra
Electricity lines inundated	<input type="checkbox"/> Consultation with regional power supplier re preferred options <input type="checkbox"/> Realign network	<input type="checkbox"/> Power poles not in standing water <input type="checkbox"/> Existing flood immunity not diminished	<input type="checkbox"/> Design based on survey data	<input type="checkbox"/> N/A	<input type="checkbox"/> Operator in association with Egon Energy
Irrigation pump/ farm building/ fence inundation	<input type="checkbox"/> Survey to determine extent of impact <input type="checkbox"/> Landholder consultation <input type="checkbox"/> Replace or relocate pumps <input type="checkbox"/> Development of a Landholder Management Plan	<input type="checkbox"/> Operation of pumps not compromised at FSL <input type="checkbox"/> Flood immunity of existing pumps not diminished	<input type="checkbox"/> Design based on survey data <input type="checkbox"/> Landholder complaints	<input type="checkbox"/> Investigate complaint <input type="checkbox"/> Action as appropriate	<input type="checkbox"/> Operator

Burnett Catchment Water Infrastructure – Burnett River Dam

Table 18.12 Physical Environment

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Sedimentation of proposed dam	<input type="checkbox"/> Remove coarse sediment from upstream extremities during low storage levels <input type="checkbox"/> Retain in stream snags and tributary sediment delivery	<input type="checkbox"/> Follow DNRM stream extraction requirements <input type="checkbox"/> N/A	<input type="checkbox"/> Monitor sediment levels at dam upstream extremities at least every 3 years, <input type="checkbox"/> Monitor reaches below dam using site survey and photopoints	<input type="checkbox"/> Extract when economic volumes accumulate or greater than 2000 m ³ <input type="checkbox"/> License extraction of coarse sediment above the dam <input type="checkbox"/> Stop coarse sediment extraction below the proposed dam	<input type="checkbox"/> Operator <input type="checkbox"/> Operator <input type="checkbox"/> DNRM
Reduced coarse sediment transport downstream	<input type="checkbox"/> Undertake Bank Stability study of existing conditions <input type="checkbox"/> Avoid sudden change in water level	<input type="checkbox"/> Follow Operations and maintenance procedures	<input type="checkbox"/> Maintain photo points for bans	<input type="checkbox"/> Install bank stabilisation in line with erosion and sedimentation handbook	<input type="checkbox"/> Operator
Potential bank instability	<input type="checkbox"/> Do not irrigate recharge areas in land systems with perched water tables <input type="checkbox"/> Provide interception drainage in areas with perched water tables <input type="checkbox"/> Irrigate recharge areas where there is coastal saltwater intrusion <input type="checkbox"/> Reduce seepage in delivery system <input type="checkbox"/> Prepare Land and Water Management Plans for all lots receiving irrigation water to identify salinity hazard	<input type="checkbox"/> No increase in salinity	<input type="checkbox"/> Water table and annual wet season soil EC monitoring in saline hazard areas	<input type="checkbox"/> Identify areas of secondary salinity and the causal process. <input type="checkbox"/> Manage water in these landscapes to reduce salinisation <input type="checkbox"/> Maintain or lower water table	<input type="checkbox"/> Irrigators <input type="checkbox"/> DNRM

Burnett Catchment Water Infrastructure – Burnett River Dam

Table 18.13 Land Use and Planning

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Adjoining land owner severely affected by inundation/acquisition - farm viability is compromised	<input type="checkbox"/> Investigate alternative viable land use options to replace unviable activity. <input type="checkbox"/> Liaise with Local Councils in the preparation of new Planning instruments and/or in making amendments to the Planning Scheme	<input type="checkbox"/> A compatible alternative land use option is identified <input type="checkbox"/> Strategic planning designations and planning controls provide for any dam catchment restrictions and accord with the objectives of maintaining water quality in the dam catchment	<input type="checkbox"/> New compatible land use is established <input type="checkbox"/> New approved developments of land accord with the provisions of the Planning Scheme and the objectives and management principles of the dam catchment	<input type="checkbox"/> N/A <input type="checkbox"/> Provide advice to Councils	<input type="checkbox"/> Operator in conjunction with Local Council <input type="checkbox"/> Operator
Inadequate planning controls provided within the Planning Schemes to ensure that incompatible land uses are not established within the catchment.		<input type="checkbox"/> Establish a database of new developments in the catchment area <input type="checkbox"/> Obtain notification of all new development proposals within the dam catchment	<input type="checkbox"/> Ongoing liaison with EPA and NPWS regarding park operations adjacent to the dam site.	<input type="checkbox"/> N/A	<input type="checkbox"/> Operator and development proponent
Adverse impacts on the adjoining activity of the Goodnight Scrub National Park	<input type="checkbox"/> Liaise with EPA to identify park activities affected by restrictions placed on dam usage	<input type="checkbox"/> Management practices are introduced into the Park Management plans which ensure that the dam functions are not intruded upon and park activity is maintained.	<input type="checkbox"/> Only appropriate recreational and tourism developments occur within the catchment which are compatible with catchment objectives	<input type="checkbox"/> Re-establish contacts with Council	<input type="checkbox"/> Burnett Water in conjunction with local Councils and land owners
Potential for increased recreational and tourism development	<input type="checkbox"/> Liaise with Local Councils in the establishment of recreation and tourist based development to ensure catchment objectives are satisfied.	<input type="checkbox"/> Burnett Water is liaising with Shire Councils on a monthly basis or as needed to review any new proposals.			

Burnett Catchment Water Infrastructure – Burnett River Dam

Table 18. 14 Surface and Groundwater

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Turbidity/ suspended solids and BOD (organic enrichment) may increase in dam during inundation over valley floor on way to FSL	<ul style="list-style-type: none"> <input type="checkbox"/> Control erosion and scour to limit suspended sediment loads from exposed lands/ paddocks. <input type="checkbox"/> Eg. Stabilise exposed soils and substrates, for instance, with groundcover vegetation <input type="checkbox"/> Releases from dam in the "filling" period to avoid times of possible high turbidity 	<ul style="list-style-type: none"> <input type="checkbox"/> Turbidity and TSS levels do not exceed the operational requirements of water users. <input type="checkbox"/> Long-term water quality downstream of dam meets water quality objectives. <input type="checkbox"/> Increase in TSS or turbidity levels downstream of dam not to exceed 120% of background levels <p><i>Eg. turbidity not to exceed 24 NTU in downstream river pool when upstream pool is 20 NTU.</i></p>	<ul style="list-style-type: none"> <input type="checkbox"/> Monthly monitoring of lake water quality <input type="checkbox"/> Upstream (lake inflows), lake at wall and downstream (Burnett river pools) monitoring during and after significant rainfall-runoff events 	<ul style="list-style-type: none"> <input type="checkbox"/> Release from dam at times of relatively low turbidity <input type="checkbox"/> Contain waters within lake when turbidity is too high for downstream release if turbidity increases from inflow to wall, consider draw down of lake to stabilise areas of sediments and nutrients. 	<ul style="list-style-type: none"> <input type="checkbox"/> Operator
Chemical & oil contamination of waters from spills;	<ul style="list-style-type: none"> <input type="checkbox"/> Manage catchment and near shore areas for risk of contaminants <input type="checkbox"/> Appropriate storage of fuels and chemicals eg. Bund quantities >10 000L in catchment area <input type="checkbox"/> Procedures developed and implemented to respond to chemical and materials spills into the impoundment. 	<ul style="list-style-type: none"> <input type="checkbox"/> No spills or contaminated runoff from the catchment <input type="checkbox"/> Where spills occur, they are cleaned up and disposed immediately and securely <input type="checkbox"/> Compliance with Water EPP throughout the catchment <input type="checkbox"/> Meet ANZECC guidelines <input type="checkbox"/> Spill response gear and kit to be maintained within the catchment area for immediate response to spill <input type="checkbox"/> Evidence of personnel training 	<ul style="list-style-type: none"> <input type="checkbox"/> Sampling of stormwater and receiving waters should a spill occur to assess level and extent of contamination and risk to the impoundment. 	<ul style="list-style-type: none"> <input type="checkbox"/> Soil and water contamination or spillage will be cleaned up immediately. <input type="checkbox"/> Where a contaminated inflow into the lake is detected, the source must be determined and the area made secure and contaminants contained and recovered. 	<ul style="list-style-type: none"> <input type="checkbox"/> All stakeholders <input type="checkbox"/> Catchment Management Authorities <input type="checkbox"/> EPA <input type="checkbox"/> Operator
Contamination of waters from existing land contamination.	<ul style="list-style-type: none"> <input type="checkbox"/> Manage catchment and nearshore areas for risk of contaminants <input type="checkbox"/> Investigation and remediation of existing contaminated sites 	<ul style="list-style-type: none"> <input type="checkbox"/> All potentially contaminated sites reported <input type="checkbox"/> Investigations completed and sites, where required, remediated prior to inundation <input type="checkbox"/> Meet ANZECC guidelines in lake 	<ul style="list-style-type: none"> <input type="checkbox"/> Testing of soils, wastes and infrastructure to be inundated according to EPA Contaminated Lands guidelines 	<ul style="list-style-type: none"> <input type="checkbox"/> Soil, wastes and other sources of contamination remediated to appropriate level prior to lake inundation to FSL. <input type="checkbox"/> Where a contaminated inflow into the lake is detected, the source must be determined and the area made secure and contaminants contained and recovered. 	<ul style="list-style-type: none"> <input type="checkbox"/> Landholders within inundation area <input type="checkbox"/> EPA <input type="checkbox"/> Operator

Burnett Catchment Water Infrastructure – Burnett River Dam

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Eutrophication and deoxygenation (inflows to lake)	<input type="checkbox"/> Lake nutrient status monitoring <input type="checkbox"/> Catchment management plan to be implemented.	<input type="checkbox"/> Maintenance of ambient concentrations and Water Quality Objectives met <input type="checkbox"/> DO exceeds 6 mg/L saturation <input type="checkbox"/>	<input type="checkbox"/> Monthly monitoring of lake water quality at inflows, lake and dam wall offtake <input type="checkbox"/> Including Mt Lawless, Mingo Crossing (amended)	<input type="checkbox"/> Assess achievement or compliance with catchment management plan goals and objectives <input type="checkbox"/> Including land cleaning, vegetation management, fertiliser application, runoff quality monitoring	<input type="checkbox"/> Operator (lake monitoring) <input type="checkbox"/> All stakeholders <input type="checkbox"/> Catchment management authorities <input type="checkbox"/> EPA, DNR&M, DPI
Deoxygenation of waters of shoreline	<input type="checkbox"/> Monitor effect of changing populations of water plants <input type="checkbox"/> Decaying aquatic vegetation may affect aquatic values of lake	<input type="checkbox"/> DO exceeds 6 mg/L saturation	<input type="checkbox"/> Inspection of lake shoreline before and after large releases from dam <input type="checkbox"/> Assess macrophyte status and test water quality	<input type="checkbox"/> Consider effects on lake aquatic fauna of significance <input type="checkbox"/> Assess effect at water intake tower for release to downstream	<input type="checkbox"/> Operator
Vertical stratification of lake	<input type="checkbox"/> Seasonal thermal stratification <input type="checkbox"/> Note specific physical and chemical conditions of surface and deep layers	<input type="checkbox"/> Maintenance of ambient water quality concentrations and WQOs met in epilimnion <input type="checkbox"/> Australian Drinking Water Guidelines where potable supply is made	<input type="checkbox"/> Minimum frequency of monthly monitoring by depth profile (DO, pH, temp, EC) (or thermistor string near dam wall). Profile with distance away from wall (eg. 1 km centres) <input type="checkbox"/> Test water samples from above and below thermocline for iron and turbidity	<input type="checkbox"/> Note the presence and depth of thermocline and position offtakes accordingly in surface layer. <input type="checkbox"/> Consider need and feasibility of mixer to enhance water turbulence.	<input type="checkbox"/> Operator
Algal Blooms (Blue-Green algae) on Lake	<input type="checkbox"/> Seasonal, likely repeatable effect during hot dry conditions <input type="checkbox"/> Possible toxic effect <input type="checkbox"/> Monitor and respond accordingly Eg. Lake wide, intake tower is priority for management Develop Algal Management and Contingency Plan	<input type="checkbox"/> Cell densities less than 15-20 000 cells/mL <input type="checkbox"/> No toxic cyanobacteria forms <input type="checkbox"/> Australian Drinking Water Guidelines where potable supply is made	<input type="checkbox"/> Minimum frequency of weekly especially during the warmer months <input type="checkbox"/> Species identification and enumeration <input type="checkbox"/> Toxicity testing at high densities	<input type="checkbox"/> When blue-green densities exceed trigger thresholds, implement Contingency Plan for additional testing (including toxicity) and water treatment requirements.	<input type="checkbox"/> Operator
Eutrophication and deoxygenation of Burnett pools below Dam	<input type="checkbox"/> Nutrient enrichment and oxygen depletion <input type="checkbox"/> Operate offtake to make epilimnetic releases (high in DO) <input type="checkbox"/> Provision of flows to meet WRP and ROP	<input type="checkbox"/> Maintenance of ambient water quality conditions and WQOs met <input type="checkbox"/> Ecological quality indicators met	<input type="checkbox"/> Monthly monitoring to assess WQOs long term at: - Pool 1 km below dam - Figtree Creek - Degilbo Creek (reference site) - Booyal Crossing, Walla	<input type="checkbox"/> Modify the volume or timing of release waters to improve flushing flows <input type="checkbox"/> Examine catchment inflow quality data and possible causes due to water quality processes in lake.	<input type="checkbox"/> Operator

Burnett Catchment Water Infrastructure – Burnett River Dam

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Groundwater					
Development of groundwater mound around Dam	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> Monitor waterlevels in select, existing privately owned bores adjacent to Dam for evidence of rising waterlevels	<input type="checkbox"/> N/A	<input type="checkbox"/> Catchment Management Authorities <input type="checkbox"/> Operator
Change in hydraulic gradient around Dam	<input type="checkbox"/> Minimise seepage around Dam	<input type="checkbox"/> Minimal impact	<input type="checkbox"/> Visually monitor land downstream of Dam for evidence of waterlogging and development of wetlands	<input type="checkbox"/> Assess and implement seepage engineering controls	<input type="checkbox"/> Operator
Risk of landslide around margin of Dam resulting in increased turbidity	<input type="checkbox"/> See surface water quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inundation of bores	<input type="checkbox"/> Effect change from groundwater to surface water use	<input type="checkbox"/> User change from groundwater to surface water use	<input type="checkbox"/> Identify affected landholders <input type="checkbox"/> Visually monitor rising inundation areas adjacent to Dam	<input type="checkbox"/> Provide temporary supply equivalent to normal use	<input type="checkbox"/> Catchment Management Authorities <input type="checkbox"/> Operator
Lowering of waterlevels downstream of Dam	<input type="checkbox"/> Temporary impact	<input type="checkbox"/> N/A	<input type="checkbox"/> Monitor waterlevels in select, existing privately owned bores downstream of Dam for evidence of falling waterlevels.	<input type="checkbox"/> N/A	<input type="checkbox"/> Operator
Localised shallow watertables and consequent groundwater and soil salinisation around Dam	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A	<input type="checkbox"/> Visually monitor land adjacent to Dam for evidence of waterlogging and development of wetlands	<input type="checkbox"/> N/A	<input type="checkbox"/> All stakeholders <input type="checkbox"/> Catchment Management Authorities <input type="checkbox"/> Operator
Irrigation Areas					
Increased groundwater discharge to surface waters in irrigation areas	<input type="checkbox"/> Application of irrigation water should be managed to minimise expansion of the groundwater mounds	<input type="checkbox"/> Expansion of the mounds is minimised	<input type="checkbox"/> Monitor bores adjacent to and distant from irrigation areas for changes in waterlevels	<input type="checkbox"/> Irrigation application rates are adjusted to reverse or minimise expansion of the mounds	<input type="checkbox"/> Irrigators <input type="checkbox"/> Catchment Management Authorities
Soil waterlogging and soil & groundwater salinisation in irrigation areas	<input type="checkbox"/> Application of irrigation water should be managed to minimise deep percolation and consequent rising watertables	<input type="checkbox"/> Where rising watertables are identified they are monitored	<input type="checkbox"/> Monitor bores adjacent to irrigation areas for changes in waterlevel, salinity, evidence of waterlogging and development of wetlands	<input type="checkbox"/> Irrigation application rates are adjusted to reverse or minimise rising watertables	<input type="checkbox"/> Irrigators <input type="checkbox"/> Catchment Management Authorities
Decreased seawater intrusion	<input type="checkbox"/> Increased surface water use will reduce seawater intrusion - i.e. significant beneficial impact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Burnett Catchment Water Infrastructure – Burnett River Dam

Table 18.15 Aquatic Flora and Fauna

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Impoundment					
<input type="checkbox"/> Poor water quality in storage	<input type="checkbox"/> Maintain water discharge quality to ANZECC Guidelines for Maintenance of Freshwater Aquatic Ecosystems <input type="checkbox"/> Develop blue-green algae contingency plan <input type="checkbox"/> Refer to Australian Mosquito Control Manual, 1998 – Prevent outbreak of mosquito	<input type="checkbox"/> Water quality within ANZECC Guidelines <input type="checkbox"/> Plan developed and implemented as specified <input type="checkbox"/> No reported outbreak of mosquito	<input type="checkbox"/> Monthly monitoring of physicochemical processes <input type="checkbox"/> Plan developed and implemented prior to operation <input type="checkbox"/> Seasonal monitoring of impoundment	<input type="checkbox"/> Consult with DNR&M <input type="checkbox"/> Consult with DNR&M <input type="checkbox"/> Consult with Queensland Health	<input type="checkbox"/> Operator <input type="checkbox"/> Operator <input type="checkbox"/> Operator
Downstream					
<input type="checkbox"/> Poor water quality from dam impacts on aquatic fauna	<input type="checkbox"/> Maintain water discharge quality to ANZECC Guidelines for Maintenance of Freshwater Aquatic Ecosystems <input type="checkbox"/> Ensure compliance with Water Resource Plan as far as possible	<input type="checkbox"/> Water quality within ANZECC Guidelines <input type="checkbox"/> Compliance with Water Resource Plan	<input type="checkbox"/> Monthly monitoring of physicochemical processes <input type="checkbox"/> Monitor flows as required by Water Resource Plan	<input type="checkbox"/> Consult with DNR&M <input type="checkbox"/> Consult with DNR&M	<input type="checkbox"/> Operator <input type="checkbox"/> Operator
<input type="checkbox"/> Environmental flows not maintained					

Burnett Catchment Water Infrastructure – Burnett River Dam

Table 18.16 Terrestrial Flora and Fauna

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Flora					
<input type="checkbox"/> Reduction in community size of <i>Bertya</i> species	<input type="checkbox"/> Propagation of <i>Bertya</i> species and revegetation at Mt Yeatman and Mt Blandy	<input type="checkbox"/> Successful propagation	<input type="checkbox"/> Flora survey	<input type="checkbox"/> Consult with local flora consultant	<input type="checkbox"/> Operator
Weed Management					
<input type="checkbox"/> Potential spread of weed species to sensitive areas	<input type="checkbox"/> Weed awareness of staff <input type="checkbox"/> To implement appropriate response in the event of an outbreak	<input type="checkbox"/> No reported incidence or spreading of weeds	<input type="checkbox"/> Visual audit	<input type="checkbox"/> Consult with DNR&M	<input type="checkbox"/> Operator
<input type="checkbox"/> Loss of suitable habitat for fauna species	<input type="checkbox"/> To compensate for the loss of native flora	<input type="checkbox"/> Increase in fauna utilisation of the area	<input type="checkbox"/> Seasonal flora and fauna survey	<input type="checkbox"/> Selective planting of native species	<input type="checkbox"/> Operator
Fauna					
<input type="checkbox"/> Loss of potential roosting sites – Powerful Owl	<input type="checkbox"/> Maintain existing population <input type="checkbox"/> Limited removal of roosting trees	<input type="checkbox"/> Stable populations of Powerful Owl	<input type="checkbox"/> Seasonal survey	<input type="checkbox"/> Placement of roosting boxes	<input type="checkbox"/> Operator

Table 18.17 Waste Management

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Actions	Responsibility
Waste from maintenance activities	<input type="checkbox"/> Disposal at licensed facility <input type="checkbox"/> Transport using licensed contractor <input type="checkbox"/> Use EPA waste tracking system	<input type="checkbox"/> Waste tracking system	<input type="checkbox"/> Waste disposal records	<input type="checkbox"/> Investigate waste management system	<input type="checkbox"/> Construction contractor

Burnett Catchment Water Infrastructure – Burnett River Dam

Table 18. 18 Hazard and Risk

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Water not released	<input type="checkbox"/> Install flow detection system <input type="checkbox"/> Install upstream flood warning devices	<input type="checkbox"/> River ecology is maintained. <input type="checkbox"/> No 'sunny day' upstream flooding	<input type="checkbox"/> Visual inspection of downstream reaches during dry periods <input type="checkbox"/> Weekly check of detection system <input type="checkbox"/> Regular maintenance schedules <input type="checkbox"/> Log checks and maintenance	<input type="checkbox"/> Review inspection and maintenance program	<input type="checkbox"/> Operator

Table 18. 19 Social and Economic

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Exacerbation of the current population increases in the Study Area	<input type="checkbox"/> Wide Bay 2020 Human Services Network to co-ordinate responses to population growth as a result of the Dam.	<input type="checkbox"/> All residents have continuing access to the services they require	<input type="checkbox"/> Human Services Network to Monitor through existing human service networks	<input type="checkbox"/> In consultation with Human service network, Families Department and Local Governments	<input type="checkbox"/> Government
Recreation areas affected by inundation.	<input type="checkbox"/> liaise with local councils and user groups in order to develop safe alternative access and facilities	<input type="checkbox"/> All residents have continuing access to the recreation services they require	<input type="checkbox"/> Human Services Network to Monitor through existing human service networks	<input type="checkbox"/> In consultation with Human service network, Families Department and Local Governments	<input type="checkbox"/> Government
Reduced population thresholds for provision of human services in Biggenden and Gayndah Shires	<input type="checkbox"/> the proponent will consult with the relevant local government authorities and human service providers in these Shires, and the Department of Families to determine any required mitigation measures.	<input type="checkbox"/> No services withdrawn from the area as a result of reduced population thresholds.	<input type="checkbox"/> Local government authorities, Human Service Network and Families Department notified.	<input type="checkbox"/> In consultation with Human service network, Families Department and Local Governments	<input type="checkbox"/> Government

Burnett Catchment Water Infrastructure – Burnett River Dam

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Changes social structure and loss of community cohesion	<input type="checkbox"/> The proponent will involve the local councils, Department of Families and the Wide Bay 2020 Human Services Network in the development of strategies to support local communities should a significant number of people leave the local community as a result of inundation.	<input type="checkbox"/> Appropriate processes put in place to assist residents to cope with change and enhance community cohesion.	<input type="checkbox"/> Relevant parties notified of number of people expected to leave the area	<input type="checkbox"/> In consultation with Human service network, Families Department and Local Governments	<input type="checkbox"/> Government

Burnett Catchment Water Infrastructure – Burnett River Dam

18.6 Environmental Monitoring

Environmental Monitoring will be undertaken at the Project site during the pre-construction, construction and operational phases as described below.

18.6.1 Pre-Construction

In order to assess the potential impacts of the dam it is necessary to measure and record the pre-development environment. A systematic approach is required to compile the necessary 'baseline data' for a range of environmental compartments. However, the development of the EIS has identified a number of areas where information could not be collated, either due to project time constraints or due to a lack of available data. (**Table 18.20**).

Management Principles

- Monitoring procedures will be developed in accordance with standard protocols and the requirements of the Environmental Protection Agency.
- Undertake baseline environmental monitoring and data collation as shown in **Table 18.20**.
- Calibrate and maintain all equipment used for environmental monitoring.
- Record and maintain details of calibration and maintenance for each piece of monitoring equipment used.
- Send all samples to a NATA registered laboratory for analysis.
- Record and maintain details of laboratory results and quality assurance measures.

Table 18.20: Baseline Studies – Pre Construction

Element	Monitoring Parameters
Surface Water Quality	Baseline Data
Sediment Levels	Baseline Data
Water Flows	Baseline Data
Impoundment bank stability	Study Data
Saline hazard areas	Wet Season EC monitoring
Groundwater Quality and Quantity	Baseline Data
Air Quality	Baseline particulate data
Noise	Baseline data at nearest residence to
Terrestrial Flora and Fauna	Baseline Data
Aquatic Flora and Fauna	Baseline Data

18.6.2 Construction

Background

The results of environmental monitoring during the construction phase will be used to assess the impact of the dam on the surrounding environment and demonstrate compliance with regulatory requirements. Construction data will be compared to the baseline data.

Management Principles

- Develop monitoring procedures in accordance with standard protocols and the requirements of the Environmental Protection Agency, DPI or other relevant authority.
- Undertake environmental monitoring during the construction phase as shown in **Table 18.21**.
- Calibrate and maintain all equipment used for environmental monitoring.
- Maintain records of the calibration and maintenance for each piece of monitoring equipment held on site.
- Send all samples to a NATA registered laboratory for analysis.
- Record and maintain details of laboratory results on site.

Burnett Catchment Water Infrastructure - Burnett River Dam

Table 18.21: Environmental Monitoring during the Construction Phase

Element	Environmental Parameter	Schedule
Surface water Quality	Turbidity, dissolved oxygen, pH total suspended solids, Chemicals (fuels, oils etc)	Monthly Event related if spill occurs
Groundwater	<input type="checkbox"/> Borehole water levels	<input type="checkbox"/> Monthly
	<input type="checkbox"/> Visual assessment of adjacent land for water logging	<input type="checkbox"/> Monthly
	<input type="checkbox"/> Borehole water levels downstream	<input type="checkbox"/> Monthly
	Irrigation bores	
	<input type="checkbox"/> water levels	<input type="checkbox"/> Monthly
	<input type="checkbox"/> salinity	<input type="checkbox"/> Monthly
	<input type="checkbox"/> waterlogging	<input type="checkbox"/> Monthly
Air Quality	Particulates	Monthly
Noise	Construction Noise Levels	following complaint
Vibration	Vibration	during blasting
Aquatic Flora and Fauna	<input type="checkbox"/> Macroinvertebrates,	<input type="checkbox"/> Every 6 months
	<input type="checkbox"/> Macrophytes	<input type="checkbox"/> Every 6 months
	<input type="checkbox"/> Lungfish (Adults)	<input type="checkbox"/> Every 6 months
	<input type="checkbox"/> Lungfish (recruitment)	<input type="checkbox"/> Every 6 months
	<input type="checkbox"/> Turtles	<input type="checkbox"/> Every 6 months
	<input type="checkbox"/> Platypus	<input type="checkbox"/> Annually

Table 18.22: Implementation Strategy: Calibrate and maintain environmental monitoring equipment

Tasks	Monitoring	Performance Criteria	Corrective Action
Calibrate and maintain equipment used in environmental monitoring	inspect records to establish regular maintenance and calibration program	Calibration and maintenance records	Prohibit use faulty or un-calibrated equipment
Sampling, calibration and maintenance undertaken by Competent person	inspect training records to establish staff competence	<input type="checkbox"/> Observation of calibration and maintenance procedures to supplier/ manufacturers guidelines <input type="checkbox"/> Laboratory sample control documents	Provision of adequate training/ instruction

18.6.3 Operation

A comprehensive monitoring program will be designed and implemented, in accordance with the requirements of the environmental authority (EPA), DPI or other relevant authority, to record changes in the environmental conditions in response to construction activities. The monitoring program will assist in the early identification of potential problems and will fulfil the proponents' due diligence requirements to document success as well as failure. A list of potential areas where monitoring may be required is given in **Table 18.23** below.

Management Principles

- To conduct an operational monitoring program that will be used to collect data to compare against baseline monitoring.
- Use the monitoring procedures in accordance with standard protocols and the requirements of the Environmental Protection Agency.
- Calibrate and maintain all equipment used for environmental monitoring.
- Maintain records of the calibration and maintenance for each piece of monitoring equipment held on site.
- Send all samples to a NATA registered laboratory for analysis.
- Record and maintain details of laboratory results.

Burnett Catchment Water Infrastructure – Burnett River Dam

Table 18.23: Proposed Environmental Monitoring Operational Phase

Element/Issue	Environmental Parameter	Schedule
Surface water Quality	Release temperature, turbidity, pH conductivity, Dissolved oxygen, iron and manganese	Monthly
	Vertical stratification	Monthly (All year but especially October to May)
	Blue green algae (speciation, density, toxicity if required)	Weekly
Groundwater	<input type="checkbox"/> Borehole water levels	<input type="checkbox"/> Quarterly until trends stabilise
	<input type="checkbox"/> Visual assessment of adjacent land for water logging	<input type="checkbox"/> Quarterly for 1 year, then annually
	<input type="checkbox"/> Borehole water levels downstream	<input type="checkbox"/> Quarterly until trends stabilise
	Irrigation bores	
	<input type="checkbox"/> water levels	<input type="checkbox"/> Quarterly
	<input type="checkbox"/> salinity	<input type="checkbox"/> Quarterly
	<input type="checkbox"/> waterlogging	<input type="checkbox"/> Quarterly
Terrestrial Flora and Fauna	Bank stability, replanting, rehabilitation monitoring	Bi-annual
Aquatic Flora and Fauna	<input type="checkbox"/> Fish transfer device,	<input type="checkbox"/> Annual
	<input type="checkbox"/> Macroinvertebrates/ fish/ turtles/ Macrophytes	<input type="checkbox"/> Bi-annual
	<input type="checkbox"/> Platypus	<input type="checkbox"/> Annual

18.6.4 Decommissioning

A decommissioned dam is where parts of the structure are removed or otherwise modified to make it incapable of storing water.

The results of environmental monitoring during the decommission phase will be used to assess the impact of the decommission of the dam on the surrounding environment and demonstrate compliance with regulatory requirements.

The actual scope of the decommissioning environmental monitoring will be established following consultation with the regulatory authorities. The format of decommission management strategy will probably be similar to that of earlier development phases and consist of the following:

Management Principles

- Develop monitoring procedures in accordance with standard protocols and the requirements of the Environmental Protection Agency.
- Undertake environmental monitoring during the decommission phase as shown in **Table 18.24**.
- Calibrate and maintain all equipment used for environmental monitoring.
- Maintain records of the calibration and maintenance for each piece of monitoring equipment held on site.
- Send all samples to a NATA registered laboratory for analysis.

Table 18.24: Draft Environmental Monitoring Decommission Phase

Element	Environmental Parameter	Schedule
Groundwater	Quality and Quantity	*TBA
Surface Water	Surface Water Quality	*TBA
Terrestrial Flora	Rehabilitation monitoring	*TBA

- TBA – to be arranged