

Water Efficiency Management Plan

University Experimental Mine Site



WEMP Submission Form

Name	The University of Queensland
ABN	63942912684
Contact Details	
Primary Contact for WEMP	Mr Stuart Green
Position in Company	Environmental Engineer, Property and Facilities Division
Mobile Phone Number	0411 235 932
WEMP Author	Leigh Burgess
Authorisation	Alasdair McClintock
Authority's Signature	See Appendix 1.
Position	Director, Property and Facilities Division
Date	February 2008

WEMP components in this submission

Included	WEMP Component	Justification for exclusion from WEMP
NO	Taps & Showers	Site uses less than 10ML
NO	Toilets and Urinals	Site uses less than 10ML
YES	Cooling Towers and	
	Evaporative Coolers	
NO	Outdoor Use	No outdoor consumption
NO	Process and Other End	Site uses less than 10ML
	Uses	

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Water Management Policy

Policy Number: Policy Name: Contact Officer: Date Approved by Senate: Date of Next Review: Related Policies: 7.50.4 Water Management Policy Environmental Engineer, Property and Facilities Division 27/3/2008 27/3/2011 7.50.2

1. Overview

The University of Queensland acknowledges the importance of water as an essential resource for successfully meeting its operational objectives. The University also realises the need to use this resource responsibly in a manner that is sustainable and complementary to its Environmental Management Policy.

2. The Policy

In addressing this statement, the University will:

- Incorporate water efficiency measures into all new and refurbished facilities through best practice in water efficient design, the selection and sizing of plant and equipment, systems and other water infrastructure;
- Maintain all plant and equipment, and control and manage systems and water infrastructure in such a way as to maximise efficiency;
- Monitor and report on the University's water consumption at micro and macro levels and identify and implement opportunities for improved water efficiency;
- Promote awareness of the responsibility for water conservation to faculties, institutes, schools, centres, divisions, sections and individuals;
- Pursue the use of alternate water sources to supplement potable water use;
- Strive to meet our obligations as a member of the Global Community including legislative requirements and minimising environmental impact; and
- Strive to procure, distribute and maintain water resources at the lowest cost while addressing the items above.

The Property and Facilities Division has the additional responsibilities of:

- Acquisition of water;
- Design and construction of new, and maintenance of existing facilities and their fixed water infrastructure;
- · Identification, development and implementation of awareness programs and
- Making available funding to support water conservation measures.

Faculties, Institutes, Schools, Centres and Divisions

UQ Business Units within their area of influence are encouraged to:

- Purchase water efficient plant and equipment;
- · Consume water responsibly and within the South East Queensland Water restrictions;
- Ensure that every individual within the Business Unit is aware of this policy and their responsibilities to conserve water;
- Ensure that any third parties are accountable for the use of any water within The University of Queensland;
- Support, where appropriate, courses and programs, and research of alternate water sources, treatment, plant and equipment, systems and other water infrastructure; and
- Make available funding to support water conservation measures.

Individuals

The University Community is encouraged to:

- · Use water in an efficient manner, including the operation of personal equipment and environment;
- · Report any water leaks to the Property & Facilities Works Control Centre; and
- Comply with any policies and procedures for water management university wide and in their local area.

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University Experimental Mine

1.0 Introduction

This document is the Water Efficiency Management Plan (WEMP) for The University of Queensland's Experimental Mine Site. The Action Plans in section 9.0 outline water efficiency measures to be progressively implemented by the University. The plan complements the University's Environmental Management System (EMS) and the Mine's Environmental Management Plan.

The Water Efficiency Management Plan for the 2006/2007 year is the 1st edition of the plan. The Utilities Management Committee (water) has been meeting since May 2002 and has since identified, monitored and reported on a number of areas where water management strategies are being applied to ensure continuing water reduction.

The targets listed in the plan directly relate to the EMS objectives and are measured using Key Performance Indicators (KPI's). Targets and actions documented in the WEMP Action Plans are measured and monitored by Environmental Services and reported to the Utilities Management Committee (UMC).

The University recognises its responsibility to the community and to the environment and has allocated resources to ensure that water is managed in an efficient and sustainable manner. The University has an Environmental Policy endorsed and signed by the Vice Chancellor.

1.2 Background

The University of Queensland currently operates an experimental (non producing) mine to provide educational support to the Division of Mining and Metallurgical Engineering, School of Engineering located at the St Lucia campus. The mine is located in Brisbane's western suburb of Indooroopilly, between Kate Street, Isles Road, Goldieslie Road and Witton Creek as shown in Figure 1.0. Witton Creek is a minor waterway which discharges into the Brisbane River.

An Environmental Management System (EMS) has been developed by the University of Queensland and is available on the Property & Facilities website at **www.pf.uq.edu.au/ems.html** It is driven by the University's Policy which aims to ensure that the relevant environmental laws and regulations are complied with and that the protection of the environment is enhanced by keeping impacts to a minimum in a sustainable, financially rewarding and technically feasible manner. The University of Queensland has prepared this Water Efficiency Management Plan (WEMP) to be consistent with the University's EMS.

The Julius Kruttschnitt Mineral Research Centre (JKMRC) has produced world-class research in mineral processing and mining since the 1960's. The research covers metals, coal and mineral sands. The ultimate goal of the research is to maximise liberation of valuable commodities with minimum energy use, minimum water use, and minimum environmental and social impact on the industry workforce.

The underground mine historically was a small silver/lead mine which records show was worked from 1919 to 1929. The University of Queensland later purchased the mine through the Department of Mining and Metallurgical Engineering (DMME) in 1951. The Julius

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Kruttschnitt Mineral Research Centre (JKMRC) is the main educational facility located at the site. The underground mine and associated facilities essentially serve to provide students with practical experience to supplement classroom teaching.

1.3 WEMP Purpose

The WEMP is written to ensure that water at The University of Queensland's Experimental Mine Site is used in an efficient manner and that strategies are implemented to ensure a reduction in potable water consumption in accordance with The University of Queensland Water Management Policy and Brisbane City Council and Queensland Water Commission Guidelines. The University will;

- Ensure that all environmental legislation and regulations are met and ensure all relevant approvals are gained;
- Regulate water use through auditing and monitoring to identify any potential problems with the network ; and
- Apply "Best Environmental Practices" in the overall management of water.

1.4 WEMP Scope

The WEMP scope is Water Consumption at The University of Queensland's Experimental Mine site, Indooroopilly. While the scope covers all aspects of water consumption at the University's mine site, only Cooling Towers are required to be covered in the WEMP under level 6 water restrictions for non-residential sites using less than 10ML and WEMP 2 can be found in Appendix 1.0

Figure 1.0 Indooroopilly Experimental Mine Site Plan



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1.5 Goals

Water at The University Experimental Mine Site is managed by the Property and Facilities Division. The site has achieved a 41% reduction in potable water consumption since 2005. The University's goal is to achieve an annual consumption of 1kL/m^2

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2.0 Management Review

2.1 Committee Roles & Responsibilities

The Environmental Management Committee (EMC) has overall responsibility for the implementation of The University of Queensland Environmental Management System (EMS) and other environmental activities. Composition of the committee includes Senior Deputy Vice Chancellor, four Executive Deans, Director; Occupational Health & Safety & Property and Facilities Division representatives. There are environmental management sub committees at St Lucia and Gatton which are responsible for developing awareness of the EMS at Faculty and School levels and monitoring of EMS objectives and targets and training programs.

The Utilities Management Committee and Sub - Committees are responsible for utilities management including monitoring water and energy projects. The composition of the committees includes Property and Facilities representatives from Engineering and Operations Sections and a representative from Finance and Business Services. The University also has a Unigreen Working Party which is responsible for promoting environmental management issues to and from the University community as well as external stakeholders.



Figure 2.0 Committee Structure

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EMS Committees

Role:

• Overall responsibility for the implementation of The University of Queensland Environmental Management Systems and other environmental management activities.

Composition:

- Senior Deputy Vice-Chancellor
- Executive Dean, Faculty of Biological and Chemical Sciences
- Executive Dean, Faculty of Natural Resources, Agriculture and Veterinary Science
- Executive Dean, Faculty of Health Sciences
- Executive Dean, Faculty of Engineering, Physical Sciences and Architecture
- Pro Vice-Chancellor, Ipswich Campus
- Associate Director, Occupational Health and Safety Unit
- Operations Manager, Property and Facilities Division (Convener)
- Administration Manager, Property and Facilities Division
- Environmental Engineer, Property and Facilities Division
- Project Officer Environment, Property and Facilities Division
- Environmental Coordinator, Property and Facilities Division (Secretary)

2.2 Water Management and Resources

Property & Facilities Division has made water management a priority at The University of Queensland with the following measures being implemented and resources being allocated from 2006;

- A Water Project Officer was appointed to ensure that compliance with SEQ water restrictions are achieved by the specified dates and to manage specific water efficiency projects for the University;
- A Water Management Policy was developed;
- Water awareness is now included in contractor inductions;
- A WEMP for contractors was developed and is now being used by contractors using UQ water;
- Additional funding has been made available for compliance with water restrictions and implementation of WEMP initiatives.

2.3 Financing WEMP Actions

The actions outlined in the WEMP Action Plans will be funded from various sources to ensure that they can be implemented. The majority of the funding for water management at the University of Queensland is the Property and Facilities Division. Other sources of funding from the University include the University Improvement Fund and other Works Programs.

Other funding opportunities will also be sought through government and other bodies.

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2.4 Stakeholder Inclusion

The University recognises the importance of being a community leader in water efficiency and has put strategies in place to achieve the goals that have been set. Property and Facilities Division realises the importance of stakeholder involvement in the management of water on campus and has identified key stakeholders across the campus and held a Water Forum to gain input into how to achieve efficiencies in areas of research and laboratory water use. Stakeholders in water management at the University include all of the staff and students as well as the larger community.

2.5 Awareness & Incentives

Unigreen

The Property & Facilities Division is responsible for the delivery of awareness programs through the Unigreen Working Party. A Unigreen Training and Awareness Management Plan has been developed to help to deliver effective training and awareness programs in 2008.

The Training and Awareness Management Plan includes improving awareness of water efficiency, expanding the Green Office Program which includes water efficiency and promoting the Water Efficiency Management Plan to the University community. Water awareness materials are available to Schools and Centres by download at www.pf.uq.edu.au/unigreen.html. Schools and Centres are encouraged to print section 3, post it on message boards and send to colleagues.

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3.0 Improving Water Efficiency in Schools and Centres

The following strategies when implemented will help to ensure water efficiency at the University of Queensland continues to improve. Reducing water consumption helps to ensure that the University can continue to provide a sustainable working, teaching, research and recreational environment for staff, students and the local community.

- Include Water Awareness in Staff and Student Training &/or inductions
- Be aware of current water restrictions
- See www.qwc.qld.gov.au for more information
- Report water leaks to Property & Facilities Division Works Control

Centre on 52222 or email wcc@pf.uq.edu.au

- Be Water Wise and encourage others to be Water Wise too
- Ensure that new equipment is water efficient
- Replace old inefficient technologies with new water efficient technology
- When planning a new project, ensure that water efficiency is considered
- Download water awareness posters from

www.pf.uq.edu.au/unigreen.html & post on notice boards

Become a Green Office Representative and help to improve

environmental awareness in your area

Contact Environmental Service Section- Property & Facilities Division

to find out how much water your building or campus uses

Contacts: Environmental Services Section, Property & Facilities Division Unigreen@pf.uq.edu.au Environmental Engineer 51587, Environmental Project Officer 57580, Environmental Coordinator 52076

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4. WEMP Management

Review and Update of the WEMP

The WEMP will be reviewed as required to ensure that it addresses issues and changes in legislation, policies and guidelines. This will be the responsibility of the Property and Facilities Division.

The WEMP has been developed as a document that will undergo periodic change in response to changes in the site operations, environmental legislation, water restrictions and/or environmental management procedures and policies of the University of Queensland.

Awareness of these changes and the requirement to update for superseded legislation and policy is the responsibility of the Property and Facilities Division.

Emergency Situations

Emergency situations other than those addressed in this WEMP are addressed using the emergency procedure listed in the Environmental Contingency program within the University's EMS. The list of emergency contacts is also shown in the Contingency program. It can be accessed at http://www.pf.uq.edu.au/ems.html

4.1 Complaints

Complaints can be registered on the incident form accessed on the EMS website as shown above. The complaint is then to be treated as an incident and investigated with corrective actions provided and implemented.

4.2 Responsibilities

The Environmental Engineer (EE) of the Property and Facilities Division oversees the requirements of the university's environmental responsibilities and will oversee implementation of the University's WEMP.

The Environmental Engineer:

- (1) Ensures that the plan is established and implemented;
- (2) Reports on its performance over time; and
- (3) Works with others to modify the plan as needed.

4.3 Enquiries

Any queries about the water management should be directed to;

Area	Contact Person	Contact Number
Overall Operations	Environmental Engineer	07 336 51587
Water Efficiency Management Plan	Project Officer Environmental	07 336 57580
Grounds Operations	Senior Supervisor Grounds	07 336 52747
Awareness & Training	Environmental Coordinator	07 3365 2076

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5.0 Water Consumption Audit

Water consumption has historically been taken from Brisbane City Council water bills on a quarterly basis.

In the future water consumption will be monitored monthly by Property and Facilities staff and the cooling tower make-up and bleed meters will be read weekly.

The following graphs show monthly & annual consumption at the University of Queensland Experimental Mine Site from 2004 to the predicted use in 2008.





There are no individual meters on the buildings at the Mine and a breakdown of consumption is therefore not available. Due to the low quantity of water used at the Mine site, it is not economically feasible to place meters on individual areas. An audit has been conducted at the Mine site and all fittings and fixtures are water efficient as required under level 6 water restrictions. There are meters on the inlet and the bleed lines of the cooling tower.

The Pilot Plant is run by the JKMRC and the responsibility for ensuring that their processes are water efficient lies with the JKMRC. Property and Facilities Division have limited finding available to part fund water efficiency projects which can demonstrate a reduction in consumption. Grants should also be sought from external companies and Government bodies to help fund water efficiency projects at the Mine.

Alternate Water Sources

Rain water tanks have been installed at the JKMRC Office Block and at the pilot plant.

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6. Monitoring, Measuring and Reporting

6.1 Monitoring

The University of Queensland has 15 buildings at the University Experimental Mine Site with water fixtures. All water meters are listed on a water meter reading sheet (PF427). The sheet is printed from the local network and manually filled out by Property and Facilities maintenance staff or contractors who read all meters on a monthly basis. The form is a controlled form managed under the Quality Management System.

6.2 Measuring

The collected data is then entered into a spreadsheet by the Environmental Project Officer. The spreadsheet has been designed to highlight entries outside a pre-determined consumption band and generate graphs for each meter.

6.3 Reporting

Any anomalies in the data are discussed with the plumbing supervisor and reported to the Works Control Centre as necessary and work orders are generated to ensure that any problems or failures are resolved. If the problem is ongoing it is reported to the Sub Utilities Management Committee (water) and if required to the Utilities Management Committee for further action.

The Sub Utilities Management Committee (water) meets every second month and discusses water consumption and the progress of actions in the water efficiency management plan and any other issues that might arise. Results of monitoring and measuring are reported to this committee.

The Sub Utilities Management Committee (water) reports to the Utilities Management Committee bi-monthly. Representation on the committees is from the Property and Facilities Division and Finance and Business Services Section. The Utilities Management Committee reports to the Environmental Management Committee quarterly.

An Environmental Report is generated annually which includes a report on activities of the Utilities Management Committees. For further information about the Environmental Management System and to view the report see www.pf.uq.edu.au/ems.html

6.4 Benchmarking

The University of Queensland is a member of the Tertiary Education Facilities Management Association (TEFMA). TEFMA conduct a benchmarking survey annually across all members which looks at all aspects of facilities management including water consumption. Key Performance Indicators such as kilolitres/Gross Floor Area/annum (kL/GFA) and kL/EFTSU (Equivalent Full Time Student Units) /annum are recorded and the results are sent out to members so that they can benchmark against each other.

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7. Description of Activities- Performance & Opportunity Assessment

The University Experimental Mine Site's current operations are described below. The aim of reviewing these activities is to determine potential impacts and ensure that management strategies and corresponding action plans are put in place to manage them. Where the activities listed are not under the direct control of Property and Facilities Division, WEMP's if required, will be the responsibility of the relevant School or Centre (see 1.1).

7.1 Buildings

Cooling Towers

There is one cooling tower at the Indooroopilly Experimental Mine Site. Cooling Towers are required to be operated under a Water Efficiency Management Plan and actions for reducing consumption are included in the Action Plan in this WEMP. The completed WEMP 2 as required by The Queensland Water Commission for Evaporative Cooling Systems can be found in Appendix 1.

Toilets, Urinals, Taps and Showers

Current water restrictions require that water from the reticulated (town) supply system is not permitted to be used for bathroom, laundry, ablution or kitchen fittings except where:

- in relation to the premises it can be demonstrated that the internal water fittings on the premises comply with the following water efficiency standards being:
 - o all the taps are water efficient taps;
 - o all the showerheads are water efficient showerheads;
 - o all the trigger sprays are water efficient trigger sprays; and
 - o all urinals are water efficient urinals.

The University has implemented an extensive retrofit program to replace all of the 11/9 litre cisterns with 6/3 litre cisterns which meet the requirements of current water restrictions. Urinals are also being retrofitted or replaced to reduce water consumption. Flow restrictors have been placed on all hand basins, and showerheads are being replaced with water efficient alternatives. Property and Facilities Division is responsible for maintaining toilets, urinals, taps and showers.

Stormwater Collection

Clean stormwater is collected from the office roofs area in a 30,000 Litre rain water tank. Overflow drains into Witton Creek. The rainwater is used for irrigation.

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7.2 The Mine

Mine Dewatering

The mine experiences large influxes of water during periods of heavy rain. A dewatering pump pumps mine water to the surface to dewater the mine during wet periods. The mine water is pumped to the storm water system, as the seepage water from the mine has been tested and been found to be comparable with the local groundwater quality. Plans are in place to use the mine water for wash down in the pilot plant reducing the need for the use of potable water.

Mining Laboratory (including CRC Drilling Facility)

Small quantities of rock waste such as Helidon sandstone, marble and granite are generated from laboratory activities. Piped water from town supply is used for dust suppression and clean-up, which is disposed of to trade waste.

The CRC drilling rig is housed inside the laboratory building to minimise noise. Its use is generally minimal.

The facility operates from 7am to approximately 7pm during the week and from 8am to 7pm on weekends.

7.3 Minerals Processing Area

Pilot Plant

The Pilot Plant consists of two buildings (buildings 638 and 639) and an external work area. They house a number of items of laboratory and pilot scale equipment such as rock crushers, grinding mills, flotation equipment and testing devices. Most of the equipment is housed within the buildings, is sound insulated and connected to a dust extraction/collection system. The dust extraction system is on the outside of the building and does generate some noise. This could potentially be a source of noise pollution on the site. The externally located 1 metre grinding mill employs wet grinding and accordingly dust extraction/collection systems are unnecessary. Minor quantities of flammable materials are kept in the workshops in a flammables storage cupboard.

Rock samples are received, processed and tested, and discarded when test work is completed. Overseas samples are that are brought in with a declaration or permit stating that they have had the necessary treatment before arriving. Rocks can be broken generally into four groups, general rock waste which goes into a skip and is collected by a waste contractor. Small quantities of rock waste which contain high concentrations of heavy metals are retained until sufficient quantity is collected for removal from site by a licensed waste contractor. Rock waste containing asbestos is usually sent back to the client. Fines generated and collected by the dust collection system are also sent to the appropriate landfill site. Radioactive waste is returned to its place of origin, under the terms of the site licence from Queensland Health.

The facility is run from 7am to approximately 7pm during the week and from 8am to 7pm on Saturday and Sunday.

Stormwater Collection from Pilot Plant Facility

Some of the stormwater that falls on building roofs is diverted into a 10,000L rain water tank, the overflow is piped directly to a reed bed filtration system, located on University land, which eventually drains into Witton Creek. The collected stormwater is used for irrigation.

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Stormwater that is collected from the external concrete pads is collected by the grated drainage system, or a spoon drain system. Water collected by the spoon drain system bypasses the settling tank and flows directly to the reed bed. The reed bed serves as a final settling pond and filtration zone by allowing solids to settle, and the overflow drains to the creek.

Process and Clean-up Water

The process and clean-up water generated from Pilot Plant 2 (Building 639) is collected for treatment. The solids are settled out in a trap, and the water is disposed of to trade waste as per the trade waste licence.

Water generated from Building 638 (Pilot Plant 1) and the external pad is collected, pumped to a settling tank, and the clear effluent disposed of to the storm water system. There however exists the potential for contaminated water (from fine suspended metalliferous rock particles) to enter the stormwater system. This will be addressed when the drainage system is upgraded.

Landscape Management

Fauna and flora management on site is directed by the current Landscape Management Plan (LMP) for the Indooroopilly mine. The site contains a high level of vegetation, especially in the northern extremities of the property. There is a major weed infestation on site which is both a potential fire hazard and a threat to remnant vegetation. The weed infestation is currently being brought under management through the LMP, and weed species will gradually be replaced by native revegetation plantings.

Potential fire risk on site is being mitigated by the establishment of fire retardant native vegetation plantings, the establishment of fire breaks, and the removal of dense weed infestation. The major native vegetation communities remaining on site are comprised of a large number of mature dry sclerophyll species and a diverse population of regenerating rainforest species.

The site is a key ecological corridor linking Witton Creek to the Brisbane River, and surrounding bushland parks, and is registered as a Land for Wildlife property. Fauna observations on site include Common Ringtail, Brushtail, and 'Bobuck' possums, Squirrel Gliders, Swamp Wallabies, Echidnas, Water Dragons and over 40 bird species.

Green waste generated by the revegetation is either removed via skip, or is trucked to the St. Lucia green waste facility.

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8. Legal Requirements

Environmental Aspects & Potential Impacts and Assessment

An impact assessment has been carried out on those activities listed in Section 7.0. The outcome is shown in Table 3.0 below.

Table 1.0	Environmental Aspects and	Potential Impacts and Assessn	ments
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Activity/Description	Aspects	Potential Impact	Assessment
Particular activity that could result in an on-site or off-site environmental impact	A listing of the elements of the site's activities which could have an adverse impact on the environment	Impacts refer to the potential change that could take place in the environment as a result of the aspects	The determination of any actual or likely environmental impact as identified from monitoring or complaints received by the site
Buildings	Cooling Towers	Potable water use- depletion of a natural resource	Opportunities for reducing consumption are to be investigated.
		Waste water	Can contain biocides, Legionella, high TDS. Discharged to sewer. Opportunities for treatment & reuse to be investigated.
	Taps, Basins, Showers Pans and Urinals	Potable water use- depletion of a natural resource	Water efficient pans, urinals, taps and showerheads are being installed.
	Pilot Plant		
	Workshop (Building 2)	Potable water used for processes. – depletion of a natural resource	Water efficiency of processes need to be investigated
		Process water used in Workshop can contain waste liquids and solids	Solids settle out in settling trap and disposed of to trade waste under licence
	Workshop (Building 1)	Process water used in Pilot Plant can contain metal fines	Water pumped to settling tank and clear effluent sent to stormwater system. Opportunity for metals to be sent to stormwater system
		Stormwater contamination (solids)	Solids settle out in run-off ditch & external collection pads before discharge to creek
	Cleaning activities	Potable water use	Contractors are required to submit a WEMP before starting any work. Contractor inductions include water efficiency. Alternate water should be used where available.
Stormwater	Solids settle out in run-	Stormwater	Solids settle out in run-off ditch
contamination (solids)	off ditch & external	contamination (solids)	& external collection pads

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	collection pads before discharge to creek		before discharge to creek
Infrastructure	Broken Pipes	Potable water use	Controlled through a preventative maintenance program.
Capture and Reuse of water	Rainwater/Stormwater use	Degradation of water quality	Where retention times are high water quality should be tested where there is a risk to human health or the environment.
Alternate Water Sources	Air Conditioning condensate, cooling tower bleed water	Risk to human health from bacteria in water	To be investigated

The table above lists the aspects specific to water consumption at the University of Queensland Experimental Mine Site. The Environmental Engineer records all aspects and impacts for the University of Queensland and keeps a register.

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9. WEMP Action Plan

The WEMP Action Plan is designed to address potential impacts identified in section 8.0.

Performance	To meet the water restriction req	uirements of the Queensland	Water Commission.
Objective (s)	To meet the requirements of the Environmental Management Sys	Water Management Program stem.	in the University's
	To meet the requirements of the	Environmental Protection (W	ater) Policy 1997.
	To meet the requirements of the	Plumbing and Drainage Act 2	2002.
	To meet the requirements of the	Water Act 2000.	
Management Strategy	The performance objectives abor strategies:	ve will be achieved by the foll	owing management
	Awareness		
	Distribute water awareness mate	rials and display signs in strat	egic areas in all buildings.
	Monitoring and Measurement		
	Install water meters where techn	ically and economically feasil	ple to do so.
	Reducing Water Usage		
	Use of improved technology who equipment	ere economically feasible to re	eplace less efficient
	Improve practices to r	educe water consumpt	cion.
Actions & responsibilities	Actions	Date to be completed	Savings Expected ML/%
	Undertake audits of buildings	February 2007- completed	
	Retrofit all bathrooms with water efficient fittings that comply with Queensland Water Commission requirements	June 2007- completed	0.91 ML/91.37%
	Distribute awareness materials to the mine for distribution throughout the buildings and workshops.	April 2007-completed	
	Monitor water consumption and provide feedback to Mine Management.	Quarterly from 2008	
	Undertake Cooling Tower audit and ensure that cooling tower is running as efficiently as possible according to <i>Best</i> <i>Practice Guidelines for</i> <i>Cooling Towers in</i> <i>Commercial Buildings</i>	completed	0.086ML 8.63%

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	Maintain and Clean cooling tower in accordance with manufacturer specifications, QWC Guidelines and relevant codes, standards and government regulations	As specified in workbooks and/or contracts but at least monthly.	
	Report on cooling tower performance, including leaks, cycles of concentration, consumption and other issues affecting water management to Ipswich Water	Quarterly	
	Landscape Management Plan for the Mine to be implemented	Dec 2007 and ongoing	
	Rehabilitation should be maintained as required to control erosion.	Ongoing as per landscape management plan	
	Monitor discharge water to ensure that trade waste licence conditions are being met and that no contaminated runoff enters Witton Creek.	Annually or as per licence conditions	
	Maintain site drains and reed bed as required to maintain water flow and quality entering Witton Creek.	Inspect prior to wet season	
	Take regular readings of cooling tower meters and site meter	Monthly	
КРІ	Maximum consumption 500L/n 0.996ML	n ² /annum Total Con	sumption Savings

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Appendix 1.0 Experimental Mine site WEMP 2 Evaporative Cooling Systems

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UNIVERSITY OF QUEENSLAND INDOOROOPILLY PART 2 WEMP GENERAL DATA (G)

Account Data	
Account Number	101024154000005
Water Service Provider	Brisbane Water
Name of Account Holder	The University of Queensland
Address of Site	14 Ormond Terrace Indooroopilly
Telephone	(07) 3365 5888
Date Account Opened	Unknown
Water Connection Size	50 mm
Organisation Data	en en la constant de
Site Description	University Experimental Mine Site
Organisation Description	Education and Research
Industry Sector Name	Education; Commercial Activity – Higher Education; ANZICC Code - 8431
Nominated WEMP Officer	Leigh Burgess
Summary of Water Using Activities	Evaporative Cooling Tower toilets, urinals, showers and taps
Current Water Source	
Reticulated Potable	Brisbane Water
Reticulated Raw	0%
Reticulated Recycled	0%
On-Site Recycling	0%
Bore	0%
Bulk Raw	0%
Other	Rainwater Tanks
Contact	
Organisation Contact	Mr
Last Name	Green
Given Name	Stuart
Job Title	Environmental Engineer
Department	Property and Facilities Division
Telephone Number	(07) 3365 1587
Fax Number	(07) 3365 1900
Water Efficiency Management Polic	y
Policy Number	NA

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WEMP PART 2 SUBMISSION (W)

Name	The University of Queensland
ABN/CAN	63 942 912 684
Contact Details	
Primary Contact	Mr Stuart Green
Position in Company	Environmental Engineer
Phone Number	(07) 3365 1587
Mobile Number	0411 235 932
Submission Details	
WSP	Ipswich City Council
WEA	David Slater (through Ashland)
WEMP Author	David Slater
WEA Signature	DanisCher
Authorisation	Alasdair McClintock
Authority's Signature	
Position	Director, Property and Facilities Division
Date	18-02-08

WEMP SUBMISSION CHECKLIST

Applicable	Form	WEMP Part	Savings (ML per year)
Yes	WEMP Part 1A	1A	completed
Yes	WEMP Part 1B	1B	completed
Yes	WEMP Part 2	2	0.086
No	WEMP Part 3	3	N/A
No	WEMP Part 4	4	completed
Total Savings	based on initial performance	e data)	0.086

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WEMP PART 2 SPECIFIC REQUIREMENTS: ACTION PLAN

Cooling Tower Action Plan

	Criteri	а	Yes	No	
Master	Type A	Туре В			
Meter	1		1		All cooling towers listed and named (one tower only)
Data	1		1		Cooling tower has a makeup meter (Meter No. 9507116)
			1		Cooling tower has a blood mater (Mater No. 07A022363)
	\checkmark		V .		County lower has a bleed meter (Meter No. 07A022303)
Actions R	Required:	None	- mee	ets all i	Initial performance report (data and averages provided) requirements make-up and bleed meter data logged since 2-11-
Actions R 2006 (mak	Required: ke-up me	None ter) and	✓ ✓ d sinc	ets all i e 23-1	Initial performance report (data and averages provided) requirements make-up and bleed meter data logged since 2-11- 2-2007 (bleed meter)
Actions R 2006 (mak Action Pla	Required: ke-up me	None ter) and	- mee d sinc	ets all r e 23-1: No	Initial performance report (data and averages provided) requirements make-up and bleed meter data logged since 2-11- 2-2007 (bleed meter)

Note The Cycles of Concentration (CoC) will be maintained by the cooling tower service technician by adjusting the bleed to allow optimum CoC based upon tower performance and without compromising the system insofar as the occurrence of excess scale/deposition in the system

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WEMP PART 2: EVAPORATIVE COOLING TOWER UQ INDOOROOPILLY SITE

CURRENT DATA: AVERAGE READINGS SINCE 2-11-2006

								Evanoration	and					
	Recirc.	Temp	Temp	Make-Up	Bleed	Hours of	Cycles	leakage		Total	Total Measured	Larget Cycles	#Water	% Water
ver	rate	E	Out	Conductivity	Conductivity	Operation	(CoC)	Theory Mea	asured	Bleed	Consumption	CoC Minimum	Conserved	Saved
	LIS	ပ္	ç	µS/cm	µS/cm	hrs/year	CoC	kL/year		kL/year	kL/year	CoC	ML/year	%
Stage	13	35	29.5	444	1456	4745	3.3	2,514.6 4-	40.3	219	659.3	5	0.086	13%

water conserved is estimated from actual usage data

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Appendix 2.0 WEMP Template for Contractors

WATER EFFICIENCY MANAGEMENT PLAN TEMPLATE

The University of Queensland is required to reduce water consumption at all sites. All contractors should use water responsibly and under the current water restriction guidelines.

Important Information regarding the use of this Water Efficiency Management Plan template

This template has been developed for contractors who plan to use the University of Queensland's water for work on any University sites, regardless of water type.

Please complete and forward a copy to the Property and Facilities Project Manager responsible for the work or project that the plan relates to.

If completing more than one job/project that will require the use of the University's water, please fill out a plan for each job/project.

The author of the plan is responsible for all actions within the plan.

The information within the plan is intended for internal use within the Property and Facilities Division of the University to ensure that water is used safely and efficiently.

Water Restrictions are currently being enforced throughout south east Queensland and contractors should be aware of their responsibilities under the current restrictions.

For further information on current water restrictions please refer to the Queensland Water Commission website @ <u>www.qwc.gov.au</u>

All breaches of the *Environmental Protection Act* or other relevant environmental legislation are required to be reported to the Environmental Engineer on 3365 1587 and an Environmental Incident Notification Form is required to be completed and forwarded to the Environmental Engineer, Property and Facilities Division.

Environmental Incident Notification Forms are available at <u>www.pf.uq.edu.au/ems.html</u>

Report leaks or other infrastructure problems to the Property and Facilities Works Control Centre at wcc@pf.uq.edu.au or telephone;

St Lucia	3365 2222	internal 52222
Gatton and Ipswich	546 01226	internal 50226

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Water EfficiencyProject_____Management PlanP&F Project
Manager____

This form is to be completed and signed by the contractor

1.0 Declaration

I declare that the information given in the Water Efficiency Management Plan is true & correct.

Name	
Position:	
Signature:	
Date:	

2.0 Business Information

Name of Business	
Contact Person	
Position	
Mobile	
Fax	
Email	
No. of Employees	

3.0 Baseline Information

Project Description_____

Project Start Date_____ Project Completion Date_____

Indicate the source/s of water you will be using

□ Mains	□ Treated wastewater	\Box Bore water
□ Stormwater	□ Rainwater tank	□ River/stream
□ Dam	Other	

Indicate the type of equipment or specific areas where water will be used, how it is used and known or estimated consumption per unit of production or per day.

Water Source (e.g. mains, rainwater)	How will the water be used? (e.g. high pressure unit with trigger hose)	L/unit of production or L/day

If known, indicate total expected water consumption for the	project	Litres
Will you be recycling water used in the project? If yes what %	□ Yes	□ No
Can the project be completed without the use of water? Comments	□ Yes	□ No
Please indicate if you require water to be tested for appropri	ate reuse. (This n	nay be the case if

Please indicate if you require water to be tested for appropriate reuse. (This may be the case if you are using water from rainwater tanks or from the lakes) \Box Yes \Box No

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