

## Irrigation Operating Procedure

### 1. Scope

This procedure is limited to the testing of soils where irrigation is applied and the use of irrigation water on The University of Queensland St Lucia campuses and sites, but does not include irrigation from the Gatton Sewerage Treatment Plant or Agricultural Irrigation Systems. These systems are operated through individual Environmental Management Plans. Water quality is managed under the Lakes Management Procedure.

More detailed information on the use of reclaimed water for irrigation is available in the Irrigation Management Plan.

### 2. Objectives

- To avoid risk to health and safety;
- To ensure that irrigation using reclaimed water is managed in a sustainable manner;
- To reduce the demand on natural fresh water resources.

### 3. Environmental Monitoring

Soil tests of the irrigated areas are conducted regularly. These results can be used with the water quality tests to identify conditions where soil structure may be adversely affected (eg. high salinity soil irrigated with high salinity water). Table 2 shows ideal values for soil analysis at the St Lucia campus as derived by Sportsturf Consultants (Aust) Pty Ltd, 2004.

**Table 2. Ideal values for use in soil analysis**

Parameter	Ideal Value
pH	6.0-7.0
Elec.Cond. (mS/cm)	<0.17
Total Salts (ppm)	<500
Phosphorous (ppm) Col.P.	40-60
<b>Cations (meq%)</b>	
Potassium	.05-.06
Calcium	>2.0
Magnesium	0.8-1.0
Ca/Mg Ratio	2-5
C.E.C. (meq %)	>5
<b>% of C.E.C</b>	
<b>Potassium</b>	>10%
Calcium	60-70%
Magnesium	20-23%
Sodium	<5%
<b>Trace Elements (ppm)</b>	
<b>Parameter</b>	<b>Ideal Value</b>
Sulphur	10-50
Zinc	<10
Copper	<10
<b>Parameter</b>	<b>Ideal Value</b>
Manganese	.01-4
Iron	<40
Boron	.3-1.0
Chloride	<100
Organic Carbon (%)	

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## **4. Irrigation Control Strategies**

### **4.1 Runoff Control**

- Ensure that a drainage system is in place such that any runoff can be drained;
- Erosion caused by irrigation runoff should be minimised; and
- Ensure such systems as rain monitors/gauges are in place, so that if a specified amount of rain has fallen, the irrigation system will not operate and the risk of surface runoff will be reduced.

### **4.2 Risk Management Control- Reclaimed Water**

There are potential hazards associated with the use of reclaimed water. These arise from the pathogens that may be present in raw sewage which are removed to varying degrees during treatment processes. A risk assessment of the potential hazards has been completed and the hazards are addressed in an Irrigation Management Plan which is available from Property and Facilities.

- Avoid airborne drift of reclaimed water spray into the areas surrounding the University campuses;
- Irrigation using reclaimed water shall occur during non-peak times (eg. night time) to avoid exposure to any persons;
- When using reclaimed water to irrigate sporting grounds there will be a time lapse of a minimum of two hours before it is used for any sporting activities so that the ground has time to dry (this time lapse will change between seasons);
- Signs and warnings should be posted at appropriate intervals around an irrigated area to notify members of the public not to drink the reclaimed irrigation water;
- A buffer distance should be kept between the irrigated area and the closest sensitive environment (waterways or buildings & footpaths). For more information see the Irrigation Management Plan;
- Irrigation water should cease to be used if an algal bloom is identified in the storage area until the algae are identified and the toxicity assessed. The water should only be used when advised by an appropriate person that it is safe to be irrigated.

### **4.3 Process Control for Reclaimed Water**

- All plumbing shall be installed and maintained in accordance with the *Standard Plumbing and Drainage Regulation 2003* under the Plumbing and Drainage Act 2002 and comply with the relevant standards;
- Ensure the irrigation system is completely closed and controlled such that no leakage of effluent occurs. If it does occur, it should be detectable via pressure drops or loss of flow;
- The irrigation network should be capable of being drained or completely flushed to allow for the disposal of effluent that does not comply with guidelines;
- When servicing equipment or working with the reclaimed water, necessary safety precautions must be taken such as washing before eating or drinking, and at the end of a work period; and
- Equipment such as sprinklers shall distribute effluent in a safe manner with respect to health and safety, i.e. spray shall always be in droplet form as aerosol form will drift with the wind and is more easily inhaled.

## **5. Monitoring & Reporting**

The Grounds Supervisor is responsible for ensuring that the soil quality is monitored. If soil quality tests highlight changes in the soil that are of concern to its sustained health, an assessment of the irrigation practice for the site should be undertaken and if necessary remedial action taken to return the soil to its original condition.

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## 6. Enquiries

Any enquiries with respect to irrigation management shall be addressed to personnel as follows:

**Table 3. Contact Personnel at The University of Queensland.**

<b>Campus</b>	<b>Department</b>	<b>Contact</b>	<b>Telephone</b>
St Lucia	Property and Facilities Division	Senior Supervisor Grounds	(07) 336 <u>52747</u>
Pinjarra Hills	Farm Manager		(07) 336 <u>55705</u>
Gatton	Property and Facilities Division	Gatton Supervisor Grounds	(07) 336 <u>50435</u>

## 7. Definitions

### 7.1 *Irrigation*

Irrigation is a process of supplying water to an area of land by utilising channels, pipes or sprinklers to replace soil moisture lost by evaporation, transpiration and seepage.

### 7.2 *Effluent*

Under the Guidelines for Sewerage Systems - Acceptance of Trade Waste, 1994, effluent is defined as “The water discharged from the wastewater treatment process. (eg. secondary effluent)”.

### 7.3 *Secondary Treated Effluent*

Secondary treated effluent is effluent which has undergone primary treatment (ie. solids are removed from effluent via sedimentation or equivalent physical means) and is then further treated by means of biological flocculation, pond stabilisation or some other equivalent process that will remove organic matter. In most cases, the effluent will then undergo chlorination to eliminate any harmful bacteria and pathogens. This is termed “disinfected secondary treated effluent”.

## 8. References

- Environmental Protection Act 1994
- Environmental Protection (Water) Policy 2009
- Plumbing and Drainage Act 2002
- ANZECC, ARMCANZ and NHMRC -2000 Guidelines for Sewerage Systems – Reclaimed Water
- Water Act 2000
- AS/NZS 3500.5:2000 National Plumbing and Drainage Standards
- AS1345 1995 Identification and Contents of Pipes, Conduits and Ducts
- AS2698.2 Plastic Pipes and Fittings for Irrigation and Rural Applications
- The State of Queensland EPA Water Recycling Guidelines 2005