

<b>Name:</b>	Greening our Future – Gisborne Junior Soccer Club
<b>Project Description:</b>	New and innovative Sub-surface Irrigation of sporting fields using recycled water
<b>Date of Report:</b>	14 June 2005

## 1. Background

*"Greening our Future"* – Gisborne Junior Soccer Club

The Gisborne Junior Soccer Club was formed and coincidentally begun its operations in the local community in a period in which the usage of water was at its most critical. The Macedon Ranges area amongst many others across the state was facing a significant number of issues caused through the extended abnormal dry weather periods and rapidly increasing population growth. Water levels across the Shire had reached the lowest levels on record and this was hardly an ideal time to be attempting to establish new sports playing field in the area.

In capturing all the issues being faced and reflecting on what needed to occur in order to provide a sustainable platform for future growth, some innovative solutions were going to be required to ensure that continued availability of water could be secured.

After much research and discussion it was determined that two elements in combination provided the best achievable outcome for the future, namely usage of recycled water being delivered via a sub surface irrigation system.

## 2. Description of Project

The project scope was to install a new and highly innovative sub surface irrigation system to deliver recycled water to a large multi-purpose sporting facility.

### System Details

The area of the project covers 10,070 square metres and contains 20,140 metres of 17mmx.5mm emitter spaced in-line drip tube where emissions rates are 1.75 lt/hr. The system application rate is 7mm/hour and the distribution uniformity is 99.9%.

The system is connected to an extension of the Western Water recycled water mains delivery pipeline.

### *Soil Moisture Sensor Monitoring & Automatic Control*

To take the guess work out of "when to water", a RainBird MS100 Soil Moisture Sensor was fitted in the field to detect over-watering and shut-down the system. Conversely, if there is insufficient moisture in the soil, an automatic controller runs a programmed schedule (ESP MC 4 program with 8 starts per program was fitted). This sensor can be altered/shut-off at the site if required.

The system has a 50mm Master electric solenoid 'RainBird' valve (which starts and shuts down all of the field electric solenoid valves at the end of a watering schedule) and 4x50mm field electric solenoid valves. The master valve has a RainBird PRS Dial pressure regulating module set at 400kPa and/or each Field 50mm accordance with field requirements.

Due to the technologically advanced nature of the system, all irrigation to the site is controlled by Greene Eden Watering Systems Pty Ltd at RainBird's Maxicom 2 central control and software at Greene Eden's office. However, under secure lock there is a RainBird MC Sat 24 station controller, a PT322 pulse transmitter and FS200 flow sensor and MS100 ground moisture sensor in the field. There is also a GSM mobile and modem package. All monitoring functions are transmitted to Greene Eden for logging/downloading etc. Programming by ET based on historical/actual evaporation figures is included.

### *Root Intrusion Protection Filter*

Being a sub-surface drip irrigation system, the in-line drip tube is protected by a secondary 50mm Netafim disc Techfilter with the discs infused with Trifluralin. This filter cartridge is to be changed-over every two (2) years; this is mandatory and ensures a long life for the system (30-40 years).

### *General Filtration*

A primary 120mesh/130 micron 80mm manual clean disc filter is included to ensure no impurities/sediment/etc passes through to the secondary Techfilter, electric solenoid valves and the in-line drip tube. STED's, reclaimed water self-cleaning screen filter with electric/hydraulic control is the primary filter. This filter requires minimal checks/maintenance.

### *Fertilizing*

The system incorporates a Mozzei ½" fertilizer injector included in the filter/backflow prevention device (RPZ) assembly for administering fertilizer through the ssdi system. The system includes pressure regulation on all field valves.



Photo's of works in progress.

### 3. Key Activities Completed

All activities have been completed:

- Site plan preparation and planning approvals [completed April-June 2004]
- Tapping/Augmentation of Western Water recycled water mains to site [completed September 2004]
- Installation of system to completion [completed October 2004]
- Fully commissioned system [completed March 2005]

### 4. Results Achieved

Visual signs of the system working are evident from the contrast between irrigated and non-irrigated areas (seen in photos below). Moving forward, the system requires only a simple maintenance schedule which is remotely controlled from South Australia with Greene Eden Watering Systems Pty Ltd and directions of any fertilising or flushing of the system coming back to the Shire of Macedon Ranges.



17 May 2005

This picture illustrates the area covered by the irrigation system, with the surrounding grasses all at various levels of die back due to the continued dry conditions, the sporting field continues to maintain its healthy cover.



12 June 2005

Despite the lack of rainfall continuing until mid June the state of the playing field remains in top condition and a visual green-ness.

Although Dixon Field was not previously irrigated, this solution and approach provided many benefits over typical irrigation systems. These include water consumption reduction by up to 40% in comparison with traditional overhead or pop-up sprinkler systems by eliminating evaporation, wind drift and over-spray. Previously installed sub-surface irrigation at Newton Sports Field (SA) has cut water consumption by 40 per cent, by eliminating the above ground issues – evaporation, wind drift and over spray, and of course expenditure through vandalism, normally experienced with above ground systems.

The delivery system also provides additional health and safety measures as Class C recycled water does not become airborne and can be used at any time, even while games are in progress.

The key result in respect to potable water savings is estimated, based on stage one alone, to be 2-3 megalitres per year and this figure will rise to 10-12 megalitres per year by the completion of stage 5 in 2007, representing a fantastic saving for the whole community.

### 5. Issues Arising

Installation processes were carried out within the allocated time frames. These works included the laying of the infrastructure into the ground, which caused minimal disruption to the field, once installed sporting groups could use the grounds again after a week.

Attempts to commission the drip system failed initially due to the inability of the water supply to maintain a constant pressure needed by the system to operation efficiently. As a connection point could not be supplied at the appropriate time, testing could not be carried out. Therefore, flows and pressures of 6 lt @ 500 kpa were used on which to base the initial design, provided by Western Water, our system design only needed maximum flows of 4 lt @ 400 kpa. Western Water was unable to supply a constant pressure due to demand of recycled water by other users during peak times. Western Water updated their pumping station and established a schedule for all users of recycled water, to provide a more reliable supply.

Following full commissioning of the project in March, the volumes of use for April were 7.5mm per week = 326,586 litres. Extra water was applied to raise moisture levels at the site to accommodate dry conditions and top dressing requirements. We would normally apply 6.6mm per week to accommodate grass requirements, only.

### 6. Conclusion

The installation of the sub surface watering system using recycled water has begun delivering the objectives and aims identified when the Smart Water submission was made back in December 2003.

This new and innovative sub surface water system at Dixon Field, utilises 'fit for use' class C recycled water and prevents around 40% of water use in comparison with traditional overhead or pop-up sprinkler systems.

After the initial project delays including commissioning of the system, the expected benefits are now being recognized.

- The ground is considerably greener than the rest of Dixon Field
- The playing surface is softer and less abrasive on the players, reducing injury to players.
- Annual refurbishment programs can be carried out such as top dressing, reseeding and fertilizing without having to upgrade the irrigation system.
- Class C recycled water is being utilised to reduce strain on our valuable potable resources.

We firmly believe that over the next 12 months the playing field will become one of the premier local surfaces available and provide numerous benefits over similar installations for many years to come.

This project will provide an enormous all year round benefit to the local community and has also been acknowledged by our many visiting teams as a facility to be admired and modeled by other sporting venues.

Refer to Testimonials appendix 1

Gisborne Junior Soccer Club Mission Statement

*"To provide support and promotion of Junior Soccer in the local community and plan for the future growth whilst providing a quality learning environment for young people. Promotion of community values and provision of a healthy and nurturing environment."*