waterwisewaysforWA

INITIAL WATER EFFICIENCY MANAGEMENT PLAN

Edith Cowan University - Joondalup Campus

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WATER CORPORATION ABN 28 003 434 917

AUSTRALIA ECU EDITH COWAN UNIVERSITY

RESERVED FOR INTERNAL DOCUMENT CONTROL *

Water Corporation Acknowledgement:
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- City West Water
- Sydney Water
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- Master Plumbers and Mechanical Services Association of Australia
- Australian Institute of Refrigeration Air Conditioning and Heating
- Plumbing Industry Commission of Victoria.
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Contents

Executive Summary

Edith Cowan University (ECU) is the second largest university in Perth, Western Australia, and caters for approximately 23,000 students. It operates two main campuses - at Joondalup and at Mt Lawley north of the CBD. A smaller campus at Churchlands will be closed by the end of Semester 1, 2008, and its courses consolidated at the Joondalup and Mt Lawley Campuses. A smaller campus operates at Bunbury, and courses to meet local needs are offered in several regional centres.

This Water Efficiency Management Plan (WEMP) has been prepared for ECU's Joondalup Campus. This campus consumes more than 20 ML of scheme water per year, and is therefore required by the Water Agencies (Water Use) By-laws 2007 to prepare this WEMP.

The objectives of the WEMP are to:

- Assess current water used on site from all sources (e.g. scheme, self-supplied groundwater, recycled, reclaimed etc);
- Identify inefficiencies and potential water conservation measures (including savings);
- Prepare an action plan to implement water conservation actions; and,
- Provide a platform for annual reporting on implementation of water conservation actions.

An assessment of ECU Joondalup Campus shows that annual scheme water use at the site since 2003 has varied marginally around an average figure of approximately 60 MLpa. In calendar year 2007, the site used 60.1 ML of water, which could be equated to 12.0 kilolitres per full-time equivalent student (kL/EFTSL). This has been chosen as the appropriate benchmark for water use on an annual basis.

There is some understanding of the patterns of water use on the campus, with monthly monitoring of the scheme water supply and sub-metering of several users. A more extensive metering program is proposed, to improve data across a full year.

An assessment of current practices on site revealed a wide range of water efficiency measures are already in place, particularly in new buildings. Staff will conduct a full audit of the campus to ensure that a consistent level of water efficiency is achieved over the next 12 to 18 months. This will then set a reasonable baseline for other water saving initiatives. Some work is already underway, for example the conversion to waterless urinals.

These more radical initiatives could include use of groundwater for secondary uses such as toilet flushing, and capturing greywater for reuse.

A Water Awareness program will be developed to encourage staff and student participation in water efficiency initiatives on the Joondalup Campus.

1 Introduction

1.1 Background

In recent years, as community demand for water has increased, the availability of this valuable natural resource has decreased. This makes it more important than ever to employ water conservation measures. As a result, new approaches to use water in smarter ways have been introduced, including water demand management.

As part of its focus on water demand management, the Government requires all business customer sites that use more than 20ML[1] of scheme water per year, to participate in the Water Corporation's Waterwise Business Program by 1 July 2009. This involves:

- Undertaking a Water Management Assessment annually with the Water Corporation
- Developing a Water Efficiency Management Plan (WEMP)
- Annual review of the WEMP and reporting progress against the water savings action plan

These are requirements under the *Water Agencies (Water Restrictions) By-laws 1998* and are mandatory. The matters to be addressed in a WEMP are prescribed in the *Water Agencies (Water Use) By-laws 2007*.

Scheme water use at the Joondalup Campus of Edith Cowan University exceeds the 20ML/y threshold. ECU has prepared this WEMP to meet its obligations under the by-laws.

ECU operates a second metropolitan campus at Mt Lawley. A WEMP has been developed concurrently at this campus, and both Plans have benefitted from the ability to compare and contrast the two operations.

The Water Corporation's primary focus is scheme water, however to make the WEMP more meaningful, we have also included information on the use of groundwater at the campus.

At an early stage of this investigation it became clear that there was insufficient data on water use on the large campus to develop realistic indicators and targets. Therefore, we have adopted the term **Initial WEMP**, to describe this document. Under this plan it is proposed that, over a period of 18 months, a number of generic water saving initiatives will be implemented, while additional water meters are used to monitor the site's water balance and usage pattern over at least one full academic year. This would then allow the development of targets and improvements on a factual basis.

[1] 1 ML (megalitre) is one million litres or one thousand cubic metres.

1.2 Objectives

The objectives of this WEMP for the ECU campus at Joondalup are to:

- Assess current water use on the site
- Identify inefficiencies and potential savings of scheme water
- Evaluate the business case for water saving options
- Prepare an action plan to implement viable water conservation measures
- Provide a process for annual reporting on implementation of water conservation actions
- Develop an environment and sustainability plan across the University, which will provide a consistent mechanism for identifying, evaluating and reporting on improvement programs, both mandatory and voluntary. [Note: In regard to this objective, ECU is currently developing an EMS which will drive several environmental improvement programs, one which is focused on Water.]

1.3 Methodology

The major steps involved in developing a WEMP are:

- Collection of information and water use data particularly in high use areas
- Assessment of baseline water use
- Development of a water balance
- Development of a water use indicators and targets
- Identification of opportunities for improvement
- Completion of an action plan
- Implementation and monitoring of actions.

To provide third-party input to the WEMP, and to ensure as far as practicable that the WEMP format is consistent with other ECU environmental and sustainability initiatives, ECU engaged scientific and technical consultants Alberfield Pty Ltd to prepare the Draft WEMP.

2 Institution Information and Site Details

2.1 General information

Edith Cowan University's origins go back to 1902 when it began as a teaching college. Today it is Western Australia's second largest university with approximately 23,000 students, including in excess of 3,000 overseas students originating from more than 80 countries. Edith Cowan University is located in Perth, Western Australia.

ECU is a contemporary university providing quality tertiary education with a strong focus on providing real life solutions to real life problems. ECU offers the flexibility and freedom to match student's individual talents and aspirations with a wide range of course options. ECU awards are recognised nationally and internationally.

At ECU we believe that research underpins human advancement and we are committed to undertaking high quality research which has strong social, economic, environmental and cultural impact. Our high quality research aligns with, and impacts on, our teaching and learning activities.

ECU has developed an Environment Policy which encompasses environmental sustainability and resource conservation. In this Policy, the University has adopted sustainability principles to guide our Environmental objectives, including:

"6.2 Resource conservation - the University will strive to conduct its operations in an environmentally sensitive manner, minimising waste and maximising efficiencies."

The Policy content includes:

"7.2 Resource Conservation
a) The University will strive to minimise consumption of water, energy, materials and other resources in all areas and maximise reuse and recycling."

In the specific area of water conservation, ECU has already completed a number of actions, which are described in this report. This WEMP has been approached on the positive basis that it provides an opportunity to review the effectiveness of past actions, and to identify and evaluate further options for water efficiencies.

2.2 Sites covered in WEMPs

2.2.1 Joondalup Campus

This Initial WEMP covers ECU's Joondalup Campus. The Campus is situated close to fast rail transport and Perth's major freeway. The purpose-built campus boasts state-of-the-art facilities including the Science and Health Building, a multi-million dollar recreation centre and an outdoor cinema during the summer months. On-campus residential accommodation is also available. The campus forms part of the Joondalup Learning Precinct (JLP), which includes West Coast TAFE and the Western Australia Police Academy.

Table 1 provides information about the activities and water use on the Joondalup Campus.

2.2.2 Mount Lawley Campus

A separate Initial WEMP has been prepared in parallel to cover ECU's Mount Lawley Campus. This second major campus is equipped with extensive teaching resources, first-rate study facilities, a new gym and sports centre and on-campus residential accommodation. It also forms part of a precinct with the Mount Lawley Senior High School and is home to one of Australia's most successful arts training institutions, the Western Australian Academy of Performing Arts (WAAPA).

There is cross-referencing between the Initial WEMPs for the two campuses, to facilitate achievement of consistent performance.

2.3 Campuses not covered in WEMP

Churchlands Campus
ECU's Churchlands Campus is being gradually redeveloped into Churchlands Green, a premium residential development. Over the remainder of 2008, availability of courses offered at Churchlands will decrease as programs move to Joondalup and Mount Lawley.

South West Campus (Bunbury)
Located two hours drive south of Perth and in Western Australia's second largest city, ECU's South West Campus (Bunbury) is the largest university outside the metropolitan area. The campus is part of an education precinct comprising of the South West Regional College of TAFE and the Bunbury Health Campus, which includes St John of God Hospital and South West Area Health Services. The campus has modern facilities, small class sizes, offers a comprehensive range of courses and has recently built on-campus residential accommodation. Water consumption does not reach the WEMP threshold, but it will be considered for inclusion in future programs as experience is gained with the process.

Table 1: Details for Joondalup Campus

Organisation name	**Edith Cowan University – Joondalup Campus**	
Billing account number(s)	9003689158	
Billing address	100 Joondalup Drive, Joondalup WA 6020	
Site address	Lot 504 Joondalup Drive, Joondalup	
Water Corporation Meter Size(s)	80mm #WHM0480022	
Organisation contacts	Facilities Manager Name: Frank Collins Position: Manager, Building & Services Phone: 6304 2901 Email: f.collins@ecu.edu.au	WEMP Contact Name: Melanie Barter Position: Co-ordinator Environmental Systems Phone: 6304 2232 Email: m.barter @ecu.edu.au
Industry Type	*84 Education*	
Site activity description	Tertiary education, including student residences	
Water use last financial year (kL)	Total – 60,100 Campus - 46,700 Student housing – 13,400	Other than Scheme 71,900
Wastewater volume last financial year (kL)	Sewer 40,267 (Discharge factor 67%[2])	Other than Sewer Unknown
List of major water using equipment	Equipment	Estimated % of water used Scheme / Other
	Cooling tower	5 / 0
	Taps, showers, toilets, urinals (434 major fixtures)	73 / 0
	Student Village	22 / 0
	Irrigation	0 / 100
	Total	100 / 100
Details of existing water conservation initiatives	Rapid response to notification of leaks. Sensor-activated urinal flushing and waterless urinals. Cooling via ring main from central chillers. Separate metering/billing for tenants and main users. Irrigation system supplied from bore. Irrigation control through Rainman system. Cooling Tower water recycling project	

[2] Note: This factor is lower than that for the Mt Lawley Campus (82%), presumably because the newer Joondalup sewers have a lower infiltration rate for rainfall and groundwater.

Centres and Regional Areas
Selected ECU programs are offered as a number of metropolitan and regional centres to meet local needs. Centres operate throughout Western Australia in the south at Margaret River, Albany and Katanning, north in Broome and in the mid-west region in Geraldton.

2.4 Water Management Team

The Water Management Team is dedicated to reducing water use on site. The team will develop ideas and implement practical solutions to minimise water use and maximise re-use. Our Water Management Team is listed in Table 2.

Table 2: Water Management Team Details

Name	Position
Frank Collins (Team Leader)	Manager, Buildings and Services
Ghaleb Jabado	Manager, Mechanical Services
Melanie Barter	Co-ordinator, Environmental Systems
Paul Wyatt	Manager, Electrical Services
Carl Overbye	Manager, Grounds

2.5 Water Management Assessment

Our business has participated in the Waterwise Business Program, by undertaking a "One-2-Five" Water Management Assessment. Table 3 shows results of the most recent session undertaken.

Table 3: Latest Water Management Assessment Details

Name of Water Management Assessment	One-2-Five
Date	5 December 2006
Participant Names	Frank Collins, Stuart Downs, Ray Heather, Mel Barter, Peter Vincent
Level Achieved	3 stars
Water Corporation Facilitator (or other)	Lee Pearson

The One-2-Five final document is attached to this report as Appendix A.

3 Water Use

3.1 Baseline Water Use

Baseline water use presented in Table 4 is the amount of Scheme Water that was used on the campus over several years. The periods listed are not regular half years, but relate to past reading dates. It is understood that readings henceforth will be in regular yearly quarters, and more closely match calendar years. This also will facilitate reconciling flows across campus, as detailed below. These data have been compiled for calendar years in Figure 1.

Table 4: Joondalup Baseline Scheme Water Use

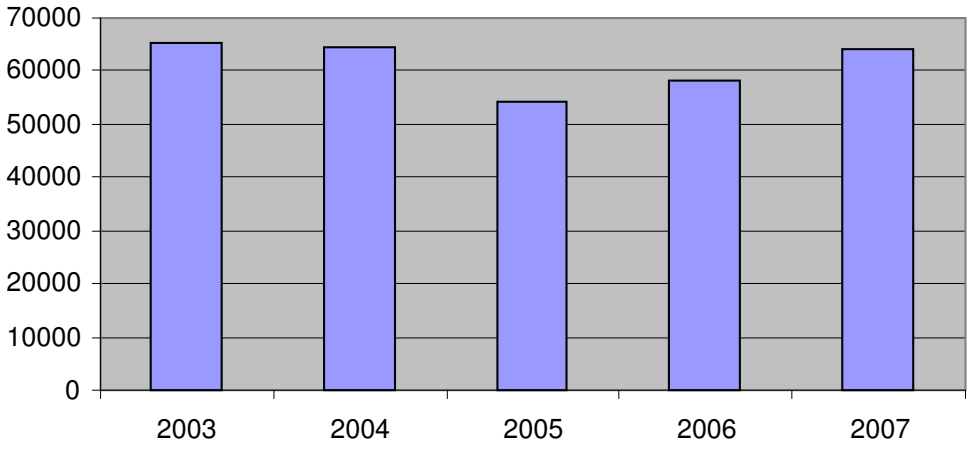
Period Ending[Note 1]	Water Use (kL)	Average Daily Water Use (kL/day)
19/03/08	16940	184
18/12/07	29426	128
03/05/07	34502	189
15/04/07	31742	192
01/11/06	25598	140
02/05/06	32799	191
11/11/05	25987	137
05/05/05	30475	167
03/11/04	24856	144
14/05/04	37362	188
28/10/03	34314	189

Note 1: Data from Water Corporation meter reading dates – not calendar ½ years

On the Campus, immediately downstream of the Water Corporation meter, there is a Magflow meter that continuously transmits a current which is proportional to the flow rate through the pipe. At present, this signal is sent to the Rainman irrigation control system, where the readings are recorded at ten-second intervals. The system can be used to provide graphs over various time periods. Examples are shown in Appendix B.

Currently, no use is made of this data. Some potential uses are discussed in Section 5 below.

Figure 1: Joondalup Campus Annual Consumption (kL)



3.2 Groundwater

Significant effort has been made on the Joondalup Campus to ensure that scheme water is not used for watering of the grounds.

The Rainman system (and its predecessor system the Hardie MM5000) is used for full computer control and monitoring of the water usage for grounds irrigation. The reason for using a sophisticated computer controlled and monitored irrigation system is to be able to efficiently manage the use of the groundwater resource available to us. These systems are easily adjustable to cater for the climate/seasonally influenced demands of landscape irrigation. The system is monitored centrally to ensure that water use targets are attained. The main reason to upgrade to the Rainman system was its far superior ability to monitor and report, and also its ability to be customisable to meet ECU requirements whatever the need.

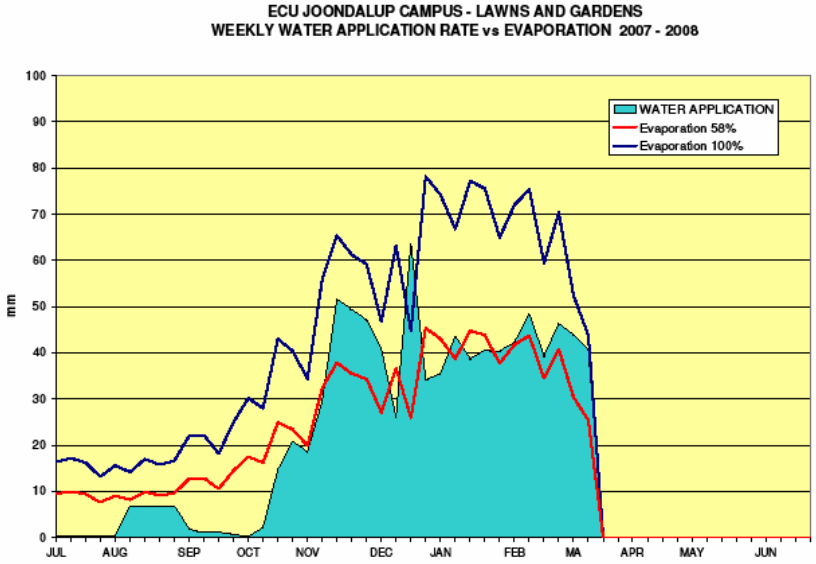
Water is applied to turf and gardens using best industry practice methods including: advanced irrigation design of pump selection, pipe sizing and sprinkler spacings; quality materials and sprinklers giving even distribution of water; and, water application rates adjusted according to weather conditions, turf/garden types, aspect, etc.

All groundwater extracted by bores is monitored by flow meters and also pressure monitored where used for direct irrigation purposes. Pumping systems drawing water from storage systems (lakes) also have flow and pressure monitoring. In the absence of on-site weather stations, figures from the Bureau of Meteorology are used to determine how efficiently the water is being used by relating volume of water used to evaporation and rainfall figures. The resultant graphical reports (such as Figure 2 below) confirm the

efficiency of water use. Flow and pressure demand are used to determine bore and irrigation pumps sizing through the use of pump curves and these bores/pumps are then operated with flow and pressure monitoring to ensure best efficiency in operation.

Annual flow testing of the bores and pumps assists in determining best operation of these facilities and appropriate use of the ground water.

Figure 2:



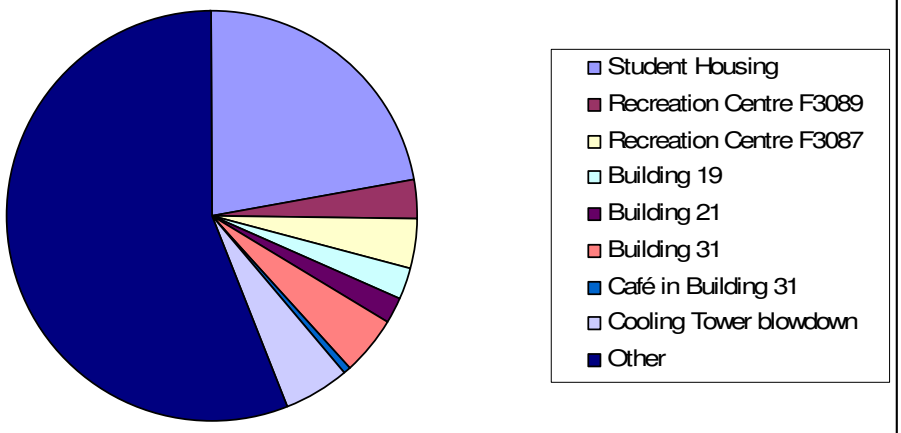
3.3 Water Balance

The previous section shows how much water was used at the Joondalup Campus over the previous 5 years. Several water meters have been installed around the Joondalup Campus to monitor uses at a number of buildings and/or tenanted facilities. This allows the University to reclaim water and sewerage costs from the tenants. Table 5 and Figure 2 show the percentage of water used in each metered area.

Table 5: Joondalup Campus Water Use Areas

Major Water Using Facility	Percentage of Total Water Use (%)
Student Housing	22.3
Recreation Centre F3089	2.9
Recreation Centre F3087	4.0
Building 19	2.6
Building 21	1.7
Building 31	4.7
Café in Building 31	0.6
Cooling Tower blowdown	5.0
Meter sum	38.7

Figure 2 Sub-metered flows



Water use shown above was determined from monthly readings of the relevant internal meters from a variety of dates. The main Water Corporation meter has only been read on the same monthly schedule since August 2007. Given the wide ranges in building occupation throughout the academic year, further monitoring is required to improve the accuracy of the data in this table and figure.

Separate metering accounts for only one-third of the total scheme water supply to the Joondalup Campus. The potential benefits and costs of further sub-metering are discussed below.

3.4 Water Use Outlook

It is an aim of the Water Corporation that a WEMP should be valid for five years, but this is somewhat in conflict with the 3-year University planning cycle. It is therefore proposed that this Initial WEMP be updated in line with the 3-year cycle, while acknowledging that some initiatives may be developed and implemented across two cycles (i.e. 6 years rather than 5 years) where the business case does not support implementation within a single cycle.

The main changes which could affect water use, and its management, on the Joondalup Campus are as follows:

- Passing ownership and management of student housing to a private company, which then also would be responsible for water and wastewater management;
- Construction of large hall for major functions[3] (e.g. Graduation ceremonies); and,
- Major ongoing effort to increase student numbers and number of courses.

As these changes come into effect, their impact on base water use will be accounted for in the annual review of the WEMP.

[3] Such major work represents a significant water and energy efficiency opportunity for ECU by getting the initial design of the building to have as low a water and energy profile as practicable, ideally natural ventilation only combined with passive heating and cooling elements (i.e. thermal mass). An example of modern practice is the new Law and Business Building on the Mt Lawley Campus.

4 Indicators and Targets

4.1 Benchmarking

The majority of scheme water consumption on the Joondalup Campus is related to domestic uses (e.g. toilets, handbasins, showers) and food preparation. There are specific uses in building cooling and heating, and for laboratory use (e.g. Building 19).

Given the basic purpose of the University as a centre for education and research, it is suggested that the most appropriate benchmark for water use on an annual basis is kilolitres per full-time equivalent student (**kL/EFTSL**). A number of provisos relate to this benchmark as follows:

- It assumes a relatively fixed relationship between student numbers and University staff levels[4].
- Changing the proportion of students in on-site accommodation will affect performance against the benchmark – given plans to place management of housing in private hands, it is recommended that student housing be deducted from water use benchmarking[5].
- This indicator should not be used for benchmarking over periods shorter than a semester or for individual buildings, because of highly variable occupancy rates.

Preliminary estimates of the benchmark for Joondalup Campus are presented in Tables 6.

Table 6: Benchmarking – Joondalup Scheme Water

Year	Water used (kL)	No. students (EFTSL[6,7])	Benchmark (kL/EFTSL)
2003	65349	3876	16.9
2004	64347	4679	13.8
2005	54333	5124	10.6
2006	58397	5274	11.1
2007	63928	5329	12.0

For comparison, the benchmark values for Mt Lawley are shown in Table 7.

Table 7: Benchmarking – Mt Lawley Scheme Water

[4] Examination of ECU-wide data for 2003-2007 shows an average ratio of 9.1 EFTSL/staff, range 8.6-9.4, suggesting that this assumption is valid.
[5] This can be done tentatively now for Joondalup in 2007 based on a few months' data; no data is available for Mt Lawley.
[6] http://www.ecu.edu.au/IRS/assets/reports_and_bulletins/2005%20Pocket.pdf
[7] http://www.ecu.edu.au/IRS/assets/reports_and_bulletins/2007_Pocket.pdf

Year	Water used (kL)	No. students (EFTSL[8,9])	Benchmark (kL/EFTSL)
2003	51141	7344	8.8
2004	40758	6404	6.4
2005	39996	5764	6.9
2006	48534	5274	9.2
2007	45343	4905	9.2

Based on the above provisos, a Benchmark Water Consumption Rate of 12 kLpa/EFTSL is suggested for Joondalup Campus. If the recommended separation of the consumption by the Student Village is actioned, the Benchmark should be 9.3 kLpa/EFTSL[10].

It should also be noted that ECU is also considering the use of an additional measure of litres per square metre of gross floor area (L/m^{2}GFA). This measure is expected to be more stable, once the building program is completed, and can be more directly related to consumption in individual buildings.

The Water Corporation may seek changes to the benchmark in future to allow comparison with similar institutions.

4.2 Water Conservation Target

Given the range of actions already implemented at Joondalup Campus, and the lack of detail on water use in individual buildings, it is considered inappropriate to set numerical targets for water conservation at this stage. It is recommended that targets be established at the end of the first year of the Action Plan (see Section 7). The target should be in terms of percentage improvement in the agreed Benchmark value, based on a realistic benefit-cost assessment of options.

[8] http://www.ecu.edu.au/IRS/assets/reports_and_bulletins/2005%20Pocket.pdf
[9] http://www.ecu.edu.au/IRS/assets/reports_and_bulletins/2007_Pocket.pdf
[10] This needs to be confirmed as appropriate by at least one full year of monitoring to determine the proportion of current total campus flow that is consumed in the Student Village.

5 Opportunities to Save Water

5.1 Information on Scheme Water Uses

It is difficult to assess opportunities for water savings without basic information on current water use.

Management at the Joondalup Campus has the advantages of a Magflow meter immediately downstream of the Water Corporation meter, and a number of meters throughout the campus for monitoring water use by tenants and some other buildings. However, these internal meters account for only one-third of the scheme water use. It is **recommended** that additional meters be installed on the supplies to other major buildings and facilities, to improve understanding of the proportions of total use across campus. This data can be linked to numbers of occupants and specific uses (such as laboratories) to indicate potential targets for efficiencies.

At present, the output from the Magflow meter goes to the Rainman irrigation control system, and results are not used systematically to monitor water use on campus. It is **recommended** that the Magflow meter output be directed to the Building Management System (BMS). Initially the results should be used provide a check against the monthly readings of Water Corporation Scheme Water inflows and the associated quarterly billing information. In addition, the individual (10-second interval) readings can provide an early indication of 'leaks' in the system if non-zero flows are recorded at times of zero occupancy. It is worth noting at this point that the meter at Joondalup has recorded zero flow at times (e.g. early morning 01/01/08), suggesting that there are no leaks in that system, provided that the meter and its interpreting processes are correctly calibrated.

At this stage, the widespread use of the more expensive Magflow meters is not recommended. Targetted use of such devices, starting with the highest users (on a per occupant basis), is **recommended** as the most efficient mechanism to identify problems such as leaks, and to provide immediate feedback on the effectiveness of actions to reduce use. A small portable sub-meter and data logger can be used to obtain preliminary building and large plant consumption profiles as a starting point. This data can then be used to build the business case for installation of permanent water sub-meters in identified high use areas.

As currently monitored, Student Housing is the largest consumer at 22% of total flow. While currently the transfer of water and wastewater costs is achieved internally, it is **recommended** that an independent metered supply from Lakeside Drive or Chancellor Pass be installed. This would heighten the direct responsibility of the new owner/managers of Student Housing for water efficiency. The current system could be maintained as an emergency supply.

The purpose of the above proposals is to develop an accurate overall monthly water balance for the site, with a link to the occupancy rate and purpose of each building. The early stages of this process will also provide information for a sound decision on realistic short-term and long-term scheme water use. As a general statement, to encourage a systematic approach, investigations of potential savings should focus firstly on high use areas.

5.2 Efficiency and Conservation

Within the context of current and proposed databases, there are a range of scheme water efficiency and conservation measures that can be implemented to a timetable linked to a realistic benefit-cost relationship.

These measures are primarily related to the major water use, which is domestic. The measures include:

- Maintenance: Appendix C contains a copy of part of the plumbing maintenance record for the Joondalup Campus. A number of the entries relate to the repair of leaking taps and cisterns. Engagement with the contractor(s) and on-site staff as part of the Awareness Program will ensure that this response time is maintained and improved. Improved staff and student awareness is expected to shorten the time for leak reporting.
- Auto-flushing of urinals: Building Services has advised that auto-flushing of urinals is activated by motion sensors. A once-off audit will confirm this; and any urinals which currently remain on timers will be upgraded. The program for converting to waterless urinals will continue.
- Toilets: There will be a once-off audit of toilets across both campuses, and a program instituted to replace any remaining single-flush cisterns with dual-flush units.
- Taps: Another aspect of the audit will be to assess which taps throughout the University could be converted to automatic shutoff, and a replacement program instituted. Where function requires manual shutoff, e.g. in kitchens, laboratories and art rooms, consideration will be given to pressure reduction while maintaining function. Staff and students in such areas will be a specific target in the Awareness Program.
- Showers: All showers, with the important exception of Emergency Showers, will be fitted with low-flow heads.
- Gardens: On the Joondalup Campus, only a small number of internal courtyards remain on scheme water. These areas are impractical to reach with bore water, but are low water demands, with features such as drip irrigation.

5.3 Water Re-use and Wastewater Management

Water re-use, improved wastewater management and a change to lower-grade water sources for particular purposes will be evaluated for their impact on scheme water use. A preliminary review identified the following opportunities:

- Demineralised water: The supply of demineralised water to the laboratories at Joondalup Campus is a low demand for scheme water, but has some operational difficulties with the salinity level in scheme water. The plant room housing these units also contains the drain lines for condensate from the air conditioning units. Staff will investigate the feasibility and cost of installing a sump to collect the condensate and pump it to a holding tank which will supply low salinity condensate to the reverse osmosis units. The study will also investigate whether other uses could be made of condensate, e.g. cooling towers.
- Groundwater uses: Lower quality water could be used for some purposes, such as flushing of toilets, which currently use scheme water. The feasibility of implementing such a dual supply will be investigated, but with an overall emphasis on maintaining health standards.
- Wastewater treatment and reuse: As indicated in Table 1, the discharge factor for sewage charges at Joondalup is 67% of scheme water supplies. The factor for the Mt Lawley Campus is 82%. Although it would have no effect on scheme water use, an overall water conservation measure could be to divert all or part of wastewater discharge to an on-site treatment plant, return solids to the sewer, and discharge the suitably treated water to groundwater. This could then be a source of irrigation water on the campus or elsewhere. The concept will be discussed initially with the Water Corporation, to determine whether there are fundamental constraints such as Bylaws or public opinion that make further investigation unwarranted. If there are no such barriers, a small working group will discuss with Water Corporation the design parameters, and costs and benefits, to understand whether further design is warranted.

5.4 Education and Awareness

Improved staff and student awareness can lead to significant reductions in water use. The University currently maintains a staff environmental awareness program (Green Office Program) which incorporates water conservation. See the Environmental Services website for more information.

Acceptance of this WEMP by the Water Corporation will be subject of articles in newsletters. Given the strong environmental awareness and performance sought by the University, these articles will encourage involvement of the University community in activities such as leak reporting. The working group will seek suggestions on water savings and water efficiencies in staff areas of responsibility, such as the above proposal on condensate reuse.

6 Action Plan

An action plan for implementation of the recommendations in Sections 4 and 5 has been developed for ECU Joondalup Campus (see Table 8). The first year of the plan is essentially about data collection to understand the pattern of scheme water use across the campus, and to ensure consistent implementation of basic water saving measures such as dual flush toilets. This information will be used to evaluate the technical feasibility and payback periods of other water saving measures, and to encourage participation and suggestions from staff and students.

The evaluation of the further measures will inform an update of the action plan.

Table 8: Initial WEMP Action Plan (18 month duration)

[Note: At this time it is not possible to complete the cells from Estimated Savings through to Cost/benefit. The information will be provided as the data on water flows become available.]

Item No	Action	Estimated Savings (kL/year)		Person respons.	Compl Date	Status (incl final savings)	Cost/benefit	
		Scheme	Other than Scheme				Cost	Payback Period
Short-term actions (up to 12 months)								
1	Install additional mechanical meters on the currently unmetered supplies to major buildings and facilities, to improve understanding of the proportions of total use across campus.							
2	Direct Magflow meter output, and the monthly reading from all volumetric meters, to the Joondalup Building Management System (BMS), and reconcile as monthly, quarterly and annual water balance.							
3	Purchase additional Magflow meter sized to the supply of individual buildings, and use for targeted identification of problems, and to provide immediate feedback on the effectiveness of actions to reduce use.							
4	Install a separate metered supply to Student Housing, independent of campus supply.							
5	Audit current level of water efficiency devices in toilets, showers and kitchen areas across campus, e.g. autoflush and waterless urinals, auto-shutoff taps, low-flow shower heads.							
6	Publicise initial WEMP and seek suggestions from staff and students.							
7	Resource Plan appropriately.							

EDITH COWAN UNIVERSITY – JOONDALUP CAMPUS

Item No	Action	Estimated Savings (kL/year)		Person respons.	Compl Date	Status (incl final savings)	Cost/benefit	
		Scheme	Other than Scheme				Cost	Payback Period
Long-term actions (greater than 12 months)								
8	Continue to develop and implement programs of bringing all toilets, showers and kitchen areas up to standard efficiency levels.							
9	Develop framework of longer-term Water Efficiency Management Plan, including groundwater use.							
10	Investigate use of air-conditioning condensate for production of demineralised water.							
11	Investigate opportunities to use groundwater to replace scheme water, e.g. for toilet flushing.							
12	Investigate methods for capturing greywater for reuse.							
Ongoing actions								
13	Awareness Program: (a) Engage with maintenance contractor(s) to ensure that response time to repair leaking taps and cisterns is maintained. (b) Improve staff and student awareness to shorten the time for leak reporting. (c) Use the existing Water Management Group which is driving the Environmental Improvement Program (Water) to seek and evaluate staff and student suggestions for water efficiency improvement, and provide feedback.							
14	Develop internal reporting system and report to Water Corporation each 6 months on progress on the Initial WEMP.							

7 Reporting

The progress on this Initial WEMP will be assessed and reported to the Water Corporation each six months. Particular emphasis will be placed on seeking and incorporating Water Corporation feedback on the longer-term WEMP.

This long-term WEMP will include annual feedback in the format required by the Water Corporation.

8 Management Commitment and Water Corporation Acceptance

Table 9: Commitment and Acceptance

Customer Commitment to Initial WEMP			
Edith Cowan University at Joondalup and Mt Lawley Campuses:			
a)	Will implement the water saving measures stated in the WEMP and ensure its employees and contractors assist in implementing these actions		
b)	Acknowledges that the Water Corporation may comment on the WEMP and/or request additional information relating to the WEMP		
c)	Acknowledges that the Water Corporation will monitor the WEMP		
d)	Will submit a biannual report, in accordance with Section 7, detailing progress made on the WEMP		
e)	Acknowledges that the WEMP will expire 18 months from the date of approval as shown below, unless in the opinion of the Water Corporation the water use on site changes significantly enough to warrant a new WEMP		
Name	Frank Collins		
Position	Manager, Buildings and Services		
Signature		Date	
Water Corporation Acceptance of Initial WEMP			
The Water Corporation has reviewed and accepted the WEMP. Through acceptance of this WEMP, the Water Corporation acknowledges that the business has complied with the requirement to submit a WEMP			
Name			
Position	Manager, Key Customer Relationships		
Signature		Date	
Document Number			

Appendix A – One-2-Five Report

Edith Cowan University – Joondalup, Churchlands, Mt Lawley
Water Management Report

Prepared for:	**Stuart Downes**
Customer Manager:	**Lee Pearson**
Facilitated by:	**Lee Pearson**
Diagnostic Review Completed:	**05 December 2006**
Next Recommended Review:	**05 December 2007**

1. Executive Summary

This report combines the output from a self-diagnostic of your management systems for water and the benchmarking of your results, against other organisations in your sector and all other One-2-Five Water users.

This report is designed to assist you to:

- Evaluate your current water practices and identify priority areas for improvement.
- Develop practical action plans to improve your management of water.
- Measure your progress and benchmark against other organisations.

This report contains the following sections:

1. **Executive Summary**

2. **Your Diagnostic Results**
   - Summary results of your self-diagnostic and explanation of critical elements

3. **Your Recommended Actions Report**
   - Objectives of Your Recommended Action Elements
   - Your Recommended Actions

4. **Your Benchmarking Report**
   - Benchmarking Summary
   - Overall Star Rating Benchmarking
     a. Your Sector
     b. All Sites
   - Element Benchmarking
     a. Your Sector
     b. All Sites

1. Executive Summary

The following report is a summary of your organisation's performance in effective water management. The outcomes are the results of your responses to the self-diagnostic session. The '5-Star' rating of your organisation's water management systems provides a benchmarking tool to gauge your performance against other sites within your own operations and other firms.

Your Rating on the One-2-Five® Star Rating Scale is: 3 Stars

5 Stars - Achieving best practice & continuous improvement
4 Stars - Water management integrated into everyday business systems
3 Stars - Formal water management systems established
2 Stars - Basic water management practiced
1 Star - Understanding of water and wastewater regulatory requirements

Water Management Cost Summary (Indicative Use and Charges for your business)

	Current Session	*Previous Session 1*	*Previous Session 2*	*Previous Session 3*	*Previous Session 4*
Session Number	WCP00015				
Session Date	05-Dec-06				
Diagnostic Type	Institutional				
Sector	Education				
Annual Potable Consumption (kL)	114,919				
Annual Bore Consumption (kL)					
Annual Neighbours Consumption (kL)					
Other Consumption (kL)					
Annual Water Usage Charges	$92,670				
Annual Water Service Charges	$32,572				
Annual Industrial Waste Charges	$1,032				
Annual Reclaimed Water Charges					
Annual Wastewater Usage Charges	$163,778				
Annual Wastewater Service Charges	$276,278				
Other Annual Charges (e.g. rates, interest)	$619				
TOTAL **ANNUAL** CHARGES	$566,949				
Production					
Production Units					
Overall Rating (**Stars**)	3				
% Achievement	47%				
% Required to reach next star level	19%				

Element	Level of Development					Critical Action Items
	1 Star	2 Star	3 Star	4 Star	5 Star	
1.1 Demonstrated corporate commitment		X				Critical
2.1 Understanding of performance and opportunities			X			
3.1 Targets, performance indicators (KPI's) and motivation		X				Critical
3.2 Plans			X			
4.1 Accountabilities			X			
4.2 Awareness and training		X				
4.3 Resourcing			X			
5.1 Criteria/Budgets for capital expenditure (CAPEX)				X		
5.2 Operating budgets				X		
6.1 Water supply, quality & reliability			X			
6.2 Compliance with legal and other requirements			X			Critical
7.1 Operating procedures			X			
7.2 Maintenance procedures				X		
8.1 Efficiency of existing plant design				X		
8.2 Innovation and new technology			X			
9.1 Metering and monitoring			X			
9.2 Reporting, feedback and control systems		X				Critical
9.3 Documentation and records		X				Critical
10.1 Water cost performance in the past 12 months			X			

Overall Ranking: 3 Stars **% Achievement: 47 %** **% Achievement to reach next level: 19 %**

Introduction to Recommended Actions Report

- Elements, which are highlighted as critical, have the highest priority at this stage of development in your water management activities. These elements need to be actioned first to enable other elements to progress. Selection of these critical elements is based on results from the self-diagnostic.

How to use the Recommended Actions Report

- Your five recommended actions are based on your diagnostic results.
- Progressing to the next level of development may require several activities and actions to be initiated.
- We suggest that these actions be used to develop an action plan, which includes clear activity statements and goals plus resource assignment and schedule for completion.
- You can complete actions and then reassess your progress using the diagnostic tool. Actions should be targeted for completion as soon as possible (preferably within 180 days).
- For each of your five recommended action this report includes:
  - The objectives of the recommended action element
  - Your specific recommended action(s)

Objectives of Your Recommended Action Elements

1.1 Demonstrated corporate commitment

Evaluates the extent to which senior management show that water management matters, and how effectively this attitude is communicated. A feature of every successful management program is commitment and leadership from top management. This means that senior management right to CEO and Board level demonstrate that water management matters in the organisation, communicate this effectively, and ensure that results are achieved. This section evaluates how effectively this has been achieved. Most organisations with successful programs have a written water policy that may be part of the environmental policy that incorporates clear objectives for improvement in water performance. The best policies reflect real action; the worst are statements of wishful thinking. This is why we focus on policies being linked to practical implementation plans and delivery.

9.2 Reporting, feedback and control systems

Once you can effectively measure water use and wastewater generation, the next step is to use the information for effective reporting and feedback systems, ensuring that the appropriate people act on variances. This element tests your systems, and ties in quite closely with accountabilities. In practice it seems that the best way to design effective reporting and feedback systems is to make sure accountabilities are correctly established and then get the operations people using the information to design their own reports. This is very different from the traditional engineering approach, which seeks to measure all the major variables and then tries to work out how to use all the trend information.

3.1 Targets, performance indicators (KPI) and motivation

Reviews progress in setting performance targets and key performance indicators (KPIs), and in establishing action plans to meet these targets. Targets provide a measurable focus. Initially many firms establish ‘stretch’ water performance targets. These demonstrate that a major step change in efficiency is expected. As the program develops, easy savings are taken up and more accurate information on savings potential becomes available. Effective firms implement systems which reward delivery of targeted performance in each water-intensive cost centre.

9.3 Documentation and records

Tracks your progress in having formal, up-to-date and accessible information on your water-using systems and management processes. While apparently a very mundane issue, this is a key area of neglect for many facilities. As a result, improvement programs are difficult to initiate, and when undertaken, the benefits are hard to measure.

6.2 Compliance with legal and other requirements

Evaluates the systems developed to manage compliance and other internal and external requirements such as policies, guidelines and Industry Codes of Practice. It also examines the level of understanding and management of trade waste and environmental compliance requirements. Organisations that manage compliance effectively develop formal procedures to react, review, assess and document compliance issues.

Your Recommended Actions	Responsibility	Date
1.1 Demonstrated corporate commitment • Include water efficiency on the agenda of facility management meetings and ensure reports are given on the progress in achieving goals.		
9.2 Reporting, feedback and control systems • Develop regular water efficiency reporting that highlights variances in water usage versus target at cost centre levels.		
3.1 Targets, performance indicators (KPI) and motivation • Develop water efficiency key performance indicators for all water intensive facilities. • Set water efficiency targets for facilities based on a savings assessment and/or benchmarking. (e.g. kL/production unit, kg load/production unit).		
9.3 Documentation and records • Compile an asset register of all major water users with a description of equipment, design capacity, water usage, wastewater generation and quality. • Maintain documentation for all implemented water projects including project objectives and results achieved.		
6.2 Compliance with legal and other requirements		
• Integrate water and wastewater management compliance issues in your risk management plans (e.g. quality, environmental, OH&S). • Provide formal training on legal requirements for Commercial Trade Waste Permit compliance.		

Overview

One-2-Five® Water Benchmarking allows you to compare your One-2-Five® results with other One-2-Five® users around Australia.

This will help you to:
- Find your competitive edge and identify key areas for development.
- Find out how well your group or site water program lines up with other organisations around Australia.

Using the One-2-Five® Water Benchmarking reports listed below, you can compare your site's performance with your industry sector and all One-2-Five® Water users.

The One-2-Five® Water Benchmarking reports are:
- Star Rating Analysis - Industry Sector
- Star Rating Analysis - All Users
- Element Benchmarking - Industry Sector
- Element Benchmarking - Country

Your Benchmarking Report

Your One-2-Five Water results have been benchmarked against the following One-2-Five Water users:
- 9 sites in your industry sector of Education
- 65 sites in your industry sector of Institutional
- 281 sites in your country - Australia
- 281 sites in total

Updates to your benchmarking reports can be accessed in real time at www.One-2-Five.com Your site number and password are required to access benchmarking reports.

Site Number WCP00015
Password 99E77154

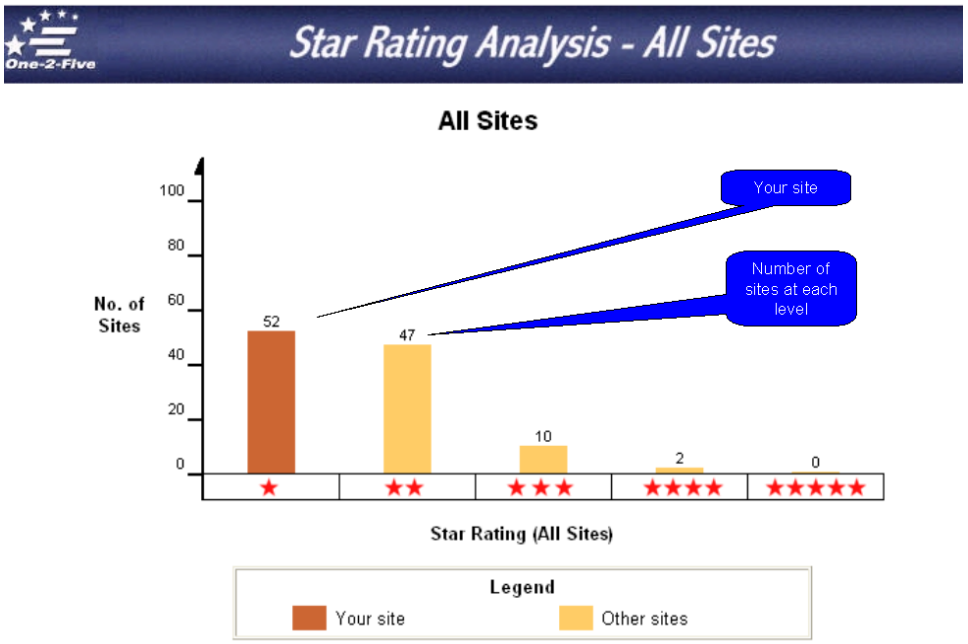
How to use the Benchmarking Report to:

- **Find Your Competitive Advantage** - Identify your results relative to average practice and best practice
- **Address Weaknesses** - Focus on any critical actions where you are below average
- **Promote Strengths** - Highlight elements where you are above average
- **Determine Market Position** - Compare your site results with other sites within your organisation

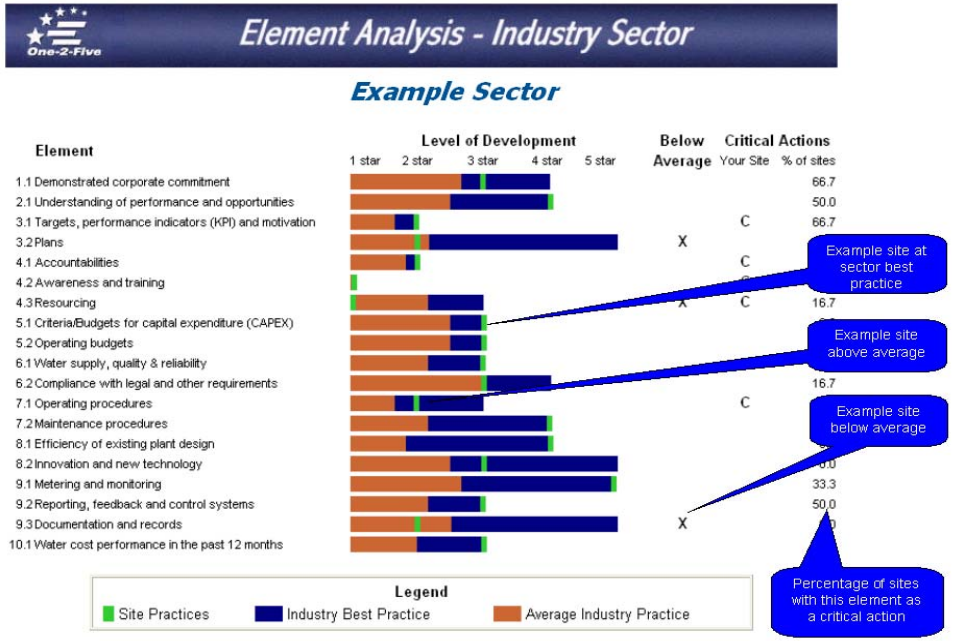
Example Reports

The following reports are of an example company. They highlight the key factors to focus on when reviewing the reports.

This site (1 Star) has significant opportunity to improve water management. This indicates high probability for cost savings.



Compared with other companies in this industry sector this company has weaknesses in planning, resourcing and documentation, but is generally stronger than average in all other elements. Overall this company is strong in leadership, innovation and metering, but lacks the planning and KPI development to achieve sustainable results.



Frequently Asked Questions

What do I need to do to get to the next Overall Star Level?

Your overall star rating and percentage achievement to reach the next overall star level are given on page four of this report. Raising 1 star level in an individual element (e.g. from 2 stars to 3 stars in element "3.2 Plans") roughly equates to an increase of 1 percent. Therefore to increase by 3 percent would require moving up 1 star level in 3 individual elements, or moving up 2 star levels in 1 element and 1 star level in another element.

How have my critical actions been determined?

- The key factors that influence your critical actions are:
- Your level of development (star rating) for each element (the lower development levels get a higher weighting) and
- The One-2-Five® prioritisation methodology embedded with the One-2-Five software. The prioritisation methodology directs businesses to actions that will be most effective in improving water management within their business. For example leadership and accountabilities have higher weighting than metering, as there is limited value in investing in sophisticated metering without the management commitment and accountabilities to improve efficiency.

Why, if I am 3 Star and at industry best practice for an element, is it still a critical action?

It could be your critical actions are the next actions your business should take to continue to improve its water management. They are based on your responses to the diagnostic and the proven prioritisation methodology embedded within One-2-Five®Water.

Best practice for an element simply indicates the best performing business in the element. It indicates that other businesses have not passed this level of development. Ultimate best practice is 5 stars for each element.

If I am below average, why is it not a critical action?

If you are below average and the element is not a critical action, it indicates that other actions are currently more critical and this element is not yet in the top 5 priority. In order to provide businesses with an achievable action plan, One-2-Five® selects the 5 highest priority critical actions. When you have completed the 5 actions identified in this report, the diagnostic can be repeated and the next 5 actions identified.

Star Rating Analysis - Industry Sector

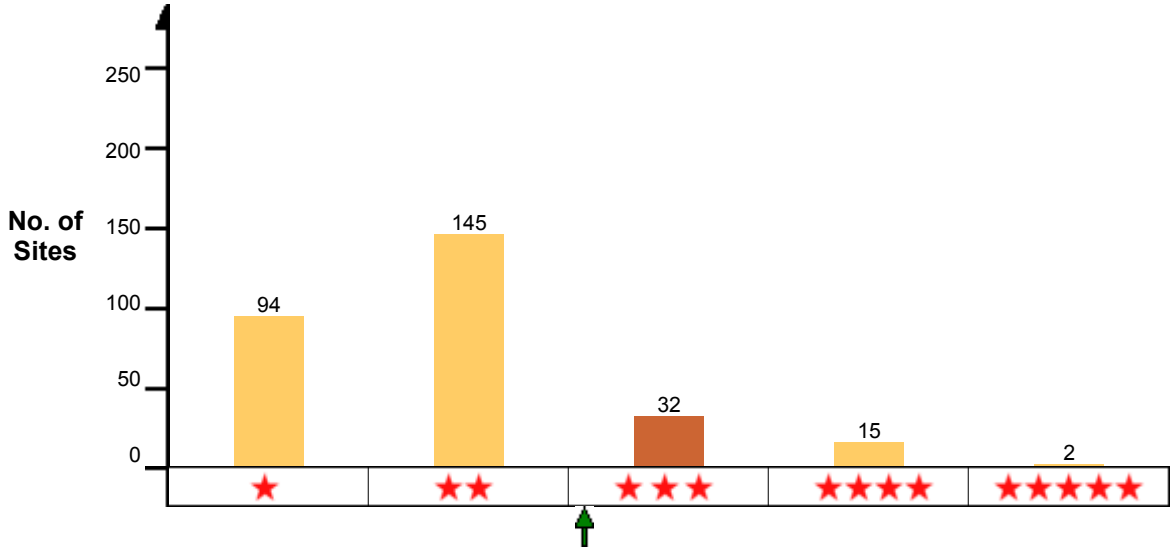
Education

Star Rating Analysis - Industry Sector

Institutional

Star Rating Analysis - All Sites

All Sites



Element Analysis - Industry Sector

Education

Element	Level of Development (1 star / 2 star / 3 star / 4 star / 5 star)	Below Average	Critical Actions: Your Site	Critical Actions: % of sites
1.1 Demonstrated corporate commitment			C	91.7
2.1 Understanding of performance and opportunities				75.0
3.1 Targets, performance indicators (KPI) and motivation			C	83.3
3.2 Plans				0.0
4.1 Accountabilities				8.3
4.2 Awareness and training				16.7
4.3 Resourcing				8.3
5.1 Criteria/Budgets for capital expenditure (CAPEX)				0.0
5.2 Operating budgets				0.0
6.1 Water supply, quality & reliability				33.3
6.2 Compliance with legal and other requirements			C	41.7
7.1 Operating procedures				0.0
7.2 Maintenance procedures				0.0
8.1 Efficiency of existing plant design				0.0
8.2 Innovation and new technology				0.0
9.1 Metering and monitoring				58.3
9.2 Reporting, feedback and control systems			C	66.7
9.3 Documentation and records			C	16.7
10.1 Water cost performance in the past 12 months				0.0

Legend

Site Practices | Industry Best Practice | Average Industry Practice

Element Analysis - Country

Australia

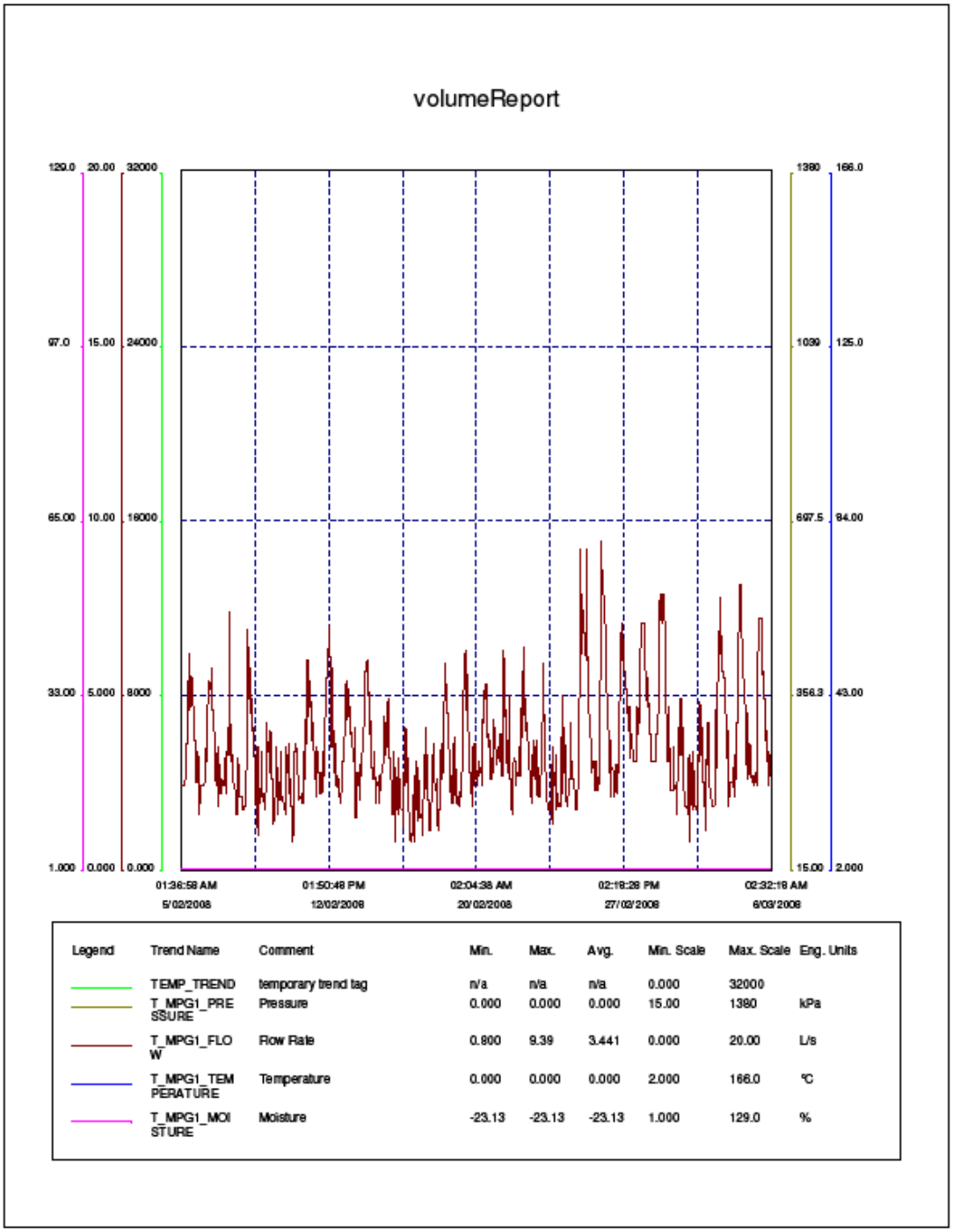
Element	Level of Development (1 star / 2 star / 3 star / 4 star / 5 star)	Below Average	Critical Actions: Your Site	Critical Actions: % of sites
1.1 Demonstrated corporate commitment		X	C	77.9
2.1 Understanding of performance and opportunities				76.5
3.1 Targets, performance indicators (KPI) and motivation			C	66.0
3.2 Plans				0.3
4.1 Accountabilities				19.0
4.2 Awareness and training				15.9
4.3 Resourcing				2.0
5.1 Criteria/Budgets for capital expenditure (CAPEX)				0.8
5.2 Operating budgets				4.5
6.1 Water supply, quality & reliability				47.0
6.2 Compliance with legal and other requirements			C	33.7
7.1 Operating procedures				26.9
7.2 Maintenance procedures				5.7
8.1 Efficiency of existing plant design				1.1
8.2 Innovation and new technology				1.1
9.1 Metering and monitoring				54.4
9.2 Reporting, feedback and control systems		X	C	58.1
9.3 Documentation and records		X	C	15.3
10.1 Water cost performance in the past 12 months				0.0

Legend

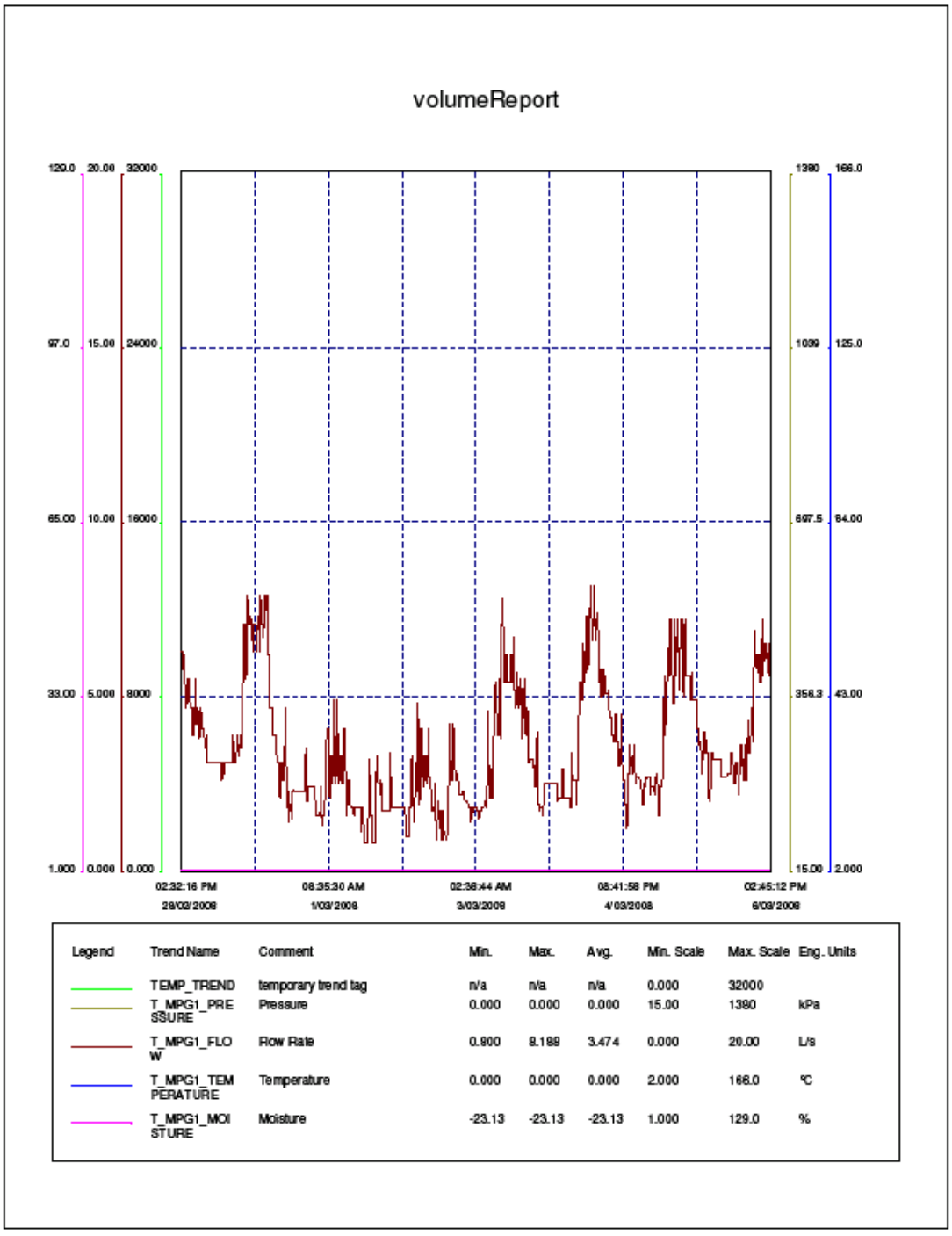
Site Practices | Country Best Practice | Average Country Practice

Appendix B – Graphs of Magflow Data

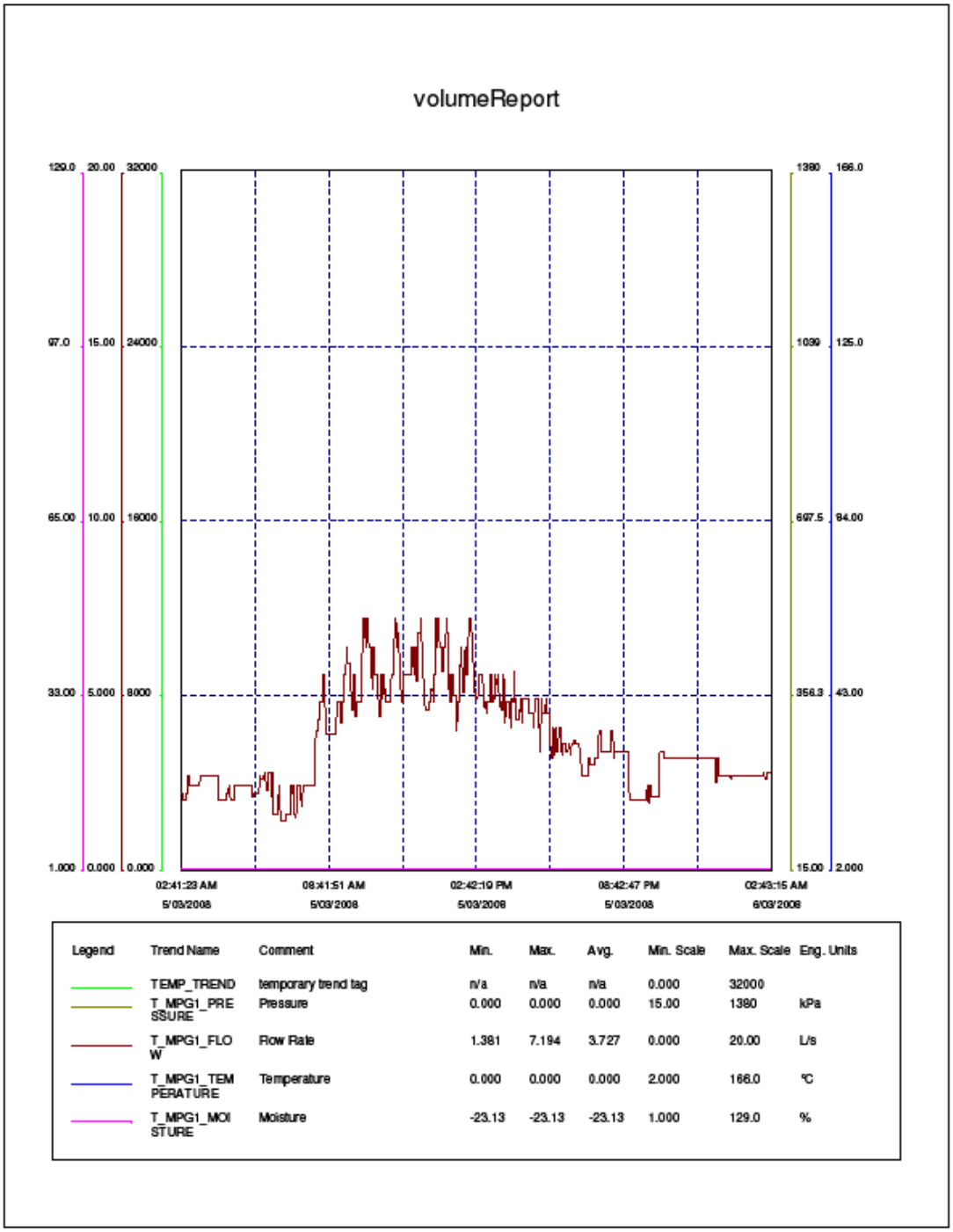
(Month, Week, Day)



Legend	Trend Name	Comment	Min.	Max.	Avg.	Min. Scale	Max. Scale	Eng. Units
	TEMP_TREND	temporary trend tag	n/a	n/a	n/a	0.000	32000	
	T_MPG1_PRESSURE	Pressure	0.000	0.000	0.000	15.00	1380	kPa
	T_MPG1_FLOW	Flow Rate	0.800	9.39	3.441	0.000	20.00	L/s
	T_MPG1_TEMPERATURE	Temperature	0.000	0.000	0.000	2.000	166.0	°C
	T_MPG1_MOISTURE	Moisture	-23.13	-23.13	-23.13	1.000	129.0	%



Legend	Trend Name	Comment	Min.	Max.	Avg.	Min. Scale	Max. Scale	Eng. Units
	TEMP_TREND	temporary trend tag	n/a	n/a	n/a	0.000	32000	
	T_MPG1_PRESSURE	Pressure	0.000	0.000	0.000	15.00	1380	kPa
	T_MPG1_FLOW	Flow Rate	0.800	8.188	3.474	0.000	20.00	L/s
	T_MPG1_TEMPERATURE	Temperature	0.000	0.000	0.000	2.000	166.0	°C
	T_MPG1_MOISTURE	Moisture	-23.13	-23.13	-23.13	1.000	129.0	%



Legend	Trend Name	Comment	Min.	Max.	Avg.	Min. Scale	Max. Scale	Eng. Units
	TEMP_TREND	temporary trend tag	n/a	n/a	n/a	0.000	32000	
	T_MPG1_PRESSURE	Pressure	0.000	0.000	0.000	15.00	1380	kPa
	T_MPG1_FLOW	Flow Rate	1.381	7.194	3.727	0.000	20.00	L/s
	T_MPG1_TEMPERATURE	Temperature	0.000	0.000	0.000	2.000	166.0	°C
	T_MPG1_MOISTURE	Moisture	-23.13	-23.13	-23.13	1.000	129.0	%

Appendix C – Example Plumbing Records for Joondalup Campus

Internal and External Plumbing Jobs for Joondalup for 2007

B0057664	STAFF ROOM MALE TOILETS TAPS ARE RUNNING	JO-B-008-SV-PL-PSF	12/01/2007 10:00	Completed
B0057712	C BLOCK LEVEL 4, TEA PREP AREA - BOILING BILLY TAP HAS NO INDICATION LIGHTS	JO-B-002-SV-PL-PSF	25/01/2007 16:09	Completed
B0057713	19.374 NO HOT WATER TO URN	JO-B-019-SV-PL-PSF	23/01/2007 11:12	Completed
B0057757	26.106 NO HOT WATER	JO-B-026-SV-PL-PSF	23/01/2007 11:05	Completed
B0057774	2.149 WATER FILTER ATTACHED TO SINK - NO COLD WATER AND FILTER DIRTY	JO-B-002-SV-PL-PSF	19/01/2007 10:08	Completed
B0057807	LEVEL 4 STAFFROOM - SAFETY SWITCH ON BOILING WATER NOT WORKING	JO-B-031-SV-PL-PSF	5/03/2007 10:14	Completed
B0057845	2.149 WATER FILTER ATTACHED TO SINK - WATER CONDITION REPORTED AS DIRTY	JO-B-002-SV-PL-PSF	23/01/2007 11:11	Completed
B0057882	19.241 SINK IS SPLIT AND IS LEAKING	JO-B-019-SV-PL-PSF	25/01/2007 15:59	Completed
B0057903	RELOCATE THREE TAPS	JO-B-001-SV-PL-PSF	25/01/2007 16:00	Completed
B0057904	BACKFLOW REPAIRS	JO-B-017-SV-PL-PSF	25/01/2007 15:58	Completed
B0057905	BACKFLOW REPAIRS	JO-B-004-SV-PL-PSF	25/01/2007 15:59	Completed
B0057978	LADIES CHANGEROOM - RETRIEVE LADIES EARRING FROM 'S' BEND UNDER SINK	JO-B-022-SV-PL-PSF	25/01/2007 16:33	Completed
B0057989	8A.214 LADIES TOILET - TOILET BOWL IN FIRST CUBICLE IS LOOSE - MOVES	JO-B-008A-SV-PL-PSF	25/01/2007 15:57	Completed
B0057992	1.206A MENS URINAL - WATER RUNNING AGAIN AND BUTTON LOOSE	JO-B-001-SV-PL-PSF	25/01/2007 15:56	Completed
B0058055	LEVEL 3 LADIES TOILET HOLE IN CEILING & WATER OR SEWERAGE COMING THROUGH	JO-B-002-SV-PL-PSF	25/01/2007 16:20	Completed
B0058056	8A.104 TAP LEAKING	JO-B-008A-SV-PL-PSF	2/02/2007 11:42	Completed
B0058084	LEVEL 3 - BACKFLOW PREVENTORS SPURTING WATER FLOODING LEVEL	JO-B-017-SV-PL-PSF	25/01/2007 15:44	Completed
B0058111	31.433 STAFFROOM - HOT WATER TAP LACKS PRESSURE AND HEAT	JO-B-031-SV-PL-PSF	2/02/2007 10:50	Completed
B0058142	LEVEL 1 MENS TOILETS - URINAL NOT FLUSHING	JO-B-031-SV-PL-PSF	2/02/2007 10:50	Completed
B0058151	2.123 LADIES TOILET BLOCKED	JO-B-002-SV-PL-PSF	25/01/2007 15:43	Completed
B0058152	6.101 LAST CUBICLE TOILET RUNNING	JO-B-006-SV-PL-PSF	25/01/2007 15:42	Completed
B0058186	KITCHEN NR 1.2107 MIXER TAP HAS COME ADRIFT	JO-B-001-SV-PL-PSF	2/02/2007 11:51	Completed
B0058229	2.150 PLANTROOM DRAIN FLOOR WASTE IS FLOODING PLANTROOM	JO-B-002-SV-PL-PSF	2/02/2007 14:07	Completed
B0058335	LEVEL 3 LADIES TOILET UNPLEASANT SMELL COULD BE DRAINS	JO-B-031-SV-PL-PSF	12/02/2007 16:56	Completed
B0058375	TURN WATER OFF TO ALL MENS URINALS IN THIS BUILDING	JO-B-031-SV-PL-PSF	8/02/2007 16:56	Completed
B0058376	TURN WATER OFF TO ALL URINALS IN THIS BUILDING	JO-B-001-SV-PL-PSF	8/02/2007 16:57	Completed
B0058377	TURN WATER OFF TO MENS URINALS IN THIS BUILDING	JO-B-002-SV-PL-PSF	8/02/2007 16:58	Completed
B0058381	STAFFROOM - HOT WATER ONLY TRICKLING OUT	JO-B-008-SV-PL-PSF	2/02/2007 13:54	Completed
B0058384	MEDICAL SUITE SMELL OF SEWERAGE	JO-B-006-SV-PL-PSF	8/02/2007 17:00	Completed
B0058387	2.150 PLANTROOM - INVESTIGATE FAILURE OF SUMP PUMP	JO-B-002-SV-PL-PSF	26/02/2007 12:11	Completed
B0058420	1.326 KITCHEN TAP LOW WATER PRESSURE (TAP FAULTY)	JO-B-001-SV-PL-PSF	9/02/2007 9:16	Completed
B0058438	GROUND FLOOR MENS URINAL IS BLOCKED	JO-B-030-SV-PL-PSF	9/02/2007 9:38	Completed
B0058558	LEVEL 2 CORRIDOR NR 19.205 WATER DRIPPING INTO CORRIDOR FROM CEILING	JO-B-019-SV-PL-PSF	9/02/2007 10:03	Completed
B0058598	17.320 ASSIST WITH INSTALLATION OF DISHWASHER	JO-B-017-SV-PL-PSF	12/02/2007 17:07	Completed
B0058648	17.103 LEAKING TAP	JO-B-017-SV-PL-PSF	12/02/2007 16:50	Completed

Internal and External Plumbing Jobs for Joondalup for 2007

B0058735	OPEN BLIND TAP IN LIBRARY COURTYARD FOR CONTRACTOR	JO-B-031-SV-PL-PSF	19/02/2007 11:34	Completed
B0058743	5.232 DRIPPING TAP IN MENS TOILETS	JO-B-005-SV-PL-PSF	19/02/2007 15:54	Completed
B0058744	CHILDCARE - TAP IN KINDY BATHROOM WONT TURN OFF.	JO-B-012-SV-PL-PSF	19/02/2007 11:36	Completed
B0058763	1.378 KITCHEN AREA - COLD WATER FROM CHILLI BILLI NOT COLD	JO-B-001-SV-PL-PSF	23/04/2007 15:39	Completed
B0058792	2.221 COLD FILTERED WATER NOT RUNNING COLD	JO-B-002-SV-PL-PSF	23/04/2007 15:37	Completed
B0058834	2.226 COLD FILTERED WATER HAS BROWN AND BLACK FLOATIES IN IT - PLSE CHECK FILTER	JO-B-002-SV-PL-PSF	19/02/2007 16:41	Completed
B0058891	31.212A LADIES TOILET NOT FLUSHING PROPERLY APPEARS BLOCKED	JO-B-031-SV-PL-PSF	1/03/2007 15:49	Completed
B0058909	8A.305 NO HOT WATER COMING FROM BOILER	JO-B-008A-SV-PL-PSF	1/03/2007 15:57	Completed
B0058923	1.322A TOILET RUNNING	JO-B-001-SV-PL-PSF	1/03/2007 15:58	Completed
B0058998	LEVEL 3 A BLOCK CHILLI BILLI HAS NO COLD WATER AND IS LEAKING	JO-B-001-SV-PL-PSF	1/10/2007 0:00	Completed
B0059046	8A.305 HOT WATER FROM BOILER HAS A BURNT SMELL AND TASTE	JO-B-008A-SV-PL-PSF	5/03/2007 11:04	Completed
B0059060	DRAINS NEED CLEANING ALL THE WAY ALONG SIDE FACING BLD 1	JO-B-002-SV-PL-PSF	15/03/2007 13:22	Completed
B0059079	19.373A CONDENSOR PIPE IN HYRAULIC ROOM IS NOT DRAINING ENOUGH WATER ON FLOOR	JO-B-019-SV-PL-PSF	2/03/2007 11:11	Completed
B0059096	22.101 WATER POOLING ON CARPET IN CRECHE	JO-B-022-SV-PL-PSF	2/03/2007 11:52	Completed
B0059214	31.304 COMMON ROOM - CHILLED WATER TAP NOT WORKING NO COLD WATER (HOT IS FINE)	JO-B-031-SV-PL-PSF	23/03/2007 15:47	Completed
B0059222	WATER LEAKING OUT FRONT OF BUILDING 17	JO-B-017-SV-PL-PSF	2/03/2007 16:23	Completed
B0059281	** REPRINT ** 31.320 LADIES TOILETS - 2 TOILETS BLOCKED	JO-B-031-SV-PL-PSF	5/03/2007 11:15	Completed
B0059304	26.114 DISABLED TOILET RUNNING	JO-B-026-SV-PL-PSF	5/03/2007 10:51	Completed
B0059355	31.115 FEMALE AND MALE TOILET NO HOT WATER	JO-B-031-SV-PL-PSF	23/03/2007 15:51	Completed
B0059359	1.377 LEAK UNDER KITCHEN SINK	JO-B-001-SV-PL-PSF	15/03/2007 13:15	Completed
B0059392	5.146 URINAL RUNNING	JO-B-005-SV-PL-PSF	15/03/2007 13:46	Completed
B0059393	9.220 MENS URINAL NOT WORKING	JO-B-009-SV-PL-PSF	15/03/2007 13:43	Completed
B0059445	5.232 MENS URINAL OVERFLOWING	JO-B-005-SV-PL-PSF	15/03/2007 13:42	Completed
B0059473	1.2100 KITCHEN - HOT WATER TASTES BAD	JO-B-001-SV-PL-PSF	15/03/2007 13:14	Completed
B0059485	2.118B ONE X LADIES TOILET BLOCKED	JO-B-002-SV-PL-PSF	15/03/2007 13:17	Completed
B0059486	2.120 MENS TOILETS 3 X BLOCKED	JO-B-002-SV-PL-PSF	15/03/2007 13:18	Completed
B0059527	4.114 URINAL RUNNING	JO-B-004-SV-PL-PSF	7/03/2007 11:56	Completed
B0059531	4.212 DRIPPING TAP	JO-B-004-SV-PL-PSF	15/03/2007 13:17	Completed
B0059538	LEVEL 3 LOUD HUMMING SOUND THROUGH BUILDING MAY BE PLUMBING	JO-B-017-SV-PL-PSF	15/03/2007 13:15	Completed
B0059554	BLD19 LACK OF WATER PRESSURE	JO-B-019-SV-PL-PSF	15/03/2007 13:56	Completed
B0059602	6.205 BLOCKED SINK (BACK OF STUDENT CENTRAL)	JO-B-006-SV-PL-PSF	15/03/2007 14:08	Completed
B0059665	31.304 NO COLD WATER IN STUDENT COMMON ROOM	JO-B-031-SV-PL-PSF	22/03/2007 13:30	Completed
B0059695	BAD SMELL EMINATING FROM TOILET AREA	JO-B-007-SV-PL-PSF	20/03/2007 14:48	Completed