



waterMAP handbook



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Minister's Foreword



Victorian industrial and non-residential water users are making a significant contribution towards the reduction of water consumption across the state.

In Melbourne alone, this group is currently using around 38 per cent less water on a per capita basis than 1990s averages through more efficient use of our most precious resource.

Despite this, the unprecedented drought, the challenges of climate change and a rapidly growing population mean that we all need to do more.

Under the waterMAP program, all industrial and non-residential customers, using more than 10 megalitres of potable water per year, must develop a plan to use water more efficiently.

The waterMAP program commenced in 2007 and now covers 1,850 customers throughout Victoria, 1,250 based in the Melbourne area.

As well as contributing to Victoria's water savings, customers who are eligible for the waterMAP program can experience reduced costs due to lower water and energy use, and a better understanding of their business inputs.

The continued success of this program requires the commitment and support of businesses, water corporations and the Government.

We thank you for what has been achieved so far and I look forward to working with the business community and water corporations in delivering this very important program into the future.

A handwritten signature in blue ink, appearing to be 'John' followed by a flourish.

Table of Contents

Section 1: Introduction	1
Your water conservation obligations	2
The waterMAP program	2
Targets	2
Who needs to complete a waterMAP?	2
Penalties for non-compliance	3
Exemptions	3
Meeting EREP requirements	3
Benefits of the program	3
Confidentiality	3
About this handbook	4
How water corporations can help you meet your obligations	4
Specialist assistance	4
Funding assistance	4
Signage	4
Section 2: Developing and implementing your waterMAP	5
Step 1: Registering your intent to prepare a waterMAP	6
Step 2: Planning and preparation	7
Step 3: Understanding water use	12
Step 4: Considering other areas	16
Step 5: Develop your overall targets	17
Step 6: Identify potential improvements	17
Step 7: Assess opportunities for improvement	18
Step 8: Set more specific objectives	19
Step 9: Complete your waterMAP	19
Step 10: Lodge your waterMAP	21
Step 11: Implement your waterMAP	21
Step 12: Monitor your water use	21
Step 13: Report against your waterMAP	22
Checklist	23
Section 3: Mandatory waterMAP templates	24
Section 4: Contacts	30
Glossary	31

Acknowledgements

This handbook draws together the best available published water efficiency information relevant to commercial and institutional businesses. This handbook is based on material developed by City West Water.

Introduction

1

- Your water conservation obligations
- The waterMAP program
- Targets
- Who needs to complete a waterMAP?
- Penalties for non-compliance
- Exemptions
- Meeting EREP requirements
- Benefits of the program
- Confidentiality
- About this handbook
- How water corporations can help you meet your obligations
- Specialist assistance
- Funding assistance
- Signage

Your water conservation obligations

Victoria's water supplies remain under pressure. Drought and the uncertainty surrounding climate change, as well as population growth, increase the demand on Victoria's water storages.

To ensure a secure and reliable water supply for Victoria, the *Our Water Our Future* initiative incorporates a holistic approach to urban water management, including targets to reduce drinking water consumption.

To meet these water conservation targets, the Victorian Government requires major commercial, industrial and institutional customers that consume 10 ML a year or more of water from an urban water supply to:

1. Register their intent to develop a water Management Action Plan (waterMAP)
2. Develop and submit a waterMAP
3. Annually report to their local water corporation on the implementation of their waterMAP and water savings; and
4. Review their waterMAP at the request of their water corporation.

These tasks are conditions outlined in Victoria's water corporation's Permanent Water Saving Plans (PWSP) created under the Water Act 1989 and Water Industry Act 1993 and are therefore mandatory.

In addition, businesses are encouraged to display signage promoting water conservation near all water fixtures.

This handbook outlines what you need to do to implement these obligations.

The waterMAP program

The waterMAP program seeks to improve the water efficiency of major water-using commercial, industrial and institutional customers.

The waterMAP program has three features for non-residential water customers:

1. A process guide for collecting information to be used in the development of a waterMAP (Steps 1-9 of this handbook). This does not need to be submitted to your water corporation but it may be asked for as part of the process of reviewing the adequacy of your waterMAP.
2. A requirement to submit and annually review a waterMAP with your local water corporation. (Template 2-7 attached at the back of this handbook)
3. Encouragement for businesses to display water conservation signage near water using fixtures.

This handbook includes a process guide, assisting businesses to develop a program to:

- Assess their current water use
- Identify inefficiencies and potential water savings
- Prepare an action plan to implement water conservation actions
- Annually review and report implementation of water conservation actions.

The waterMAP guide also includes templates to assist businesses to register, submit their waterMAP and annually report to their local water corporation, as well as contact information to obtain water conservation signage to display near water using fixtures.

The waterMAP program builds on the highly successful 'Pathways to Sustainability' program which focussed on reducing water use by the top 200 water users in Melbourne through the development and implementation of water management action plans. This program has saved 6.2 billion litres of water a year since 2001/02.

Targets

In developing a waterMAP it is recommended that businesses seek to achieve at least 10 per cent reduction in water use. Whilst this is not a mandatory requirement, current non-residential water saving programs have identified this as a benchmark water savings level to be used as an aspirational target. In some instances, a 10 per cent reduction may not be achievable due to existing water savings programs however other businesses may have the capacity to exceed this target.

Who needs to complete a waterMAP?

Non-residential customers that use 10 ML a year or more at any one site of potable (drinking quality) water from an urban supply are required to prepare a waterMAP.

Businesses that are preparing voluntary waterMAPs are encouraged to use this handbook as a guide to help them identify water efficiencies, develop a water management action plan and implement projects.

An urban water supply is water provided by a Victorian urban water corporation, excluding recycled water and bulk water entitlement holders. However, at the customer's and water corporation's discretion, waterMAPs could focus on increasing the efficiency of excluded water sources as well as water from the urban water system.

A non-residential customer site is any site other than a domestic residence and includes businesses, local council sites, hospitals, schools, primary industries using urban supplies, community groups and commercially operated residential-style properties classified as non-residential under the Victorian Planning Provisions.

waterMAPs are site specific and water savings need to be targeted at each site.

waterMAPs affect existing and new customers:

- Existing non-residential customers currently using 10 ML a year or more and existing non-residential customers that the local water corporation estimate are likely to use 10 ML a year or more in the future, must not continue to use water unless they:
 - > register their intent to develop a waterMAP within a month of being notified by their water corporation
 - > submit a plan within a further three months of the registration period
 - > submit a review of implementation actions annually
- New non-residential customers that the local water corporation estimate will use 10 ML a year or more, will be required to complete a waterMAP before connection to the water supply
- All such non-residential customers will be required to submit an annual report on their implementation of the plan. The water corporation can direct a customer to improve their waterMAP if necessary.

Penalties for non-compliance

The Permanent Water Savings Plans (PWSP) created under Water Act 1989 and Water Industry Act 1993 attract financial penalties and/or restriction of water supply to customers that do not meet the requirements of PWSP.

In addition, the Water Act and Water Industry Act require water corporations to provide to the Minister for Water a list of organisations that use high volumes of water and details of their participation in any water conservation program.

Exemptions

No customer site will be exempt from the waterMAP process, however plans developed under the Victorian Government's 'Pathways to Sustainability' program may be accepted as a waterMAP if they meet the criteria in this handbook.

The following programs may also be accepted as a waterMAP, providing they meet the criteria in this handbook and address all sites using 10 ML a year or more:

- Sustainable Water Use Plans for local government
- Trade waste programs.

Meeting EREP requirements

Commencing in 2008, Victoria's largest industrial and commercial consumers (ie. in the order of the largest 250 consumers in the state) of energy and water will be required to prepare an Energy Resource Efficiency Plan (EREP) under the Environment Protection (Amendment) Act 2006. The EREP program will be administered by EPA Victoria and may apply to major non-residential customers who are also subject to prepare a waterMAP.

The proposed thresholds are that major non-residential customers consuming 120ML or more of water (whether supplied by an urban water corporation or by other legal agreement such as a bulk entitlement or ground water licence) or consuming 200TJ or more of energy at a site will trigger a requirement for an EREP.

EREP is a regulatory program designed to assist significant consumers of energy and water to identify financially viable opportunities to improve energy, water and waste efficiency within their business. While a waterMAP seeks to improve water efficiency by integrating energy, water and waste, an EREP seeks to improve overall resource efficiency. Draft guidelines on the EREP program will be available from EPA Victoria in August/September 2007.

EREP will not be required to be submitted to the EPA until December 2008, given Victoria's water storages are still under pressure there is a need for major water users to manage their water usage earlier than the EREP requirements.

Major customers that have a waterMAP for a site that may trigger an EREP would still be required to register with EPA Victoria.

Work undertaken towards a waterMAP may also be recognised under the WATER element of the EREP program. In order to achieve this, the customer and the water authority will work with the EPA to transition the customer's work from a water focused waterMAP to an integrated EREP.

If you think the site you operate will trigger an EREP, contact your local water corporation or EPA.

Further information on the EREP program can be found at www.epa.vic.gov.au

Benefits of the program

Developing a waterMAP can bring many benefits, including:

- Reduced water consumption costs
- Reduced sewer discharge costs
- Reduced energy costs and greenhouse emissions
- Enhanced company profile and reputation as a result of your improved environmental performance
- Potential funding assistance to investigate and implement water efficiency measures
- A better understanding of water use within your business
- Behavioural change of staff and other water users that leads to further water conservation.
- Helping to ensure that water is available for future generations.

Confidentiality

Water corporations appreciate that the information collected in this handbook and documented in your waterMAP may contain sensitive business or operating data. Water corporations will treat all information that is shared with them in a confidential manner.

About this handbook

This handbook guides you through developing your waterMAP.

The information in this handbook is based on lessons from past programs to increase the water efficiency of large water users, feedback from customers, various referenced sources and advice from licensed plumbers, consultants and industry experts.

The handbook guides you to develop, implement and review your waterMAP. It provides tables to assist with the process of developing your waterMAP and templates that you should complete and submit to your local water corporation for approval.

It is recognised that given the diversity in the size and nature of non-residential customers, there may be instances where a question may not be applicable, or the response needs to be tailored to reflect the nature of the business.

For instance, small and medium enterprises may not have a lot of documented policies or large organisation structures and they will complete the initial tables more quickly. However, they should still consider their business behaviour and who holds responsibility for water use within the business.

In small businesses, practices may reflect policies not formally documented. In relation to water use, this is an opportunity to review those practices and reflect on whether they are best practice.

Large, complex water users may find the material needs modification to better reflect the nature and analysis of water use.

How water corporations can help you meet your obligations

The obligation to produce an acceptable waterMAP is with each business enterprise.

Urban water corporations provide water, sewerage, trade waste and recycled water services to Victorians.

Water corporations can:

- Help you to develop your organisation's waterMAP
- Identify opportunities for financial assistance to implement your waterMAP
- Provide information on best practice activities for a variety of water using fixtures (eg. taps, toilets and cooling towers) and sectors (eg. laundries, cooling towers, hotels and hospitals)
- Provide information on your organisation's water consumption
- Assist with providing education and training to management, staff and contractors
- Assist you to involve staff in water saving initiatives
- Approach industry associations who can help you develop your waterMAP
- Help you to access material such as stickers and posters to remind your staff and customers to be water wise.

Specialist assistance

You may wish to contact a service provider for specialist advice to help identify or implement water saving solutions.

Your water corporation can provide you with a list of skilled and knowledgeable service providers with experience in water efficiency for commercial, industrial and institutional facilities.

Before you engage a service provider it is important to check that they comply with relevant legislation. For example, make sure that plumbers (including sub-contractors) are licensed and can provide compliance certificates for all works completed.

Funding assistance

Individual water corporations and the Government may have funding programs that can assist you to develop your waterMAP or implement the actions arising from your plan. Contact your local water corporation to identify if there are any funding programs available that meet your requirements.

Signage

To promote the efficient use of water across your business it is recommended that appropriate signage promoting the efficient use of water is displayed near all water appliances. Your local water corporation may already have water saving signage templates that can be used within your business.

developing & implementing your waterMAP

2

- **Step 1:** Registering your intent to prepare a waterMAP
- **Step 2:** Planning and preparing your waterMAP
- **Step 3:** Understanding water use
- **Step 4:** Considering other areas
- **Step 5:** Developing your overall targets
- **Step 6:** Identifying potential improvements
- **Step 7:** Assessing opportunities for improvements
- **Step 8:** Setting more specific objectives
- **Step 9:** Completing your waterMAP
- **Step 10:** Lodging your waterMAP
- **Step 11:** Implementing your waterMAP
- **Step 12:** Monitoring your water use
- **Step 13:** Reporting against your waterMAP
- Checklist

Step 1: Registering your intent to prepare a waterMAP

Non-residential customers who use, or are estimated to be likely to use greater than 10ML of potable (drinking quality) water in a financial year are required to register their intent to prepare a waterMAP. Registration is to take place directly with your local water corporation

A registration form is provided below.

Organisation name: ABN:		
Operating name: (if different to above)		
Billing account number(s):		
Site address:		
Organisation contacts	Senior Site Manager Name: Title: Phone: Email:	Other Contact Name: Title: Phone: Email:
Site activities description:		
Water consumption ____Year (kL/yr)		
Wastewater volume ____Year (kL/yr)		
Equipment List of major water using equipment:		Estimated % of water consumed
Cooling tower		
Taps, showers, toilets, urinals		
Washdown equipment		
Sterilising equipment		
Production process		
Irrigation		
Other (attach separate list):		
		Total 100%
Details of existing water conservation initiatives		
Identify the names of any peak industry body of which the business is a member		

Office Use:

Registration accepted by: (name)

Registration number:

Registration accepted on: (date)

Step 2: Planning and preparation

The information detailed in this step will help you develop and implement your waterMAP and engage staff in the process. (Where appropriate copy the information from the registration form)

Collect background information

Record all the basic information for your site by completing **Table 1**.

Table 1: Site background information

Name of organisation:	
Billing account number:	
Site address:	
Name of site manager:	
Title of site manager:	
Phone no:	(B) (M)
Fax no:	
Email address:	
Secondary site contact:	
Position:	
Phone no:	(B) (M)
Fax no:	
Email address:	
Water corporation representative:	
Contact details:	
Phone no:	(B) (M)
Fax no:	
Email address:	
Program start date:	
Brief description of the operations at this site:	
Number of employees on site per day:	
Hours of operation:	

Decide which managers and staff will be involved

Management's involvement, enthusiasm and commitment to the program is critical because valuable time and resources are required to develop and implement your waterMAP.

Decide who your appropriate management contact(s) are and record their details in **Table 2**.

Table 2: Management contacts

	Management contact 1	Management contact 2	Management contact 3
Name:			
Position/title:			
Phone no:			
Fax no:			
Email address:			

It is also a good idea to involve key staff members who may influence or have an understanding of how water is used at your site. This will enable you to easily identify and implement water saving measures. You may wish to involve staff from groups such as:

- Senior management
- Facilities managers
- On-site maintenance staff
- Finance/accounting, who can provide financial information to support initiatives
- Human resources, who can help with training, communication and motivating staff
- General staff
- OH&S and environment staff

Identify your appropriate key staff and record their details in **Table 3**.

Table 3: Key staff

Key staff Contact no.	Contact no.	Department/position	Role (what they can contribute to the program)

Get your managers and staff involved

Now that you've identified which people in your organisation are suitable for developing your waterMAP, it's time to get them involved.

The first step is to hold a meeting of all the people who will be involved and decide the objectives of the program. This will ensure that the objectives match the direction of your organisation and cover all relevant areas, and that key staff are involved in determining the program's aims.

Industry based workshops will be conducted to provide those involved with an understanding of the program. These workshops will include:

- How to work through the waterMAP handbook
- How to maintain program momentum
- Where to find suitable service providers
- How to apply for funding assistance
- What assistance is available from your local water corporation
- Provide a forum for questions to be answered

It is important that managers understand and communicate the objectives and importance of the program to all staff. It is also a good idea to keep management informed as the program progresses.

It is important to recognise employee participation in the program on individual performance plans and to allow time for them to participate. Your staff will then be better committed to the program.

Engaging other staff who may not be directly involved in the program is also important. You may wish to:

- Conduct education or training programs for staff on new fittings, fixtures or processes. It may be helpful to include the organisation's commitment to water conservation in induction programs
- Ensure that you regularly and effectively communicate with your staff and management by implementing a communication strategy
- Encourage your staff to share ideas by providing a suggestions box, including the program as an item for discussion in team meetings, or providing a space on your intranet for staff to provide feedback
- Recognise the ideas, involvement and achievements of staff who identify or implement water-efficiency measures and celebrate your successes, such as when a reduced water bill arrives
- Update your organisation's policies and procedures to incorporate water conservation initiatives that have been implemented
- Provide incentives for staff who have a direct influence on water use by linking water conservation measures to performance reviews.

Get the most from your service providers

It's important to involve your chosen service providers, suppliers and contractors in a way that will help you get maximum benefit from the program. Share your commitment to saving water with them and encourage them to share any ideas they may have. You may also like to consider placing water efficiency indicators in any performance contracts that you develop.

Involve other users

Other users of your facility, such as the general public, may have a very large impact on your organisation's water use. It may be more difficult to engage these users in the program because their contact with your organisation may be brief. You may wish to consider incorporating the following ideas into public-facing areas of your business:

- Let your customers/water users know that your organisation is committed to saving water
- Make accessible information on how customers can help you to save water
- Recognise any water saving behaviour that you witness, such as reporting a leak
- Provide the public with an opportunity to offer feedback on current water saving initiatives and to share any new water saving ideas they may have
- Display water conservation signage near water fixtures.

Communication is important

Communicating effectively with everyone who uses water within your organisation will help you achieve your water saving goals.

Use communication to:

- Inform people about the need for water conservation and your organisation's commitment to the program
- Advise people of the actions your organisation is taking to save water
- Advise people of what they can do to save water
- Provide progress reports of savings achieved
- Recognise people who identify new ideas and initiatives.

You can do this by providing:

- Formal presentations, perhaps involving a guest speaker if appropriate
- Regular update bulletins and/or newsletters
- Information sessions
- Signage
- Fact sheets
- Regular team meetings to discuss water conservation.

Your water corporation representative can provide assistance and advice, especially about communicating within your organisation, as well as with other water users such as the general public. They may also be able to provide you with materials or templates.

If you have a communications or marketing department within your organisation, it's a good idea to involve them in communicating the program to your employees and other water users. There may be set communication methods within your organisation with which you need to comply, and these teams often have expert knowledge to ensure your communication is as effective as possible.

Completing **Table 4** will help you identify what you would like to communicate, who you need to communicate with, when the communication should occur and how it will be done.

Table 4: Proposed communications

What?	Who?	When?	How?
For example: Grounds irrigation to be in-line with permanent water saving rules	Grounds and maintenance staff	At the start of each season (quarterly)	Info session and bulletin

Review relevant policies and procedures

A quick review of company policies and procedures to incorporate your organisation's commitment to water conservation is recommended. The review will generally cover all aspects of the organisation, such as financial policies, maintenance procedures, OH&S policies and other operational procedures.

The review should be conducted early in the planning stages to ensure that the program you design fits with your organisation's objectives and values. It will also identify where further work needs to be undertaken.

The following steps will assist in this process:

- Determine the level of review and who will be involved. As a minimum, a business systems management review should be conducted with representatives from senior management, finance and facility management
- Review your organisation's policies and procedures and highlight where changes should be made.

Completing **Table 5** will help you identify necessary changes to policies and procedures.

Table 5: Review of policies and procedures

Area to review	Review details	Actions required
Senior management's commitment to water conservation, eg. what policies are in place that relate to water conservation?		
Understanding of water use and where water is used on the site. This could consider: <ul style="list-style-type: none"> • Water metering and monitoring, eg. when is water used and how much is used? • Water supply management and alternative supplies, eg. where does water come from? Drinking water, stormwater or recycled water? • Does a site map exist that documents where water infrastructure is located? 		
Setting of water use targets and key performance indicators, eg. what are key performance indicators and do they relate to water use, especially in high water-using areas?		
Reporting of water management, both internal and external. To what extent does this occur?		
Water management considerations in operating and maintenance and education and training, eg. do procedures detail when to perform maintenance to manage water efficiency? Do inductions include details about water conservation?		
Responsibilities for water management, eg. do position descriptions include responsibilities for water management?		
What is the company's policy on capital expenditure? What is the required payback period?		
What legal and regulatory requirements must be complied with?		
Other...		

Step 3: Understanding water use

In order to identify what savings can be achieved at your site, it is essential to understand where and how water is used and how much it costs.

Calculate your baseline water use

Your baseline water use is the amount of water that you are currently using. This information helps you determine what potential savings can be achieved in the timeframe identified. During the program, it will also help you measure your performance. Any savings you achieve can be easily measured against your current, or baseline, water use.

To determine baseline water use you'll need your site's water bills for the previous 12 to 24 months. If required, your water corporation representative will provide this information.

When reviewing your water use history, ensure the data represents normal operating conditions, ie. there were no shutdowns or refurbishments during the period. If there has been a deviation from normal conditions during the period, include a description or reason for this and the estimated impact on water use during the period.

Where possible separately identify or estimate usage for fire service testing.

Complete **Table 6** using the information on your water bills to calculate your baseline water use.

Table 6: Baseline water use

Month/year	Source (eg. potable, recycled, bulk etc.)	Water used (kL)	Number of days	Average daily usage (kL/days)	Water use costs	Sewage disposal costs	
For example: 06/2005	Water corporation supplied urban (potable)	2,524	30	84.1	\$2,299	\$2,362	
							Total per/annum

NB: It may be easier to assess trends/seasonal variations in water use by graphing this data.

Determine your Key Business Activity Indicator

The Key Business Activity Indicator is a measure of business activity that takes into account the core business operations specific to your site. Water use is often directly related to business activities such as how much of a product is manufactured, or how many staff are employed. It is important to consider how variations like this affect water use when determining water saving targets for your business.

Determining your Key Business Activity Indicator allows you to set a measurable target for your water saving initiatives, regardless of variations in business activity.

It's a good idea to use the same measure or indicator that your business uses to assess business efficiency when calculating your Key Business Activity Indicator.

Some examples of Key Business Activity Indicators are:

- Commercial buildings and shopping centres: total area (m²) or number of employees or customers
- Hotels or hospitals: number of beds/meals or occupancy rate
- Manufacturing or laundries: quantity of production (tonnes/weight)
- Educational facilities: number of full time student equivalents
- Sports facilities: irrigation area (m²), crowd numbers or number of events
- Public facilities: number of events or number of visitors.

Other indicators are possible and we encourage you to discuss them with your water corporation representative.

Use **Table 7** to calculate your Key Business Activity Indicator.

Table 7: Key Business Activity Indicator

What?	Example	Actual
Data collection start date	22/11/07	
Data collection end date	22/11/08	
A = baseline potable water use per annum (kL)	20,000	
Business efficiency indicator	No. of visitors	
B = Quantity of business efficiency indicator	10,000 (visitors)	
Is this representative of normal operating conditions?	No	
If not, give reasons for variation (eg. shutdown, seasonal, refurbishment, etc.)	Refurbishment	
C = Impact of variation on water consumption (kL per annum)	5,000	
D = A – C Baseline water use corrected for variation (kL)	15,000	
E = D/B This is your Key Business Activity Indicator	1.5kL/visitor	

Benchmarking

Comparing the water use in your organisation to best practice in similar organisations can help you measure how efficiently your site is operating. Understanding current best practice will also help you determine realistic water and money-saving targets.

Benchmark information for a range of businesses and organisations in Melbourne is available from City West Water, South East Water and Yarra Valley Water websites (see page 30).

Develop a site water use plan

Once you know how much water is used at your site, it is also important to understand exactly where it is used. Develop a map of water use areas on your site. A quick walkthrough of your site will ensure that all areas have been included. Recording the hours of operation and estimated water use for each area will also help monitor water use. Use **Table 8** to determine your site's water use areas.

Table 8: Water use areas

Area	Hours of Operation	Estimated water use (kL)	% of Total water use
For example: kitchen	5am – 2pm	1,200	10%

Carry out initial monitoring

Once your water use areas have been identified, the actual water used can be measured. This involves monitoring main meters and perhaps check-metering high water use areas.

Data logging

To better understand water use patterns at your site, monitoring or data logging of the main water meters can be conducted. Data logging will also help identify any unaccounted water use such as leaks or appliances left operating while the facility is unattended.

All main meters should be continuously monitored for about four weeks; however issues such as seasonality may require different timeframes. Your water corporation representative can provide advice on monitoring methods.

Attach your monitoring results to this handbook. Any actions arising from the monitoring should be detailed in Step 5 and 8 of your waterMAP.

Check-metering

You may wish to consider using check-meters to investigate any issues identified by the data logging. Check-meters measure water use in specific areas of your site. Any equipment that you estimate uses 15 per cent or more of your total site's water consumption (such as cooling towers in commercial buildings) should be check-metered to help determine their water-efficiency.

Two types of check-meters are available: temporary, non-intrusive ultra-sonic data loggers or permanent check-meters, which may be more practical. Your water corporation representative can provide advice on the use of check meters.

Table 9 helps identify areas that use 15 per cent or more of your site's total water use. If check-meters are installed, use **Table 10** to record their data.

Table 9: Check-meters installed

Area of water use	Meter(s) installed (meter numbers)	Estimated water use (kL)
For example: Cooling towers	1234	09/10/2008

Check-meters should be read daily. If possible, read the meters when the facility closes for the day and again the following morning. Ideally the meter readings should be very similar. If not, there may be a leak or appliances may be operating in error outside business hours.

Monitoring of the check-meters should be conducted over at least a four-week period unless otherwise discussed with your water corporation representative.

Document your check-meter readings and provide comments, such as work conducted outside normal operating hours, in **Table 10**.

Table 10: Check-meter readings

Meter (number/area)	Date	Time	Reading	Water used (kL)	Comment
For example: 1234 / cooling tower	29/10/2008	7am	2468		
1234 / cooling tower	29/10/2008	6pm	2568	100	Normal operations

You may wish to graph this data to clearly show the water use patterns for each check-meter over time.

Please note: Water corporations are not responsible for the maintenance or replacement of any check-meters that are provided as part of this program unless such maintenance or replacement forms a part of the meter warranty. Customers must make their own arrangements for the installation, monitoring, maintenance and replacement of the check-meters.

Step 4: Considering other areas

There are other factors to consider as you identify and implement water saving opportunities.

Trade waste and sewage disposal

The amount of water you use affects your trade waste and sewage disposal costs. If you are currently charged for trade waste, you could save money.

Chemical use

Water corporations operate industry programs that reduce the use of chemicals entering the sewer, including salts. Salts in wastewater limit its potential for treatment and use as recycled water.

Salts can come from a variety of sources, but a major source is water treatment chemicals. Many commercial facilities use water treatment chemicals, especially in cooling towers, to manage bacteria, scale and fouling, and corrosion. Some cooling towers do not use water as efficiently as they could, leading to elevated water and treatment chemical use.

Improved water efficiency should also reduce associated chemical treatment. Complete **Table 11** to understand the effect that improved water efficiency will have on your chemical use in all areas of water treatment.

Listing the chemicals used on-site for water treatment will also help identify opportunities to use chemicals more efficiently, further reducing the environmental impact of your site.

Table 11: Chemicals used on site

Area of water use	Chemical used (purpose)	Amount used (kg/yr)	Cost (\$)
For example: Cooling tower	XYZ chemical	200	3,500

This information can also be used when assessing the financial feasibility of implementing water conservation measures.

Step 5: Develop your overall targets

Setting water reduction targets provides a way to measure the success of the program in your organisation. Contact your local water corporation for advice on available benchmark information. Any targets should include a realistic timeframe to ensure that motivation for participating in the program remains high.

If no best practice industry benchmarks are available it is recommended that you set an aspirational target of at least 10 per cent reduction in water use to challenge existing practices and processes.

It is possible that your site is already operating at best practice. If so, congratulations. You will still benefit from developing a waterMAP for your site by gaining a full understanding of water use and maintaining or improving current efficiencies. Include your current activities in your waterMAP and update your targets as you investigate options for saving more water. Setting an overall target now provides good motivation for your team to begin the program, even though you may be saving water already.

Table 12: Water reduction target

Target	Time frame
For example: to operate at best practice of 50L/visitor	Within the next 12 months

Step 6: Identify potential improvements

Now that you understand your site's water consumption and you've set targets to reduce it, you need to identify improvements that can be made.

You can identify improvement opportunities by walking through your site, concentrating on the major water-using areas.

Walkthroughs should be undertaken at different times to observe changes at the start or end of a day, or on a hot or cold day. Be sure to include the entire site, especially areas that are not frequently visited. Walkthroughs should be undertaken at the start of the program and then at intervals throughout, when projects are complete or other problems arise.

During a walkthrough, use **Table 13** to record observations and highlight areas where potential improvements can be made. Observations should include behavioural aspects as well as asset or appliance aspects.

Questions to ask while undertaking a walkthrough should include:

- Are there any leaks or spills (also an OH&S risk) and where are they coming from?
- Is monitoring equipment in the right place?
- Where is water being used?
- How is cleaning undertaken? Does it use water? Can it be done differently?
- Is there anything obvious that could help improve water efficiency?
- Any other issues or concerns?

Ask staff in each area if they have any issues or ideas regarding water use and reuse.

Table 13: Site walkthrough

Area	Details of major water using processes, equipment or appliances	Observations	Initial recommendations or corrective action to be taken
For example: Kitchen	Prepare food for meals	Thaw meat using water	Take out night before and place in fridge
For example: Washdown area	Equipment washing	Leaking taps	Replace tap washers

Step 7: Assess opportunities for improvement

Once you have developed your list of improvement opportunities, it's a good idea to further analyse them to help you determine what measures, if any, you will implement. This will also help you understand the technical and financial feasibility of their implementation.

Investigate opportunities for improvement

The actions required to improve water efficiency may not have been clear during your initial walkthrough. You may need to carry out a technically based walkthrough or audit, perhaps using the assistance of a specialist.

For example, you may have identified the cooling towers as an opportunity for improvement. You may require a technical review of their operation to determine exactly what improvements can be made. In this case a cooling tower specialist could be engaged to review the water efficiency of cooling tower operation.

Another example of a potential improvement that requires further investigation could be the collection and use of rainwater instead of drinking water for certain processes. How this could be achieved needs to be investigated.

Feasibility

The feasibility of implementing your proposed improvement measures should be demonstrated by benefits to your business. You should be able to show how they can increase shareholder value, competitive advantage or profits, and/or reduce risk.

Look at the technical viability of each opportunity (is it practical to implement?), as well as the financial viability or cost benefit analysis (is the payback period within the organisation's recommended payback period?).

Most organisations have an existing method for determining the feasibility of projects and it makes sense to follow whatever method is already used. The simplest method is to carry out a cost benefit analysis by calculating payback or return on investment.

To carry out a cost benefit analysis:

1. Identify the costs involved

Record both direct and indirect costs, including equipment, operating (including power and waste discharge), financial interest, insurance, etc. in **Table 14**. Include the costs for implementing the measure as well as any ongoing costs.

Non-monetary costs such as social and environmental costs that may not directly affect the financial bottom line but affect your business should also be considered. Any measures you implement should be consistent with your organisation's policies.

2. Identify the benefits

Record the monetary benefits of reduced water consumption, including trade waste and chemical costs (if applicable) in **Table 14**. Also include other benefits, such as an improved business reputation.

3. Investigate funding options

Consider the various funding options available from your water corporation and the Victorian Government that can aid your water saving projects.

4. Calculate the payback period

Calculate how long it will take for the benefits of implementing the measure to outweigh the costs. Your business can then assess whether it is feasible to implement. Typically, businesses implement measures if the determined payback period is less than three years, however social and environmental aspects of the project should also be taken into account.

Payback period is calculated by dividing the cost of implementation by the savings achieved. For example, if a water efficiency project costs \$10,000 to implement and it saves \$2,500 in water and sewage discharge costs per year, it has a payback period of four years.

Consider ordering projects into short, medium and long-term based on the payback period and ease of implementation. **See page 9** for further advice.

Table 14: Cost benefit analysis

Measure	Monetary benefit	Savings	Non monetary benefit	Direct cost	Cost \$	Indirect cost	Cost \$	Payback period
For example: Cooling tower specialist recommends increasing cooling tower cycle	Save water	\$	Improve company profile	Service provider to amend cycle	Minimal	None	\$	1 month

Step 8 Set more specific objectives

Now that you have decided exactly how and where you will save water, you may wish to further develop objectives for the program's success. Specify the areas of your business where water efficiency can most be improved and set measures for each of these.

It's a good idea to review your overall Key Business Activity Indicator target detailed in **Table 7** to ensure it is still realistic before developing more specific objectives.

Table 15: Specific objectives

Objective	Measure	Time frame
For example: Cooling towers Reduce drinking water consumption across the entire site	Save 15% (20kL/year)	12 months

Step 9: Complete your waterMAP

The waterMAP details all actions involved in improving water efficiency in your organisation. It is split into immediate, short, medium and long-term actions as well as ongoing actions.

Consider actions with a shorter implementation time that will provide reasonable short-term savings. Once these easier items are completed, look at moving on to more complex action items that will provide savings over the longer term.

The waterMAP template can be amended to suit the needs of your organisation and can be reviewed and updated at any time.

The information you have recorded in the tables throughout this handbook will help you to complete the waterMAP.

Tip: When describing an action, it is helpful to refer to any linked objective.

Table 16: Water management action plan

Immediate (0 – 3 months) – Address leaks and inefficient taps, showerheads, toilets and urinals; and post water conservation signage									
Item No.	Action	Estimated costs	Estimated reduction in water consumption (kL)	Other benefits	Estimated savings (\$)	Payback period	Who's responsible	Date to be completed	Status
Short term actions (3 – 6 months)									
Item No.	Action	Estimated costs	Estimated reduction in water consumption (kL)	Other benefits	Estimated savings (\$)	Payback period	Who's responsible	Date to be completed	Status
Medium term actions (6 – 2 years)									
Item No.	Action	Estimated costs	Estimated reduction in water consumption (kL)	Other benefits	Estimated savings (\$)	Payback period	Who's responsible	Date to be completed	Status
Long term actions (>2 years)									
Item No.	Action	Estimated costs	Estimated reduction in water consumption (kL)	Other benefits	Estimated savings (\$)	Payback period	Who's responsible	Date to be completed	Status
Ongoing actions									
Item No.	Action	Estimated costs	Estimated reduction in water consumption (kL)	Other benefits	Estimated savings (\$)	Payback period	Who's responsible	Frequency	Status

Step 10: Lodge your waterMAP

If you have been identified by your water corporation as likely to exceed 10ML/pa consumption or are a new customer you are required to lodge your waterMAP by a date specified by your local water corporation. Your waterMAP consists of templates 1 to 5 below.

Your water corporation will acknowledge receipt of the plan.

If your local water corporation believes further detail is required in your waterMAP, they will be in contact with you to provide feedback on any areas in need of further detail.

Step 11: Implement your waterMAP

Once you have completed a waterMAP it's time to put it into action.

To ensure that your waterMAP is implemented successfully, it is recommended that you:

- Appoint a responsible officer to oversee implementing the particular measures
- Schedule regular meetings where you review the progress of the actions against the assigned targets

Step 12: Monitor your water use

Regularly monitoring your water use is important because it helps you measure the success of actions you have implemented. Monitoring also helps you identify which actions are most successful, which actions need to be reviewed and any new actions to be included.

It is recommended that you establish a monitoring plan before you begin implementing your waterMAP. Where possible, consider including:

- Monthly water use of each area involved
- Monthly water use of your entire site
- Monthly review of your Key Business Activity Indicator
- Records of any abnormal operating conditions or events, eg. a water leak
- Records of any other relevant actions or events.

Monthly monitoring provides regular and up-to-date information on water consumption and savings achieved and allows you to quickly identify any issues.

The following table is provided to allow you to monitor water use on a monthly basis.

Table 17: Monitoring

Water use area	Month/year	Water used (kL)	Comments
Total	Total	Total	

Step 13: Report against your waterMAP

You are required to annually report to your water corporation on the implementation of your waterMAP and water savings.

Consider putting together a team of people who were involved in developing the original waterMAP and your water corporation representative to prepare the reports.

As you review your progress towards your targets, complete **Table 18**. If required, your water corporation representative can provide information about your recorded water consumption.

It is likely that you will identify new actions for water savings as part of this process. Please add any new actions to your waterMAP for investigation and implementation.

Table 18: Water savings

Baseline information	
1. Water use	
2. Key Business Activity Indicator	
Current information	
3. Annual water use (kL)	
4. Key Business Activity Indicator	
Targets	
5. Water savings (kL/annum)	
6. Key Business Activity Indicator	
Explanation (if targets were not met)	

Checklist

To help in making sure all of the required actions have been addressed in your waterMAP, the following checklist is provided.

Have you:	✓ or ✗
Gathered basic information about the site?	
Gained management commitment to water conservation?	
Identified key staff to participate in the program?	
Reviewed policies and procedures to include water conservation where relevant?	
Informed site users of the program?	
Gained commitment from all staff and site users?	
Gathered information on the previous 12 to 24 months' water consumption and graphed it to show trends?	
Compared your water use trends to site activities?	
Identified a Key Business Activity Indicator?	
Completed data logging of your main meters?	
Tracked your Key Business Activity Indicator during the data logging period?	
Installed and documented check-meters?	
Monitored the water use measured by the check-meters?	
Investigated and documented your trade waste?	
Investigated and documented your chemical use for water treatment?	
Set an overall site reduction target?	
Completed a site walkthrough?	
Identified actions to address any immediate issues?	
Further investigated any complex issues raised during a walkthrough?	
Considered employing a specialist service provider?	
Completed a feasibility study or cost/benefit analysis of any improvements you have chosen to implement?	
Set a specific reduction target based on a report from your specialist service provider?	
Recorded any actions from your investigations in your waterMAP?	
Appointed the appropriate personnel to manage the implementation of your waterMAP?	
Implemented the required works?	
Developed a monitoring plan to measure the success of any actions implemented and to show progress towards your overall and specific water saving targets?	
Provided information to your water corporation on the information of your waterMAP and water savings?	
Implement employee education / communication program?	
Displayed water saving signage near all water fixtures?	

mandatory waterMAP templates

3

The following set of templates is to be submitted to your local water corporation. Where your organisation has multiple sites with greater than 10ML potable water consumption per financial year, a separate template is to be filled out for each site.

Company details

Template 1: Registration for each site consuming more than 10ML

Organisation name: ABN:		
Operating name: (if different to above)		
Billing account number(s):		
Site address:		
Organisation contacts	Senior Site Manager Name: Title: Phone: Email:	Other Contact Name: Title: Phone: Email:
Site activities description:		
Water consumption ____ Year (kL/yr)		
Wastewater volume ____ Year (kL/yr)		
Equipment List of major water using equipment:		Estimated % of water consumed
Cooling tower		
Taps, showers, toilets, urinals		
Washdown equipment		
Sterilising equipment		
Production process		
Irrigation		
Other (attach separate list):		
		Total 100%
Details of existing water conservation initiatives	_____ Year	
	_____ Year	
	_____ Year	
Identify the names of any peak industry body of which the business is a member		

Office Use:

Registration accepted by: (name)

Registration number:

Registration accepted on: (date)

Development information

Template 2: Baseline water use (refer to pg 12, table 6 of the handbook)

Month	Water used	Average Daily usage (kL)	Water used (key business activity indicator)	Cost		
				Water used	Sewage disposal	
						Total per annum

Template 3: Water use areas (refer to pg 14, table 8 of the handbook)

Area	Estimated water use (kL)	% of Total water use

Action Plan

Template 4: Immediate waterMAP Actions (refer to pg 20, table 16 of the handbook)

Item No.	Action	Cost	Estimated savings			Payback period	Completion date	Status
			Water (kL/day)	Other	Other			
Immediate (0 – 3 months) – Address leaks and inefficient taps, showerheads, toilets and urinals and post water conservation signage								
1								
2								

Template 5: waterMAP Actions (refer to pg 20, table 16 of the handbook)

Item No.	Action	Cost	Estimated savings			Payback period	Completion date	Status
			Water (kL/day)	Other	Other			
Short term (3 – 6 months) – Address leaks and inefficient taps, showerheads, toilets and urinals and post water conservation signage								
3								
4								
Medium term actions (6 months – 2 years)								
5								
6								
Long term actions (> 2 years)								
7								
8								
Ongoing actions								
9								
10								

Reporting

Template 6: Report on waterMAP – to be completed annually

Annual report for period:

Business summary:

Recent history: waterMAP target compared to actual experience

Actual total site water consumption 2005-06 (kL)	a	Actual total site water consumption 2006-07(kL)	b	% change over the year	$\frac{(a/b)-1}{1} \times 100$	Target saving identified in waterMAP	Actual water consumption year under review (kL)	c	Actual change in consumption (kL)	b-c	% contribution this year	$\frac{(b-c)}{a} \times 100$	Estimated cost of water saving in year under review	d	Actual cost of completed projects	e	Target unit cost of savings \$/kL	Actual unit cost of savings to date	(b-c)/e
Change in consumption attributed to waterMAP projects																			
Comment on variation between savings generated by waterMAP projects and total variation:																			
Variation																			
Business water use indicator identified in waterMAP																			
Target in waterMAP																			
Actual achieved																			
% change																			
Comment on change in the business water use indicator:																			
Comments on actual experience of implementation of overall waterMAP including costs and benefits achieved:																			
Comments on implementation plan for next period of review:																			
Explanation of variation in business wide actual water savings compared with savings achieved through waterMAP projects:																			
Comments on revision and updating of waterMAP:																			

Template 7: Report on waterMAP – to be completed annually

Annual Report for period:

Implementing management actions

Action item number from submitted waterMAP	Action description	Status as at date of report	Month action became fully operational	Estimated water use before action (kL)	Target water saving by implementing action in a full year (kL)	Target % saving from each action	Estimated actual savings at date of report kL	% Actual improvement on estimated water consumption $(c/a) \times 100$	Revised estimated full year savings (kL)	% improvement on estimated water consumption $(e/a) \times 100$	Actual cost of completed action	Project comments
				a	b	%	c	$(c/a) \times 100$	e	$(e/a) \times 100$	\$	
	Totals for projects implemented in year under review							(total: c/total: a) x 100		(total: e/total: a) x 100		
	Projects of be completed in next review period											
	Totals for projects to be completed next review period											
	Projects for future years											
	Total future projects											
	Cancelled Projects											
	Total Cancelled projects											
	New Projects added to waterMAP											
	Total additional Projects											
	Totals revised WaterMAP (f+g+h+i+i)											
	Original WaterMAP Totals											
	Total changes resulting from revised waterMAP (K-l)											

Contacts

4

VicWater

Department of Sustainability and Environment:

Our Water Our Future

Australian Industry Group

Plastics and Chemical Industries Association

Victorian Employers Chamber
of Commerce and Industry

Grow Me the Money

Property Council

Textile Rental and Laundry Association of Australia

Alternative Technology Association

Environment Protection Authority

Plumbing Industry Commission

Australian Institute of Refrigeration
Air Conditioning and Heating

Facilities Management Association of Australia

Water efficiency labelling standards

Yarra Valley Water

South East Water

City West Water

www.vicwater.org.au

www.dse.vic.gov.au

www.ourwater.vic.gov.au

www.aigroup.asn.au

www.pacia.org.au

www.vecci.org.au

www.growmethemoney.com.au

www.propertyoz.com.au

www.trlaa.com.au

www.ata.org.au

www.epa.vic.gov.au

www.pic.vic.gov.au

www.airah.org.au

www.fma.com.au

www.waterrating.gov.au

www.yvw.com.au

www.southeastwater.com.au

www.citywestwater.com.au

Glossary

Baseline water use	Water consumption status at the beginning of the program. Baseline measurements are used as a reference point to determine a facility's water savings as it completes its waterMAP. The potable water consumption for the full financial year in the period immediately preceding the one where the waterMAP was triggered
Check-meters	Sub-metering installed to record the water use of individual appliances or areas
waterMAP	A water Management Action Plan. The waterMAP is developed by customers
Water corporation representative	Representative from your local urban water corporation
Commercial customer	A business engaging in commerce or a commercial enterprise that is a customer of an urban water corporation
Data logging	The automatic collection of data over a period of time in this case collection of water consumption data
Domestic and stock use	Water used for: (a) Household purposes (b) Watering of animals kept as pets (c) Watering of cattle or other stock (d) In the case of the curtilage of a house and any outbuilding watering an area not exceeding 1.2 hectares for fire prevention dam; or (e) Irrigation of a kitchen garden but does not include use for dairies, piggeries feed lots, poultry or any other intensive or commercial use
Drinking water	Water that is fit for human consumption
EREP	Environment and Resource Efficiency Plan - a resource efficiency program administered by EPA Victoria
Greywater	Household wastewater that has not been contaminated by toilet discharge. Greywater includes wastewater that has been in baths, showers, bathroom washbasins, clothes washing machines, sinks and laundry troughs
Groundwater	Any water naturally stored underground in aquifers or that flows through and saturates soil and rock supplying springs and wells
Industrial customer	A manufacturing business that is a customer of an urban water corporation
Institutional customer	An organisation created for a social cause eg. hospitals, educational facilities
Kilolitre (kL)	1000 litres
Non-residential customer	Any customer other than a domestic resident. Includes businesses, local council sites, hospitals, schools, primary industries using urban supplies community groups and commercially operated residential-style properties classified as non-residential under the Victorian Planning Provisions
Non-residential property	A property where potable water supplied by a water corporation is used for any purpose other than domestic and stock use
Main meters	Main meters record the total water use of an entire building or series of buildings
Major commercial and institutional customers	In the context of this document, non-residential customers described above
Megalitre (ML)	1 million litres
Participant	Customer participating in the waterMAP program
Pathogens	Organisms capable of causing disease eg. bacteria, viruses, protozoans and Helminths
Potable Water	Water that is fit for consumption (drinking)
Recycled water	Treated sewage that undergoes additional advanced treatment to make it safe for certain uses such as landscape irrigation
Service provider	One of a wide range of specialist contractors, including plumbers, auditors and cooling tower assessors.
Stormwater	Rainfall that runs off roofs, roads and other surfaces where it flows into gutters, streams, rivers and creeks and eventually into bays. Stormwater can carry contaminants such as litter, detergents, nutrients and heavy metals
Terajoule (TJ)	A joule (J) is the international measurement unit of electrical mechanical and thermal energy. 1 terajoule (TJ) = 10 ¹² J 1 TJ = 0.278 GWh
Total Dissolved Solids (TDS)	The combined content of all organic and inorganic substances contained in water or wastewater that are present in a molecular ionized or colloidal form ionized or colloidal form
Trade waste	Wastewater generated as the result of any commercial trade experimental or industrial processes and discharged into a sewerage system. Trade waste may contain chemicals fats or detergents and is typically wastewater from washing cleaning or rinsing processes
WELS scheme	The Water Efficiency Labelling and Standards (WELS) scheme is a nationally consistent approach to providing consumers with information on the water efficiency rating of products/ equipment. Products covered by this scheme include clothes washing machines dishwashers, toilets, showers and taps. The labels now appear with a star rating with 6-star being the most water efficient and 0-star showing that the equipment has no water efficiency.