



**Melbourne
Water**

Public Health Compliance

Quarterly Report

Quarter Four 2006/07
(April, May, June 2007)

DRINKING WATER

Issues/Initiatives/Incidents

Upper Yarra Reservoir Water Quality Incident

After many months of record drought conditions the storm event of Wednesday 27th June 2007 produced very turbid inflows to Upper Yarra Reservoir. In the following week the turbidity of the water supplied from the outlet increased to between 10 and 15 NTU. On Saturday 14th July 2007 turbidity reached 24 NTU. This is significantly above the Australian Drinking Water Guidelines aesthetic limit of 5 NTU. Turbidity from Upper Yarra Reservoir is normally about 2 NTU and is supplied to customers unfiltered. As of Tuesday 24th July, Yarra Valley Water had received sixteen (16) customer complaints associated with this event.

On Saturday 30th June the inflows from the Thomson River, via Swingler Weir, were shut off to help reduce the load of turbidity into Upper Yarra Reservoir. The outlet level at Upper Yarra is being changed as necessary to supply the lowest turbidity water, which is presently near the bottom. Throughout this event the turbidity in the reservoir has ranged from about 7 NTU to 140 NTU.

In order to minimise the water quality impacts on Silvan Reservoir, transfer flows to Silvan from Upper Yarra have been reduced significantly. Water quality monitoring has been increased in the reservoir itself and the downstream supplies to assist with operational control and to manage the customer impacts in consultation with Yarra Valley Water. This includes turbidity, colour, microbiological indicators (*E.coli*, coliforms), pathogens, particle size and UV transmissivity.

Water quality monitoring has also been increased to measure the disinfection effectiveness for the supply of water to the townships of the Yarra Valley with the increased turbidity. This includes transmissivity testing to validate UV disinfection. Microbiological monitoring has measured low levels of *E.coli* in the raw water (consistently less than 10 orgs/100mL), demonstrating that the pathogen risk of the source water remains low.

On Monday 16th July, following consultation with the Department of Human Services, Yarra Valley Water issued a boil water notice to customers in East Warburton. The rest of the Yarra Valley townships between Warburton and Woori Yallock were issued boil water notices later that same week. This was a precautionary notice to approximately 6000 customers and is based on the turbidity being high enough (ie. > 20 NTU) to create some uncertainty about the effectiveness of the disinfection.

This notice is likely to stay in place for a number of weeks depending on how quickly the turbidity in Upper Yarra Reservoir settles or when the filtration plants (described below) can be built. Melbourne Water has approved the installation of small, package media-filtration plants to treat the turbid water to a standard that will enable effective disinfection of the water. It is estimated that it will take approximately 2 months for these plants to be fabricated, delivered to site and commissioned.

It is not known how long it will take for the water in Upper Yarra Reservoir to improve, but it is possible for the current problems to extend throughout the current water harvesting period, particularly if further high intensity rainfall events occur. The main issue for the coming months is managing the gradual water quality deterioration anticipated in Silvan Reservoir, which under normal operations, supplies a relatively large area of Melbourne. Reservoir quality scenarios for Silvan are being modelled by the Centre for Water Research (Perth) and more detailed analysis of the sources of pathogens found in water from Upper Yarra and other catchment areas are being undertaken.

Recycled Water Cross Connection at Eastern Treatment Plant (ETP) - Update

On March 19 it was discovered that a potable water pipe in a kitchen in the new Courtyard building at ETP was supplying Class '2W' recycled water (approximately equivalent to EPA Class B). The supply to the kitchen was immediately shut off and an incident declared.

2W water has been used for toilet flushing at ETP since the Plant became operational in 1975. Mechanical problems with toilet flushing due to fine grit in the 2W water resulted in the supply to the toilets in the Administration building being switched to potable water around March 2006. Due to increasing accommodation requirements, and a need to upgrade amenities in the Administration building, a project commenced in early 2006 to undertake refurbishment works and construct a new building. The supply for the new building's water supply was plumbed off the potable water supply to the toilets in the Administration building.

Upgraded toilets were installed in the Administration building in order to overcome flushing problems. As a result, on 1 March the decision was made to switch the water supply to those toilets from potable back to 2W.

On 19 March, an employee based in the Courtyard building reported that the tap water had a noticeable smell and tasted very poor. The supply was immediately isolated and investigations commenced. It was then that the connection was found to be coming from the line now supplying 2W water to the Administration building toilets.

While the 2W recycled water is produced from a treatment process comprising screening, primary treatment, activated sludge treatment, micro screening, chlorination, sand filtration and further chlorination, it is not considered suitable for drinking and is considered equivalent to Class B under the EPA Victoria (EPAV) Recycled Water Guidelines.

All employees and contractors on the site were notified of the incident and Business Management Health Services (BMHS) were called to the site to offer medical advice to people who may have been affected. The Department of Human Services (DHS), WorkSafe and EPAV were also notified.

A list of people who had used the building and its conference rooms during the period was drawn up. It was established that approximately 106 people used the affected building during the period 1 – 19 March. Of these, approximately 60 reported consuming water from the affected kitchen. Of these, 22 people have since reported a range of symptoms including those typical of gastro-intestinal illness.

Melbourne Water is working closely with DHS to provide support and ongoing monitoring of the people affected. BMHS will also continue to follow-up affected people for a period of 6 months in order to ensure there are no longer-term effects or recurring symptoms.

Melbourne Water has sent a letter to all those who drank the water formally informing them of the issue and offering them ongoing support in respect of medical advice via BMHS, counselling via Gus Carfi and Associates and coverage of any reasonable medical expenses.

DHS has also sent all affected people a letter requesting them to contact DHS if they become ill within a period of six weeks of receiving the letter. The letter also offers an immunoglobulin injection for anyone who has not had a hepatitis A vaccination or had hepatitis A. The risk of contracting hepatitis A from drinking the recycled water is considered to be very low.

Melbourne Water has engaged an independent investigator to undertake an investigation into the causes of the incident. This is expected to be completed by the end of Q1 2007/08. In the interim, additional site controls have been implemented in relation to modification of any services. WorkSafe has undertaken an initial investigation of the incident. The investigation resulted in the issuing of two "provisional improvement notices" and one "prohibition notice". All three notices have been signed off. WorkSafe is waiting for the Melbourne Water investigation report prior to completing their investigations.

A debrief on how the incident was managed was held on the 22 May. The debrief was facilitated by IBIS Consulting and was attended by some of the affected people, DHS, WorkSafe and those involved in the management of the incident. No significant issues on the management of the incident were raised in the debrief.

Catchment and Water Supply Asset Security

During the quarter 30 minor security breaches were recorded. These predominately involved the cutting of fences, trespassing, vandalism, fishing and littering in the catchments. These security breaches had no discernible impact on water quality.

Regulations and Compliance Targets

This section summarises the statutory requirements and corporate targets related to the quality of water supplied by Melbourne Water. Details of compliance and indicators of microbial performance are shown in the following sections.

The *Health (Fluoridation) Act 1973* requires the provision of fluoride in drinking water at concentrations not in excess of 1 mg/L. The requirements of the Act are further amplified by the accompanying Standards for Fluoridation of Public Water Supplies. In the Standards the Department of Human Services (DHS) adopted the recommendations contained in the NHMRC/AWRC 1987 Guidelines for Drinking Water Quality in Australia (referred to as NHMRC/AWRC 1987 Guidelines).

The *Health (Quality of Drinking Water) Regulations 2002*, made under the *Health Act 1958*, have been repealed by Part 6 of the new *Safe Drinking Water Act 2003* and have been replaced by the *Safe Drinking Water Regulations 2005*. The drinking water quality standards set under the Regulations apply at prescribed sampling points and are the responsibility of the water supplier (the retail water businesses in Melbourne).

Melbourne Water and the retail water companies have amended the water quality standards (Schedule 3) in the Bulk Water Supply Agreements (BWSAs). This ensures consistency with the standards in the Regulations that the retail water businesses must meet at customer taps. The new regulations came into force on 19 July 2005.

Melbourne Water has requirements to meet service standards for the Essential Services Commission, which came into force at the beginning of 2005. These standards are based on the standards in the BWSAs.

Melbourne Water also sets some operational targets compatible with statutory requirements. The targets aim to allow Melbourne Water to meet its obligations under the BWSAs and enable the retail water businesses to deliver water in accordance with the conditions of their operating licences. These conditions include compliance with health related parameters of the Australian Drinking Water Guidelines 2004.

Statutory Compliance

Fluoridation Plant Reliability

Compliance with Health (Fluoridation) Act (1973)

Based on Long Term (12 mth) Average Dosage not to exceed 1 mg/L

Treatment Plant	Compliance			
	Q1 06/07	Q2 06/07	Q3 06/07	Q4 06/07
Cardinia				
Research/Winneke	*			
Monbulk				
Silvan-Olinda				
Silvan-Preston				
Silvan-Waverley				
Yan Yean			#	

* Research Plant offline 15/06/2006 and replaced by new Winneke Plant online 07/09/2006.

** Yan Yean Reservoir and Plant off line from 1/02/2006 to 30/06/2006.

Yan Yean Reservoir and Plant off line from 5/02/2007 to 31/03/2007.

Compliance achieved		Not applicable		Compliance not achieved	
---------------------	--	----------------	--	-------------------------	--

During Quarter Four the average fluoride concentration at all plants did not exceed 1 mg/L.

Quarterly Compliance with Health (Fluoridation) Act (1973)

Quarterly Average Dosage to be between 0.7 - 1.2 mg/L

Treatment Plants	Compliance			
	Q1 06/07	Q2 06/07	Q3 06/07	Q4 06/07
Cardinia				
Research/Winneke	*			
Monbulk				
Silvan-Olinda				
Silvan-Preston				
Silvan-Waverley				
Yan Yean			#	

* Research Plant offline 15/06/2006 and replaced by new Winneke Plant online 07/09/2006.

** Yan Yean Reservoir and Plant off line from 1/02/2006 to 30/06/2006.

Yan Yean Reservoir and Plant off line from 5/02/2007 to 31/03/2007.

Compliance achieved		Not applicable		Compliance not achieved	
---------------------	--	----------------	--	-------------------------	--

During Quarter Four all sites were compliant on a quarterly basis.

Compliance Summary

Summary of Compliance for Corporate Public Health Targets and Performance Standards for Water Quality in the Bulk Water Supply Agreements (BWSA) and the Essential Services Commission (ESC) Standards

Quarter Four 2006/07

Compliance Measure	Target Met
Disinfection Plant Reliability (Corporate target - combined reliability measure of 96%).	Yes
Supply to retail companies at entry and water quality monitoring points - <i>E.coli</i> . (Corporate target - 100 % of samples < 1 org/100 mL)	Yes
Trihalomethanes and Haloacetic Acids (BWSA - 100% of samples meet standards)	Yes
Aluminium - aesthetic parameter (Compliance with ESC Standards)	Yes
Turbidity - aesthetic parameter. (Compliance with ESC Standards)	Yes

New regulations under the *Safe Drinking Water Act 2003* (SDWA) have resulted in additional chlorine based chemicals (disinfection by-products) being included in the BWSA variations that came into effect on 1 January 2005. These are Chloroacetic Acid, Dichloroacetic Acid and Trichloroacetic Acid. Melbourne Water also has requirements to meet service standards for the ESC starting from this time. Aluminium and turbidity are now regulated parameters under the SDWA and have been included in the BWSAs and ESC standards. Aluminium and turbidity are aesthetic rather than health based parameters.

During Quarter Four of 2006/07, Melbourne Water complied with the health parameters of the BWSA.

Detailed information on quarterly compliance against the indicators is given in the following sections.

Bulk Water Supply Agreements and Corporate Compliance Details

Plant Disinfection Reliability – Primary and Secondary Plants

Primary disinfection plants are those that disinfect water from systems open to the environment and contamination, such as major storage reservoirs.

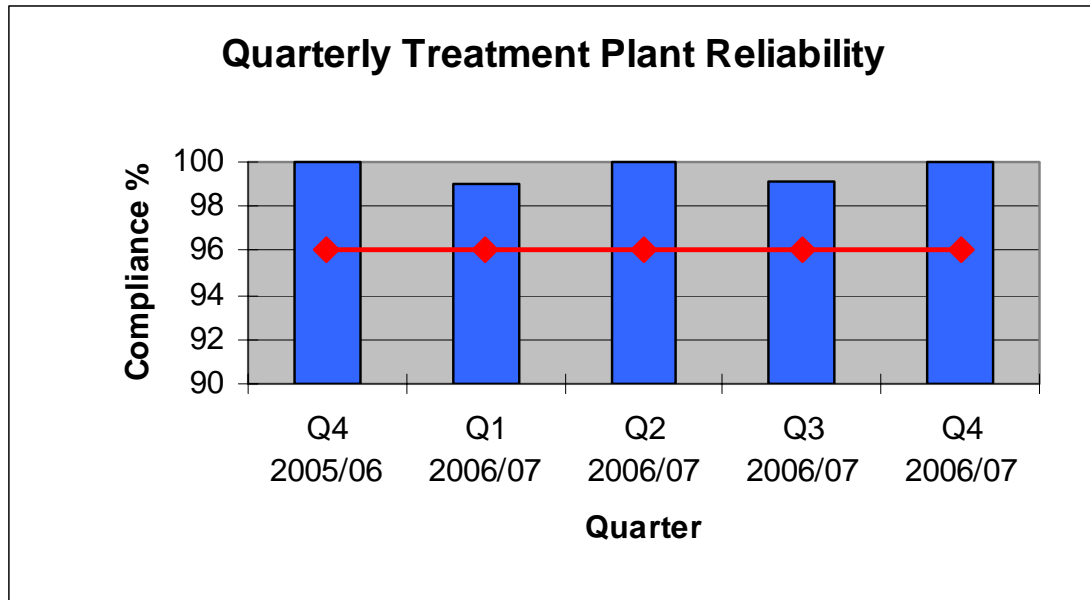
Secondary disinfection plants are those that disinfect after the water has initially been treated by a primary plant. They disinfect within a closed system to control regrowth of bacteria in the pipe network.

There are up to 37 primary and secondary plants included in the performance assessment for reliability compliance. The actual number in operation depends on system configuration during the quarter.

The established reliability measures for primary and secondary chlorination plants in operation are:

- Primary chlorinators meeting the chlorine contact time requirements for 99.9% of available operating time, and
- Secondary chlorinators within their operating range for 95% of available operating time

Melbourne Water has a target for 96% of all plants to meet the reliability measures. The target was met in Quarter Four.

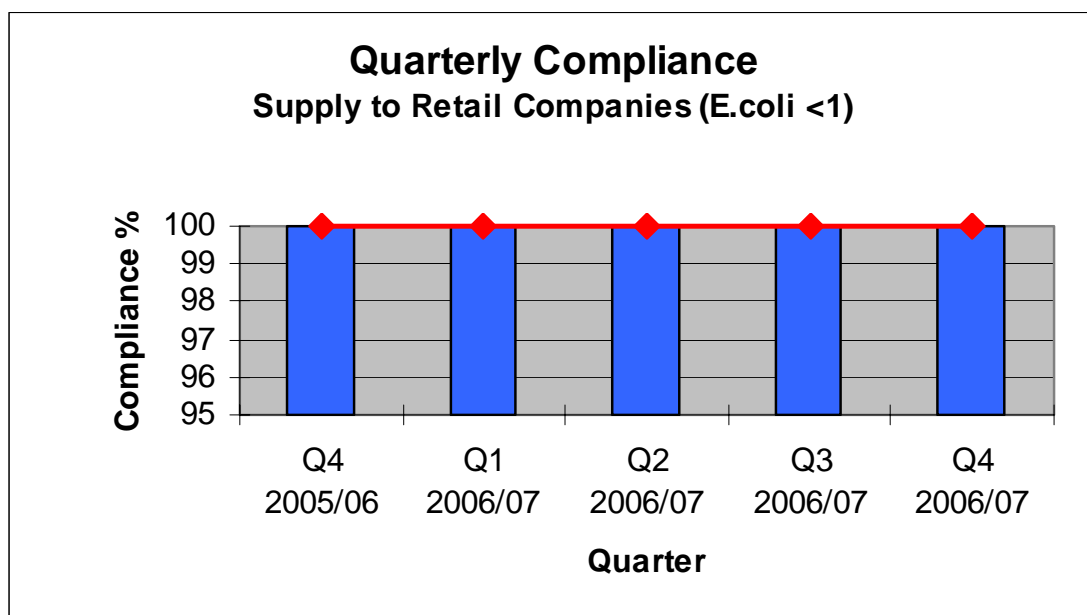


Supply to Retail Companies – E.coli

The overall objective is for no *Escherichia coli* (*E.coli*) to be present in the water supply system. All detections are investigated and appropriate actions are taken. The chart below shows the percentage of samples taken at entry points and water quality monitoring points, which contain less than one *E.coli* bacterium per 100mL.

Entry points to supply are monitoring points immediately downstream of primary disinfection. Water quality monitoring points are other points at storages or water mains within the wholesale transfer system. They are identified in the BWSAs with the retail water businesses.

Melbourne Water's target is for 100% of the samples taken to be free from *E.coli*. It is more stringent than the requirements of the BWSAs that specify a target of 99% for each monitoring point. During Quarter Four this target was met.



Disinfection By-products - Trihalomethanes (THMs) and Haloacetic Acids

Trihalomethanes and the related haloacetic acids are present in drinking water principally as by-products of disinfection using chlorine. Some epidemiological studies have reported associations between the ingestion of chlorinated drinking water with a range of health matters including increased cancer rates.

The new Bulk Water Supply Agreements (BWSAs) with the retail water businesses contain targets for Haloacetic Acids that are those that were expected to be in the final regulations under the *Safe Drinking Water Act 2003* (SDWA). Some minor variations were contained in the final regulations. The targets are consistent with standards in the SDWA regulations, which adopt the health limits of the Australian Drinking Water Guidelines. For Trihalomethanes, the target is more stringent than in the regulations.

Routine sampling at selected sites is carried out to provide adequate data on the quality of water supplied to the retail water businesses. It is currently performed on a quarterly basis. An expanded monitoring program began in Quarter Two of 2004/05 at the time the SDWA came into effect. During Quarter Four of 2006/07 all targets were met.

Performance against Bulk Water Supply Agreement Targets

Parameter	BWSA targets	Q1 2006/07	Q2 2006/07	Q3 2006/07	Q4 2006/07
Chloroacetic Acid	0.15 mg/L				
Dichloroacetic acid	0.10 mg/L				
Trichloroacetic acid	0.10 mg/L				
Total Trihalomethanes	0.15 mg/L				

Target met		Action required & taken		Action required & not taken	
------------	--	-------------------------	--	-----------------------------	--

Other Chemical and Physical Parameters included in Bulk Water Supply Agreements (BWSAs) and reported to the Essential Services Commission (ESC)

The ESC service standards and the revised BWSAs have requirements for aluminium and turbidity, which are aesthetic rather than health based parameters.

The standards set by the BWSAs and ESC have different underlying concepts in that the BWSAs' assessment is on individual rolling average performance achieved at each sample site while the ESC performance measures are assessed on annual aggregates for all sites.

For aluminium, the ESC target is more stringent than in the SDWA regulations, which relate to retail customers' taps. For turbidity, targets are based on achieving or bettering recent historical performance. Performance against the ESC service standards is shown in the table.

During Quarter Four both the target for turbidity and aluminium were met.

Performance against ESC service standards *

Parameter	Q1 2006/07	Q2 2006/07	Q3 2006/07	Q4 2006/07
Aluminium (mg/litre)				
Turbidity (NTU)				

NTU = Nephelometric Turbidity Units

Target met for this quarter		Target not met for this quarter * (see note)	
-----------------------------	--	----------------------------------------------	--

Note: The ESC assesses compliance with these service standards on an annual basis, rather than for quarterly periods as shown above. Quarterly results are therefore an indication of likely annual compliance. However in the case of aluminium a single failure at any time will result in annual non-compliance as the Essential Services Commission (ESC) service standards contain a standard for “Aesthetic standards (aluminium)” of 99.88% of the aggregated number of samples from all monitoring points to comply with the BWSA provisions.

RECREATIONAL WATER ENVIRONMENT

Major Incidents/Initiatives/Issues

Yarra River Priority Project: Faecal Investigations – Ongoing study

This is a *Yarra River Action Plan* three-year investigation that initially targeted 52 sites on the Yarra River system below Warrandyte. Screening investigations allow the identification of likely sources of faecal pollution whereupon more detailed investigations attempt to pinpoint the source, which can then be remediated. It will finish in June 2008.

Surveillance monitoring commenced at the outlets of 21 drains and three creeks in December 2006. Sampling is fortnightly and the dataset is intended to evaluate effectiveness of the program while identifying recurring problem drainage systems. Merri Creek was added in May 2007. Elevated bacterial measurements found during surveillance monitoring at the outlets of two drainage systems have already yielded results with additional faecal sources being located after investigations—in the Harper Street drain and Alexandra Parade drain systems. Working group members have agreed to continue surveillance monitoring beyond June 2007. Results will be formally reviewed in October or November 2007.

During the initial Yarra River Screening Investigation, sampling contractors regularly reported strong hydrocarbon smells when sampling the Richmond Quarry Main Drain at its outlet. These observations led to additional sampling for hydrocarbons and the subsequent involvement of EPA Victoria when gross hydrocarbon contamination of soil was suspected. Much site remediation has occurred and Melbourne Water is collaborating with EPA Victoria on an investigation of remaining hydrocarbon sources, using a novel activated-carbon absorption technique.

Ageing sewer systems appear to represent a definite issue—leading to sewage finding its way into the stormwater system. In Abbotsford, four sewer sections have been re-lined and two or more are scheduled in 2007. In the Hedgeley Dene Main Drain catchment in Glen Iris, 120 metres of sewer have been re-lined.

A Manningham council resident was found to have a septic-tank effluent outlet connected to the drainage system. There is a dedicated council officer allocated to a septic tank management program, however, there are apparently hundreds of these polluting connections (including septic tanks being bypassed in some instances) so contamination will continue for many years and further faecal source investigations in the Templestowe area are pointless. Resources have been shifted elsewhere.

The food-processing industry and restaurant strips have been identified as sources of bacterial contamination. Poor housekeeping practices are chiefly to blame and existing bylaws and legislation may support improved approaches. Local government has a key role to play in this case.

These findings will be taken to the Yarra Coordinating Committee, where advice will be sought on facilitating targeted sewer asset-management programs, options for hastening septic tank management practices in Templestowe and ways of tackling restaurant strips and rubbish and food waste disposal.

Statutory Compliance and Reporting

Melbourne Water has no existing statutory requirements for public health performance in regard to waterways. There are requirements for sewerage in the form of certain conditions that apply to the EPA Victoria (EPAV) licences for the Eastern and Western Treatment Plants. The key health parameter is *Escherichia coli* (*E.coli*), which is defined in Appendix 1.

Bacteriological Conditions of Receiving Waters Required under the EPA Victoria Licence - Eastern Treatment Plant.

Melbourne Water is required to monitor the effect of the treated wastewater discharged from the Eastern Treatment Plant on the bacteriological quality of the receiving waters near the point of discharge at Boags Rocks. Monitoring is carried out each week in the pipeline upstream of the actual discharge and at six designated locations along the foreshore, including Gunnamatta Beach. Licence requirements are for samples to be measured for *E.coli*.

- (a) Statutory Compliance and Reporting – Waste Discharge Sampling Point
The EPAV licence specifies annual median and 90th percentile performance limits of 200 org/100mL and 1000 org/100mL respectively, for *E.coli* at the discharge sampling point. The median and 90th percentile annual limits for 2006/07 were met.

Compliance with specified levels of E.coli

Parameter	Compliance target
<i>E.coli</i> - annual median.	
<i>E.coli</i> - annual 90th percentile	

Compliance on target

Compliance not on target

- (b) Statutory Reporting - Foreshore Locations

The EPAV Licence requires monitoring of the receiving environment in accordance with the Eastern Treatment Plant Environmental Improvement Plan, which is a component of the Licence. The objectives for receiving water quality are defined by the State environment protection policy (Waters of Victoria). The limit for *E.coli* specified in the policy for primary contact recreation is a median of not more than 150 org/100mL. The limits for Enterococci are a median and 75th percentile of 35 org/100mL and 150 org/100mL respectively (Appendix 2). For the fourth quarter of 2006/07, compliance with the State environment protection policy was met.

Reporting of Results in Accordance with Statutory Requirements

Parameter	2006/07			
	Q1	Q2	Q3	Q4
<i>E.coli</i> - median				
Enterococci - median and 75%ile				

Reporting not required
Report required and submitted

Report required but not submitted

Bacteriological Conditions of Receiving Waters Required under the EPA Victoria Licence - Western Treatment Plant.

The EPAV licence for the Western Treatment Plant requires Melbourne Water to manage the effect of the discharge on the bacteriological conditions of the receiving waters of Port Phillip Bay. Long term monitoring has occurred at the actual discharges from the Plant and offshore at two locations, which are accessible from public roads. Samples are taken each week and measured for *E.coli*.

Statutory Compliance and Reporting

Before accreditation in August 2000, the EPAV licence required weekly monitoring for *E.coli* at the four discharge points. This practice has continued as an appropriate means of assessing operating performance. No guidelines or limits have been established and results are only required as part of the annual report to the EPAV in September each year.

Again, before accreditation, the EPAV Licence required monitoring at the two foreshore locations and reporting of results when limits were exceeded. These were a geometric mean of 1000 org/100mL and an 80th percentile of 2000 org/100mL over each 42 day period beginning 1 January of each year. Although this is not a specific requirement of the accredited licence, Melbourne Water continues this monitoring as part of the overall program and to measure performance against the State environment protection policy (Waters of Victoria). For the fourth quarter of 2006/07 both geometric mean and 80th percentile results were below the traditional targets and compliance with the State Environment Protection Policy was met.

Comparison of Results against Traditional Licence Requirements

Parameter	2006/07			
	Q1	Q2	Q3	Q4
<i>E.coli</i> - geometric mean				
<i>E.coli</i> - 80th percentile				

Reporting not required		Report required but not submitted	
Report required and submitted			

Meeting “State Environment Protection Policy” Objectives

As part of Melbourne Water’s long term Waterway Water Quality Monitoring Network, *Escherichia coli* (*E.coli*) is monitored at 73 sites with a more intensive weekly monitoring program in the Yarra and Maribyrnong Rivers (Yarra Watch) all year round and other key recreational sites in the summer.

The following information provides details on the levels of *E.coli* in Melbourne’s waterways using State Environment Protection Policy (SEPP) objectives as long-term targets. An explanation of *E.coli* as an indicator of contamination in relation to swimming is contained in Appendix Two.

A revised State Environment Protection Policy (Waters of Victoria) was issued in June 2003. Objectives are more stringent in an endeavour to improve water quality. New targets applied to the Melbourne Water region, excluding the Yarra and Western Port catchments, where regionally specific SEPPs are in force.

SEPP objectives are established according to the “beneficial uses” associated with a particular waterway. In the case of “primary contact recreation” involving direct contact with the water, there is a possibility that water may be ingested. The general policy objective for “primary contact recreation” is a median *E.coli* of <150 org/100mL, although it remains as a geometric mean of <200 org/100mL in the Yarra and Western Port catchment policies. In waterways where only “secondary contact recreation” occurs, the policy objective is less stringent.

This report uses a rolling twelve months of *E.coli* data and applies geometric means and 50th percentiles (medians) dependant on the particular SEPP for the waterway. Sites have been grouped by SEPP schedule rather than by regionally named catchments. Although comparison is made against SEPP, actual compliance is not assessed. However the use of monthly samples over 12 months gives a good indication of performance against the SEPPs - incorporating a range of seasons and a greater number of samples, similar to other environmental parameters in the SEPPs.

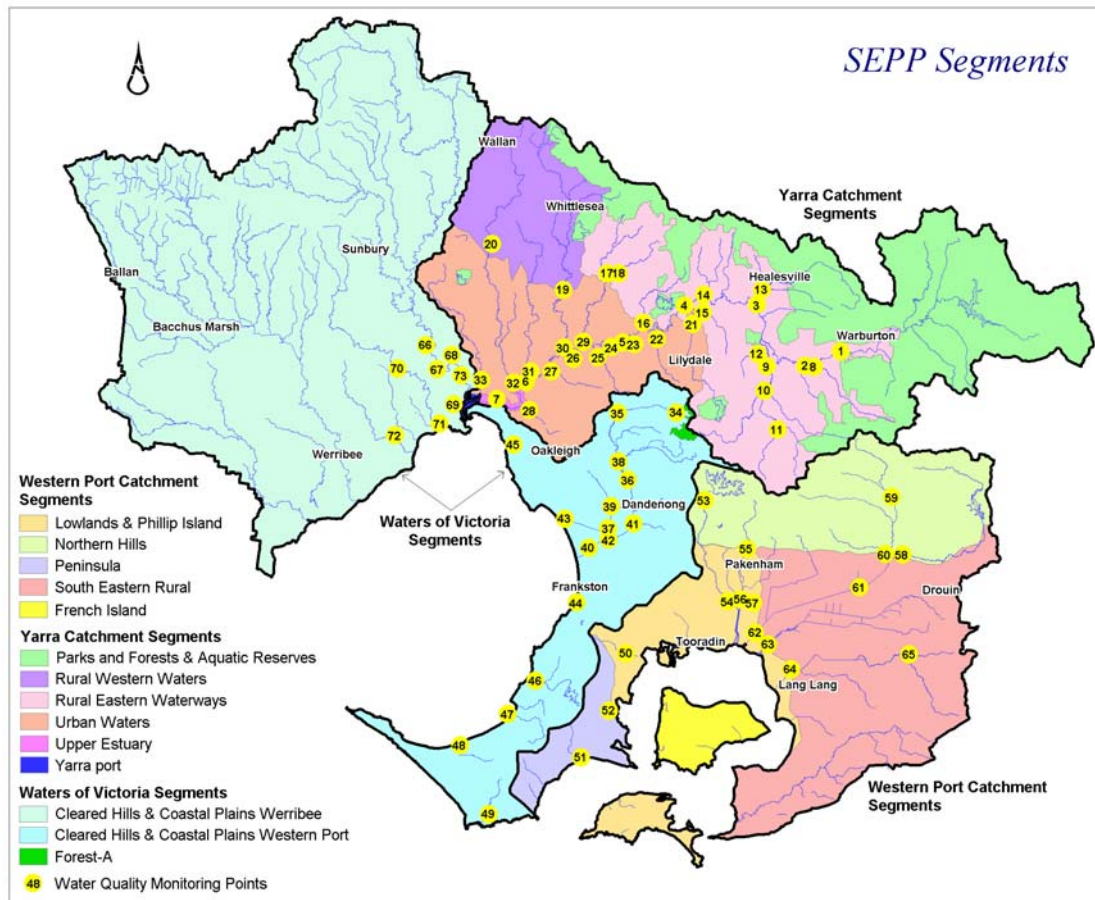
Monitoring regimes needed to assess true compliance, as specified in the SEPPs, would be:

- Waters of Victoria – ‘the median of five samples taken at regular intervals within 30 days’,
- Waters of Western Port and Catchment – ‘a 42 day geometric mean’, and
- Waters of the Yarra Catchment – ‘geometric mean of not less than five samples taken over a period of not more than 42 days’.

With Melbourne Water’s current program, it is only possible to determine true SEPP compliance using the Yarra Watch sites where results are obtained weekly. Yarra Watch results are provided later in this report.

A map of the SEPP segments and sampling points is also shown. An expanded monitoring program to cover the Werribee Cleared Hills and Coastal Plains Segment, now managed by Melbourne Water, is being developed.

Waterway Water Quality - Quarter Four 2006/07



Compliance Performance

Number of sites and performance rating

SEPP Schedule & Segments	No. of Sites	Q1 2006/07	Q2 2006/07	Q3 2006/07	Q4 2006/07
Waters of the Yarra Catchment					
# Rural Eastern Waters	15	7	11	12	11
# Rural Western Waters	2	2	2	2	2
# Upper Estuary	1	0	0	1	0
# Urban Waters	15	1	1	4	2
Waters of Victoria					
# Cleared Hills & Coastal Plains Werribee/ Maribyrnong	8	5	6	6	6
# Cleared Hills & Coastal Plains Western Port	15	5	4	5	6
# Forest-A	1	1	1	1	1
Waters of Western Port & Catchment					
# Lowlands & Phillip Island	7	4	4	4	4
# Northern Hills	5	1	3	3	3
# Peninsula	1	0	0	0	1
# South Eastern Rural	3	0	0	0	0

Yarra Catchment SEPP Objective – *E.coli* Geometric mean 200 org/100mL

Waters of Victoria SEPP Objective – *E.coli* Median 150 org/100mL

Waters of Western Port SEPP Objective – *E.coli* Geometric mean 200 org/100mL

Number of sites passing SEPP	Nil	< Half	= or > Half	All
------------------------------	-----	--------	-------------	-----

Yarra Watch Program

The Yarra Watch Program, which commenced in March 2005, is separate from Melbourne Water's long-term routine monitoring program. Yarra Watch is designed to provide information to the public on the water quality trends in the Yarra. It involves weekly sampling for *E. coli* and Enterococci at 12 Yarra River sites. The program is managed by Melbourne Water with results published on the EPAV website. It covers the Yarra from the Docklands to Millgrove near Warburton.

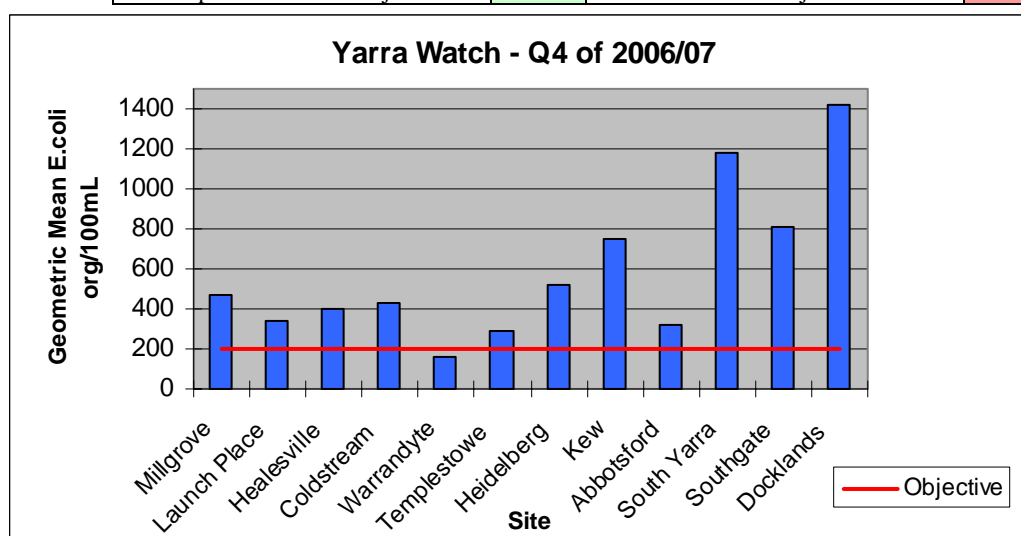
The Yarra Watch results and comparison with equivalent results for 2002 to 2005 are shown below. Docklands, South Yarra and Templestowe sites have only been monitored since March 2005. There was improved water quality in Quarter 1 due to the dry conditions. Even so there were two occasions when EPAV issued stormwater advisory notices for the river following rainfall events. South Yarra continues to be the worst performing site.

Yarra Watch results for 2006/07

(Main source of data: EPA Victoria web site)

River Section	Sampling Site	2006/07			
		Q1	Q2	Q3	Q4
Lower Yarra	Docklands	289	152	673	1419
	Southgate	404	205	307	806
	South Yarra	538	305	506	1183
	Abbotsford	206	152	150	321
Middle Yarra	Kew	498	302	343	753
	Heidelberg	195	281	317	519
	Templestowe	99	144	256	295
	Warrandyte	43	88	187	156
Upper Yarra	Coldstream	251	395	342	428
	Healesville	281	366	448	401
	Launching Place	221	359	359	344
	Millgrove	123	248	327	471

Complies with SEPP objective	Exceeds SEPP objective
------------------------------	------------------------



All figures are *E. coli* calculated as geometric means in org/100mL. Compliance is measured against the SEPP target for primary contact of a geometric mean for *E. coli* of 200 org/100mL. This target applies to all the listed sites. For secondary contact the traditionally accepted target is a geometric mean of 1000 org/100mL.

* New sites established under Yarra Watch Program.

RECYCLED WATER

Major Incidents/Initiatives/Issues.

Recycled Water from Treatment Plants

The cross connection incident at the Eastern Treatment Plant has been addressed in the Drinking Water Issues/Initiatives/Incidents on Page 2 of this report.

WERRIBEE AGRICULTURE

Major Incidents/Initiatives/Issues.

There were no significant health compliance matters during Quarter Four.

Statutory Compliance

Compliance with Livestock Disease Control Act 1994

During the quarter, all cattle sales conducted by Werribee Agriculture complied with S.44 (1) of the *Livestock Disease Control Act 1994*.

APPENDICES

Appendix One: Guide to Terms

Term/Parameter	Unit	Definition
<i>Escherichia coli</i> <i>E.coli</i>	Number of organisms per 100mL	A common bacterium from the intestines of warm-blooded animals including humans. Used as the primary microbial indicator of faecal contamination. For drinking water, performance is assessed by the percentage of samples with <i>E.coli</i> less than 1 organism per 100 mL of water at entry and monitoring points.
Enterococci	Number of organisms per 100mL	A group of bacteria found in the gastrointestinal tract of warm-blooded animals. Recognised as the best microbial indicator for measuring faecal contamination of marine recreational waters. Quality is assessed using the total number of organisms per 100 mL of water at beach sampling points.

Appendix Two: Bacterial indicators

Escherichia coli is used throughout the world as an indicator of faecal contamination as it is associated with the presence of pathogenic bacteria and viruses in water. It is the most reliable indicator organism for detecting any faecal contamination in drinking water supplies.

For recreational waters both *E.coli* and enterococci are used as bacterial indicator organisms. Melbourne Water monitors waterways and receiving waters for the presence of *E.coli* through the Water Quality Monitoring Network and Licence Monitoring programs. Measurement of enterococci provides the best bacterial indicator of faecal contamination of marine recreational waters. EPA Victoria monitors enterococci at Port Phillip Bay beaches as part of the annual Beach Report program. Scientific studies have demonstrated an association between enterococci and the degree of health risk to swimmers. The overall risk of illness from swimming in the Bay is low.

State environment protection policies include acceptable levels of *E.coli* (and enterococci) for swimming. In the event of unacceptable results, EPA Victoria makes a recommendation to local Councils and the general public to avoid swimming in the contaminated area.

A revised State environment protection policy (Waters of Victoria) was issued in June 2003 and EPA Victoria has adopted the water quality guidelines in the "Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000". In these, the primary contact guideline for *E.coli* is for a median of five samples over one month being <150 org/100mL (as against a geometric mean of <200 org/100mL). This change to *E.coli* will have no impact in regard to Melbourne Water's marine

discharges but may impact the long-term attainment of State environment protection policy water quality objectives in waterways.

Bacteriological contamination in Port Phillip Bay is usually confined to beaches near stormwater or stream outlets. Sources of contamination, which enter the Bay through urban streams and stormwater drains, are derived from domestic animals, birds, herbivores, septic tank outflows and sewage spills.

Appendix Three: Melbourne Water's role in blue-green algae management

Melbourne Water conducts algal bloom monitoring of water bodies under its control and has algal bloom response plans in place. The water bodies include water supply reservoirs, sewage treatment lagoons, retarding basins and recreational lakes.

Water bodies are selected for monitoring on the basis of history of incidence, susceptibility to blooms and potential consequences. If a bloom of potentially toxic blue-green algae is discovered in a water body, a number of management actions are considered and implemented by the responsible management group. Toxicity testing can be undertaken, along with aeration of the water body, posting of signs, media releases and increased monitoring.

The Department of Sustainability and Environment (DSE) is the state wide coordinator for addressing blue-green algal blooms within Victoria. A network of eighteen "convening agencies" has been established to provide a sub-coordinating role and a means of managing outbreaks of blue green algae, which occur on a regional scale, i.e. when more than one local water manager is involved.

The convening agencies for the State are drawn from rural water authorities, non-metropolitan urban water authorities, Melbourne Water and DSE regions. Melbourne Water, through the Infrastructure Group, is the convening agency for the metropolitan area (Bunyip, Yarra and part of the Maribyrnong catchments).

The role of the convening agency is to compile a regional coordination plan and arrange for the establishment of a response group to manage the bloom. In the event of a bloom, the DSE, Department of Human Services and the relevant convening agency are informed in writing by the authority responsible for the waterway or water body in question.