



**Melbourne
Water**

Environmental Compliance

Quarterly Report

Quarter Two 2007/2008
(October, November, December)

Incidents, Initiatives and Issues

Incidents

This item formally reports outcomes from the Magistrates Court hearing regarding charges of water pollution related to spills from the Winneke Treatment Plant and Cardinia Fluoridation Plant. In light of Melbourne Water's good environmental management record, no conviction was recorded, however Melbourne Water was ordered to pay \$ 150 000 to two community environmental projects – the Westernport Seagrass and Mangrove Project and the City of Whittlesea Growling Grass Frog Project and to pay EPA Victoria's costs.

The Court recognised Melbourne Water's actions to remedy both incidents quickly and the efforts to prevent incidents like this occurring in the future. EPA Victoria also commented that the form and rigour of the environmental audits conducted at all sites where chemicals are stored were considered to be "world's best practice".

Initiatives and Issues

Qualification of the Yarra River and Thomson River Environmental Entitlements

Environmental flow allocations in the Yarra and Thomson Rivers have been further reduced by a recent temporary qualification of rights issued by the Minister for Water.

The temporary qualifications of environmental flows in the Yarra and Thomson Rivers have been granted by the Minister in response to the Water Cabinet Committee's decision to reduce environmental flows by an additional 10,000 ML in each of these river systems. The qualification aims to reduce the risk of Melbourne entering Stage 4 water restrictions in the period before the desalination plant is commissioned.

Yarra River Qualification

The Yarra River qualification was declared on 23 October 2007 and involves the reduction in passing flow requirements at Millgrove, Yering Gorge and Chandler Highway to achieve an additional 10 GL of water savings on average over a year. This qualification supersedes the earlier temporary qualification issued by the Minister on 16 April 2007.

The current qualification refers to two Phases of environmental flow reduction:

Phase 1 achieves estimated water savings of 37,000 ML on average per year and includes the deferral of the annual allocation of 17,000 ML for environmental freshening flows, as well as savings through further reduced environmental minimum flow requirements. The minimum flow rules for Phase 1 replace those outlined in the State environmental protection policy schedule for the Yarra River.

Phase 1 environmental flows will apply until the earlier of the following events:

- When construction of Melbourne's new desalination plant is complete
- When Melbourne is no longer subject to restrictions more severe than Stage 2

Phase 2 achieves estimated water savings of 27,000 ML on average per year including the deferral of the annual allocation of the 17,000 ML for freshening flows. Phase 2 maintains the environmental flow rules outlined in the SEPP Schedule F7 and drought operating rules as agreed to by the EPA Victoria.

Phase 2 will apply once Phase 1 is no longer in force until Melbourne is no longer subject to restrictions more severe than Stage 1.

Thomson River Qualification

The Thomson River qualification was declared on 20 December 2007 and represents a further qualification of the Thomson River environmental bulk entitlement which was first qualified on 29 March 2007.

The first qualification in March 2007 altered the operational tolerance of releases from Thomson Reservoir to enable water savings of up to 4,000 ML/year for the Melbourne Water Supply System. This qualification is to remain in place until Melbourne is no longer subject to restrictions more severe than Stage 1.

The second qualification in December 2007:

- Transfers 10,000 ML from the environment's current share of water held in Thomson Reservoir (15,874 ML) to Melbourne's share of water held in Thomson (as of 1 January 2008);
- Reduces the annual environmental allocation of 10,000 ML, which accumulates from 1 July each year, to 2,000 ML to be held in storage for the environment. This water cannot be accessed until the expiry of the qualification
- Changes the passing flow requirements on the Thomson River during the months of May to November (the non-irrigation period) to closer reflect the Thomson Environmental Flow Task Force Recommendations for minimum environmental flows, reducing the flow requirements in some months and increasing the requirements in others.

Operation according to the Task Force recommended minimum flows will result in a net reduction in environmental releases from storage to meet minimum flow requirements. These water savings will accumulate in the environment's share of the storage and will be released as freshening flows to reduce the impact of the qualification on river health.

The Thomson River December Qualification will remain in place until the earlier of:

- When Melbourne is no longer subject to restrictions more severe than Stage 2; or
- When construction of Melbourne's new desalination plant is complete.

20 Year River Health 'Vision' templates

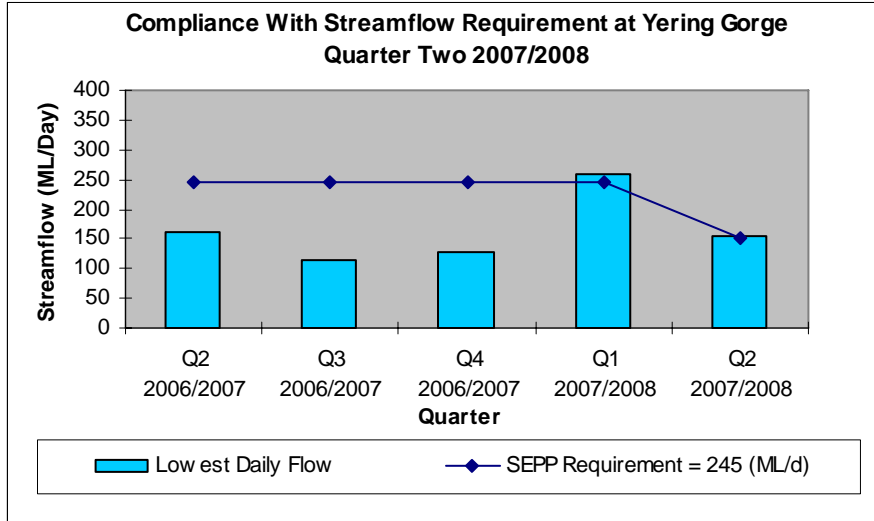
A draft report was received on the methodology to develop 20-year vision templates for all waterways in the Port Phillip & Westernport Region. This will help gain a consistent vision across Melbourne Water, and allow external parties clear access to this vision. This project includes written descriptions, cross-sections, landscape drawings and photographs to illustrate the vision for a particular waterway in 20 years time.

Factors included are the geomorphology, vegetation, fauna, water quality, flow, riparian width and recreation values of the waterway. The template will be in a web-based format to allow anyone to click on a point in a waterway and gain access to the waterway information.

Next steps are to address some of the issues brought up by this study, gather data, and develop the web based tool. A draft timeframe has been set of July 2008 for completion of a full set of templates.

Statutory Compliance

State Environment Protection Policy Requirement for Passing Flow in the Yarra River



Melbourne Water is required to comply with the environmental flow rules specified in the Yarra River Environmental Entitlement and the subsequent qualifications described in Incidents and Issues. These supersede the interim requirement specified in Schedule F7 (Waters of the Yarra Catchment) of the Waters of Victoria State environment protection policy for a flow of no less than 245 ML/day in the Yarra River downstream of the Yering Gorge diversion.

Yarra River monitoring by Melbourne Water has shown that when flows fall below 150 ML/day environmental conditions deteriorate due to low dissolved oxygen levels in the river. This has been taken into account in the Yarra River Environmental Entitlement and Melbourne Water is required to make releases according to the following table.

During this quarter, the minimum flow at Yering Gorge was 154 ML/day and Melbourne Water met the requirements of the Yarra Drought Response Plan.

The Phase 1 qualification will cease after the earlier of either construction of the deslaminisation plant or the removal of Stage 3 restrictions and the Phase 2 qualification will cease after the removal of Stage 2 restrictions.

Yarra River Environmental Entitlement: Passing Flow Requirements

The Yarra River Environmental Entitlement and the subsequent qualifications that relate to this entitlement supersede the SEPP requirements for passing flows in the Yarra River. The new passing flow requirements at key sites along the Yarra River are noted below and are consistent with the *Temporary Qualification of Rights in the Melbourne Water Supply System – Yarra October 2007*

Melbourne Water did not begin operating to the new Phase 1 qualification until 14 November 2007. Therefore compliance is to be measured against the first qualification passing flows, which are equivalent to the SEPP Guidelines. The following table stipulates the passing flow compliance requirements for the Yarra over this period. Quarter three reporting will be according to Phase 1 requirements.

Waterway	Environmental Passing Flow Requirement	
	Phase 1 (14/11/2007 – 31/12/2007)	Phase 2 (1/10/2007 – 13/11/2007)
Armstrong Creek West	The lesser of 5ML/day and the natural flow	Same as phase 1 (subject to Millgrove rule)
Armstrong Creek East	No flow requirement	Same as phase 1 (subject to Millgrove rule)
McMahons Creek	The lesser of 2ML/day and the natural flow	Same as phase 1 (subject to Millgrove rule)
Micks Creek	No flow requirement	Same as phase 1 (subject to Millgrove rule)
Starvation Creek	The lesser of 2ML/day and the natural flow	Same as phase 1 (subject to Millgrove rule)
Big Flume Creek	No flow requirement	Same as phase 1 (subject to Millgrove rule)
O'Shannassy River below the reservoir	4ML/day	Same as Phase 1
Cement Creek East	The lesser of 3ML/day and the natural flow	Same as Phase 1
Cement Creek West	The lesser of 3ML/day and the natural flow	Same as Phase 1
Cardinia Creek below the reservoir	5ML/day	Same as Phase 1
Coranderrk Creek	The lesser of 3ML/day and the natural flow	Same as Phase 1
Graceburn Creek	The lesser of 3ML/day and the natural flow, reduced to 1ML/day if required to maintain Healesville supply.	Same as Phase 1
Watts River below the Maroondah Reservoir	1ML/day	Same as Phase 1
Donnelly Creek below the weir	The lesser of 1ML/day and the natural flow	Same as Phase 1
Olinda Creek below Silvan Reservoir	2ML/day	Same as Phase 1
Plenty River East Branch below Toorourrong Reservoir	The lesser of 0.2ML/day and the natural flow	Same as Phase 1
Yarra River at Doctors Creek Gauging Station	10ML/day	Same as Phase 1
Yarra River at Millgrove Gauging Station	No flow requirement	(a) Reduce harvesting water from Armstrong, McMahons, Micks, Starvation and Big Flume weirs to maintain the flow at the Millgrove Gauging Station

		<p>between 73ML/day and 98ML/day.</p> <p>(b) Cease harvesting water from Armstrong, McMahons, Micks, Starvation, Big Flume weirs if the flow at Millgrove Gauging Station is less than 73ML/day.</p>
Yarra River at Yarra Grange Gauging Station	No Flow Requirement	Same as Phase 1.
Yarra River at Yarra Glen Gauging Station	<p>If at least one of the following trigger events did not occur during the previous calendar years and flows greater than the triggers below are observed at Yarra Glen, harvest only that which is in excess of:</p> <p>(a) 1,500ML/day in April and May; and</p> <p>(b) 2,000ML/day from June to September</p> <p>Over one 7 day period when each of the above flows occurs for the first time in this calendar year.</p>	No flow requirement. ¹
Yarra River at Yering Pumps Gauging Station	<p>(a) Cease harvesting water at Yering Gorge pump station when the flow at Yering pumps gauging station is equal to or less than 200ML/day.</p> <p>(b) Subject to paragraph (c), meet a minimum environmental flow of 150ML/day</p> <p>(c) In order to meet the flow in paragraph (b) and subject to paragraph (d), release a total flow from the Yarra headworks system of up to 50% of the sum of the natural inflows to Upper Yarra and O'Shannassy reservoirs with a maximum of 80ML/day</p> <p>(d) The Environment Minister may instruct the Storage Operator to withhold part of the release required under paragraph (c) and release it later within that same calendar month in a pattern and at a rate determined by the Environment Minister.</p> <p>(e) All water accumulated through the application of paragraph (d) must be released to the river before the beginning of the next calendar month.</p>	<p>(a) Cease harvesting water at Yering Gorge pump station when the flow at the Yering pumps gauging station is equal to or less than 245ML/day.</p> <p>(b) Subject to paragraph (c), meet a minimum environmental flow of 150ML/day</p> <p>(c) In order to meet the flow in paragraph (b) and subject to paragraph (d), release a total flow from the Yarra headworks system of up to the lesser of 80ML/day and the sum of natural inflows to Upper Yarra and O'Shannassy Reservoirs.</p> <p>(d) The Environment Minister may instruct the Storage Operator to withhold a part of the release required under paragraph (c) and release it later within that same calendar month in a pattern and at a rate determined by the Environment Minister.</p> <p>(e) All water accumulated through the application of paragraph (d) water must be released to the river before the beginning of the next calendar month.</p>
Yarra River at Chandler Highway Gauging Station	If the flow at Chandler Highway Gauging Station is less than 150ML/day, cease harvesting water at Yering Gorge pump station.	No Flow Requirement ²

Sewerage System Summary of Statutory Compliance by Facility

Summary of Compliance by Facility Quarter Two 2007/2008

Facility	Compliance * of Samples O2 (%)	Non-Sample Compliance**	Sewage Spills***	Odour Complaints
Eastern Treatment Plant			0	2
Western Treatment Plant			0	0
Wastewater Transfer	N/A	N/A	5	1
Total	N/A	N/A	5	3

	Compliance achieved for all parameters
	Compliance not achieved for one or more parameters.

* Compliance of samples details the compliance status for maximum/minimum/range or annual discharge parameters as indicated by the quarter's results.

**Non sample compliance covers licence breaches for issues other than discharge parameter limits
Details on compliance breaches appear in following sections.

***Sewage spills include all spill types (operational failures, compliant and non-compliant less than 1:5 rainfall event spills and greater than 1:5 rainfall event spills)

Sewerage System Statutory Compliance Detail

Compliance of Samples – 2nd Quarter 2007/2008

The following table shows compliance of Melbourne Water's wastewater treatment plants with parameters in EPA Victoria licences where limits are expressed as a maximum, minimum or a range.

Treatment Plant Compliance with EPA Victoria Licences by Parameter *
Quarter Two 2007/2008

SITE	Amm	Surf	Metals	PH	D.O.	Flow	TRC	Other#
	Max	Max	Max	Range	Min.	Max	Max	
WTP all outlets								
ETP								
Air Emissions								

	Compliance achieved
	Compliance not achieved** - See following sections for details
	Not applicable

* See Appendix One for a guide to the above parameters and Appendix Five for the location map of Western Treatment Plant Outlets.

Parameters that are less significant and rarely fail to meet the required standard.

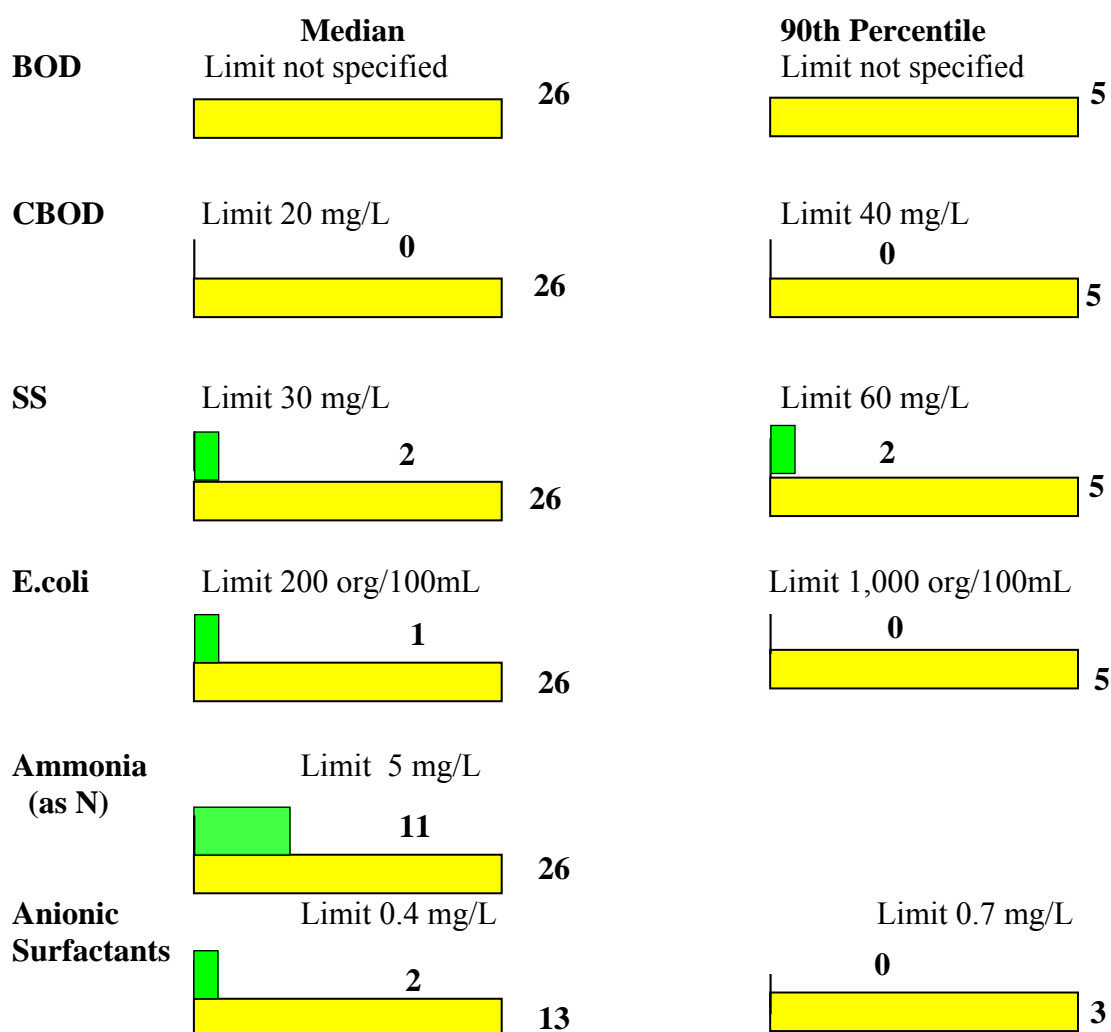
** EPA Victoria is given an explanation for each non-compliance

Eastern Treatment Plant

Annual Parameters

The following details Eastern Treatment Plant's performance for critical parameters. Performance with respect to other parameters is reported here only if the results exceed licence limits, in which case explanatory information is contained in the following section.

NOTE: The plant has been granted a waiver for BOD compliance by EPA Victoria on the understanding that CBOD is also monitored and CBOD limits are complied with.



	Number of sample results to date greater than the Licence Limit – exceeds the total allowance for the year (licence breach).
	Number of sample results to date greater than the Licence Limit – exceeds the allowance for the year to date.
	Number of sample results to date greater than the Licence Limit – within the allowance for the year to date.
	Number of sample results during the year allowed to exceed the Licence Limit.

General Licence Requirements

No issues.

Groundwater Monitoring

Routine groundwater sampling was completed on 27 and 28 November 2008. The report from this has not yet been received.

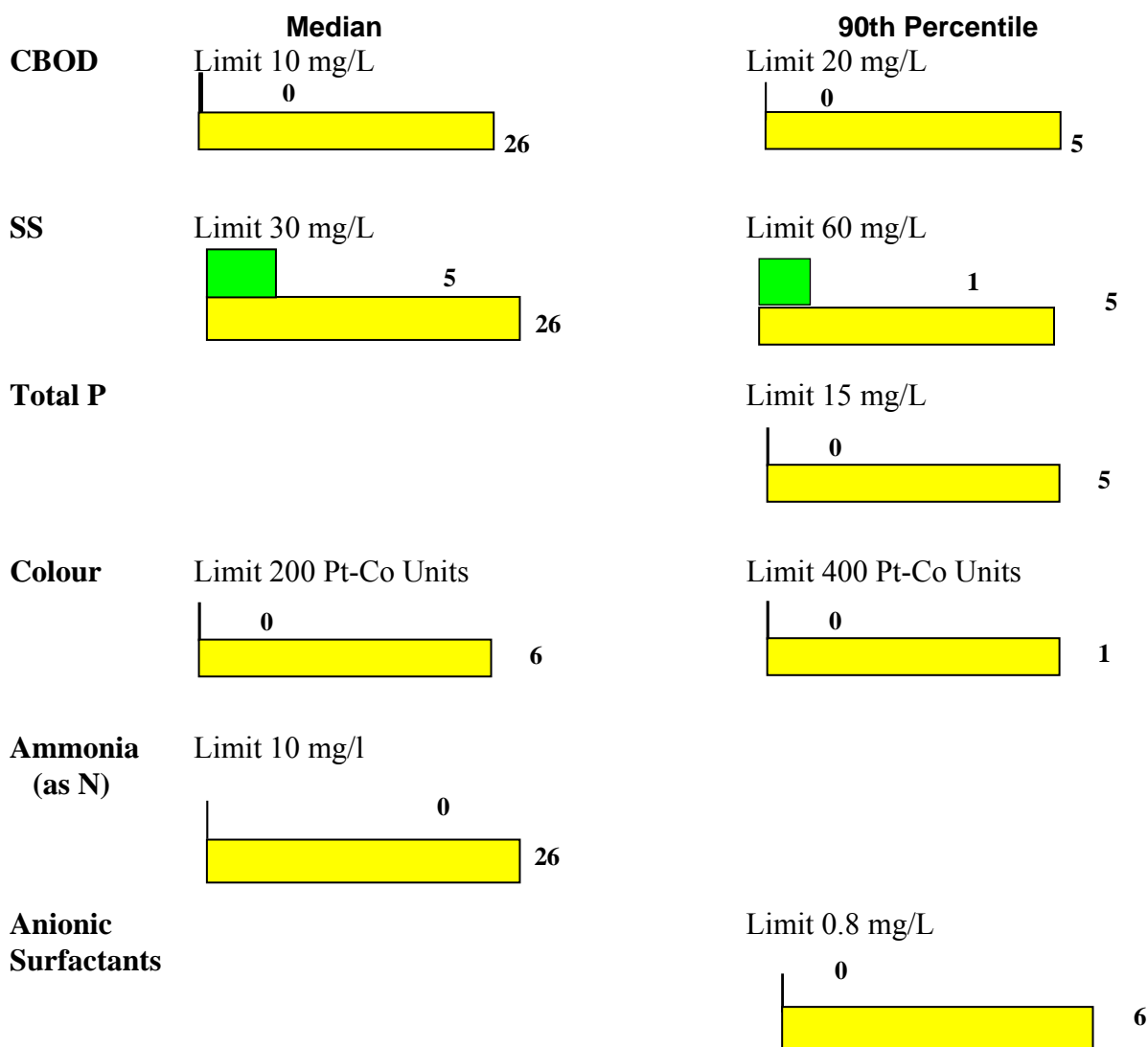
Details of Licence Non-Compliance/Parameter Exceedances

None to report.

Western Treatment Plant

The following details Western Treatment Plant's performance for critical parameters. Performance with respect to other parameters is reported here only if the results exceed licence limits.

Annual Parameters - flow weighted average of all four licensed outlets



	Number of sample results to date greater than the Licence Limit – exceeds the total allowance for the year (licence breach).
	Number of sample results to date greater than the Licence Limit – exceeds the allowance for the year to date.
	Number of sample results to date greater than the Licence Limit – within the allowance for the year to date.
	Number of sample results during the year allowed to exceed the Licence Limit.

General Licence Requirements

No issues.

Groundwater Monitoring

A report was received during the quarter on the hydraulic characteristics of aquifers below the Plant. The report showed that groundwater generally flowed north to south in the Werribee formation aquifer into Port Phillip Bay with some local flow into the Werribee River. Groundwater generally flowed from north-west to south-east in the newer volcanic aquifer, also into Port Phillip Bay. There was little variation in the levels in these two aquifers.

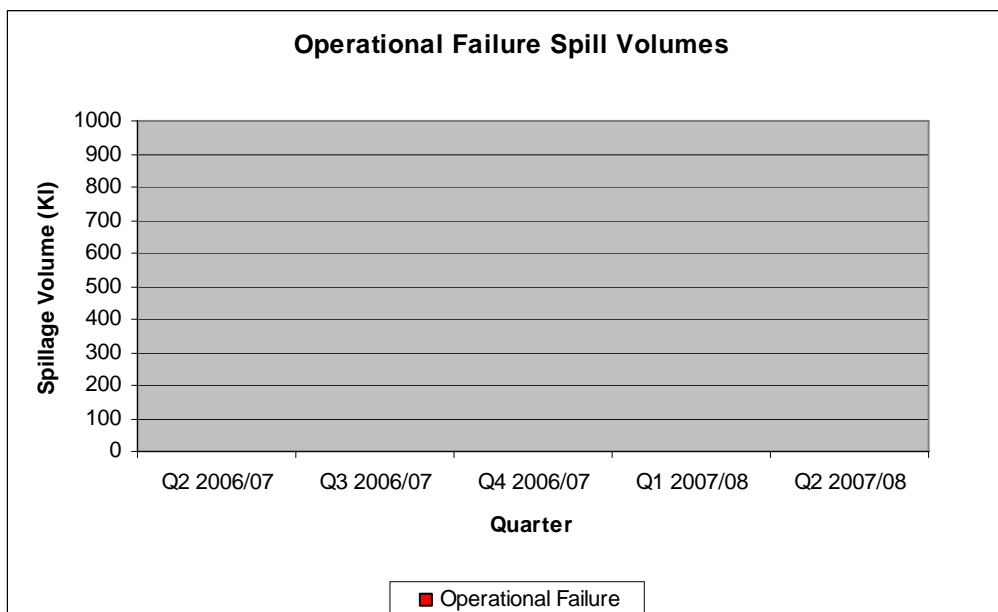
Details of Licence Non-Compliance/Parameter Exceedances

None to report.

Sewage Spills Summary

Number of Spills	Q2 2006/07	Q3 2006/07	Q4 2006/07	Q1 2007/08	Q2 2007/08
Number of Spills	0	0	0	0	5
Operational failure	0	0	0	0	0
<1:5 compliant	0	0	0	0	5
<1:5 non-compliant	0	0	0	0	0
>1:5	0	0	0	0	0
Significance*	Q2 2006/07	Q3 2006/07	Q4 2006/07	Q1 2007/08	Q2 2007/08
Minor (Rating 1 - 3)	0	0	0	0	4
Significant (Rating 4 – 5)	0	0	0	0	1
Not Rated	0	0	0	0	0
EPA Victoria Reporting Protocol Met	Yes	Yes	Yes	Yes	Yes

*Melbourne Water reports spills according to the Melbourne Water-EPA Victoria spill reporting protocol that is contained in Appendix Three. The rating assigned to a spill is determined by applying the potential impact rating to the incident (refer to Appendix Two). If a spill is contained on site with no damage to the environment it will be reported in this report but not included in spills publicly reported.



Spills Due to Operational Failures

There were no spills due to operational failure during the quarter.

The above graph indicates the volume of sewage spilt due to equipment breakdown or human error.

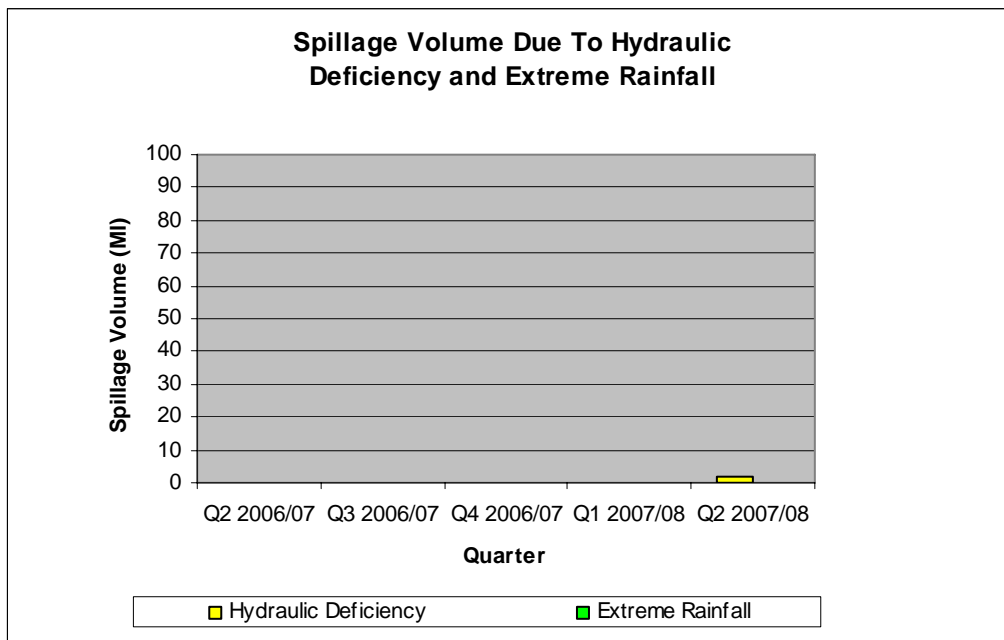
Eastern Treatment Plant

There were no spills at Eastern Treatment Plant during the quarter.

Western Treatment Plant

There were no spills at Western Treatment Plant during the quarter.

Spills Due to Rainfall Events Greater than 1:5 Year Return Frequency (Extreme Rainfall) and Hydraulic Deficiency



Hydraulic Deficiency - Spills due to insufficient pipe/pump capacity

Extreme Rainfall - Spills due to rainfall events greater than 1: 5 year return frequency

There were five spills due to hydraulic deficiency during the quarter.

ERS Overflows

3 December rainfall event

Heavy rainfall was experienced on 3 December 2007 across parts of metropolitan Melbourne and the resultant spill into Moonee Ponds Creek was classified due to hydraulic deficiency as compliant.

The event resulted in the hydraulic overload of the sewerage system in the Moonee Ponds catchment. Despite optimal operation of the system one ERS site located on the Pascoe Vale Main Sewer spilled less than 0.001 ML of highly diluted sewage into the Moonee Ponds Creek.

20 to 22 December rainfall event

Heavy rainfall was experienced on 20, 21 and 22 December 2007 across parts of metropolitan Melbourne and the resultant four spills into Moonee Ponds and Merri Creeks were classified due to hydraulic deficiency as compliant.

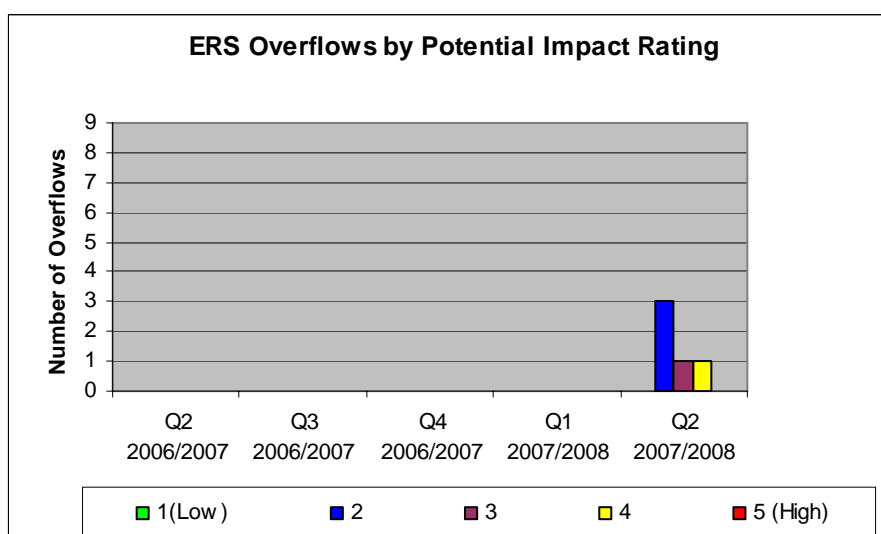
During this event there were three spills resulting from hydraulic overload of the sewerage system in the Moonee Ponds catchment. Despite optimal operation of the system one ERS site located on the Pascoe Vale Main Sewer spilled less than 0.001 ML, approximately 1.17 ML and approximately 0.216 ML of highly diluted sewage into the Moonee Ponds Creek on each respective day.

During this event there was one spill resulting from the hydraulic overload of the sewerage system in the Merri Creek catchment on 21 December 2007. Despite optimal operation of the system one ERS site located on the Merri Creek Main Sewer spilled approximately 0.179 ML of highly diluted sewage into the Moonee Ponds Creek.

Follow up inspections of spill sites was undertaken to ensure that surrounding areas were clean of debris and that the flap gates on the ERS had reseated correctly. EPA Victoria reporting requirements were met for all of these spills.

The Northern Suburbs Sewerage Strategy has commenced and this will eliminate sewerage spills in these areas and provide for long term growth once completed.

ERS Overflows

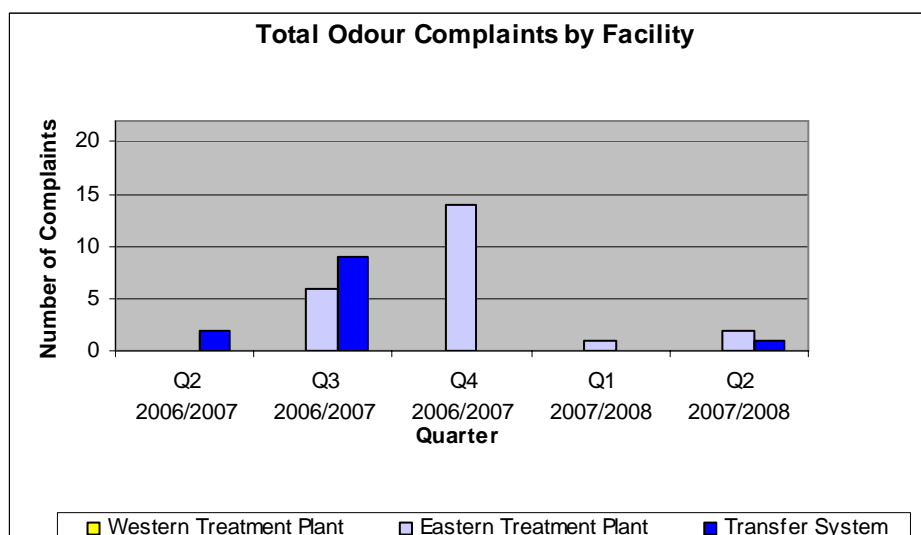


Odour Complaints

EPA Victoria regulates odour and this requires Melbourne Water to have no offensive odour attributable to its activities. New facilities have to be designed to meet this requirement and existing facilities with odour have to establish improvement programs to achieve this in agreement with EPA Victoria. Melbourne Water has an odour management strategy to ensure that treatment plant and transfer system odour performance meets regulatory requirements. This strategy has been developed with EPA Victoria agreement. This includes targeted actions for Eastern and Western Treatment Plants and the Transfer System.

Odour performance from facilities is measured through odour complaints attributable to the facility. EPA Victoria will consider an odour complaint a discharge licence breach if it is attributable to Melbourne Water and if either the relevant improvement program is not being implemented or the program is considered unsatisfactory. Odour complaints from facilities without a discharge licence could result in a requirement to develop and implement a neighbourhood improvement plan. Should odour become a significant local issue EPA Victoria could strengthen this approach and require a review of improvement strategies or issue sanctions such as penalty infringement notices.

None of the odour complaints described below are considered to be licence breaches by EPA Victoria at this time.



Eastern Treatment Plant

There were two odour complaints received during the quarter. Details are as follows:

On 15 November 2007 the manager from the CFA Training Ground (located on Thompson Rd directly adjacent to the Southern Sludge Drying Pans) reported an odour in the training grounds. Melbourne Water staff visited the site and were able to detect odour. Six of the sludge drying pans had been turned over as part of the sludge drying operations for the day in that area. The sludge drying pans have been identified as a source of odour from site. The turning of the sludge drying pans is slightly more odorous than the harvesting procedure. In terms of odour emission rates it is still less than a duty pan and pans with supernatant. The wind track to the time of the complaint passed close to the edge of the Southern Sludge Drying Pans on Thompson road. To reduce the impact of odour from sludge drying operations, harvesting activities will be reduced in the area of these drying pans when there is a low to moderate South Westerly wind in the area.

On 29 November 2007 a member of the public reported an odour detectable at the South East Outfall at Boags Rocks. The complainant registered their complaint with EPA Victoria at 3.00pm on the day. The log sheet from the daily beach walk on the day reported no abnormal issues with a faint treated effluent odour detectable at Boags Rocks and 200m from the outfall at St Andrews Beach and slight water turbidity at the outfall. An investigation of operational and process records for the day showed that the plant was operating normally and all discharged flow was chlorinated. The onshore wind conditions at the time of the complaint contributed to the odour being detected.

Western Treatment Plant

There were no odour complaints received during the quarter.

Transfer System

There was one odour complaint received during the quarter. Details are as follows:

On 30 December 2007 a member of the public reported an odour in the vicinity of Manhole 12 on the Upper Moonee Ponds Sewer, Oak Park. Melbourne Water contractor Thiess visited the site and found that the manhole cover had cracked and was emitting odour. The cover was replaced and the odour ceased. A follow-up inspection several days later however found the new cover had also cracked and it appeared that recent works in the area has disturbed the ground around the manhole. Melbourne Water is following up with council to rectify the problem.

Corporate Compliance

Melbourne Water Passing Flow Compliance in Rivers and Streams

The qualifications on environmental entitlements for the Thomson and Yarra Rivers remain in place until level 2 restrictions are lifted.

The table below outlines compliance with passing flow requirements at various sites. Some of these passing flows may vary due to the Yarra bulk entitlement conversion process.

Melbourne Water Passing Flow Compliance Quarter Two 2007/2008

Site	Passing Flow (ML/d)	Actual Min. Flow (ML/d)	Compliance	Comments New Environmental Release 2007 (Phase 1)
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RESERVOIRS:

Cardinia Res. to Cardinia Ck	5	5	√	The lesser of 5 ML/d and the Natural flow
Maroondah Res. to Watts R.	1	1	√	Operating rule - 1 ML/d released via ungauged outlet pipe
O'Shannassy Res. To O'Shannassy R.	4	4	√	Operating rule - 4 ML/d released via ungauged outlet pipe
Silvan Res. to Olinda Ck	2	2	√	Operating rule - 2 ML/d released via "V" notch, outlet pond.
Tarago Res to Tarago R At Scalp Ck	5	10	√	MWC agreement with former SR&WSC
Thomson Res. To Thomson R: • Below Dam • At Narrows • At Coopers Ck	25 80 225	67 75* 214**	√ √ √	Melbourne Water Bulk Entitlement provision for Thomson Reservoir.
Toorourrong Res. to Plenty R.	0.2	0.2	√	MWC operating rule - 0.2 ML/d released for stock
Upper Yarra Res. to Yarra R: • Upper Yarra Dam • At Yering Gorge Pump Stn • At Chandler Highway	10 200/150 150	10 154 184	√ √ √	- At Doctors Ck. Gauging Station -Cease harvesting when flow <= 200ML/d./ or minimum Env .Flow =150 ML/d when not pumping. - When flow less than 150 MLD, cease harvesting at Yering Gorge.

WEIRS[†]:

Armstrong Ck Weir	5	5	√	MWC operating rule
Coranderrk Ck Weir	3	3	√	MWC operating rule – via ungauged outlet pipe
Donnelly Ck Weir	1	1	√	MWC operating rule– via ungauged outlet pipe
Graceburn Ck Weir	3	3	√	The lesser of 3 ML/day and the natural flow reduced to 1 ML/d if required to maintain Healesville supply.
McMahons Ck Weir	2	2	√	MWC operating rule
Silver Ck Weir	1	0***	√	Bulk Entitlement provision - 1 ML/d is released when streamflow is

				4 ML/d or greater
Starvation Ck Weir	2	2	√	MWC operating rule
Wallaby Ck Weir	1	0****	√	Bulk Entitlement provision - 1 ML/d is released when streamflow is 2 ML/d or greater

*At Narrows, the 7 day rolling average was above operating tolerances for December

**The 7 day rolling average was below operating tolerances on the 21/10/2007 and 22/10/2007.

*** Silver Creek Weir stream flow was less than 4 ML/d during this period. (Bulk Entitlement provision - 1 ML/d is released when stream flow is 4ML/d or greater).

**** Wallaby Creek Weir compensation dictated by stream flow which is low due to drought conditions.

Thomson River Coopers Ck non compliance

During October 2007 a non-compliance with the minimum environmental flows for the Thomson River at Coopers Creek was recorded.

The 7-day total flow operational tolerance requirement was not met on two days:

- On 21st October the total 7-day volume shortfall was 16 ML, averaging a daily shortfall of 2.3 ML over the 7-day period
- On 22nd October the total 7-day volume shortfall was 5 ML, averaging a daily shortfall of 0.7 ML over the 7-day period.

The non-compliance resulted from the difficulty associated with estimating the release requirement to maintain the minimum flows at the Coopers Creek gauging station.

Estimation of the release requirement relies on a number of factors including:

- Catchment inflows that may contribute to the achievement of the minimum flow requirements
- Losses that may occur during the transfer of water from the dam to the compliance locations
- Time taken for the water that is released from storage to reach the compliance locations (which can be up to 18 hours).

All contribute to the difficulty associated with estimating accurately the release volume required to meet the minimum flows while minimising over releases; particularly during the continuing drought conditions.

The operators use their best endeavours to minimise over-releases of environmental flows while ensuring compliance within the tolerance specifications for environmental flow releases.

Maribyrnong River Bulk Entitlement

Melbourne Water is required to manage its share of releases from Rosslynne Reservoir and water extractions from the Maribyrnong River to ensure that, as a result of diversion activities, passing flows in the river at Keilor do not fall below requirements specified in the Maribyrnong Bulk Entitlement Orders - 5 ML/day or the natural flow, whichever is the lesser. Natural flow is based on flow at Deep Creek at the Bulla gauging station.

Days when flow at Keilor was below that required		0
	Compliance achieved	
	Compliance non achieved	

Trade Waste Agreements

Changes made to the Reporting of Non-Compliant Discharges

In the past Retail Water Companies only reported the number of non-compliant discharges which was then used for Melbourne Water reporting purposes. This did not distinguish between low and high risk discharges. Changes have now been made to Retail Water Company reporting methods which report the level of risk in relation to the non-compliances.

Under the new reporting arrangements Retail Water Companies provide information on non-compliant discharge occurrences to Melbourne Water every month, including a summary on the risk to Melbourne Water. This risk assessment includes an evaluation of the impact that each non-compliant discharge is likely to have on occupational health & safety, assets, treatment plant processes, environment, recycled water, biosolids quality and biogas.

Trade Waste Reporting Results for Quarter 2 2007/2008 Financial Year

Melbourne Water's key performance indicator for trade waste is as follows:

- Zero high risk non-compliant trade waste discharges to Melbourne Water's sewer system.

The following table shows the number of non-compliant discharges for each Retail Water Company for each risk level.

	CWW	YVW	SEW
October			
Insignificant	55	36	22
Moderate	0	0	0
High	0	0	0
November			
Insignificant	55	34	19
Moderate	0	0	0
High	0	0	0
December			
Insignificant	59	21	24
Moderate	0	0	0
High	0	0	0
Total	169	91	65

Table 1 - Risk level of non-compliant discharges as reported by RWC's

The table above includes non-compliant discharges that were both resolved and unresolved during each month.

The graph below summarises the number of non-compliant discharges at each risk level for the previous quarter, for all Retail Water Companies.

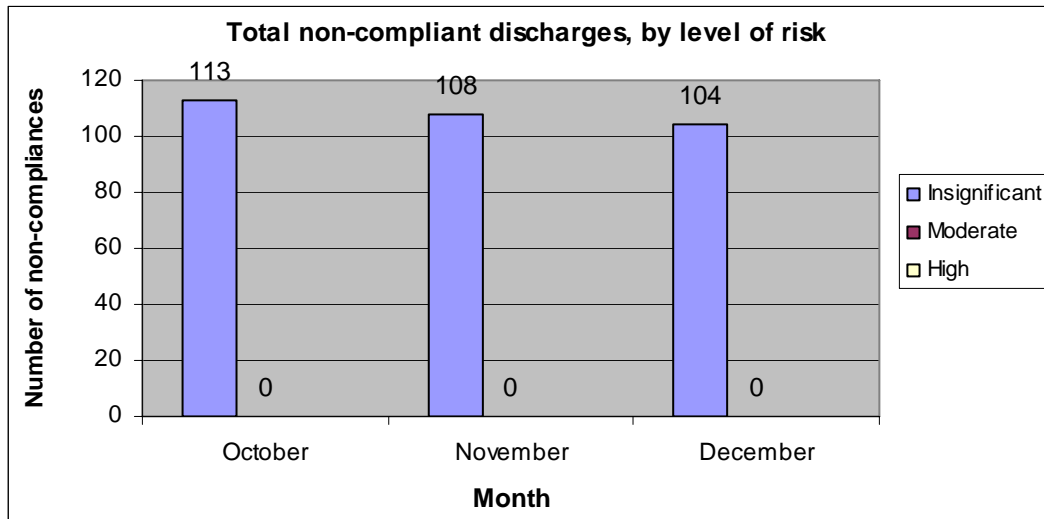


Figure 1 - Total non-compliant discharges by risk level

Discussion of Trade Waste Reporting Results for Quarter 2 2007/2008 Financial Year

High Risk:

There were zero high risk non-compliances in Q2 2007/ 2008.

High risk non-compliances could strongly affect the occupational health & safety of sewer workers, inhibit the treatment plant process affecting product compliance, significantly impact on the receiving environment, breach Melbourne Water's operating licence or ability to supply customers with recycled water, biogas or biosolids. "High" risk non compliances would require both Retail Water Company and Melbourne Water incident management response and debrief procedures to be followed.

Moderate Risk:

There were zero moderate risk non-compliances in Q2 2007/ 2008.

Moderate risk non-compliances could affect the occupational health & safety of sewer workers, inhibit the treatment plant process without affecting product compliance, impact on the receiving environment which can be easily remediated, impact on the licence compliance for a short period of time and/or affect Melbourne Water's ability to supply customers with recycled water, biogas and biosolids. The likelihood of impact of "Moderate" risk non-compliances is low due to existing Melbourne Water and Retail Water Company control measures in place. "Moderate" risk non compliances would require a follow-up report of the incident including actions taken to resolve the issue, increased monitoring and contingencies in place to prevent reoccurrence.

Insignificant Risk:

*There were 113 insignificant risk non-compliances in October 2007,
There were 108 insignificant risk non-compliances in November 2007,
There were 104 insignificant risk non-compliances in December 2007.*

Non-compliant discharges ranked as “Insignificant” present very little or no risk to Melbourne Water. They can be easily managed through procedures and control measures in place to ensure customers takes action to rectify issues and return to compliance.

The risk assessment framework that has been developed aims to ensure that the appropriate management actions for each risk level are appropriately undertaken and consistently applied.

Water Recycling at Western and Eastern Treatment Plants

Waste minimisation, through effluent and biosolids reuse and by other means, is a licence objective for both Eastern Treatment Plant and Western Treatment Plant. Melbourne Water has established a target to recycle on average 20 % of effluent by 2010.

Eastern Treatment Plant

During the quarter approximately 376 ML of recycled water was supplied to customers along the South East Outfall and 1,811 ML was supplied to the Eastern Irrigation Scheme. In addition to this approximately 3,371 ML of water was used onsite at the Eastern Treatment Plant.

The Eastern Irrigation Scheme provides “Class A” recycled water from their plant off Thompson Road to the Sandhurst Club, Wedge Rd Reserve and other customers in the Cranbourne and Five Ways districts.

Western Treatment Plant

During the quarter approximately 3,879 ML of recycled water was supplied to Southern Rural Water for the Werribee Irrigation District, and 62 ML was supplied to the Werribee Tourist Precinct, incorporating both the Werribee Park Golf Club and the State Equestrian Centre. In addition to this, 8 ML was supplied to Mc Killop College, 23 ML to the Werribee Technical Precinct and 35 ML to the retail water companies as part of the drought relief initiative.

Also approximately 8,590 ML of recycled water was used onsite at the Western Treatment Plant.

The chlorination and UV disinfection plant is supplying Class A recycled water to both the Werribee Tourist Precinct customers and the Werribee Irrigation District.

Influent Total Dissolved Solid Limit

To ensure that flows into Western Treatment Plant do not have total dissolved solids levels that would compromise effluent reuse opportunities, the revised discharge licence from EPA Victoria has a future influent limit of median total dissolved solids to not exceed 1000 mg/L by 2009. This section will report on compliance with the current compliance limit of 1250 mg/L.

Influent limit of 1250 mg/L total dissolved solids	
Compliance	Not Achieved
	Achieved

Biosolids Reuse at Western and Eastern Treatment Plant

Melbourne Water has developed a biosolids management strategy that includes targets to beneficially use 100% of annual production at Eastern Treatment Plant by 2005 and Western Treatment Plant by 2010.

EPA Victoria approved the Eastern and Western Treatment Plant biosolids management plans in January 2004. These plans describe biosolids inventories, address quality/quantity issues and beneficial use options and set relevant Melbourne Water operational targets.

The Board noted the 2006 Biosolids Beneficial Use Strategy in July 2006. The Strategy outlined actions to achieve the use of clay-rich biosolids stored onsite at the Eastern Treatment Plant as structural fill in roads in the short to medium term. The strategy also outlined plans for further investigations into the potential use of Eastern Treatment Plant biosolids for land application in the longer term, subject to clarification of potential risks and liabilities. In addition, a research program for identifying future innovative options for beneficial use of biosolids from both the Eastern and Western Treatment Plants will be implemented. At Western Treatment Plant, the strategy recommends developing a business case for the potential use of biosolids as a fuel at the Blue Circle Southern Cement facility at Geelong.

Eastern Treatment Plant

During the quarter there were no biosolids removed from the Eastern Treatment Plant for beneficial use.

Due to the high clay content of the Eastern Treatment Plant stockpiled biosolids, Melbourne Water is pursuing the use of biosolids as road embankment fill. Melbourne Water has received confirmation from EPA Victoria that the project is consistent with regulatory obligations and EPA Victoria is working to develop guidelines for using biosolids in this application. Developing these guidelines would allow biosolids structural fill projects to proceed under an approved Environment Improvement Plan.

Western Treatment Plant

During the quarter no biosolids were removed from the Western Treatment Plant for beneficial use.

Due to the high contaminant levels and potentially useful calorific value of the Western Treatment Plant biosolids, Melbourne Water completed a feasibility study into energy recovery. The study investigated both onsite and offsite energy recovery alternatives and found that use of biosolids as a fuel at Blue Circle Southern Cement was the preferred option.

Status Report - Meeting SEPP Targets for Melbourne's Waterways

The following information describes the physico-chemical and bacteriological condition of Melbourne's waterways during the reporting period. Objectives set out in the three relevant State environment protection policies (SEPPs) are the long-term targets for water quality. There is no specific statutory obligation on Melbourne Water to meet these targets.

The Waters of Victoria SEPP has a provision for the development of interim waterway water quality targets if there is little chance of attaining the desired quality within the ten-year time frame of the SEPP. Melbourne Water will be developing interim targets where relevant as part of the Regional River Health Strategy. Melbourne Water has adopted a long-term aim to achieve objectives for water quality in accordance with State environmental protection policies and targets set out in the Regional River Health Strategy and Waterways Water Quality Strategy.

This quarterly report uses a rolling twelve months of waterway water quality data and uses the relevant statistical measure from the particular SEPP schedule and segment a waterway falls within. The map shows SEPP segments and where monitoring points are located. The performance tables show performance against relevant SEPP objectives with red indicating a failure to meet SEPP and green indicating compliance with SEPP. The number in each cell is the result for the previous 12 months.

SEPP compliance calculations require eleven samples for most parameters. For a small number of sites in this report, a reduced number of data were available due to drought or access conditions. New monitoring sites are being added in the extended area and as data becomes available this will be included in the tables.

Waterway monitoring data from the last twelve months showed that waterways within Greater Melbourne performed well for pH with nearly all catchments complying with their SEPP objectives. While catchments varied from zero to full compliance for *E. coli* and turbidity, most passed the SEPP objective. All waterways performed poorly for dissolved oxygen and nutrient levels.

Waterway Water Quality

Quarter Two, 2007/2008

The table below shows the water quality compliance of Greater Melbourne's waterways during the reporting period, sorted by catchment. Results indicate the percentage of samples taken in each catchment that comply with State water quality guidelines.



Definitions

DO	Dissolved oxygen
EC	Electrical conductivity
Turb	Turbidity
T-P	total phosphorus
T-N	total nitrogen
min	Minimum
max	maximum
...%tile	..th percentile
geo	geometric mean
*	This SEPP requires 5 samples at regular intervals within 30 days, however these figures have been calculated using 12 monthly readings
**	This SEPP requires a 42 day geometric mean, however these figures have been calculated using 12 monthly readings.
%sat	percentage saturation
uS/cm	micro Siemens per centimetre
NTU	nephelometric turbidity units
mg/l	milligrams per litre
org/100ml	organisms per 100 millilitres
NA	none applicable

Waters of the Yarra Catchment	DO% Min	pH Min	pH Max	E Coli Geomean	Turb 50%	TP Max	TN Max
	% sat	ph units	ph units	org/ 100ml	NTU	mg/l	mg/l

Rural Eastern Waters

	<i>80</i>	<i>6</i>	<i>8.5</i>	<i>200</i>	<i>15</i>	<i>0.05</i>	<i>0.6</i>
Yarra River at McKenzie-King Drive, Millgrove	47	6.6	7.9	168.4	3	0.024	0.837
Yarra River at Don Road, Launching Place (EPA 2916)	44	5.8	8.2	167.7	7	0.027	1.057
Yarra River at Maroondah Hwy, Healesville (EPA 2904)	54	6.2	8.8	223.3	10	0.039	1.296
Yarra River at Spadonis Reserve, Coldstream	58	6.8	7.9	199.3	11	0.05	1.487
Little Yarra River at Corduroy Road, Yarra Junction	54	5.8	8.1	250.6	14	0.034	1.857
Woori Yallock Creek at Warburton Highway, Woori Yallock	40	5.9	7.5	142.9	17	0.35	2.02
Woori Yallock Creek at Macclesfield-Woori Yallock Road, Yellingbo	57	5.9	7.5	111.9	16	0.04	2.508
Cockatoo Creek at Tschampions Road, Macclesfield	58	5.9	8.2	36.8	23	0.058	2.099
Wandin Yallock Creek at Killara Road, Gruyere	25	6.6	7.5	101.5	10	0.069	2.747
Watts River at Healesville-Kinglake Road, Healesville	19.7	6	8.2	311.3	7	0.076	1.578
Steels Creek at Yarra Glen-Healesville Road, Yarra Glen	31	6.2	7.3	23.5	41	0.073	2.14
Stringybark Creek at Melba Highway, Yering	36	6.7	8.1	73.8	11	0.28	1.777
Watsons Creek at Henley Road, Kangaroo Road	30	7.1	8.6	27.5	3.5	0.035	1.523
Arthurs Creek at Hurstbridge-Arhturs Creek Road, Hurstbridge	17	6.7	8.3	51.0	22.5	0.15	2.111
Diamond Creek at Strathewan Road, Cottlesbridge	18	6.6	8.3	30.2	14	0.11	3.714

Rural Western Waters

	<i>60</i>	<i>6</i>	<i>8.5</i>	<i>200</i>	<i>25</i>	<i>0.05</i>	<i>0.6</i>
Plenty River at Kurrak Road, South Morang	31	7.2	7.9	29.5	7.5	0.079	1.866
Merri Creek at Summerhill Road, Craigieburn	37	6.9	8.3	35.1	4	0.14	1.335

Upper Estuary

	<i>60</i>	<i>6.5</i>	<i>8.5</i>	<i>200</i>	<i>30</i>	<i>N/A</i>	<i>N/A</i>
Yarra River at Princes Bridge, Melbourne	50	6.9	8.3	403.2	5.5		

Urban Waters

	<i>60</i>	<i>6</i>	<i>8.5</i>	<i>200</i>	<i>25</i>	<i>0.1</i>	<i>1</i>
Yarra River at Kangaroo Ground-Warrandyte Road, Warrandyte	58	6.8	8.6	70.9	10	0.059	2.405
Yarra River at Chandler Hwy, Kew (Replaces MY01)	45	6.9	8.9	342.8	17.5	0.11	1.833
Olinda Creek at MacIntyre Lane, Coldstream	44.3	7.1	8	309.6	13	0.12	5.322
Brushy Creek at Lower Homestead Road, Wonga Park	34.9	6.9	7.7	601.3	20.5	0.29	9.64
Jumping Creek at Jumping Creek Road, Wonga Park	29	6.9	8.1	143.6	8	0.076	1.131
Andersons Creek at Everard Drive, Warrandyte	10	6.8	7.9	307.6	11	0.56	4.771
Mullum Mullum Creek at Deep Creek Reserve, Warrandyte	39.5	6.9	8.2	568.9	22.5	0.57	4.49
Ruffey Creek at Parker Street, Templestowe	37	7.2	8.6	517.7	6	0.2	2.631
Koonung Creek at Bulleen Road, Bulleen	28	6.9	8.3	506.5	11.5	0.2	3.29
Gardiners Creek at Glenferrie Road, Hawthorn	43	6.9	9.1	688.8	9.5	0.16	2.083
Diamond Creek at Main Road, Eltham	28	6.9	8.3	434.7	26.5	0.14	1.659
Plenty River at Henty Road, Lower Plenty	26	6.9	8.8	325.9	18	0.12	1.507
Darebin Creek at Clark Road, Alphington	55	6.9	8.6	642.1	11	0.24	1.989
Merri Creek at Roseneath Street, Yarra Bend	58	6.9	9.1	171.2	7.5	0.18	1.741
Moonee Ponds Creek at Racecourse Road, Flemington	40	6.9	8.9	1,616.4	11.5	0.19	3.87

Waters of Western Port Bay & Catchment	DO% Min	pH Min	pH Max	E Coli Geomean	Turb 50%	TP Max	TN Max
	% sat	ph units	ph units	org/100ml	NTU	mg/l	mg/l

Lowlands & Phillip Island

	80	6.5	9	200	15	0.05	0.6
Watsons Creek at Dandenong-Hastings Road, Somerville	21	6.6	7.6	428.5	14	3.6	291.575
Warrangine Creek at Frankston-Flinders Road, Hastings	43	7.1	7.9	209.5	9	0.11	4.808
Cardinia Creek at Ballarto Road, Cardinia	60	7.1	10	175.6	18	0.12	1.937
Toomuc Creek at Ballarto Road, Rythdale	28	6.8	8.1	187.7	16	0.14	2.127
Deep Creek at Ballarto Road, Rythdale	39	6.7	7.8	183.3	73	0.96	3.632
Bunyip River at Healesville Koo-Wee-Rup Road, Koo-Wee-Rup	57	4.3	8.5	25.8	18	0.59	2.5065
Yallock Outfall at South Gippsland Highway, Monomeith	74	6.7	7.9	81.3	94	0.33	10.464

Northern Hills

	85	6.5	9	200	5	0.03	0.2
Cardinia Creek at Chadwick Road, Upper Beaconsfield	62	6.9	8.7	49.8	7	0.043	3.27
Toomuc Creek at Princes Highway, Pakenham	22	6.9	8.1	121.7	5.5	0.098	2.45
Tarago River at Morrisons Road, Labertouche	55	6.8	8.3	315.1	7.5	0.052	1.357
Bunyip River at North Labertouche Road, Labertouche	53	6.7	8.2	59.3	7.5	0.042	0.998
Bunyip River d/s Cannibal Creek, Longwarry North	57	6.9	8.2	312.2	9	0.042	0.994

Peninsula

	80	6.5	9	200	15	0.05	0.6
Merricks Creek at Bridge Street, Merricks (Beach Road)	29	6.9	8.2	153.1	6	0.28	5.105

South Eastern Rural

	80	6.5	9	200	15	0.05	0.6
Bunyip River at Little Road, Iona	60	6.8	8.2	634.4	8.5	0.1	0.994
Lang Lang River at South Gippsland Highway, Lang Lang	42	6.7	8	190.5	20.5	0.31	6.436
Lang Lang River upstream Drouin-Poowong Road, Athlone	17	6.8	8.1	313.1	10.5	0.42	5.329

Waters of Victoria	EC 75%	DO% 25%	pH 25%	pH 75%	E Coli Geomean	Turb 75%	TP 75%	TN 75%
	uS/cm	% sat	ph units	ph units	org/ 100ml	NTU	mg/l	mg/l

Cleared Hills & Coastal Plains

Werribee/Maribyrnong

	1500	85	6.5	8.3	150	10	0.045	0.6
Maribyrnong River at Brimbank Park Ford (upstream Taylors Creek), Keilor	2300	51.5	7.875	8.025	59.5	10	0.05725	1.15525
Maribyrnong River at Canning Street Ford, Avondale Heights (EPA 6070)	2250	63.75	7.775	8.125	98.9	17	0.0675	1.269
Steele Creek at Rose Avenue, Niddrie	965	65.5	7.7	8.2	305.2	9.25	0.0515	0.6705
Stony Creek at Bena Street, Yarraville	482.5	63.75	7.7	8.525	802.9	14	0.3175	3.084
Kororoit Creek at Millbank Drive, Deer Park (Replaces EPA5509)	2210	57.25	7.4	7.9	84.5	8.5	0.05825	0.717
Kororoit Creek at Racecourse Road Ford, Altona	21075	73	7.8	8.45	94.7	32.75	0.215	1.57675
Skeleton Creek at Ayr Street, Laverton	4165	49.75	7.375	7.8	223.4	13.5	0.17	0.97963
Maribyrnong River at end of Newsom St. 500m d/s of Ascot Vale MD, Ascot Vale West	46000	65.75	7.8	8	67.0	9.5	0.1625	0.739

Cleared Hills & Coastal Plains

Westernport

	500	85	6.4	7.7	150	10	0.045	0.6
Dandenong Creek at Boronia Road, Wantirna	473.75	47	7.3	7.725	200.4	25	0.1175	2.192
Dandenong Creek at Stud Road, Dandenong North (EPA 5654)	346.75	63.75	7.35	7.825	141.9	42.25	0.08825	1.21275
Dandenong Creek at Pillars Crossing, Dandenong South	432.5	58.75	7.3	7.825	218.8	54.25	0.0975	1.37425
Corhanwarrabul Creek at Wellington Road, Rowville	509.5	51.5	7.2	7.65	205.9	32.25	0.1025	1.36425
Mile Creek at Cheltenham Road, Keysborough	1742.5	71	7.475	7.95	380.6	14.25	0.08075	1.60475
National Water Sports Centre outlet, Bangholme (EPA 5682)	22250	66.75	7.825	8.1	107.3	43.25	0.12	1.49275
Hallam Main Drain at South Gippsland Highway, Hampton Park	953.75	51	7.175	7.625	224.6	22.75	0.075	1.51575
Eumemmerring Creek at Worsley Road, Bangholme	727.5	73.5	7.6	8.05	178.7	34.5	0.155	1.55625
Mordialloc Creek at Wells Road, Mordialloc	12875	51.75	7.1	7.55	267.6	36.25	0.23	1.30275
Kananook Creek at Wells Street, Frankston	42750	61.75	7.575	8	413.0	15.75	0.1325	0.97025
Elster Creek at Cochrane Street, Elwood	548	74.75	7.55	8.85	597.5	12.25	0.10775	1.6325
Balcombe Creek at footbridge off Uralla Drive, Mt Martha	1650	51.5	7.2	8.025	421.5	23	0.09325	2.1025
Dunns Creek at Marine Drive, Safety Beach	6775	62	7.4	7.625	521.5	13.75	0.07825	1.073
Chinamans Creek at Eastborne Road, Rosebud West	1625	24.25	7.2	7.7	417.3	4.75	0.105	2.9955
Main Creek at Boneo Road, Flinders	2500	75	7.6	8.2	86.1	7.75	0.0735	1.214

Forest - A

	100	90	6.4	7.7	150	5	0.025	0.5
Dandenong Creek at Sheffield Road, Doongalla Forest	160.5	70	7	7.65	70.9	12	0.0225	1.2105

Reporting Alert Levels for Waterway Water Quality

Water quality alert levels were agreed between EPA Victoria and Melbourne Water in 1994. Alert levels are generally well above water quality objectives specified in relevant State environment protection policies, representing instances of particularly undesirable water quality. Melbourne Water is required to report all alert-level exceedances that occur within our jurisdiction to provide a means of identifying sites that often experience poor water quality and also to provide a mechanism for locating and mitigating chronic pollution problems.

From October to December 2007, a total of 110 alert-level exceedances were reported to EPA Victoria, or about 2.4 % of the total number of water quality measurements.

This compares with 107 exceedances reported in the first quarter this year. Exceedances were most commonly reported for dissolved oxygen and nitrogen containing nutrients. There were three sites with more than six exceedances. By far the largest number of exceedances was recorded in Watsons Creek at Dandenong-Hastings Road in Somerville. Most of these exceedances were nutrient related and most likely are the product of the market gardens runoff. Other sites with large number of exceedances were Brushy Creek at Lower Homestead Road Bridge, Wonga Park most likely related to the wastewater treatment plant upstream of the site and Chinamans Creek at Eastborne Road, which does not have an adequate sewerage network in its catchment.

Renewable Energy and Greenhouse Gas Emissions Performance

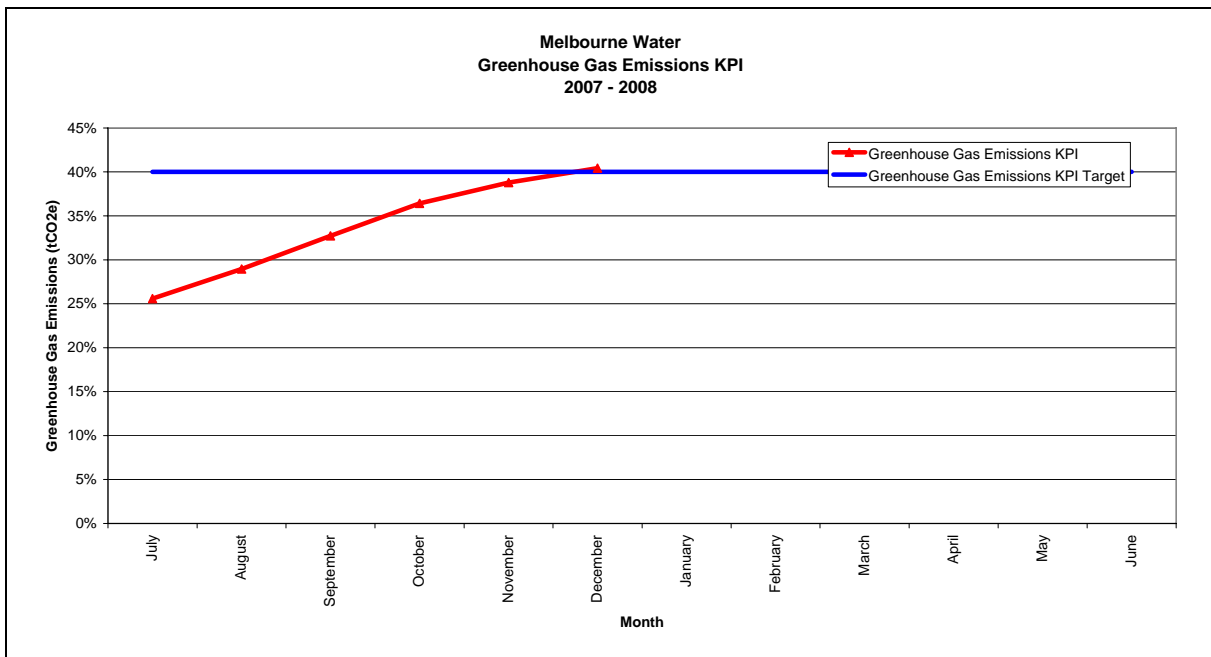
Melbourne Water has established Key Performance Indicators for increased renewable energy and reduced greenhouse gas emissions. While there are no strict regulatory requirements for these, there are increasing soft regulatory requirements such as EPA Victoria's discharge licence requirement to implement energy efficiency projects with pay back periods of three years or less. The Commonwealth Government is also introducing similar requirements for businesses that use more than 0.5 PJ of energy each year and Melbourne Water uses about 2 PJ.

The following graphs show performance against the two Key Performance Indicators. The definition for each is included with each graph. For information two additional charts are included showing the energy content of sewage and water and the fuel efficiency of Melbourne Water's vehicle fleet.

At this stage it looks like we will achieve the target for Greenhouse Emissions of 40 % of 0001 emissions but the renewable energy target of 50 % to total energy used will not be achieved. This will be discussed further in the Quarter three report when there is more information on the extent of operation of Melbourne Water's mini hydro plant.

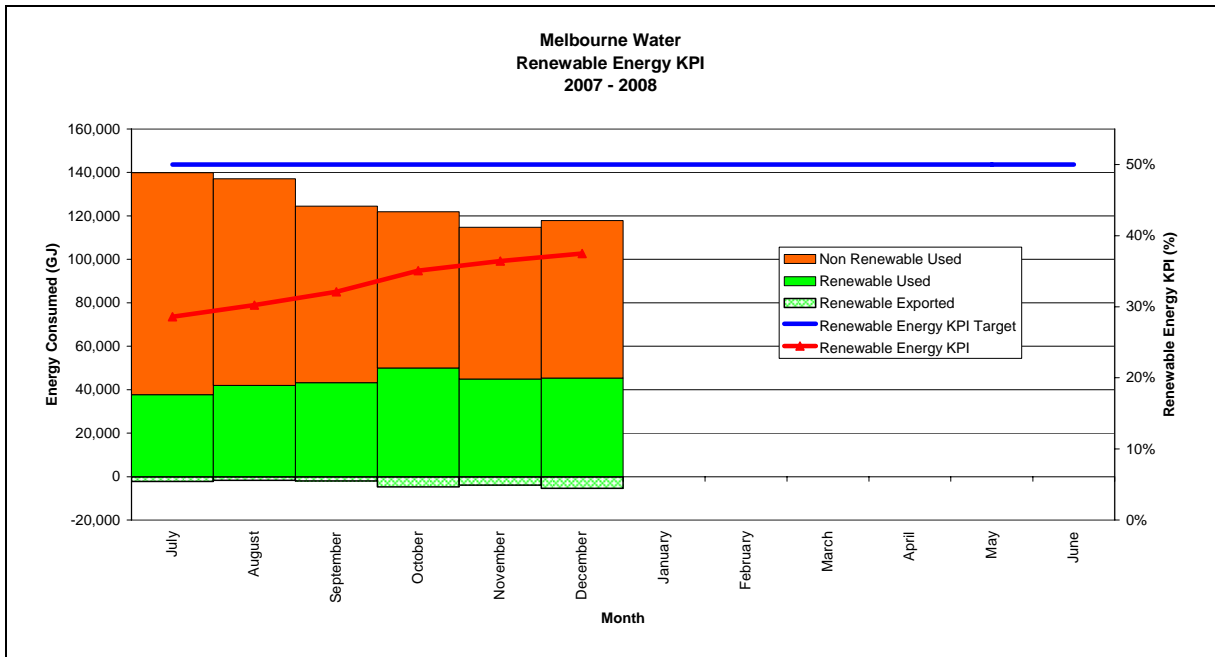
Greenhouse Emissions KPI

$$= (\text{Total Emissions 2000/01} - \text{Total Emissions 2005/06}) / \text{Total Emissions 2000/01}$$



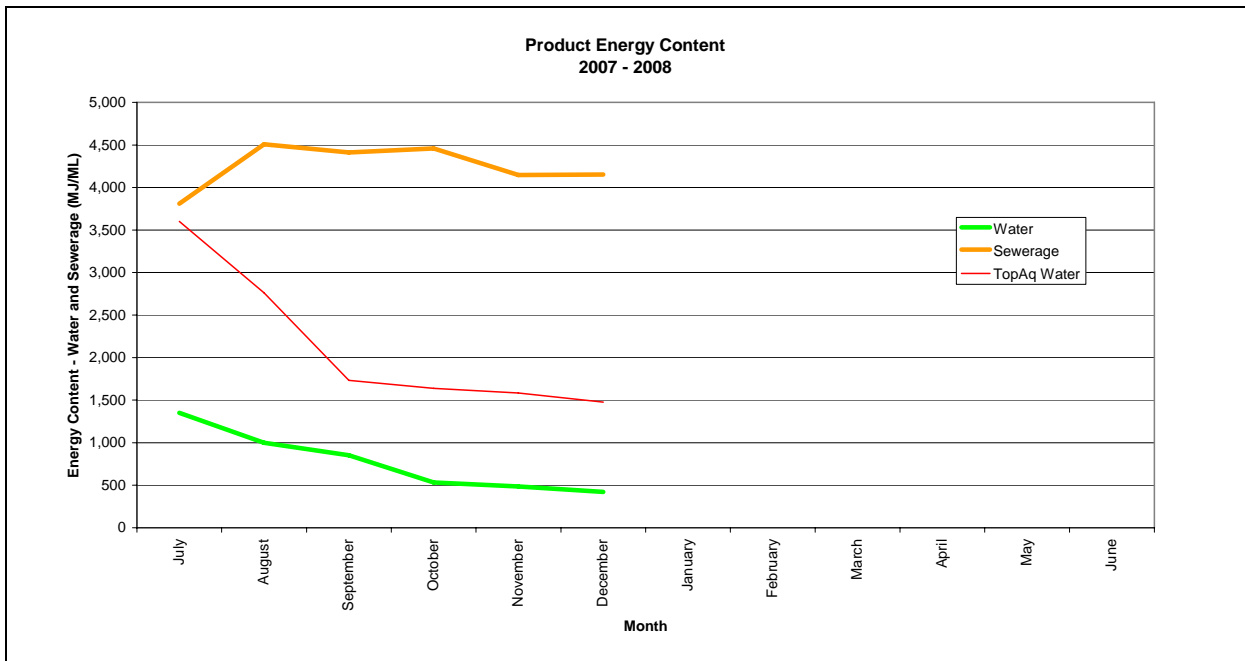
Renewable Energy KPI

= Renewable Energy Produced or Used / Total Energy used by Melbourne Water



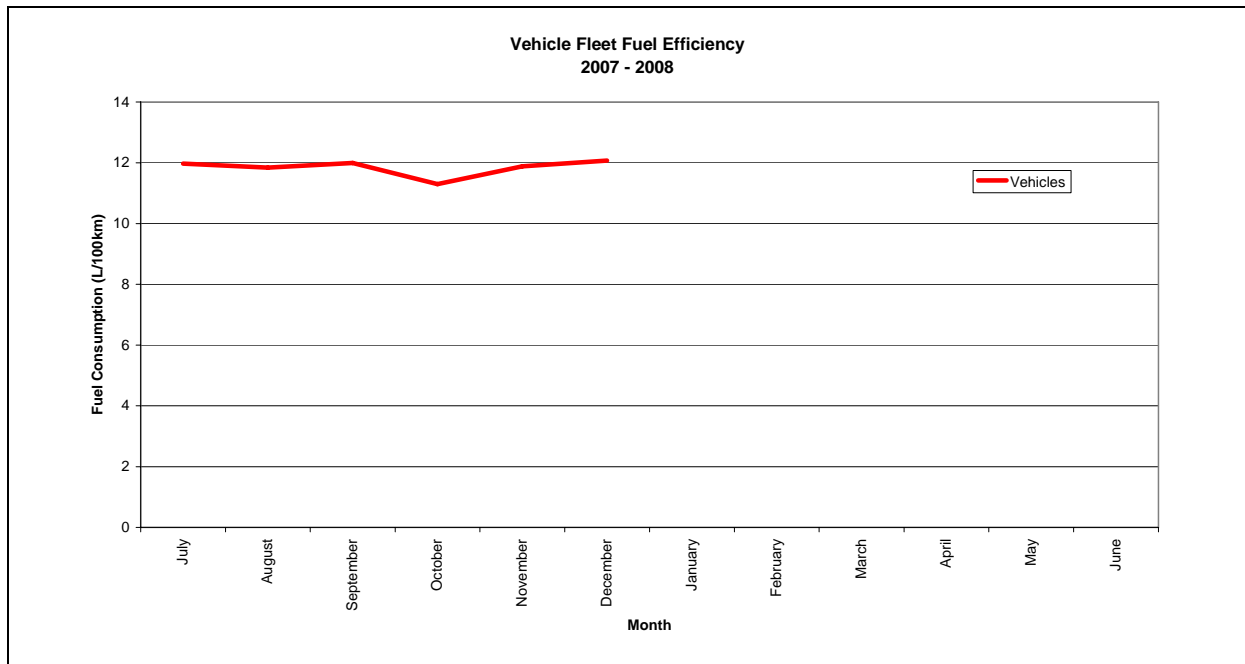
Energy content

Energy content is how much energy Melbourne Water or Earth Tech (TopAq Water) uses to produce a ML of product. Earth Tech's line is the average energy required per ML of Class A water from ETP effluent.



Vehicle fleet efficiency

On average how much fuel is used to travel 100 kms.



Catchment Profile

Assessment of fish community and riverine habitat in the Yarra River



During the quarter a report on the freshwater fish community and riverine habitat in the Yarra River was produced by the Arthur Rylah Institute. The report provides a snapshot of the status of fish community, distribution and available aquatic habitat in the Yarra during a period of relatively low stream flow from January to March 2007.

Considering the severity of catchment alteration, the aquatic habitat and riparian condition of the Yarra River was shown to be of a high standard, supporting a diverse community of aquatic fauna. In 43 sites from below Dights Falls to Millgrove, 22 species of fish and two species of crayfish were recorded. The surveys were dominated by Australian smelt, roach (exotic), common galaxias and short-finned eels. High abundances were also recorded for Macquarie perch, common carp, redfin (exotic) and brown trout (exotic).

The abundance and diversity of native species was highest downstream of Dights Falls with reaches upstream of Warrandyte Gorge being the lowest. While the fish community varied with landscape zones along the river, the biggest influence on abundance and diversity of fish appeared to be the restricted fish passage caused by Dights Falls. With an aggregation of migratory fish below, and an absence upstream of Dights Falls, the study demonstrated the ineffectiveness of the fishway during the low water conditions.

The survey confirmed that a number of significant self-sustaining populations of native species occur in the Yarra River, particularly the nationally threatened species Macquarie perch and Murray cod. Macquarie perch were positively associated with higher proportions of bedrock, vegetated banks, moderately deep water below riffles and cascades.

High diversity and abundance of native species was found in the Warrandyte reach due to improved quality and abundance in instream habitat and riparian cover. In contrast, a decline in the overall quality of riverine habitat upstream of this reach, associated with a decline in riparian cover and instream habitat diversity and deposition of fine sediment, resulted in a decline in species diversity.

The study identified a number of future investigations and management recommendations, including a need to assess and remedy the effectiveness of the Dights Falls fishway, particularly during low flow conditions. In addition, a survey using targeted methodologies to determine the status of Australian grayling in the Yarra River was recommended.

Appendices

Appendix One: Guide to Terms

Parameter	Units	Explanation
BOD <i>Biochemical Oxygen Demand</i>	mg/L*	A measure of the oxygen depleting potential of waste - usually measured over a five day period.
CBOD <i>Carbonaceous Biochemical Oxygen Demand</i>	mg/L*	A measure of the oxygen depleting potential of the carbonaceous (organic) portion of the waste - usually measured over a five day period.
SS <i>Suspended Solids</i>	mg/L*	A gravimetric measure of undissolved matter, when retained on filter.
Amm <i>Ammonia</i>	mg/L*	A form of nitrogen, present in untreated sewage and many industrial wastes. Is toxic to certain fish and marine species.
Surf <i>Anionic Surfactants</i>	mg/L*	Surface active agents, associated with detergents
pH	numeric	A measure of the acidity (pH 0-7) or alkalinity (pH 7-14) of sample. Pure water is slightly acidic, due to dissolved carbon dioxide.
TRC <i>Total Residual Chlorine</i>	mg/L*	A measure of the remaining chlorine associated with the disinfection of effluent.
D.O. <i>Dissolved Oxygen</i>	mg/L*	An indication of "waterway health". Levels may deviate from saturation by pollutant depletion, or supersaturation due to algal activity.
Metals	mg/L* or µg/L#	Are an indication of contamination. Metals tested include lead, cadmium, chromium, copper, zinc, nickel and mercury.
E. coli <i>Escherichia coli</i>	no. of organism s/ 100ml	A common bacteria from the intestines of warm blooded animals. Used as an indicator of faecal contamination.
PAH's <i>Polynuclear Aromatic Hydrocarbons</i>	µg/L#	Polynuclear Aromatic Hydrocarbons are by-products of petro-chemical industries and combustion processes. Many PAH's are highly carcinogenic.
Total P or TP <i>Total Phosphorus</i>	mg/L*	Measured as phosphate after acid digestion of total sample to convert all combinations of phosphorus to phosphate.
Phenols	µg/L#	Phenols are widely used in resins, disinfectants and industrial products. Trace residuals are resistant to decomposition.
Total N or TN Total Nitrogen	mg/L*	The total amount of nitrogen comprising organic nitrogen, ammonia, nitrate and nitrite
Turb Turbidity	NTU	Cloudiness caused by materials suspended in water
EC Electrical conductivity	µS/cm	A measure of the ability to conduct an electrical current and used as an indicator of salinity
Org N <i>Organic Nitrogen</i>	mg/L*	A distinction between the inorganic nitrogen forms (ammonia, nitrite and nitrate), and the organic compounds present in food/body wastes. (proteins, amines)

* milligrams per litre of water sampled - is equivalent to parts per million

usually expressed as micrograms per litre of water sampled - is equivalent to parts per billion

Appendix Two: Details of the Environmental Impact Rating of Sewer Spillages

The development of an environmental impact rating for sewer spills includes the following factors:

- environmental quality of the receiving water;
- spill content;
- dilution of effluent in receiving water; and
- the volume of the spill.

The impact rating is based on a procedure that considers the various combinations of grade for each of the factors together and then groups them into an impact rating based on a simple model. Each possible combination of grades has been put into one of the ratings from one to five. Although this may appear to be an arbitrary process, the results represent a reasonable estimation of the potential environmental impact of a spill from a sewer.

The environmental impact rating is an indication of the potential impact of spill events, not a measure of actual impact.

Examples

An example of a significant spill achieving an impact rating of “5” occurred during Period 12 1994/95. ERS number 327 discharged 10 826 Kl of untreated sewage into the Maribyrnong River. The volume of this spill was the key determinant in the spill classification of “5”.

ERS number 327 discharged on another occasion during Period 12 1994/95 resulting in 68 Kl of sewage being discharged into the Maribyrnong River. This spill was given a rating of “2” due to the relatively minor volume of sewage discharged into the waterway and was not regarded as significant.

Appendix Three: Melbourne Water Spillage Reporting

How Melbourne Water reports sewerage system spills within Melbourne Water and to EPA Victoria is described below.

All spills, regardless of volume or content, are reported internally or to an external authority. The significance of the spill determines the reporting process.

Spills where there may be an environmental or public health hazard*

1. Immediately by phone or fax using the EPA NOTIFICATION OF SEWER SPILL form by a senior manager to EPA Victoria.
2. These spills require a SEWER SPILL NOTIFICATION FOLLOW-UP report to EPA Victoria within 21 days of the spill.
3. Subsequent written reports are provided to Melbourne Water executives (as required) and EPA Victoria (quarterly).

Where there is potential for a public health impact DHS is also notified.

All Spills (including spills of low significance)

1. Each period, a summary of all spills is included in the Business Unit's Operating Report to Board.
2. The Quarterly Board Environmental Compliance Report provides more details on all spills.
3. A Quarterly Spills Report summary of spills is forwarded to EPA Victoria.

*Hazards that require immediate follow up include where there is a:

- public health concern
- sensitive receiving environment
- large industrial or commercial waste component
- sewer spill very visible in a public area
- potential for media involvement
- sewer pipe 300mm diameter or greater
- flow >80L/min (ie: two house taps going flat out for approx hour = 5 KL)

Appendix Four: Description of the Phases of Trade Waste Agreement Restrictions

The retail water companies use a risk-ranking model as one of the tools used to manage trade waste discharged to sewer. The risk-ranking model has been developed over many years and takes into account key aspects of each customer's circumstances.

These include:

- Location of the discharge in relation to the receiving sewage treatment plant;
- Volume of trade waste discharged to sewer;
- Compliance history of the customer;
- Activities undertaken on the customer's site which generate trade waste; and
- Substances in the trade waste.

The risk-ranking model calculates a risk weighting for each customer and from this customers are allocated to one of five risk categories, with a risk ranking of 1 being the highest risk and 5 being the lowest. The risk rating determines the level of monitoring required for a company.

Retail water companies initiate a three-step management process when a customer does not comply with the conditions of their Trade Waste Agreement or Consent.

Stage 1:

When a non-compliant sample is identified, an Initial Trade Waste Notice is issued. The Notice specifies how the trade waste fails to comply and requires the customer to remedy the problem, provide written documentation explaining reasons for the non-compliance and the steps taken to ensure it will not happen again.

Stage 2:

If further samples of trade waste do not comply after the date specified in the Notice a letter is issued requiring the customer to:

- review its waste treatment processes;
- attend a meeting to discuss the cause of the non-compliance and processes to prevent a recurrence; and
- meet costs in ensuring trade waste complies with the Agreement.

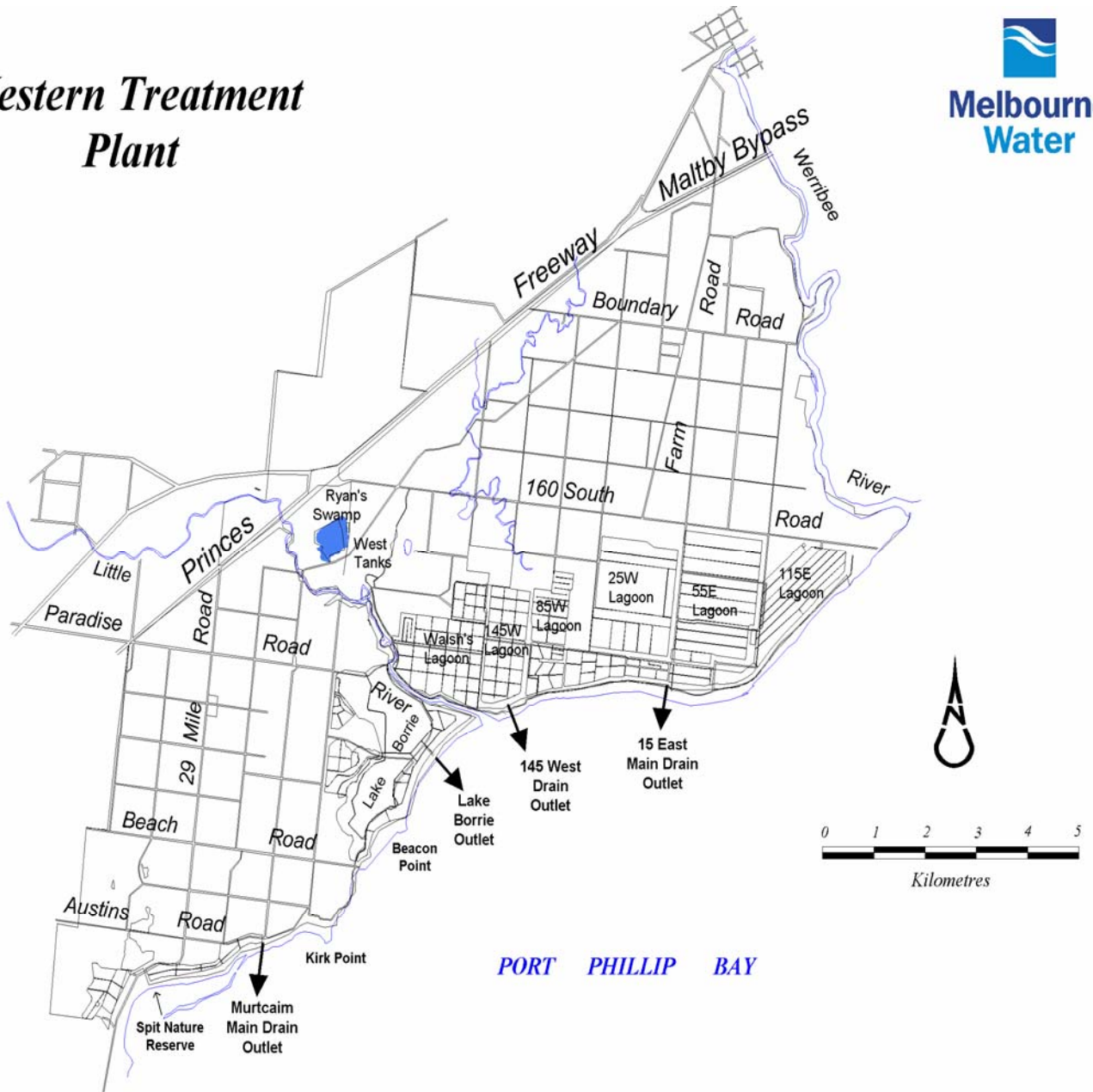
Stage 3:

Samples of trade waste will continue to be taken and analysed and no further action will be taken if the trade waste becomes compliant. However if a sample does not comply a Notice of Breach will be issued setting out a date by which the trade waste must comply with the Agreement.

If the trade waste does not comply by the set date the customer must cease discharging trade waste to the sewer immediately, the trade waste connection point will be sealed and the media may be informed. Any further discharge of waste will be liable to a fine of up to \$20,000 and up to \$8000 for each day during which waste is discharged. Before any further trade waste can be discharged, a new Agreement must be negotiated and the customer must prove it will achieve on-going compliance.

Appendix Five: Map of Western Treatment Plant Discharge Points

Western Treatment Plant



Appendix Six: Environment Protection Authority (EPA) Enforcement Policy

The Environment Protection Act (1970) establishes the Environment Protection Authority to provide for a system of administration to ensure a high standard of environmental quality. The Act allows for a range of regulatory and non-regulatory activities including implementation of State environment protection policies, environmental monitoring and community education programs.

EPA Investigations

After an incident has been reported to the EPA, authorised officers from the EPA have the power under the Environmental Protection Act (1970) to embark upon an investigation. The investigation may involve:

- entry to the premises to take samples, photographs, tests, etc
- requesting information such as files, maps and or other documents relating to the incident
- identifying the occupier of the premises
- ordering clean-up procedures
- conducting formal interviews with management or individuals associated with the incident

Enforcement Measures

After investigation of a particular incident by the EPA the following enforcement measures are available under the Environment Protection Act (1970):

- warnings
- directions by an authorised officer
- notices
- infringement notices
- prosecutions
- licence suspension or revocation
- injunctions

Mounting a Prosecution - What is considered

In brief, the following factors are taken into account when deciding upon the most appropriate enforcement measures following an incident:

- the seriousness of the offence and harm to the environment
- previous history of offences
- the prevalence of the offence in the eyes of the public
- enforcement costs for the EPA
- the precedent which may be set by not taking enforcement action
- the cooperation of the alleged offending individual or company.

Melbourne Water and EPA Victoria

Melbourne Water could be subject to formal investigation by EPA Victoria in relation to incidents such as the 1992 Epsom Road Sewer Collapse and subsequent unlicensed discharge into the Maribyrnong River.

Melbourne Water has maintains a long-term cooperative relationship with EPA Victoria, including Quarterly Liaison Meetings of senior managers. This working relationship has resulted in open and honest communication so that the interaction between Melbourne Water's environmental performance and EPA Victoria's expectations holds no surprises.

Every incident such as the overflow of untreated sewage from an Emergency Relief Structure into a waterway could be regarded as an unlicensed discharge and an offence under the Environment Protection Act (1970). Where such incidents lead to unclear regulatory requirements steps are taken so that a clear position is developed. For example EPA Victoria has clarified that releases from the sewerage system through Emergency Relief Structures are compliant if they occur during rainfall events in excess of 1 in 5 years.

Appendix Seven: Emergency Response Procedures in Melbourne Water

A critical element of Melbourne Water's risk management process is ensuring the Corporation is prepared for and can effectively respond to and recover from incidents with potential to have an impact on our stakeholders, customers, the broader community or the environment.

Melbourne Water has established PERFORM (Prompt Emergency Response for Melbourne), which outlines the responsibility all Melbourne Water people have in incident management and details how we will respond to an incident in an integrated manner. The program highlights the need for thorough planning, preparation and training as a means of ensuring the effective and efficient management of any incident.

PERFORM is more than an incident management program, it is a comprehensive risk management program which incorporates prevention, preparedness, response and recovery for any adverse incident which could affect Melbourne Water.

The aims of PERFORM are to:

- Prevent or reduce the risks of incidents occurring in Melbourne Water
- Prevent or reduce the impact and consequences of incidents on customers, local community, stakeholders, environment, service delivery, system assets and operations
- Promote and support the maintenance and control of effective incident and emergency management processes

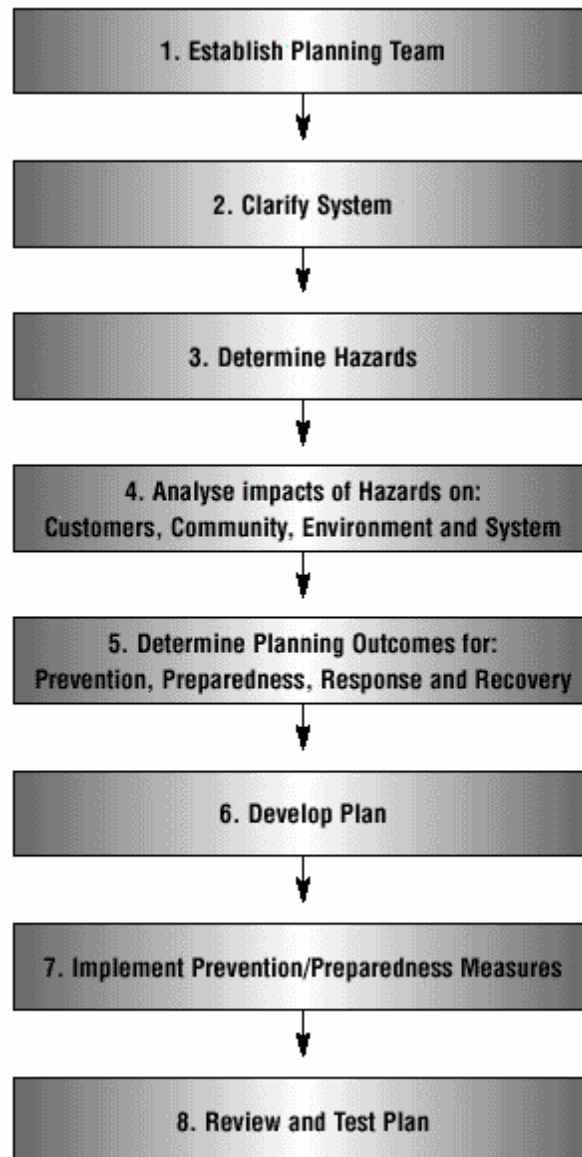
An *Incident* is any event or circumstance within our, or our customers operations that causes or is likely to cause:

- An interruption of service to customers
- A threat to our systems
- A threat to community health and safety
- A threat to the environment
- A threat to private or public property.
- The creation of the need for urgent action under statute or legislation

PERFORM incidents are categorised into five types. The following table defines the incident types and provides some examples of each type:

Category	Definition	Examples
Near Miss	A Near Miss is an unintended event that, but for the intervention of a risk control measure or human intervention, is likely to have resulted in a minor, significant or major incident, or in an emergency.	<ul style="list-style-type: none"> • Detection of a chlorine release of greater than two ppm, but less than 10 ppm at Winneke water treatment plant • Lost bush walkers in catchment area
Minor	<p>A Minor Incident is one where local work teams, under normal supervision, can effectively cope with little or no adverse effects on the Corporation, its customers and the community.</p> <p><i>Note: If the media become involved, a Minor Incident becomes a Major Incident.</i></p>	<ul style="list-style-type: none"> • Minor motor vehicle accident • Short duration computer system malfunction • Minor flooding • Vandalism in catchment area • Employee or contractor/visitor injury • Intentional access to catchment area
Significant	<p>A Significant Incident is one that can be managed at the site level but:</p> <ul style="list-style-type: none"> • May need external resourcing over and above that which is usually used by the work team; and/or • The actual or potential impact on the Corporation, its customers, the community and the environment is more widespread. <p><i>Note: If the media become involved, a Significant Incident becomes a Major Incident.</i></p>	<ul style="list-style-type: none"> • Burst main causing some property damage • General sewer stoppage with contained spill • Moderate flooding • Prolonged SCADA outage • Minor industrial actions • Asset or system failure causing property damage • Intentional damage to catchment area
Major	<p>A Major Incident is one which requires off-site co-ordination with major levels of external resourcing and support; and/or causes or has the potential to cause major impact on the Corporation, its customers, the community and the environment.</p> <p><i>Note: All incidents which involve the media are to be considered as Major Incidents</i></p>	<ul style="list-style-type: none"> • Burst main in a large shopping centre • General sewer stoppage resulting in an uncontained spill • Major or widespread flooding • Bushfire in water supply catchments (natural or intentional) • Dam failure • Major industrial action • Asset or system failure causing major property damage
Emergency	<p>An Emergency is an event which significantly impacts Melbourne Water's ability to continue its operations. It will affect Melbourne Water's:</p> <ul style="list-style-type: none"> • Operability (acceptable level of service) • Image or reputation (community, media, political) • Liability (legal, financial) 	<ul style="list-style-type: none"> • Any of the above major incidents • Fatality or multiple injuries • Loss of stakeholder support • Corporate governance/compliance issue • Occurrence of any of the five key metropolitan water industry threats

PERFORM does not only involve cleaning up after an incident. It also involves planning, training, procedure documentation and test planning. The incident management planning process is described below;



PERFORM applies to all Melbourne Water operations and business areas. Each group has generic plans to cover routine system faults for the different water supply, wastewater and drainage operations or for any other activity that has potential to have an impact on Melbourne Water's business, its customers or the community.

A contingency plan is a series of processes or procedures to prevent, prepare for, and respond to and recover from events that can be foreseen to occur that can affect our operations or service delivery. It identifies any potential problem areas, and provides options for containing and controlling such events.

Each manager is responsible for determining the probability and consequences of failure of assets, systems and work practices, as well as for preparing contingency plans to deal with any failure.