

## CASE STUDY 4: YARRA VALLEY WATER – MERRI CREEK WATERWAYS INVESTMENT PRIORITISATION PROJECT



The collaborative Waterways Investment Prioritisation (WIP) project sought to pilot in the Merri Creek urbanised catchment, utilisation of an “Outcomes-based approach” to garner greater community and environmental value at the lowest community cost. Focussed on the existing northern suburbs of Melbourne, it sought to determine if we can deliver greater community and environmental benefits by integrating water management programs and services of Water Authorities (Yarra Valley Water and Melbourne Water) and local Councils.

### Management approach

An Outcomes Based Approach was taken to align stakeholders’ investments within the Merri Creek catchment that are most likely to achieve the agreed outcomes sought for the waterway. The approach provides a basis for both prioritising solution implementation schemes and ensuring that any scheme is appropriate in terms of the applied technical solution, the level of control and the benefits realised for the customers and the environment.

### Receiving environment principles considered

The practical outcomes to be achieved in the Merri Creek were largely based on a previously completed community consultation, the current legislation State Environmental Protection Policy Waters of Victoria<sup>[1]</sup> (SEPP WoV) and Melbourne Water’s Healthy Waterways Strategy and the Merri Creek Management Committees views. The practical outcomes were split into three main categories (See Table 1)

1. Public Health
2. Environment
3. Aesthetics

[1] With implementation of current Victorian Environment Protection Act from July 2021, SEPP does not continue as subordinate instruments under the EP Act, and its formal statutory role except in some limited circumstances however, some clauses of SEPP continue to provide a useful source of information to aid duty holders. SEPP’s clause 27: “Management of Sewerage Systems” will be used as guidance for the General Environmental Duty until further notice. Please refer to EPA’s publication: 1994: Using SEPPs and WMPs in the new environment protection framework guide.

### Background

The catchment of Merri Creek is located in the established suburbs of Melbourne. To improve the water quality of Merri Creek, Yarra Valley Water and other major stakeholders planned to invest approximately \$25M. The planned investments were designed to meet the obligations and drivers of individual organisations rather than as a whole. Most of the planned expenditure (~\$19M) was related to sewage infrastructure upgrades for compliance with the SEPP clause 27 to contain flows associated with a 1-in-5-year rainfall event. The rest of the investment (~\$6M) was planned for stormwater, vegetation management, WSUD and waterway maintenance programs.

Yarra Valley Water (YVW), Melbourne Water (MWC), the Department of Environment, Land, Water and Planning (DELWP) and the relevant councils have partnered to develop a case study on waterway investment prioritisation for the existing developed areas in Merri Creek catchment to test whether their waterway investments can deliver greater value to the community and the waterway health as well as provision of amenity.

### Investigations and Program Objectives

The objective of this case study was to integrate water agencies and local councils’ waterway investments, to provide greater values to the community in terms of:

1. Improved waterway health
2. Provision of amenity

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Table 1 shows an agreed practical outcome used for this project.

**TABLE 1**  
Perceptions, agreed practical outcomes of WIP

	Community perception study	Current legislation	Key stakeholder	Agreed practical outcome
<b>Public health</b>				
Primary contact recreation	N	Y	N	N
Secondary contact recreation	N	Y	Not clearly defined	N
Passive recreation-liveability	Y	Y	Y	Y
<b>Environment</b>				
Native fish	Y	Y	Y	Maintain and/or enhance biodiversity
Frogs	Y	Y	Y	
Macroinvertebrates	Y	Y	Y	
Vegetation	Y	Y	Y	
<b>Aesthetics</b>				
Vegetation	Y	Y	Y	Y
Odours	Y	Y	Y	Y
Water colour/appearance	Y	Y	Y	Y
Water turbidity/murky	Y	Y	Y	N
Accessibility	Y	N	Y	Y
Absence of litter	Y	Y	Y	Litter load reduced

An assessment of the key threats or inhibitors to achieving these outcomes was then completed. These were derived from diffuse and point source stormwater and wet and dry weather sewage analysis. Extensive data provided by the Centre of Aquatic Pollution Identification and Management (CAPIM) was used to inform stormwater pollution concentrations and locations within the catchment, whereas sewage data was collected

from YVW sewage overflow history and hydraulic model analysis.

An assessment of the current planned expenditure relating to the outcomes sought was then undertaken and potential actions were identified to target the best community and environmental values.

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### Stakeholder Involvement

YVW, MWC, DELWP and the relevant councils have collaborated to develop this pilot study. CAPIM and YVW provided data and information about stormwater pollution and wastewater overflows.

### Outcomes

The study demonstrated that the key threats to achieving the desired outcomes in Merri Creek and the downstream Yarra River and Port Phillip Bay derived from stormwater pollution, which contributed over 99% of the pollutant loads. Therefore, the planned expenditure for Merri Creek does not align well with the expected practical outcomes[2].

The industrial area towards the top end of the study area was a particularly high contributor of heavy metal pollution, impacting the ecological habitat in the waterway. The main impact to aesthetics was from stormwater sediments and gross pollutants whereas less frequent sewage overflows was also an impact.

The study demonstrated the primary areas of focus for the incoming years should be:

- Public health – Prevent dry weather spills and rectify any illegal sewer to stormwater connections
- Environment – Reduce heavy metal loads, enhance riparian vegetation, further monitoring and stormwater characterisation targeting load reductions from priority sources
- Aesthetics – litter load reduction and passive recreation enhancements

Several alternate engineering solutions were identified including tactical stormwater to sewer diversion, stormwater treatment tanks and additional gross pollutant traps (stormwater and sewage overflows). These approaches coupled with the current vegetation management and enhancement programs will deliver a far greater benefit at a lower community cost.

[2] A comparison of E.coli loads found in dry and wet weather showed that E.coli from stormwater sources pose a far higher risk to recreational uses of waterway than wet weather wastewater overflows.

### Costs

The potential actions identified in Table 2 shift investments from low or no-risk areas (wastewater overflows) to high-risk areas (stormwater discharges). In doing so, the overall investment could potentially be reduced from \$25M to \$13M, and the overall outcomes could be improved. This demonstrates that an outcomes management approach can yield better results for less expenditure than that achieved by the singular containment standard, which focuses on the sewerage system as the pollution source.

**Table 2**  
**Outcome management approach for Merri Creek:**  
**Actions and outcomes**

Description	Estimated Investment	Outcome	Benefit
Reduction of heavy metal pollution loads and associated toxicants from industrial areas	\$1M	Environment	High
Stormwater monitoring and characterisation. Program to identify key sites for stormwater treatment/diversion to sewer (first flush)	\$2M \$3M	Environment, aesthetics	High
Identification and rectification of illegal sewer and stormwater connections	\$1M	Public health	High
Continue targeted vegetation management/enhancement programs	\$3.5M	Environment, Aesthetics	High
Mitigate aesthetic impacts from stormwater	\$2M	Aesthetics	High
Mitigate aesthetic impacts from WWOs	\$0.5M	Aesthetics	Low/Medium
<b>TOTAL</b>	<b>\$13M</b>		

### Project Timing

This pilot study has been completed in 2016. In 2018 YVW and MWC jointly supported a research project by Monash University to quantify the wastewater and stormwater contributions to human health risks in the Merri Creek by using a Quantitative Microbial Risk Assessment (QMRA) model. The findings of this research in 2020 confirms that stormwater might be of a greater concern for the public health risks that wastewater.