Wetland Design Manual A1: Vision, Core Outcomes & Aspirational Outcomes

Manual

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VICTORIA State Government

Melbourne Water makes a vital contribution to the famous Melbourne lifestyle through the supply of high-quality water, reliable sewerage services, integrated drainage and flood management services and by enhancing our waterways and land for greater community use.

Melbourne Water
Enhancing Life and Liveability

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1. Purpose

Wetlands should be designed to respond to the opportunities and constraints of a particular site. The design response will be informed by characteristics of the site (e.g. its topography, point of discharge, existing vegetation, geomorphic character and soils) and the requirements of an urban development.

The design process and final form of a wetland will be influenced by the wetland vision. In addition to improving water quality, a vision typically includes regulating flow rates, enhanced landscape and ecological values, and provides a range of passive recreational and aesthetic benefits to the community.

2. Scope

This part of the manual describes core outcomes that must be achieved for all Melbourne Water wetlands. The Deemed to Comply standards (refer Part A2 of this manual) specify wetland properties that we are confident will achieve the core outcomes. The Alternative Approach provides the option of proposing wetland elements that differ from the prescriptive Deemed to Comply approach, but still achieve the required core outcomes.

Aspirational outcomes are also described in this part of the manual. Achieving these aspirational outcomes is encouraged by Melbourne Water; however we will not accept aspirational outcomes in lieu of compliance with the required core outcomes.

The aim of this manual is to facilitate consistent delivery of best practice wetland designs. It is therefore important to define what is meant by best practice wetland design in clear terms, so that the expectations and requirements of Melbourne Water for wetlands are clear to all involved.

3. Vision

Melbourne Water's Stormwater Strategy (2013) states that sustainable stormwater management is expected to protect people, property and receiving waters, enhance liveability and supply fit-for-purpose cost-effective water.

Melbourne Water is working to achieve multiple community outcomes by considering stormwater within an integrated water management framework, alongside water supply, sewerage, drainage and waterway health. The desired community outcomes are:

- Healthy waterways and bays,
- Alternative water supply,
- Liveability,
- Public health.

Our vision for stormwater management proposes that:

"Sustainable stormwater management supports prosperous communities, thriving landscapes and healthy waterways and bays."

Melbourne Water has prepared the "*Design, Construction & Establishment of Wetlands*" (the manual) to assist future wetland designs to achieve the vision, the desired community outcomes and the four core outcomes described below.

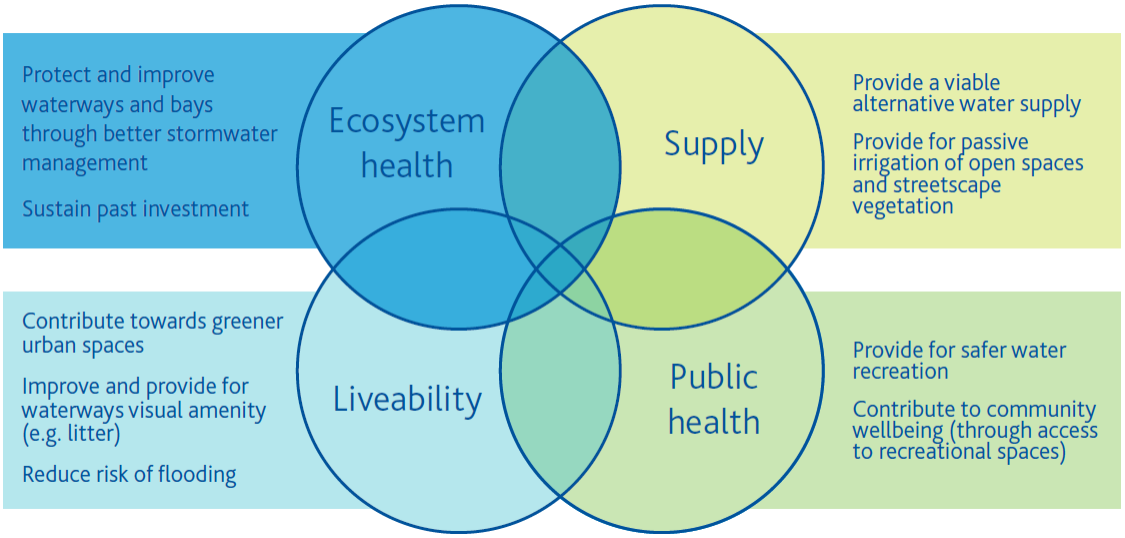

Figure 1: Community outcomes from sustainable stormwater management (Stormwater Strategy Figure E1)

3.1 Core Outcomes

All Melbourne Water wetlands must achieve the following core outcomes:

1. Deliver effective pollutant removal and flow regime management;
2. Offer a safe environment for the community to interact with;
3. Provide a safe environment for Melbourne Water officers and contractors to work and maintain; and
4. Enable cost effective, long-term asset management over a life span of at least 25 years.

These core outcomes are described in more detail in the following pages.

3.2 Effective Pollutant Removal and Flow Management

The primary function of wetlands is to mitigate the impacts of urbanisation by reducing pollutant loads in stormwater runoff. The State Environment Protection Policy Waters of Victoria (SEPP WoV) sets out base statutory requirements for the quality of stormwater runoff. The Victorian Planning Provisions (Clause 56-07) mandate the treatment of urban stormwater to best practice standards for all residential subdivisions; wetlands are often used for this purpose.

The Best Practice Environmental Management Guidelines for Urban Stormwater describe the level of stormwater treatment necessary to comply with these regulatory requirements (refer Table 1). In some circumstances, a wetland may need to be designed to meet a higher or different level of performance than Table 1 to address local environmental objectives, Development Services Scheme targets or other pollutant control issues. Note that these Victorian stormwater standards are currently being revised.

Table 1: Victorian Best Practice stormwater treatment standards (*under review*)

Pollutant	Performance objective
Total suspended solids	80% reduction from typical annual urban load
Total phosphorous	45% reduction from typical annual urban load
Total nitrogen	45% reduction from typical annual urban load
Litter	70% reduction from typical annual urban load

Source: (Urban Stormwater: Best Practice Environmental Management Guidelines – Victorian Stormwater Committee, 1999)

3.3 Community Safety

Many people find wetland environments appealing. It is important that aquatic safety risks are managed appropriately, and that the safety of people around wetlands, especially when in flood, is a central focus of any design. Standing water, pipe/pit inlets and overland flow paths must be considered as part of aquatic safety risk management.

A safety design audit may be required to ensure that the unmitigated and mitigated risk profiles of a design are within acceptable levels. For more information, please contact Melbourne Water's Business Improvement team.

3.4 Maintenance and Operational Staff Safety

Wetland designs must provide a safe environment for Melbourne Water officers and contractors. Measures include stable access routes for vehicles, ability to inspect key wetland components without heavy lifting and/or confined space access requirements, and maximising the proportion of maintenance tasks that can be undertaken from dry land.

3.5 Cost Effective Asset Management

Asset management refers principally to the operation and maintenance of natural and built assets, including waterways, and includes all elements that support the efficient and effective management of such assets, including:

- Adopting a "whole-of-life" system approach to the planning, design, construction, operation and maintenance of our assets;
- Embracing opportunities for innovation in optimizing the levels of service provided by our assets to meet customer needs; and
- Undertaking performance and condition monitoring; and data capture and reporting via knowledge management systems, to inform continuous improvement of our asset management approach.

Wetlands must be cost effective to:

- Design
- Construct
- Operate
- Maintain

The developer contribution approach provides a cost effective mechanism for the delivery of wetlands in tandem with new development. The aim is to balance the benefits being derived from the wetland with the costs of delivering it.

The cost of maintaining wetlands is ultimately borne by the community through the Waterways and Drainage Charge that Melbourne Water collects via the Water Retailers. We are obligated to ensure wetlands are cost effective to maintain.

4. Aspirational Outcomes

Wetland designers should strive to achieve a range of aspirational outcomes in addition to the required core outcomes described above. These aspirational outcomes are summarised in this section.

Aspirational outcomes are not always reimbursable by Melbourne Water. Designers should discuss aspirational outcomes with Melbourne Water at the Concept design stage to ascertain if they are acceptable and/or reimbursable by Melbourne Water. Designers should also work with the local council to ensure that desired aspirational outcomes correspond with council recreational and public open space and maintenance policies.

4.1 Wellbeing, Liveability and Amenity

- Create greener urban spaces.
- Provide the community with amenity and passive and active recreational opportunities.
- Improve visual amenity through reduction in litter and pollutants.
- Complement the amenity values of the broader landscape; particularly those related to adjacent public open space and associated passive and active recreation.
- Ensure efficient use of space through the integration of wetlands with flood management areas.

4.2 Alternative Water Supply

Provide a water supply for uses such as irrigating open spaces and streetscape vegetation.

4.3 Recreational

Provide recreational opportunities, including walking, bird watching, picnicking and other forms of passive recreation.

Provide an appropriate level of direct and indirect access to the wetland.

4.4 Landscape and Cultural Objectives

Retain, enhance and interpret existing ecological, landscape and cultural values, such as trees and other native vegetation and sites of archaeological significance. These are valuable assets to the local community and help to create a unique sense of place.

4.5 Accessibility

Provide public access to the wetland and associated open spaces including those with limited mobility such as the disabled and elderly. The provision of public access requires consideration of potential hazards associated with access paths, provision of passing areas, ramps,

hand/grab rails where needed, and the types of surfaces used on paths including the use of tactile ground surface indicators.

4.6 Conservation

Wetlands often represent important biological 'hot spots' in urban areas, as they encompass a wide range of aquatic and terrestrial habitats and may support diverse flora and fauna communities.

Whilst stormwater treatment wetlands are not specifically designed to meet conservation objectives, the general provision of habitat within and around a wetland may be provided by:

- Rocks or logs placed in or around a wetland to provide shelter, perches and basking areas for native wildlife.
- Terrestrial planting of indigenous tree, shrub and groundcover species to provide additional habitat for some wetland animals, such as feeding and resting sites for waterbirds and over-wintering shelter for frogs.
- Enhancing any adjacent riparian habitats and creating ecological linkages (corridors) between waterways and other vegetation patches.

The creation of structural complexity in riparian and wetland vegetation is important for ecological diversity and landscape amenity. This may be achieved by including a range of plant life forms on the planting schedule. The use of locally indigenous species ensures that plants are adapted to local environmental conditions and that the character of the wetland is in keeping with the surrounding landscape.

When designing riparian communities, care needs to be taken so as to not create nesting sites for colonial bird species, as resident populations of colonial bird species can have a significant detrimental effect on wetland water quality.

It should be noted that water bodies can attract flocking birds, which may pose a hazard to airports. Local council planning schemes should be consulted when considering whether to locate a wetland near an airport.

Wetlands have a primary function of treating stormwater and improving water quality to receiving waterways and bays; they do not have a primary function of constructing habitat and/or conservation zones. Therefore, maintenance and ongoing functionality of the asset is often more important than habitat or biodiversity protection or preservation in these works.

5. References

Document title
Best Practice Environmental Management Guidelines for Urban Stormwater
Melbourne Water Stormwater Strategy (2013)
State Environment Protection Policy Waters of Victoria
Victorian Planning Provisions

6. Document History

Date	Reviewed/ Actioned By	Version	Action
December 2020	Senior Asset Practitioner – Water Quality	4	Template and links updated