



Developer Guidance

Integrated Water Management Plans

2023

Table of contents

1. Introduction	1
2. Integrated Water Management Plans for new developments	2
3. Integration with the land development process	3
4. Integrated water management considerations	4
5. Stakeholder strategies that influence Development IWM Plans	5
6. Objectives for integrated water management planning	6
7. Requirements of a Development Integrated Water Management Plan	8
8. Water cycle management interventions – examples	11
Appendix 1: An example Development Integrated Water Management Plan structure	13
Appendix 2: Development Integrated Water Management Plan summary tables	15
Appendix 3: Development Integrated Water Management Plan requirements	18
Glossary	20

1. Introduction

This document will help developers and their consultants to produce Integrated Water Management (IWM) Plans for new developments. It outlines how to include water management solutions that reflect the values of the community.

This document is a re-release of the Western Water IWM developer guidance (2018), which was originally developed in collaboration with Hume City Council, City of Melton, Macedon Ranges Shire Council,

Moorabool Shire Council, Melbourne Water and the Department of Land, Water and Planning (now the Department of Environment, Energy and Climate Action) and has been updated to reflect our approach to IWM following the merger of Western Water and City West Water to Greater Western Water in 2021. There have been no substantive changes to the requirements of a Development IWM Plan (Section 7).

Appendices 2 and 3 have been added to clarify existing requirements and streamline the review process. You will be required to complete and submit all tables in Appendices 2 and 3 with your Development IWM Plan.

What is Integrated Water Management?

Integrated Water Management (IWM) is an approach to how we plan, manage, and deliver water services. IWM considers all elements of the urban water cycle and how organisations can work together to effectively manage water resources.

It covers all the services provided in the water cycle including water supply, sewage management, drainage and flood management, waterways and ecosystems, and liveability.

In considering all elements of the urban water cycle, an IWM approach can help you:

- make the best use of all water sources to secure our water supplies
- protect and enhance the health of our waterways and bays
- support Traditional Owner cultural values
- improve community wellbeing through the provision of green open spaces, access to local waterways and opportunities to connect with nature
- support the prosperity of local businesses and industries through affordable and reliable water services
- deliver effective wastewater systems that maximise opportunities to transform waste into resources
- create resilient urban and natural environments that can withstand extreme weather events

How we will support you

Collaborating with us on your Development IWM Plan will help us assess it. You are encouraged to work with us and other water cycle management authorities to find innovative solutions that deliver better outcomes for the environment and the community.

We aim to assess plans that we have been consulted on within 28 days of submission.

Without consultation, it may take us longer to assess your Plan.

2. Integrated Water Management Plans for new developments

Land development is an opportunity to plan future services and infrastructure for functional, liveable spaces.

A Development IWM Plan helps all stakeholders work together to provide water cycle services. The Plan will enable development and the provision of water cycle services, while protecting environmental values and building resilience to climate change. A Development IWM Plan includes the designs and plans for a new development's water cycle services and infrastructure all in one place. A Development IWM Plan should also outline water efficiency and alternative water supply measures.

Local councils may also require a Development IWM Plan or similar document.

A Development IWM Plan should use an IWM approach.

The plan must show subdivision outcomes and water cycle services that are appropriate for the site and take into consideration any regional, catchment or organisational IWM plans, strategies, objectives or structure plans.

There is an example of a Development IWM Plan structure in Appendix 1 (this example is based on the Department of Energy, Environment and Climate Action's IWM Framework for Victoria). All tables in Appendices 2 and 3 are required to be completed and submitted with a Development IWM Plan.

Before we issue a consent of the Statement of Compliance (as shown in Figure 1) the initiatives outlined in the Development IWM Plan must be in place.

A Development IWM Plan covers services provided by many organisations. Working with stakeholders to develop the Plan will ensure it meets the needs of authorities, stakeholders and the community.



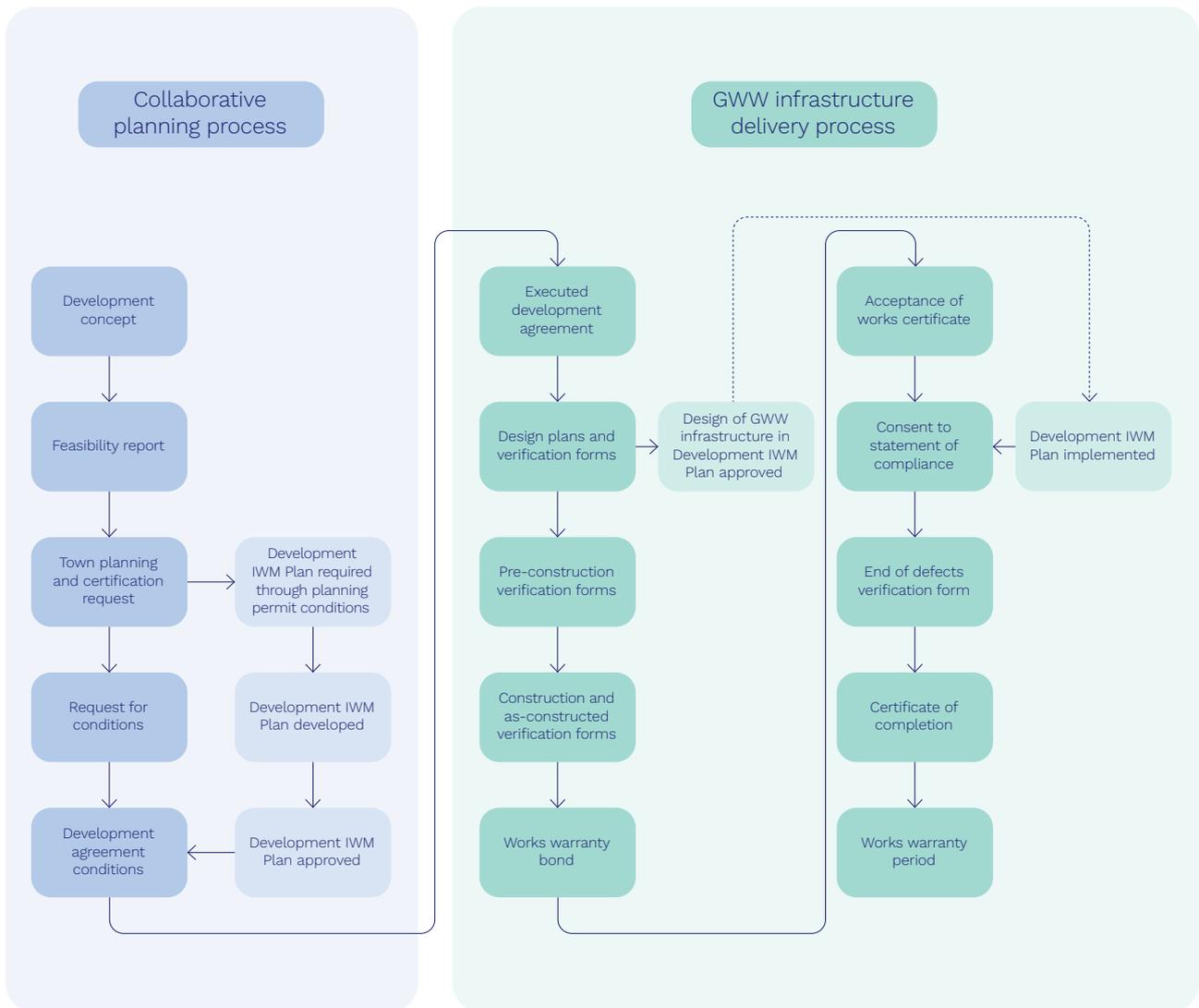
3. Integration with the land development process

The Development IWM Plan process is integrated into the land development process.

The Development IWM Plan process is split in two. The first part of the process is the creation of the Plan and the second part is the implementation of the Plan. This process is outlined in Figure 1 below.

Different stakeholders may have different processes to follow during implementation. This Development IWM Plan process aims to combine all water cycle management planning across the various water cycle service providers into a single plan.

Figure 1. Development IWM Plans within the land development process



4. Integrated water management considerations

A Development IWM Plan should consider how to manage water as a strategic resource within a sustainable development framework.

The location of your development

Identify issues and opportunities specific to the development's location. For example protecting downstream waterways from the effect of increased stormwater runoff.

The size of your development

All greenfield and brownfield subdivisions regardless of size need a Development IWM Plan.

There are opportunities for innovative solutions with all developments. Regardless of size, in your Plan you must show that you have considered more than a standard approach to providing water cycle services.

The water cycle and the changing environment

An IWM approach acknowledges the changing climate. Climate change is causing more frequent extreme weather events and impacting stormwater volumes.

Along with the changing climate, a Development IWM Plan should factor in all elements of the water cycle. This includes water supply, sewerage, drainage, waterways and the urban landscape.

This approach means we can manage our water resources while also protecting our environment and providing liveable urban spaces.

Collaboration with key stakeholders

A Development IWM Plan needs to identify and collate existing local or regional water cycle management plans (see Table 2).

We manage the water cycle along with several other authorities (see Table 3). A Development IWM Plan needs input from the various organisations who manage the water cycle.

When collating a Development IWM Plan it's best to engage early with these stakeholders, including with councils and Melbourne Water.

5. Stakeholder strategies that influence Development IWM Plans

Collaboration in water cycle planning takes place across multiple scales:

1. State
2. Regional
3. Catchment
4. Local government area
5. Precinct
6. Development

This document covers the development scale process.

The water cycle operates over all spatial scales, and planning its management also requires planning at a range of scales.

Water cycle service providers have strategies and plans that cover different spatial scales. IWM involves integrating these activities over a defined area.

Table 1. IWM Planning process at different scales (non exhaustive)

Planning scale	Key strategies/ planning instruments
State	<ul style="list-style-type: none"> • Water for Victoria • IWM Framework for Victoria • Water Act
Regional	<ul style="list-style-type: none"> • Regional urban water strategy • Sustainable water strategy
Catchment	<ul style="list-style-type: none"> • Catchment IWM Plans • Catchment and waterway strategies
Local government area	<ul style="list-style-type: none"> • Local government IWM Plans
Precinct	<ul style="list-style-type: none"> • Precinct IWM Plans
Development	<ul style="list-style-type: none"> • Development IWM Plans

6. Objectives for integrated water management planning

A Development IWM Plan should include five key aspects of water cycle management (see Table 2). These aspects reflect the common objectives of our region’s relevant authorities.

Some of the objectives are aspirational and go beyond the regulatory requirements.

This document is general guidance for all development in our service region. Some Precinct Structure Plans (PSPs) will have more specific requirements.

Table 2. Objectives for integrated water management planning

IWM aspect	Service objective
1 Water supply	<ul style="list-style-type: none"> Affordable, safe, reliable and quality potable water services now and in the future to meet mandatory standards for uses requiring potable water. Minimised consumption of potable water. Optimised use of alternative fit-for-purpose water sources (e.g. recycled water, rainwater, stormwater etc).
2 Sewerage services	<ul style="list-style-type: none"> Affordable, safe, reliable and quality sewerage services that protect public health and the environment. Maximising the recovery of valued resources from the sewerage system, such as recycled water.
3 Drainage and stormwater	<ul style="list-style-type: none"> Manage stormwater in a way that maintains or enhances the predevelopment hydrology of the area, minimises downstream impacts and enhances liveability by retaining water in the landscape. Stormwater is a valued resource.
4 Waterway health and floodplains	<ul style="list-style-type: none"> Ensure natural waterways and floodplains maintain their hydraulic functionality, their ecological condition is improved and these assets offer multi-functional value to the urban landscape. Cultural and heritage values are identified, maintained and enhanced. Urban design maximises the value of waterways and floodplains for recreational use and as habitat for flora and fauna.
5 Land use and urban amenity	<ul style="list-style-type: none"> Ensure land use and open space within the development maximises opportunities for multi-functional use associated with the water cycle and enhances the natural living environment. Land use and open space contribute to urban cooling and mitigate the urban heat island effect. Urban amenity creates urban spaces that enhance the liveability of the community and are resilient in future climate conditions. Connections between community, waterways and open spaces are maximised both locally and within the broader landscape.

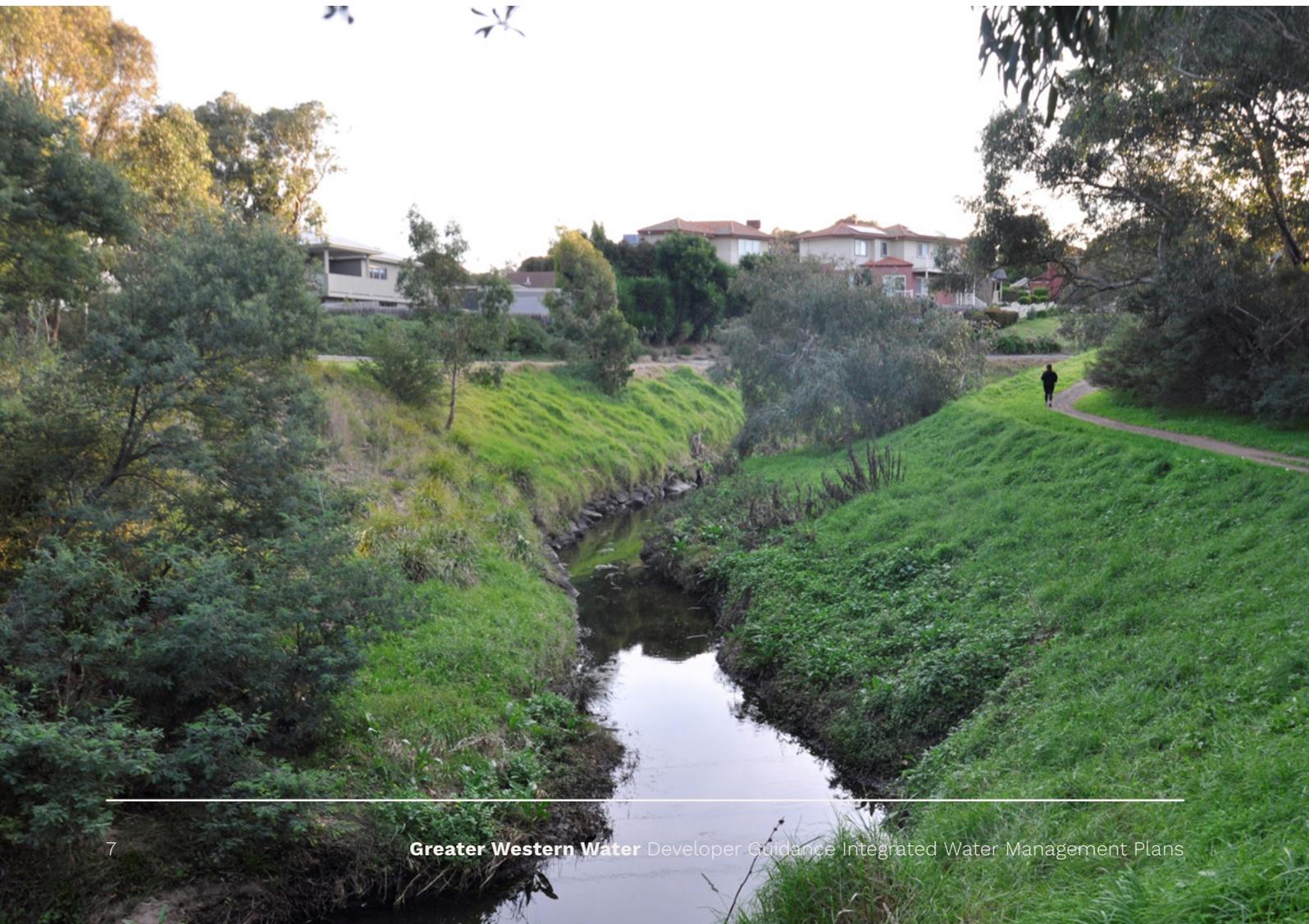
Services integration

Throughout the urban water cycle there are interactions between services. By collaborating, we can take advantage of these interactions to create innovative solutions. For example, urban landscapes require water to keep them green and cool.

This water could come from:

- the potable water supply network, with costs for production and transfer
- the recycled water supply network, with costs for production and transfer, and benefits to sewerage system management
- the drainage system through stormwater harvesting, with costs for production and transfer, and benefits to the drainage system and waterway health
- the drainage system through passive irrigation, with no cost for production or transfer, and benefits to the drainage system and waterway health.

An IWM approach to assessing these options will lead to the best solutions.



7. Requirements of a Development Integrated Water Management Plan

Table 3 below summarises the requirements of each authority and where they fit in the water cycle. Your Development IWM Plan needs to address each of the

requirements in Table 3 and in Appendix 3, and state where in the Plan each requirement has been addressed.

Table 3. Water cycle authorities, responsibilities and IWM Development Plan requirements.

Requirements for developers for inclusion in their Development IWM Plan	Context	Authority
<p>1. Outline the water cycle resilience and liveability outcomes that will be met through the provision of water cycle services for the development.</p>	<p>Planning scheme</p> <p>The Victorian Planning Provisions dictate the regulatory outcomes required of a planning scheme. Typically, these are articulated in Precinct Structure Plans from the Victorian Planning Authority or in council planning schemes. This includes water cycle management outcomes.</p> <p>There may, however, be additional outcomes associated with management of the development's water cycle that are specific to the place in which the development is situated, for example in an IWM Strategic Directions Statement or a Catchment IWM Plan. These may be required by an authority or be a specific outcome driven by the developer.</p>	<ul style="list-style-type: none"> • Victorian Planning Authority • Local Councils • Melbourne Water • Greater Western Water
<p>2. Outline how the development will be provided with water supply, sewerage services and/or alternative water supply from construction commencement to full development.</p> <p>3. Demonstrate through options analysis, with consideration of other water cycle aspects, how the preferred option achieves IWM objectives and presents best community value.</p> <p>4. Undertake a water supply and sewage flow balance for the life of the development.</p> <p>5. Outline the measures that will be taken to ensure both potable water and alternative water is used efficiently.</p> <p>6. Present geospatially the infrastructure required to provide water supply and sewerage services across the development.</p> <p>7. Meet any other relevant requirements as outlined in the applicable Precinct Structure Plan.</p>	<p>Water Supply and Sewerage Services</p> <p>Greater Western Water provides potable water, recycled water and sewerage services.</p> <p>Typically, subdivided land in our service region must be provided with reticulated potable water and sewerage services.</p> <p>Depending on the location of the development, these and other services may be provided on-lot independent of us.</p> <p>Our Land Development Manual (Sep 2022) outlines the process and requirements for developers to build water supply and sewerage infrastructure. In addition to these requirements, and in alignment with Precinct Structure Plan requirements, the IWM Plan will outline how the development will optimise water use efficiency both on lot and across the development broadly.</p>	<ul style="list-style-type: none"> • Greater Western Water

Requirements for developers for inclusion in their Development IWM Plan	Context	Authority
<p>8. Outline how the development will be provided with drainage and waterway services from construction commencement to full development.</p> <p>9. Demonstrate through options analysis, with consideration of other water cycle aspects, how the preferred option achieves IWM objectives including meeting or exceeding Clause 56 Best Practice Environmental Management requirements and presents best community value. Including its ability to maintain pre-development hydrology, minimize downstream impacts and improve ecological condition.</p> <p>10. Undertake a stormwater flow and pollutant balance for the life of the development.</p> <p>11. Present geospatially the infrastructure required to provide drainage and waterway services across the development.</p> <p>12. Meet any other relevant requirements as outlined in the applicable Precinct Structure Plan.</p>	<p>Drainage, stormwater management and waterway health</p> <p>Melbourne Water provides bulk water supply and sewerage services to water corporations, including GWW.</p> <p>Melbourne Water also provide waterways and major drainage services across much of the Port Phillip Bay and Westernport Catchment, including most of GWW's service area.</p> <p>Melbourne Water has set conditions on developments so that they are safe from flooding and don't impact other properties or the protection of waterways.</p> <p>Melbourne Water has a range of guidelines and resources online to ensure developers build drainage infrastructure to protect properties from flooding, and waterways from excess stormwater runoff and pollution.</p>	<ul style="list-style-type: none"> Melbourne Water
	<p>Councils provide 'local-scale' drainage services to deliver local flood management strategies.</p> <p>Clause 56.07-4 of the Victorian Planning Provisions, sets stormwater management objectives that residential subdivisions must meet. These objectives are designed to reduce the impact of flows and pollutants to our waterways, bays and ocean.</p> <p>Local councils and the Victorian Government are responsible for Clause 56, and Melbourne Water also plays a role.</p> <p>Local councils have a range of guidelines and resources to ensure developers build minor drainage infrastructure to protect property from flooding, and waterways from excess stormwater runoff and pollution.</p>	<ul style="list-style-type: none"> Greater Western Water's service area encompasses parts of the municipalities of: <ul style="list-style-type: none"> Melton City Council Moorabool Shire Council Hume City Council Wyndham City Council Hobsons Bay City Council Maribyrnong City Council Brimbank City Council Moonee Valley City Council City of Melbourne Yarra City Council Macedon Ranges Shire Council

Requirements for developers for inclusion in their Development IWM Plan	Context	Authority
<p>13. Outline how the development will be provided with urban landscape services from construction commencement to full development.</p> <p>14. Demonstrate through options analysis, with consideration of other water cycle aspects, how the preferred options achieve IWM objectives and present best community value.</p> <p>15. Present geospatially the urban landscape infrastructure across the development, including parks, gardens, street trees and water sensitive urban design components and their associated water services.</p> <p>16. Meet any other relevant requirements as outlined in the applicable Precinct Structure Plans.</p>	<p>Urban amenity</p> <p>Local councils also provide urban amenity through public open space, streetscape and urban landscape infrastructure and are also a major user of water to support these community assets.</p> <p>Precinct Structure Plans dictate urban amenity requirements, which must be planned for to the satisfaction of the local council. The IWM Plan will outline how these services, and the water cycle interactions, will be provided.</p>	<ul style="list-style-type: none"> Local Councils



8. Water cycle management interventions – examples

There are some examples of water cycle management techniques in Table 4 below (this is not a complete list).

You can combine different solutions from each aspect from this list depending on what your site needs.

It's important that you show how you will use new approaches and technologies for your development.

It's expected that you use a combination of these interventions for each development.

Table 4. Water cycle management interventions (ticks are indicative of IWM value)

Intervention	Water supply	Sewerage services	Drainage and stormwater	Waterway health and floodplains	Land use and urban amenity
Potable water supply	✓				✓
Class A recycled water supply	✓✓	✓			✓✓
Class B & C recycled water supply	✓✓	✓			✓
Rainwater tanks and reuse	✓✓		✓	✓✓	
Water efficient appliances		✓			
Local sewer treatment/ recycled water plants (gravity or pressure)		✓			
Sewer mining	✓✓	✓			✓✓
Aquifer storage and recovery	✓				✓
Stormwater capture and reuse	✓✓		✓	✓✓	✓
Water Sensitive Urban Design (WSUD) options (raingardens, sediment ponds, wetlands, swales)			✓	✓	✓
Greywater recycling	✓✓	✓			

Intervention	Water supply	Sewerage services	Drainage and stormwater	Waterway health and floodplains	Land use and urban amenity
Reticulated sewerage		✓			
Passive irrigation systems	✓		✓	✓	✓
Onsite domestic wastewater management		✓✓			
Digital metering	✓✓	✓✓			
Retarding basins			✓		
Rooftop greening			✓	✓	✓
Treed streetscapes, parks and gardens			✓	✓	✓
Water smart vegetation selection	✓			✓	✓
Porous paving			✓	✓	✓
Infiltration trenches			✓	✓✓	
Community education	✓	✓	✓	✓	✓
Well established long-term IWM accountabilities	✓	✓	✓	✓	✓

Appendix 1: An example Development Integrated Water Management Plan structure

The below table is an example structure for a Development IWM Plan.

It includes references to the requirements set out in Section 7.

	Requirement (see Section 7)
1. Recommendations and summary	
a. Servicing plan	
b. Implementation timeframe	
c. Strategic alignment	
2. Introduction	
a. Project description and service need	
I. Water consumption demand	4
II. Sewerage services demand	4
III. Stormwater flow generated	10
IV. Stormwater nutrients generated	10
V. Flood management requirements	
VI. Urban amenity and open space requirements	
b. Success statement	
3. Background	
a. Scope of the plan	
b. Assumptions and constraints	
c. Scope of the plan	

Requirement (see Section 7)

4. Projects partners values	
a. Greater Western Water values	
b. Melbourne Water values	
c. Local government values	
d. Community aspirations (where applicable)	
e. The values of First Nations people (where applicable)	
f. Defined accountabilities (where applicable)	
5. Service levels and desired outcomes	1
6. Options analysis	3, 9, 14
7. Integrated Water Management Servicing Plans	
a. Water supply (potable and alternative)	2, 5
b. Sewerage management	2
c. Stormwater management	8
d. Flood protection	8
e. Waterway health protection	8
f. Urban amenity and open space provision	13
8. Implementation	
a. Stakeholder impact analysis (if applicable)	
Appendices	
I. Development maps with PSP features	
II. Potable water network servicing plan	6
III. Sewerage network servicing plan	6
IV. Alternative water network servicing plan (if applicable)	6
V. Drainage network servicing plan (including Developer Services Scheme)	11
VI. Public open space and urban amenity plan	15

Appendix 2: Development Integrated Water Management Plan summary tables

All tables in Appendix 2 are to be completed and submitted with all Development IWM Plans.

1. Site information

Lot balance

Lot size (m2)	Number of lots	Occupancy
0-200		
200-250		
250-300		
>300		
Total		

Land budget

Parameter	Unit	Value	Percentage
Residential area	ha		
Public active open space area	ha		
Public passive open space area	ha		
Commercial/industrial area	ha		
Other	ha		
Total site area	ha		

2. Analysis assumptions

MUSIC model parameters

Parameter	Unit	Value
Rainfall station	Station # and location	
Date period	Year starting to year ending	
Time step	Minutes	

Demand assumptions

Parameter	Unit	Value
Irrigation rate for active open space	ML/ha/year	
Irrigation rate for passive open space	ML/ha/year	
Potable water demand (per lot)	L/day	

Rainwater analysis assumptions

Parameter	Unit	Value
Rainwater demand (per lot)	L/day	
Toilet (per lot)	L/day	
Clothes washer (per lot)	L/day	
Garden (per lot)	L/day	
Rainwater tank volume (per lot)	kL	
Rainwater supplied (per lot)	L/day	
Rainwater supplied (per lot)	L/year	

Total site water balance

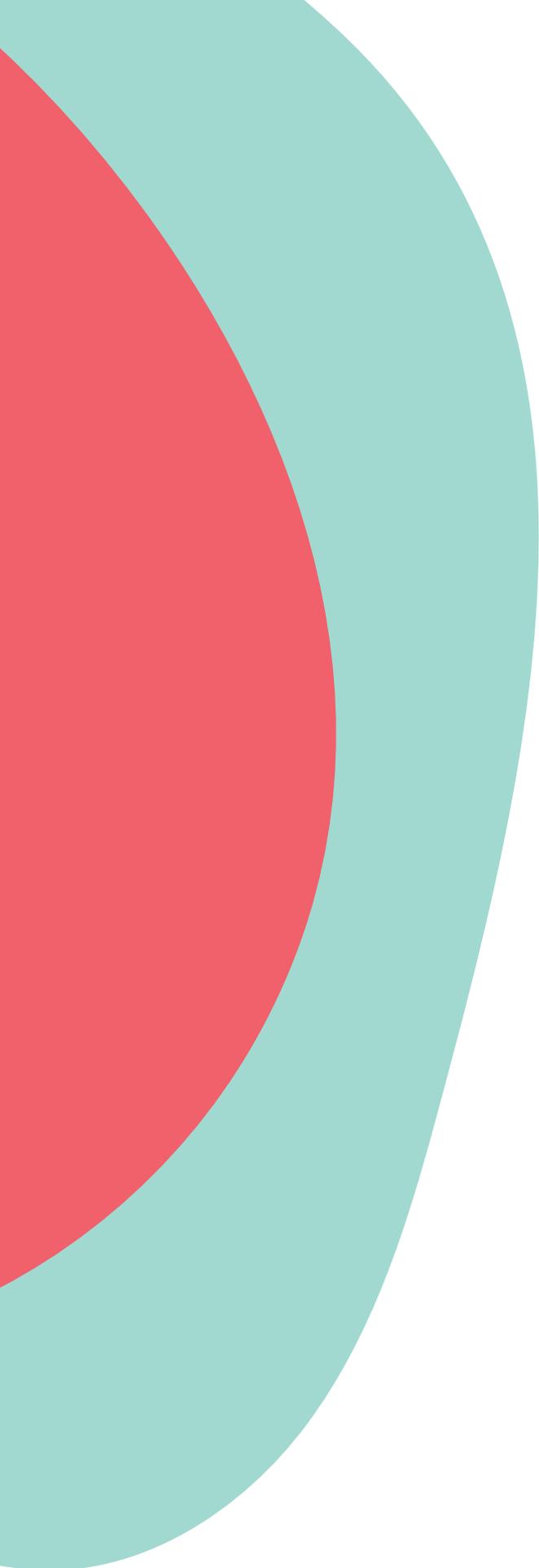
Parameter	Unit	Value
Total site potable water demand	ML/ year	
Total site rainwater tanks installed	no.	
Total site rainwater supplied	ML/ year	
Total site stormwater supplied	ML/ year	
Total site alternative water supplied	ML/ year	
Total site potable water reduction from alternative water supplied	%	
Total site sewage generation	ML/ year	
Total site potable water demand	ML/ year	

Appendix 3: Development Integrated Water Management Plan requirements

In the table below, indicate the section in your Development IWM Plan that responds to the requirements as outlined in Section 8 of the Developer Guidance and submit this table with your Development IWM Plan.

	The requirements below must be included in your Development IWM Plan.	Section
1	Outline the water cycle resilience and liveability outcomes that will be met through the provision of water cycle services for the development.	
2	Outline how the development will be provided with water supply, sewerage services and/or alternative water supply from construction commencement to full development.	
3	Demonstrate through options analysis, with consideration of other water cycle aspects, how the preferred option achieves IWM objectives and presents best community value.	
4	Undertake a water supply and sewage flow balance for the life of the development.	
5	Outline the measures that will be taken to ensure both potable water and alternative water is used efficiently.	
6	Present geospatially the infrastructure required to provide water supply and sewerage services across the development.	
7	Meet any other relevant requirements as outlined in the applicable Precinct Structure Plan.	
8	Outline how the development will be provided with drainage and waterway services from construction commencement to full development.	
9	Demonstrate through options analysis, with consideration of other water cycle aspects, how the preferred option achieves IWM objectives including meeting or exceeding Clause 56 Best Practice Environmental Management requirements and presents best community value. Including its ability to maintain pre-development hydrology, minimize downstream impacts and improve ecological condition.	
10	Undertake a stormwater flow and pollutant balance for the life of the development.	
11	Present geospatially the infrastructure required to provide drainage and waterway services across the development.	
12	Meet any other relevant requirements as outlined in the applicable Precinct Structure Plan.	

	The requirements below must be included in your Development IWM Plan.	Section
13	Outline how the development will be provided with urban landscape services from construction commencement to full development.	
14	Demonstrate through options analysis, with consideration of other water cycle aspects, how the preferred options achieve IWM objectives and present best community value.	
15	Demonstrate through options analysis, with consideration of other water cycle aspects, how the preferred options achieve IWM objectives and present best community value.	
16	Meet any other relevant requirements as outlined in the applicable Precinct Structure Plans.	



Glossary

Brownfield

Land that has been previously used for industrial or commercial purposes and has been identified for re-development.

Catchment

An area where water falling as rain is collected by the landscape, eventually flowing to a body of water such as a creek, river, dam, lake or ocean; or into a groundwater system.

Climate change

A long-term change of the earth's temperature and weather patterns, generally attributed directly or indirectly to human activities such as fossil fuel combustion and vegetation clearing and burning.

Community

Includes individuals, public and private landholders, community groups and business owners.

Fit for purpose (water quality)

Water of a quality that is appropriate for its intended use.

Flow

Movement of water – the rate of water discharged from a source, given in volume with respect to time.

Greenfield

Undeveloped land identified for residential or industrial/commercial development, generally on the fringe of metropolitan Melbourne.

Growth areas

Locations on the fringe of metropolitan Melbourne designated in planning schemes for large-scale transformation, over many years, from rural to urban use.

Integrated water management (IWM)

A collaborative approach to planning that brings together all elements of the water cycle including sewage management, water supply, stormwater management and water treatment, considering environmental, economic and social benefits.

Integrated Water Management Forum

A meeting of urban water management organisations to identify, prioritise and commit to the investigation of integrated water management opportunities.

Integrated water management opportunity

A servicing need that has the potential to leverage broader benefits when undertaken collaboratively, using an integrated water management approach.

Liveability

A measure of a city's residents' quality of life, used to benchmark cities around the world. It includes socioeconomic, environmental, transport and recreational measures.

Megalitre (ML)

One million (1,000,000) litres.

Open space

Includes land reserved for natural landscape, parklands, recreation and active sports, as well as waterways and bays.

Potable water

Water of suitable quality for drinking.

Precinct Structure Plan

A Precinct Structure Plan (PSP) is a land use and infrastructure plan to guide the development of an area over time. It provides a long-term vision for how an area will develop in the future. A PSP sets out the preferred locations of residential and employment land and infrastructure, and provides guidance for transport and parking, urban design, heritage and character, open spaces and integrated water management.

Rainwater

Water that has fallen as rain or has been collected from rainfall.

Recycled water

Water derived from sewerage systems or industry processes that is treated to a standard appropriate for its intended use.

Resilience

The capacity of individuals, communities, institutions, businesses, systems and infrastructure to survive, adapt and grow, no matter what chronic stresses or shocks they encounter.

Runoff

The portion of rainfall which actually ends up as streamflow, also known as rainfall excess.

Sewage

Wastewater produced from households and industry.

Sewerage

The pipes and plants that collect, remove, treat and dispose of liquid urban waste.

Stormwater

Runoff from urban areas. The net increase in runoff and decrease in groundwater recharge resulting from the introduction of impervious surfaces such as roofs and roads within urban development.

Strategy

A high-level direction designed to achieve an outcome or a set of outcomes related to IWM, over a defined time period for a defined geographic location.

Urban heat-island effect

When the built environment absorbs, traps, and in some cases directly emits heat, causing urban areas to be significantly warmer than surrounding non-urban areas.

Urban water cycle

The cycle of water through urban environments. Distinguished from the natural urban water cycle by the transfer of water through built infrastructure and the high runoff rates generated by impervious surfaces.

Wastewater

Water that has had its quality affected by human influence, deriving from industrial, domestic, agricultural or commercial activities.

Water sensitive urban design (WSUD)

Integrating the urban water cycle into urban design to minimise environmental damage and improve recreational and aesthetic outcomes.

Waterways

Rivers and streams, their associated estuaries and floodplains (including floodplain wetlands) and non-riverine wetlands.

Waterway condition/waterway health

Waterway condition (or waterway health) is an umbrella term for the overall state of key features and processes that underpin functioning waterway ecosystems (such as species and communities, habitat, connectivity, water quality, riparian vegetation, physical form, and ecosystem processes such as nutrient cycling and carbon storage).

Wetlands

Areas, whether natural, modified or artificial, subject to permanent or temporary inundation, that hold static or very slow-moving water and develop, or have the potential to develop, biota adapted to inundation and the aquatic environment. Wetlands may be fresh or saline.

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