

Our Water Future

Integrated Water Management



MORNINGTON
PENINSULA
Shire

Acknowledgement of Traditional Owners

Mornington Peninsula Shire acknowledges and pays respect to the elders, families and ancestors of the Bunurong/BoonWurrung people, who have been the custodians of this land for many thousands of years. We acknowledge that the land on which we meet is the place of age-old ceremonies, celebrations, initiation and renewal; and that the Bunurong/BoonWurrung peoples' living culture continues to have a unique role in the life of this region.

Integrated Water Management is a collaborative approach to planning and managing all elements of the water cycle.

It has the potential of providing greater community and environment value by leveraging on opportunities to maximise the outcomes of water cycle management.

Our Water Future



Improve community connection with waterways and bays

Promote best practice stormwater management

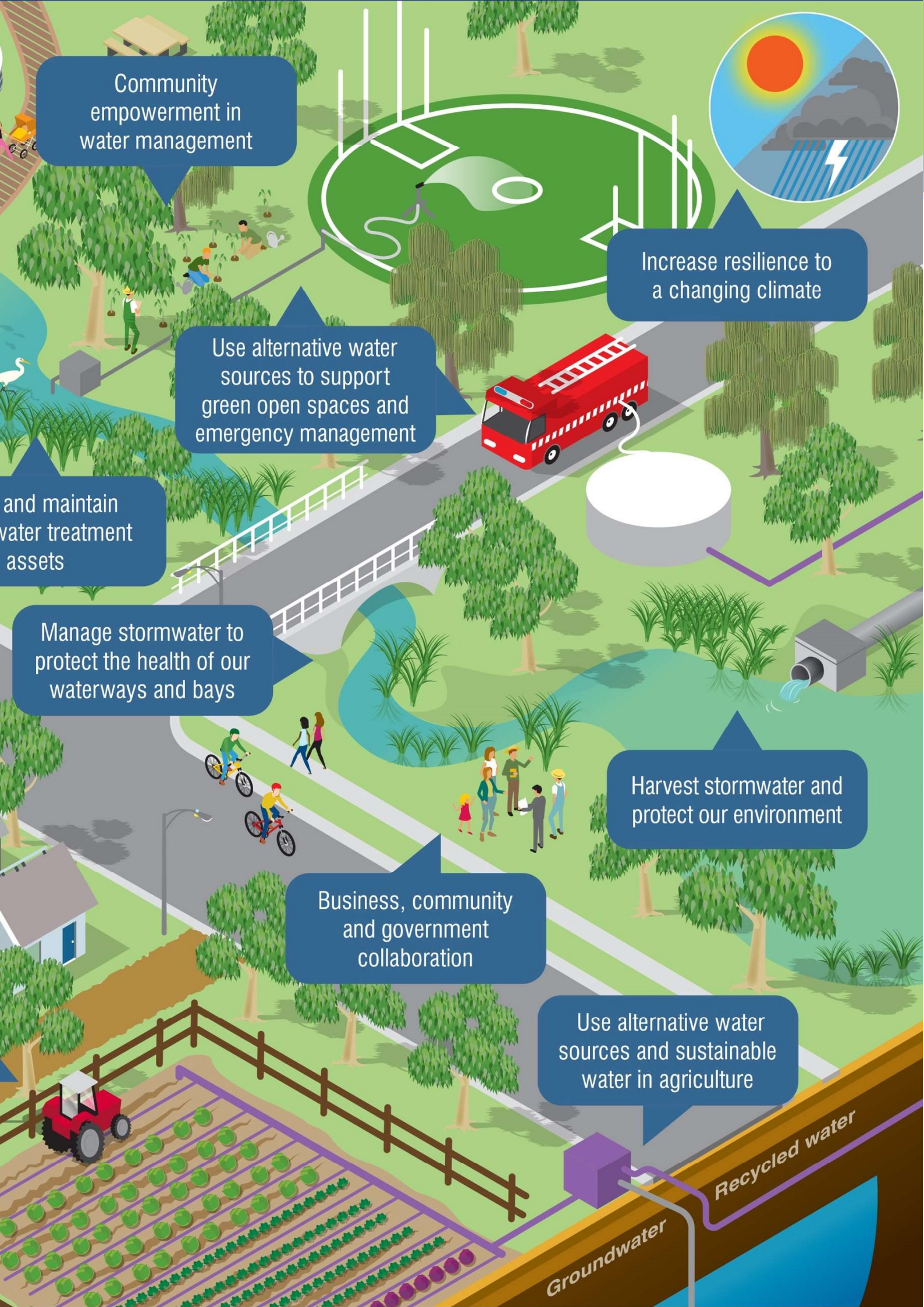
Use alternative water sources for street trees

Increase water conservation and reuse

Connect properties to sewer and maintain septic tanks

Promote best practice stormwater management

Build a stormwater a

An isometric illustration of a sustainable community. At the top, a circular green field with white lines is surrounded by trees. To the right, a circular inset shows a sun, clouds, and rain. A red fire truck is on a road next to a large white cylindrical water storage tank. A bridge crosses a stream with reeds. In the foreground, a red tractor is in a field of green plants. A purple pipe labeled 'Recycled water' and a grey pipe labeled 'Groundwater' are shown at the bottom. Various groups of people are engaged in different activities throughout the scene.

Community empowerment in water management

Increase resilience to a changing climate

Use alternative water sources to support green open spaces and emergency management

and maintain water treatment assets

Manage stormwater to protect the health of our waterways and bays

Harvest stormwater and protect our environment

Business, community and government collaboration

Use alternative water sources and sustainable water in agriculture

Recycled water

Groundwater

Mornington Peninsula

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Glossary

Terms	Description
Agroecology	The application of ecological principles to agricultural systems and practices
Alternative water source	Alternative water sources include rainwater from your roof, storm water, recycled water (treated wastewater) or greywater
Environmental water	Water managed to improve or maintain the health of rivers and wetlands – including the plants and animals that depend on them. Environmental water can mean any water in a river or wetland that provides environmental benefits, the Victorian Environmental Water Holder (VEWH) use the term to mean water available under environmental entitlements actively managed to benefit the environment
Environmentally Sustainable Design (ESD)	An aspect of design, applying to buildings as well as civil works, that seeks to improve the performance, reduce environmental impacts, resource use and waste and create healthy environments for occupants/users
Green wedge land	Green wedge land is defined in Section 46AC of the <i>Planning and Environment Act 1987</i> as “land that is described in a metropolitan fringe planning scheme as being outside an urban growth boundary.”
Impervious surfaces	Hard surfaces that do not allow water to infiltrate to the underlying soil such as roads, roof tops, paving and car parks
Infiltration	The process by which surface water enters the soil
Nuisance flooding	Low levels of inundation that do not pose significant threats to public safety or cause major property damage, but can disrupt routine day-to-day activities, put added strain on infrastructure systems such as roadways and sewers and cause minor property damage
Rainwater	Rainwater captured from a roof
Stormwater	The net increase in runoff from urban development due to water not being able to seep into the ground because of impervious surfaces, such as roofs and roads – Clause 73.01
Urban Heating	An increase in localised temperature due to the urban built environment, primarily due to high amounts of concrete and asphalt, and a reduction in vegetation. Increasing tree canopy cover is a key method to reducing these effects
Water Sensitive Urban Design	A holistic approach to water management that integrates urban design and planning with social and physical sciences in order to deliver water services and protect aquatic environments in an urban setting
TSS, TP, TN	Stormwater pollutant loads categorised as Total Suspended Solids (TSS), Total Phosphorous (TP) and Total Nitrogen (TN)

1 Introduction

1.1 Background

Water is integral to the liveability of our townships, the health of our environment and the prosperity of our community.

We are increasingly using water faster than nature can replace it. Climate change, urbanisation, population growth, greater demands for food and changing land use will impact the community here in the Peninsula. Heightened community expectations and technological innovation also present their own challenges and opportunities. We need to adapt to global trends and the challenges ahead in water management to ensure that Mornington Peninsula region is thriving, healthy and resilient.

To address these pressures, there needs to be a collaborative and integrated solution to water cycle management. Integrated Water Management (IWM) is a collaborative approach to planning and managing all elements of the water cycle to maximise social, environmental and economic outcomes for the community.

Our state water plan, *Water for Victoria (2016)*, aims to ensure that our communities are resilient and our townships are liveable, now and in the future. The *Integrated Water Management Framework 2017* was developed to help deliver that objective. Mornington Peninsula Shire's *Integrated Water Management Plan* is aligned with the framework to ensure consistency in approach. It takes us into the next decade and prepares us for the change anticipated.

1.2 Vision

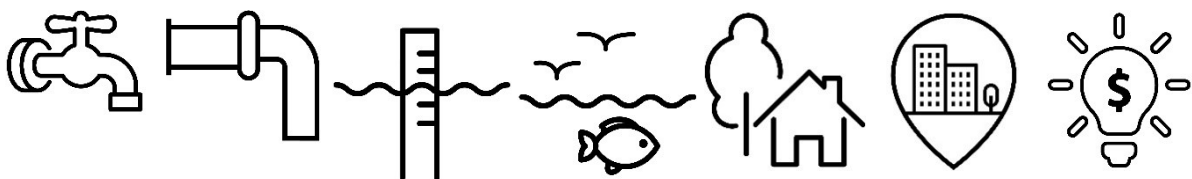
Mornington Peninsula Shire plays a critical role in water cycle management, both directly through public assets management, and indirectly through working with the community and stakeholders.

Achieving the outcomes identified in this Plan, requires investment and advocacy and collaboration with stakeholders, including state and federal government, water authorities, regulators, neighbouring councils and the community.

This Strategy has been designed to drive collaboration in water-related projects within Shire's operations as well as strengthening the connection with the community and other stakeholders.

Vision

To work together in water planning and management for a liveable, resilient and thriving community and environment on the Mornington Peninsula



Water
supply

Wastewater

Flood risk

Healthy
waterways

Healthy
landscapes

Community
values

Economy

2 Integrated Water Management for Mornington Peninsula Shire

2.1 What is Integrated Water Management?

Integrated Water Management (IWM) is a **collaborative approach to planning and managing all elements of the water cycle**, including stormwater, wastewater, water supplies (surface water and groundwater) and waterways. It has the potential to provide greater community value by leveraging opportunities to achieve better economic value and outcomes that benefit our community and environment.

Mornington Peninsula Shire's IWM Plan sets out strategic direction and identifies existing and future opportunities for water management for our region. The Strategy will enhance liveability on the Mornington Peninsula and build water resilience through the whole water cycle (see Figure 1). The implementation of this Strategy and associated action plan will support the implementation of *Water for Victoria* at a local level.

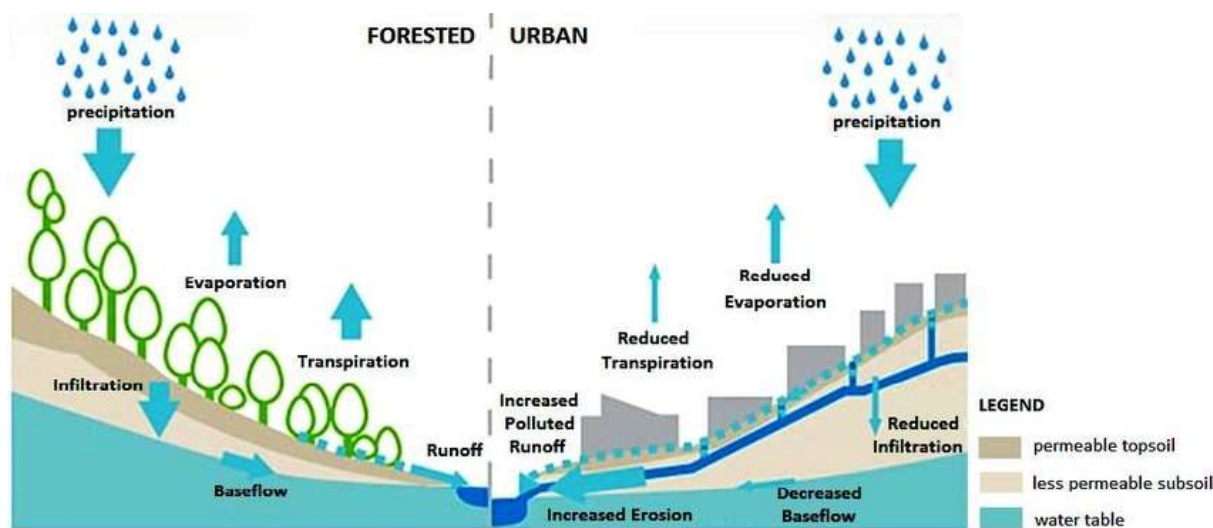


Figure 1: Natural and Urban Water Cycle (Source: Melbourne Water)

2.2 How is IWM different to historical water management approaches?

Historically, water planning and management, such as stormwater management, is carried out in isolation from mains water, wastewater and natural water cycles. In an IWM approach, all aspects of the water cycle are considered together to identify a wider range of achievable benefits.

For this to be successful, it requires collaboration across multiple organisations that have influences in all elements of the water cycle. This includes, but is not limited to, local governments, residents and community, water corporations, catchment management authorities, the Department of Environment, Land, Water, Planning (DELWP), and Traditional Owners. By having local government involved, it means that there are opportunities for the community's priorities to be included in the collaborative planning process. Appendix 1 details external stakeholder mapping, including roles and responsibilities, potential collaborations and advocacy opportunities.

Mornington Peninsula Our Water Future

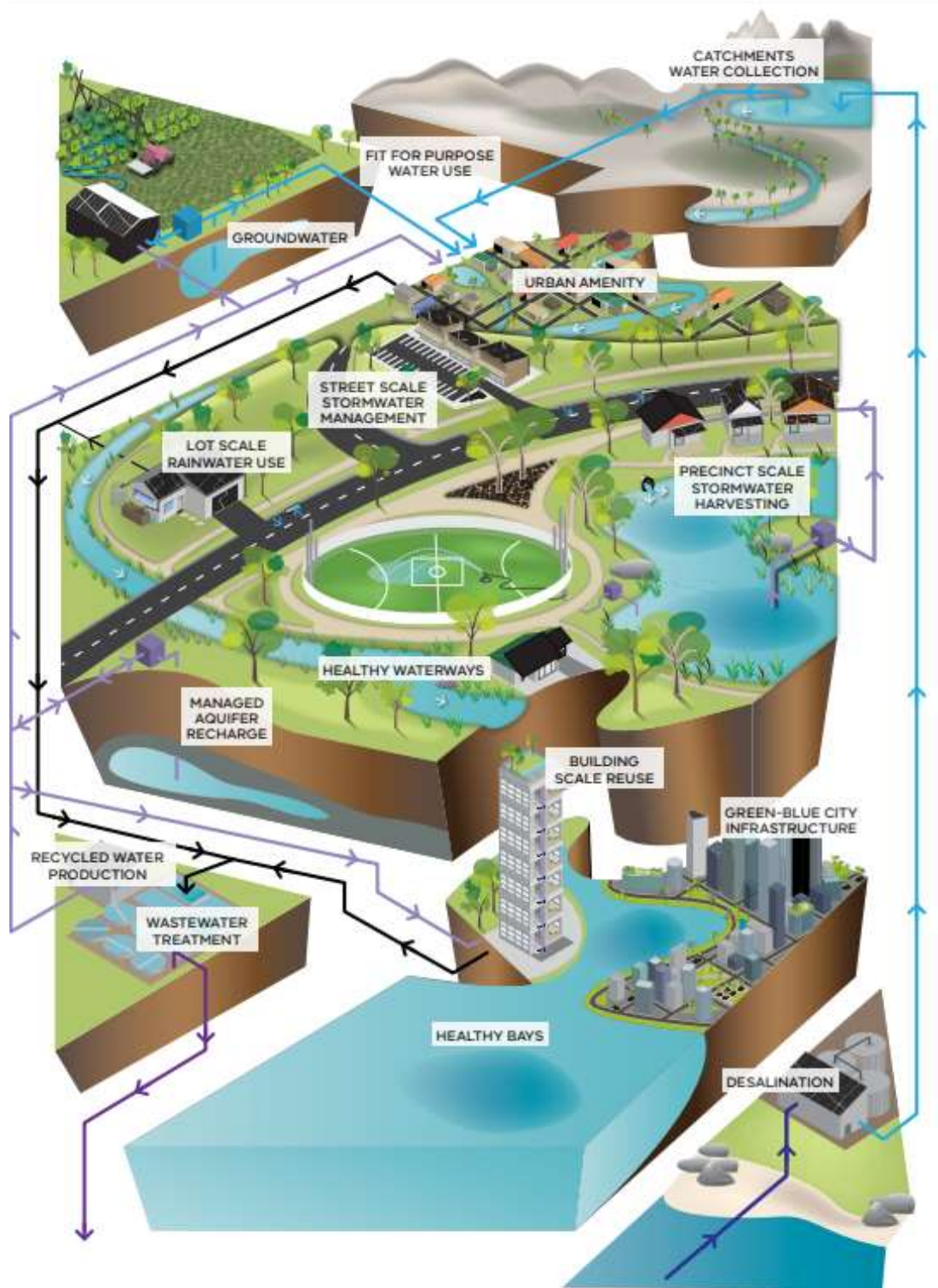


Figure 2: Examples of options and outcomes from the application of IWM (Source: DELWP IWM Framework)

2.3 What can IWM do for the Mornington Peninsula

An integrated approach to water planning and management can provide multiple benefits to local communities:

- **Enhance liveability** by creating open green spaces and reducing heat island effects by supporting tree canopy growth
- **Build resilience** to climate change effects by ensuring water security and reducing flood risk
- **Protect the environment** by reducing stormwater and septic system impacts
- **Increase community water literacy** and connection with water
- **Support economic** growth in local agriculture (which also facilitates food security) and industry



Figure 3: IWM Benefits (Source: Waterwise UK)

2.4 Policy Context

This plan supports and aligns with the Commonwealth Government, State Government and Local Government plans and considers existing and future challenges and opportunities.

Below is a flowchart illustrating the various legislations and policies as it relates to this IWM Plan.



Mornington Peninsula

Our Water Future

2.5 IWM Plan's Relationship with Other Council Plans

Table 1 shows the alignment of the seven IWM Strategic Outcomes with a number of existing council strategies and plans.

Table 1: Alignment of IWM Strategic Outcomes with Existing Council Plans

IWM Strategic Outcomes	Council Policy Document											
	Council Plan 2021	Climate Emergency Plan 2020	Flood Management Plan 2017	ESD Policy	Sports Capacity Plan 2019	Biodiversity Conservation Plan 2019	Wastewater Management Plan 2018	Green Wedge Management Plan 2019	Health and Wellbeing Plan 2017	Economic Development Strategy 2016	Road Management Plan 2018	Play Space Strategy 2015
Safe, secure and affordable supplies in an uncertain future												
Effective and affordable wastewater systems												
Opportunities are sought to manage existing and future flood risks and impacts												
Healthy and valued waterways and marine environments												
Healthy and valued urban and rural landscapes												
Community values are reflected in place-based planning												
Diverse jobs, economic benefits and innovation												

Direct contribution to existing policy



Potential contribution to existing policy



2.6 IWM Framework

2.6.1 The IWM Forums and Catchment Scale IWM Plan

The *Integrated Water Management Framework for Victoria (2017)* established IWM Forums to enable delivery of the state water plan, *Water for Victoria (2016)*. Chapter 5 of *Water for Victoria* states the aim for our communities is to be resilient and liveable, now and into the future.

The IWM Forums are designed to enable collaborative IWM planning between local government, water corporations, catchment management authorities and Traditional Owners.

The Forums boundaries are aligned with the existing five major waterway catchment boundaries within the Port Phillip and Western Port catchments. Mornington Peninsula Shire is represented on both the Western Port and Dandenong Forums.

Mornington Peninsula Shire is an active participant in the Forums. The IWM Forum provides a platform for Mornington Peninsula Shire to collaborate with and learn from other IWM forum members. They assist with achieving the objective set in this IWM Strategy.

Development of a Catchment Scale IWM Plan is in progress. With input from all forum members, this will determine key performance indicators and targets at a catchment scale. The objectives and targets in this local Plan will align with the Catchment Scale Plan.

2.6.2 IWM Strategic Outcomes for Mornington Peninsula

The *IWM Plan* has been designed to align with the seven IWM strategic outcomes adopted by the State Government's Integrated Water Management Forums and the Strategic Direction Statements (SDSs), Sep 2018 (see Fig. 4). Each of these will have a significant role in shaping the liveability, prosperity and resilience of Mornington Peninsula. These outcome areas provide a guide to identify and prioritise the various IWM opportunities.

These 'Strategic Outcomes' have therefore been adopted in this Strategy to directly flow from this framework to Integrated Water Management in Local Government.

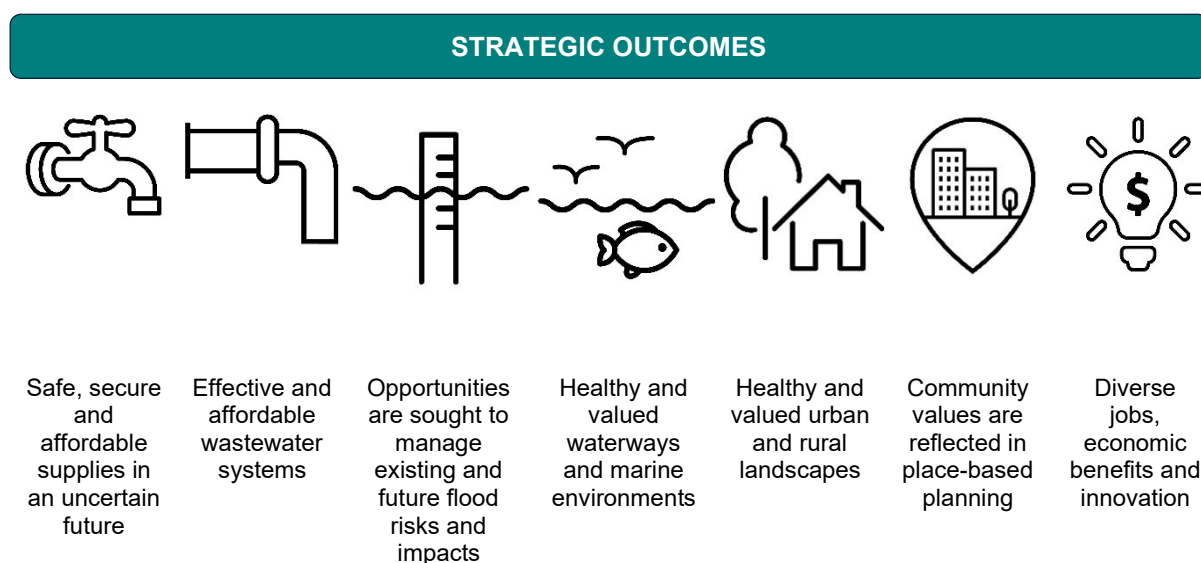
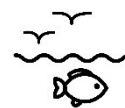
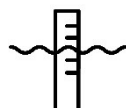
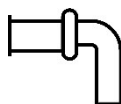


Figure 4: IWM Strategic Outcomes

Mornington Peninsula

Our Water Future

STRATEGIC OUTCOMES



Safe, secure and affordable supplies in an uncertain future

A diverse range of fit for purpose water supplies and resources are utilised

Water quality meets regulatory standards and community expectations

Efficiently managed water and demand

Water is available to maintain valued green community assets

All water resources, including groundwater, are managed in a balanced and sustainable way

Secure fit for purpose water supply for emergency management, agricultural and non-agricultural industry and economy under all climatic conditions, including droughts

Effective and affordable wastewater systems

Meets public health and environmental standards

Effective innovative, best practice, fit for purpose sewerage systems for both septic and sewered areas

Waste-to-resource opportunities are maximised

Optimised and managed onsite domestic and commercial systems

A risk-based approach to sewerage and wastewater management adopted

Opportunities are sought to manage existing and future flood risks and impacts

Community and property resilient to local flood risk and climate change

Emergency information is shared, available and understandable by both practitioners and the community

Appropriate levels of flood protection in urban areas

Resilient urban and natural environments

Flooding is managed to support environmental values

Floodplains are managed to support aquatic ecosystems

Healthy and valued waterways and marine environments

Fishable and swimmable marine environments and swimmable recreational waterways

Waterways in the catchment are managed for long term ecological resilience, balancing the needs for regional flood mitigation, agriculture, industry and urbanisation

Reduced nutrients, sediments and discharges to both waterways and bays

The waterways, wetlands and floodplains provide a secure bio-link with a range of habitats resilient to changes in condition and climate

Impacts from urban, peri urban, industrial, business and transport activities are mitigated close to the source to protect our waterways and bays

Wetlands and other aquatic ecosystems are enhanced with sustainable populations of macroinvertebrates, iconic fish, bird and frog species, and platypus

Traditional Owner and Aboriginal values, knowledge and practices are integrated and protected in waterway management and planning

Reduced nutrient and sediment discharges to aquifers, waterways and bays

Water quality at the bays supports active and passive recreation

Remnant higher stream values and habitats are rehabilitated and protected

Mornington Peninsula

Our Water Future

STRATEGIC OUTCOMES



Healthy and valued urban and rural landscapes

Aboriginal cultural values associated with urban landscapes and waterways are protected

Urban landscapes are supported by water to retain moisture for cooler, greener cities and towns

Waterways and coastal environments accessible as valuable open space

Active and passive recreation supported by fit for purpose water

The waterways, wetlands and floodplains are inviting places that are connected, accessible and interconnected for public enjoyment and amenity

Waterways form the basis for an interconnected network of natural spaces where biodiversity is connected and resilient, and people can connect with nature

Riparian zones and floodplains within the catchment continue to increase and expand the quality and connection of indigenous vegetation



Community values are reflected in place-based planning

Diverse urban landscapes that enhance local conditions and add value to community liveability

Local water related risks and issues, including emerging and legacy issues, are understood and managed

Empowered and engaged community who actively participate in collaborative decision-making

Place-based planning considers and integrates urban stormwater runoff and retention to protect waterways, enhance groundwater systems and support urban landscapes

Stakeholders and the broader community are knowledgeable, engaged, empowered and working together



Diverse jobs, economic benefits and innovation

Jobs and economic growth supported by water

Innovative planning and operation

Strong governance, collaboration and performance

Actions in *Water for Victoria 2016* with specific regard to Traditional Owner and Aboriginal consultation, engagement, employment and economic development have been comprehensively implemented

Empowered key industry groups to enable good water cycle management through improved business practices

Improved business water practices provide new opportunities for jobs and economic growth

The table shows each of the primary seven strategic outcomes. Secondary outcomes are nested beneath. These are a synthesis of the Western Port and Dandenong SDS secondary outcomes, applying local Mornington Peninsula context. These outcome areas acknowledge the breath of council plans and policies that relate to the seven primary strategic outcomes.

3 Meeting Challenges Now and Into the Future

The Mornington Peninsula is experiencing an ongoing change in climate, steady growth in population and urban development.

3.1 Mitigating and Adapting to Climate Change

Recognising that the Earth's current warming trajectory threatens most life on this planet, the Mornington Peninsula Shire declared a climate emergency in 2019. One year later, the Shire adopted our Climate Emergency Plan – *Ensuring Our Future: Our Climate Emergency Response*. This signals a move away from 'business as usual' approach towards reversing carbon output and moving towards a 'net zero' future.

Based on the *Greater Melbourne Climate Projections 2019* report, climate change impacts are already being felt now, and will increase in the future. The Mornington Peninsula is already experiencing increasing temperatures, shifting rainfall patterns, decreased rainfall, coastal inundation, extreme weather events and biodiversity loss.

"We need to plan for climate change because the change is happening already and it's going to keep happening and it's going to make life a lot more challenging for a lot of people" – community member



Increased rainfall events will exacerbate flooding, whilst elevated temperatures increase bushfire risk and impact health and wellbeing. Reductions in average annual rainfall means prolong drought which puts pressure on our water supplies, the natural environment and limits agricultural production. *Figure 5: Farm in Tuerong, March 2019*

Increased rainfall events will exacerbate flooding, whilst elevated temperatures increase bushfire risk and impact health and wellbeing. Reductions in average annual rainfall means prolong drought which puts pressure on our water supplies, the natural environment and limits agricultural production.

The community are most concerned about ecological damage and enhanced bushfire risk¹¹. They understand the challenge that climate change poses and are supportive of initiatives that decrease their vulnerability and improves their wellbeing in light of climate change impacts.

Climate change is also driving Australian cropping belt further south. It is changing what is possible to cultivate on the Peninsula. With access to recycled water in the region, there are growing opportunities to further strengthen Mornington Peninsula's contribution to Melbourne's foodbowl.

¹¹ MPSC Climate Emergency Survey 2020

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Key Implication:

1. We need to prepare for Climate Change impacts on the water cycle, such as
 - Increase in temperature
 - Reduction in cool season rainfall (April to October)
 - Large decreases in streamflow
 - Increase in extreme rainfall events
 - Increase in flash flooding
 - Increase in bushfire risk
 - Sea level rise
2. We should harness the opportunities a changed climate for the Mornington Peninsula e.g. Strengthening the Foodbowl contribution

3.2 Impacts of Population Growth and Urbanisation

Demand for water is expected to increase with projected population growth of 0.6% per annum in the Mornington Peninsula area².

This can provide challenges for water and liveability. More houses to support population growth could mean less green space which increases the heat island effect. In addition, it could also mean more impervious surfaces from new developments which generates greater volume of stormwater runoff, leading to increased flood risks and impacts our waterway health.

As the population grows, publicly accessible green open spaces will become increasingly important in creating liveability for the community. Growth or maintenance of vegetation coverage is also critical to provide shading to combat the heat island effect. Considerable amounts of water are required to maintain a suitable level of amenity in Shire reserves, parks, gardens, and streetscapes, additionally sports fields are required to be fit for play. Alternative water sources, such as recycled water and stormwater can be harvested, managed and utilised for irrigation purposes to reduce reliance on drinking water.

In the next 16 years, we expect:

- An additional 14,115 people
- An additional 7818 dwellings
- At least 22 new sports fields

Melbourne's Water Security

The security of Melbourne's future water supply is impacted by a number of factors, including population growth and climate change. This graph shows a range of projected outcomes. Under the worst-case scenario, it is forecast that water supply will run out by 2028.

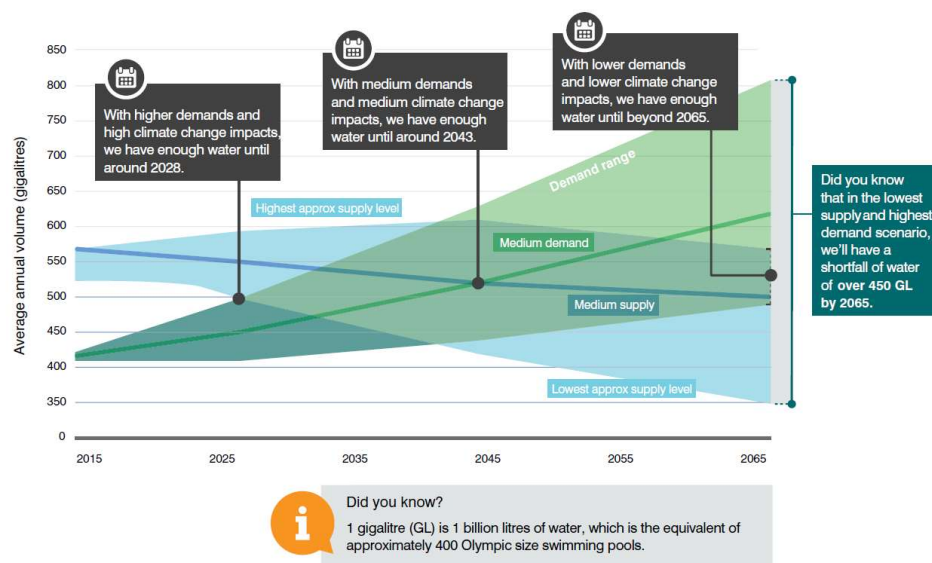


Figure 6 : Water supply and demand ³

Key Implication:

We need to prepare for the impacts of population growth and urbanisation on the water cycle. These impacts are likely to be amplified by climate change, and may include:

- Increased flooding and reductions in waterway health from increased urban stormwater runoff
- Increased demand for water e.g. for new sporting reserves
- Increased sewerage needs

² ID Consulting, commissioned by MPSC

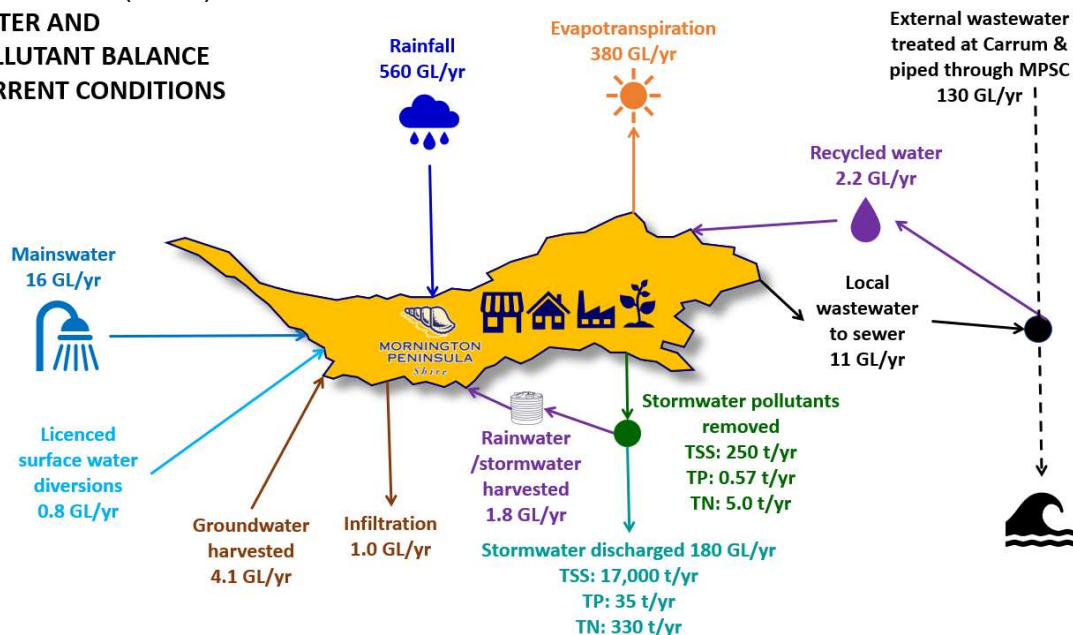
³ Water for Future Thriving Melbourne 2017

4 State of Our Water Resources

The water balance below shows the inflow and outflow of water across the catchment boundary of the Mornington Peninsula. A water and pollutant balance is a key input in this Plan, as it informs us of the current and future state of our water resources as well as stormwater pollutant loads. This can be used to inform opportunities to maximise alternative sources of water (recycled treated wastewater, stormwater, rainwater).

4.1.1 Current (2020)

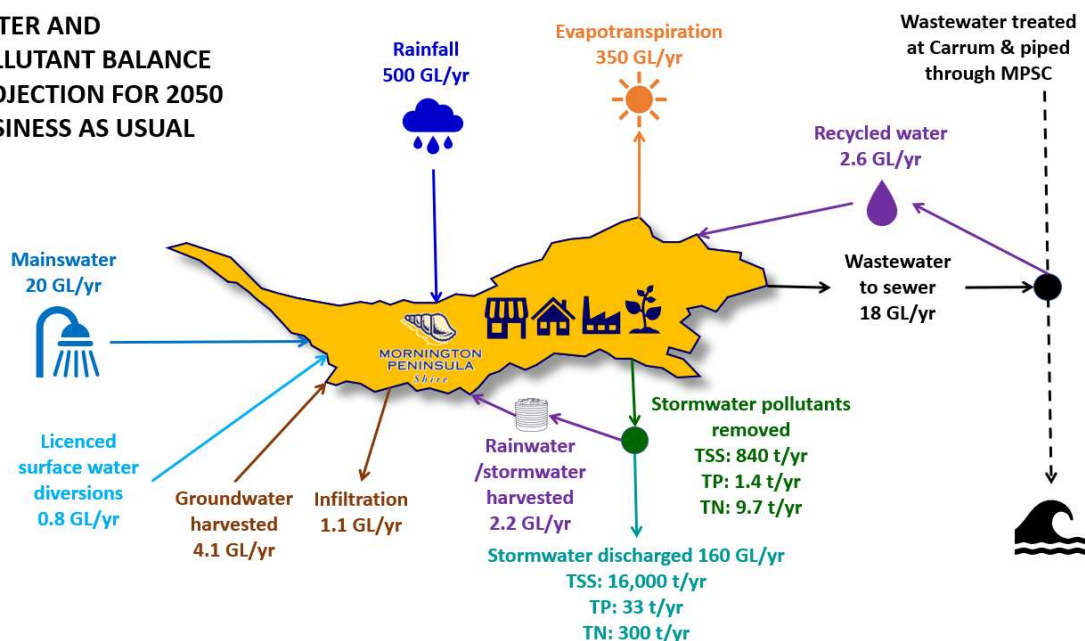
WATER AND POLLUTANT BALANCE CURRENT CONDITIONS



4.1.2 Future (2050)

Climate change, urbanisation and population growth impacts on the future balance

WATER AND POLLUTANT BALANCE PROJECTION FOR 2050 BUSINESS AS USUAL



4.1.3 Key Findings from Water and Pollutant Balance

1. Potable drinking water

By 2050, assuming a Business as Usual approach (with no further intervention or remediation other than that required), demand for mains water on the Peninsula will increase by 25%, or 4GL/y, (1GL is 1 billion litres of water) due to population growth and urban development (residential & industrial).

2. Groundwater

The current water balance indicates a deficit of 3GL/y in groundwater (i.e. more extraction than recharge). This could be due to a combination of reduced annual rainfall and over extraction of groundwater. In addition, the elimination of septic system infiltration from sewer connections could further contribute to the declining groundwater resource.

The 1% decline in total groundwater available in the Bunyip River basin reported by DELWP's *Long Term Water Resource Assessment 2019* further substantiates the fact that groundwater is a finite resource.

There needs to be a recognition that groundwater is a finite source and it is variable in quality and quantity across the Peninsula. We continue to take more than we are replenishing during our lifetime. .

3. Stormwater and wastewater

The volume of stormwater & treated wastewater generated significantly exceeds the volume of mains water used on the Peninsula. Of the 130GL/y of Class A recycled water that is discharged at Boags Rock via the South Eastern Outfall near Gunnamatta, only a very small percentage is utilised. This illustrates a huge water reuse potential of stormwater and recycled water to displace the high value potable water used every day.

4. Stormwater pollution

Polluted runoff is a major threat to the health of our waterways and bays. Figure 6 shows the largest contributor to stormwater runoff and loads is the agriculture and conservation area, followed by residential zone, commercial and industrial area and lastly parkland (based on water and pollutant balance analysis).

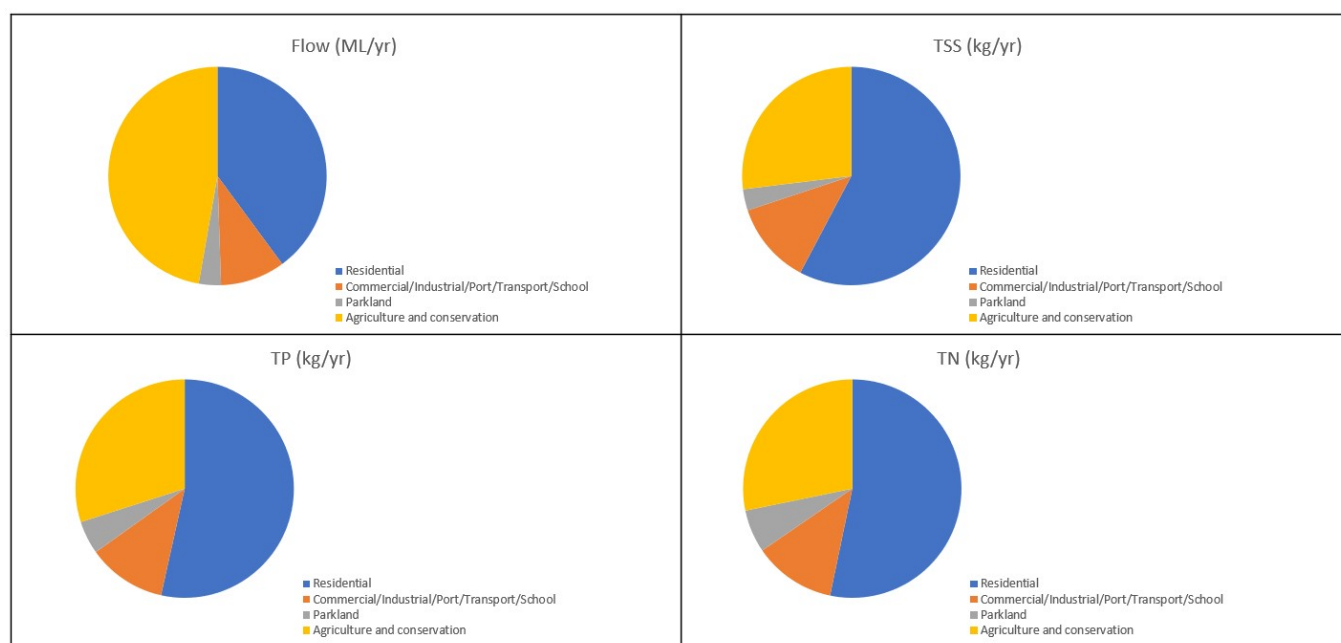


Figure 7: Pollutant load by land use. Pollutant load by surface type can be found in Appendix 3.

Stormwater run-off in rural areas

In rural areas, pollution from agricultural activities is a major contributor to reductions in water quality of surface water (creeks, river) and groundwater. Approximately half of the stormwater runoff volume and a quarter of the pollutant loads (nutrients and sediments) are generated from agricultural land use. Increased adoption of sustainable farming practices is required to reduce associated water quality impacts. Council is proactive in driving this as evidenced in the draft Food Economy and Agroecology Strategy.

Stormwater run-off in urban areas

Urban areas make up approximately 30% of the municipality but generate more than half the runoff and pollutant loads. The projected stormwater pollutants removed under 2050 'business as usual' falls considerably short of best practice. There needs to be additional stormwater treatment for all urban surfaces including roads and carparks.

Case Study: Stormwater impacts of unsealed roads and urbanisation on receiving waterways

Unsealed roads from past developments throughout the Peninsula, such as in Mt Martha, Flinders and Tyabb, are contributing to sediment washouts into the receiving waterways and causing blockages in drainage infrastructure. Greater than 30% of Total Suspended Solids (TSS) from sediments are contributed by unsealed roads (Fig. 7). This is likely to be caused by erosion or damage from heavy rain impacting unsealed roads, especially when drainage infrastructure is limited.

High capital costs and infrastructure challenges as well as the community's desire to maintain the rural characteristic of the neighbourhood limits the amount of unsealed roads that can be sealed. More innovation and collaboration with our partners and the community is required for best practice sediment management.

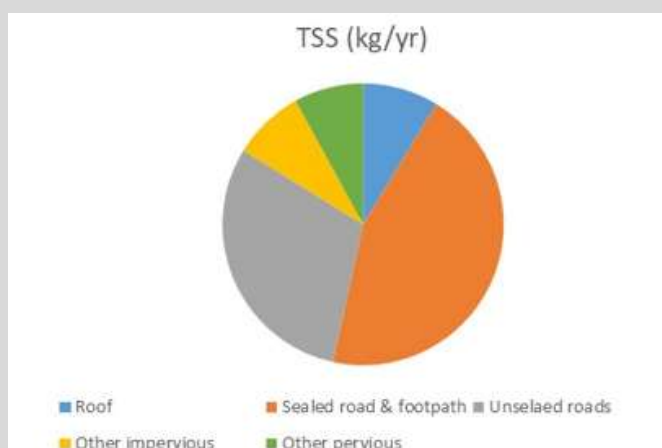


Figure 8: Total suspended solids transported by stormwater by surface types. Other pollutants by surface types are shown in the Appendix

Mornington Peninsula

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Key Implication:

The water and pollutant balance shows that with climate change, urbanisation and population growth as well as land uses:

- We are using water faster than nature can replace it
- There will be an increased output of wastewater and urban stormwater
- Urban development, agriculture and industrial activities are polluting our waterways

We should:

1. Reduce our reliance on potable water by harnessing the reuse potential of alternative water sources (e.g. rainwater, stormwater and recycled water)
2. Prevent and manage stormwater pollution from agricultural activities, urban development and commercial/ industrial activities to protect the health of our waterways and bays
3. Move towards sustainable groundwater and surface water management to support their existing and potential beneficial uses

5 Water Future on the Mornington Peninsula

Each of the seven IWM strategic outcomes are presented in this section. Under each strategic outcome, there is a description of its importance (context), and the challenges and opportunities. Strategies to deliver these outcomes are then explored.

5.1 Strategic Outcome 1: Safe, secure and affordable water supplies in an uncertain future



Water security is a top concern for the Mornington Peninsula community in the Shire's recent Climate Emergency survey.

Changes to the water cycle driven by projected population growth and climate change will pose numerous challenges to water systems across the Peninsula. The demand for potable water is expected to rise, creating a need to identify opportunities to increase the use of alternative, fit for purpose water sources, including recycled water and stormwater. This is an integral part of the Victorian Government's *Water for Victoria* (2016) plan and is also addressed in *Plan Melbourne* (2017), which includes a policy to 'Reduce pressure on water supplies by making the best use of all water sources' (Policy 6.3.1).

"I think we're going to face less rainfall. We need to consider water security because we need to ensure a reliable food source, for all the other creatures that aren't humans but matter as much as we do. It's going to be really important as the world gets hotter and drier." – Include source of quote here.



Access to water services is a challenge in pockets of Mornington Peninsula, particularly in the green wedge areas. 4% properties on the Mornington Peninsula are not connected to mains water supply, including Red Hill South, Arthurs Seat and Main Ridge. These townships rely on rainwater, carted water and groundwater, with domestic, agriculture and sports field irrigation competing for the limited groundwater yield.

In addition, the lack of water supply infrastructure means that they are more vulnerable to bushfire risks. Increased bushfire risk from climate change is a key community concern, and the community are largely supportive of alternative water use for firefighting.

Have you checked your water bill?

Mornington Peninsula residents uses **205L** potable water/ person/ day
(Source: South East Water 2019)

Compare this to **Target 155**
(voluntary water efficiency program)

The figures are likely to be high due to the following:

- There are many properties on Mornington Peninsula with a swimming pool (8000 registered)
- 2018-19 was a hotter than average year

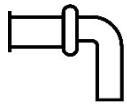
We can all play a role in using water more efficiently

Key strategies to deliver this outcome

Secure long-term water supply and reduce pressure on water supplies by

- Decreasing potable water use by using water more efficiently and choosing water saving products
- Increasing use of fit for purpose alternative water sources, including recycled water and stormwater

5.2 Strategic Outcome 2: Effective and affordable wastewater systems



The majority of wastewater generated on the Mornington Peninsula is treated in three centralised water recycling plants (Mt Martha, Boneo and Somers) located across the Peninsula. Wastewater at these plants is treated to various classes of recycled water for reuse or discharge into the ocean at Boags Rock. The South Eastern Outfall (SEO) runs from Melbourne Water's Eastern Treatment Plant in Carrum, then collects more water from Mt Martha, Somers and Boneo recycling plants, finishing the journey at the Boags Rocks outfall at Gunnamatta, delivering greater than 150GL/y of high quality recycled water into Bass Strait.

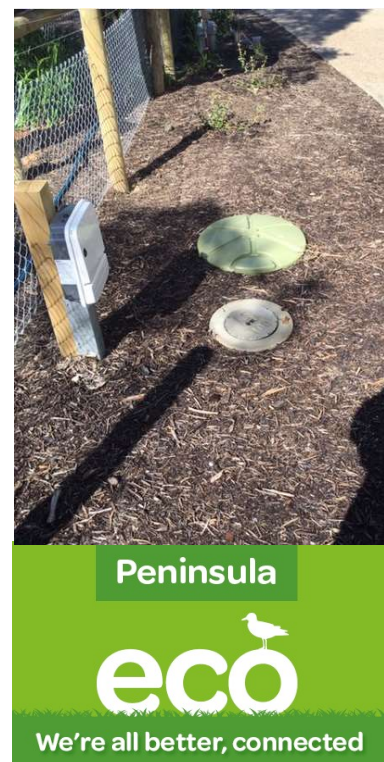
The *Melbourne Sewerage Strategy* (2018) recognises the need to transition from a 'treat and discharge' system to a 'resource recovery' system that uses the principles of circular economy. As water resources decrease, it is increasingly important to recover our wastewater resources, including recycled water, as an alternative water source. Wastewater treatment also generates a significant amount of greenhouse gas emissions, totalling 19,267 tonnes CO₂ in 2017/18⁴.

20% of Shire properties are not connected to reticulated sewerage and treat wastewater in on-site septic systems. This equate to over 22,000 septic systems in the Shire. Polluted runoff and infiltration from these systems can cause contamination of waterways, groundwater and beaches and poses risks to public health.

Ageing and poorly maintained septic systems, stormwater and surface inundation of septic systems and lack of sewer availability in the long term are some of the challenges faced here on the Peninsula.

Investment in wastewater management is required to mitigate harmful impacts to the environment and public health. Key strategies include supporting South East Water sewerage programs, 'Septic Track' information management system and community education programs.

Audits of septic tanks on the Mornington Peninsula⁵ showed that many were poorly maintained or inadequate, which puts community and environmental health at risk. To address this, the Peninsula Eco project was initiated in 2015, connecting properties in the southern Peninsula with septic tanks to the sewer system. As at 30/06/2020, nearly 6,000 properties have connected in the Peninsula ECO and Rye/Tootgarook regions. Boneo Water Recycling Plant is currently undergoing a capacity upgrade to treat the increased volume of wastewater generated from the increase in numbers of sewer connections.



Key strategies to deliver this outcome

- Stimulate circular economy by reusing wastewater as an alternative water source and advocate for biogas recovery/reuse at treatment facilities
- Increase the number of sewer connections in priority catchments to reduce the impact on the environment and public health
- Improve management of septic tanks and encourage domestic reuse of wastewater in new septic systems

⁴ South East Water data 2019

⁵ VAGO Managing the Environmental Impacts of Domestic Wastewater 2006 and 2018

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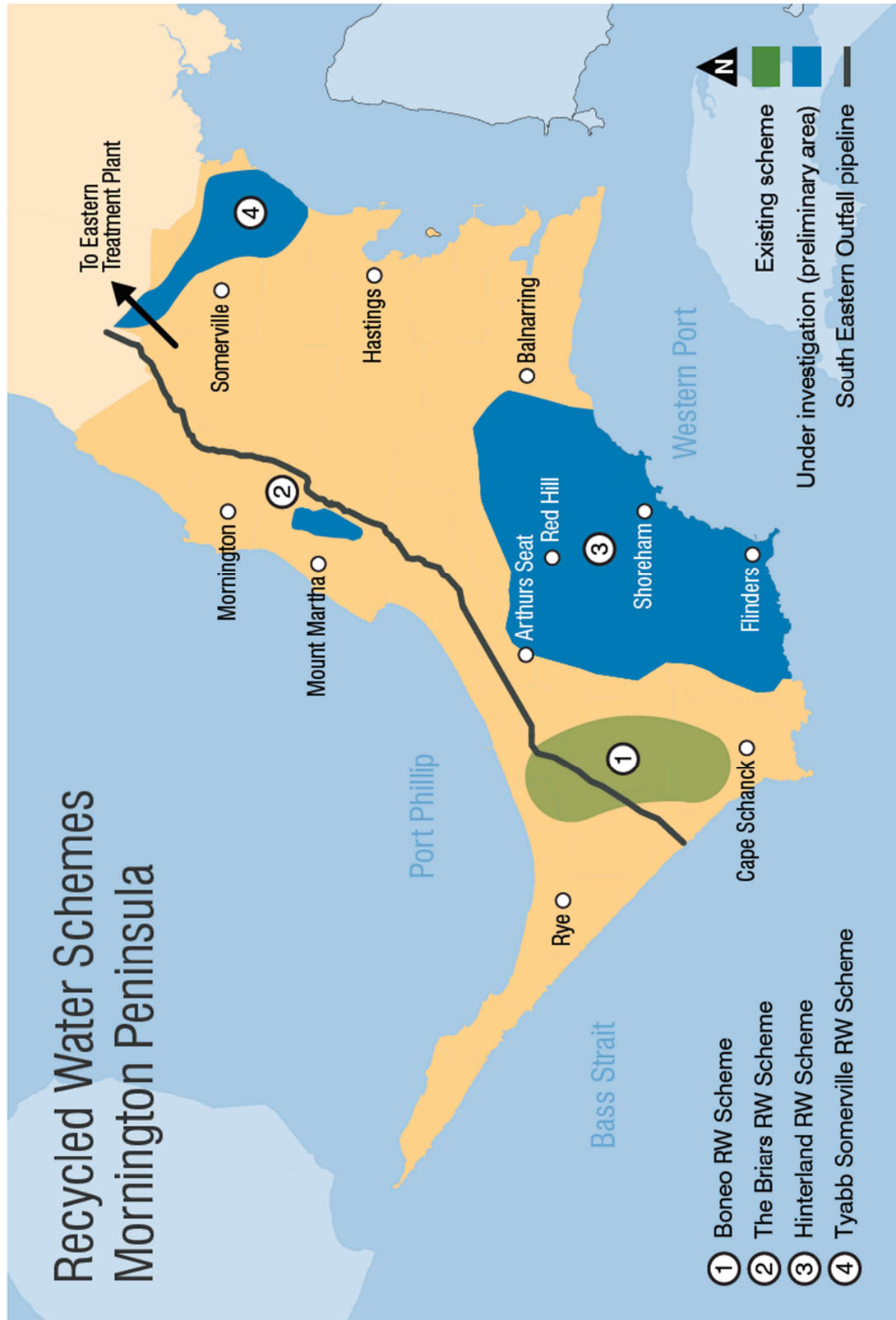


Figure 9: Schematic map of existing recycled water scheme and potential future opportunities

5.3 Strategic Outcome 3: Existing and future flood risks are managed to maximise outcomes for the community



The Mornington Peninsula has a unique set of flood-related risks impacting its diverse communities. The region has historically experienced a mix of flash flooding, coastal flooding and riverine flooding, which can impact the local environment, roads, property and infrastructure.

Approximately 40% of the region is classified as flood prone. Most flooding that occurs is flash flooding, with some creeks experiencing riverine flooding. Most townships have areas of flooding and ponding due to road alignments, topography, and limited drainage infrastructure. Although many coastal areas are protected from the sea by cliffs or primary dunes, some coastal areas have historically had flood issues due to tidal influences, high groundwater and/or limited drainage opportunities. Ongoing urbanisation and development exacerbates the historic flood regimes by increasing runoff, placing increasing pressure on infrastructure. Loss of vegetation from urbanisation and agriculture has caused flooding in previously non-prone areas.

Much work has been done by the Shire to develop and continually update a flood risk knowledgebase that informs decisions to mitigate flood risk. Continuous drainage improvements protect towns against flooding where possible, whilst building controls have assisted in reducing runoff and mitigating flooding. Many urban areas with fully developed drainage systems have limited improvement opportunities. Areas remain where public awareness of localised inundation issues is the established adaptation strategy.



Figure 10: Flooding at Brasser Avenue, Dromana, May 2019

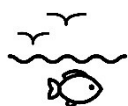
A medium climate change scenario is expected to result in 0.8 metre sea level rise and increased storm frequency and intensity by 2100. Increases in storm intensity will challenge existing infrastructure, whilst the expected sea level rise will restrict outflows of stormwater to the sea, leading to more flooding. Higher intensity and more frequent rain events will mean frequency and severity of flash flooding will increase. Sea level rise will inundate areas of the Western Port coastline as well as lower areas adjacent to Port Phillip Bay. However, sea level rise will also result in the backing up of many drainage outlets, limiting their function and thus increasing the flood risk of already vulnerable networks.

Historically, flood risk management has mostly been managed in isolation from the rest of the water cycle. However, the industry is shifting towards delivering multiple benefits to the water cycle through flood risk management. Other stormwater management and greening initiatives can also deliver flood risk reduction outcomes. IWM initiatives can reduce flooding from drainage systems by creating more storage in the urban catchments, be it a retarding basin, rainwater tanks or permeable soil. To deliver other IWM outcomes, these storages can be multi – functional by enabling stormwater harvesting, recreation and amenity.

Key strategies to deliver this outcome

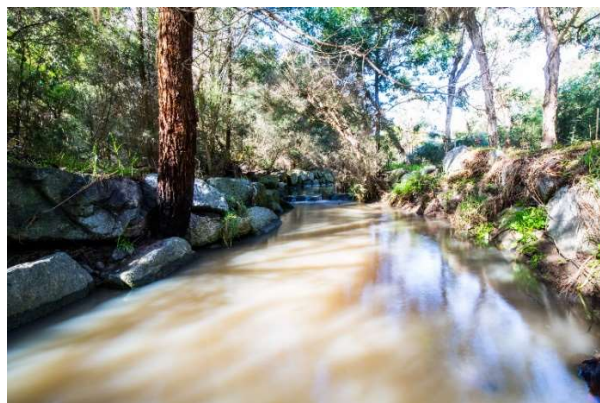
- Flood management initiatives to maximise multiple benefit outcomes to the water cycle
- Create additional flood storage volumes in multi- functional assets (e.g. rainwater tanks with a dedicated storage volume for detention)

5.4 Strategic Outcome 4: Healthy and valued waterways and marine environments



The natural environments of the Mornington Peninsula encompass a diverse range of landforms and ecosystems. These support a correspondingly diverse suite of flora and fauna species, many of which are rare or threatened⁶. The Mornington Peninsula has an extensive network of water bodies, including 440 kms of waterways with 18 creek catchments and 190km of coastline (representing more than 10% of Victoria's total coast and more than 30% of the Port Phillip coast) that surrounds land that is 70% Green Wedge.

Waterways support varied uses and values including providing habitat for significant plant and animal species. Melbourne Water *Healthy Waterways Strategy* (2018) has assessed the water quality of



Mornington Peninsula's wetlands, rivers and estuaries. Water quality is currently of a 'low' status, with a current trajectory of 'very low'. Waterways on the Peninsula are characterised by poor water quality and impacted by modified hydrology but often rate well in streamside indices, reflecting the quality and extent of riparian vegetation. According to the *Healthy Waterway Strategy*, two catchments in the shire are considered stormwater priority areas (urban and non-urban): Main and Splitters Creeks- Main Ridge and Drum Drum Alloc Creek- Rosebud.

The Mornington Peninsula has recorded 402 native vertebrate fauna species including 301

birds, 11 amphibian and 29 fish species, which rely on the waterways for habitat and food.

Vulnerable and endangered species within the Peninsula are often associated with naturally occurring wetlands. These are limited on the Peninsula, the largest being the state-significant, ground-water dependent Tootgarook Wetlands, covering an estimated 380 ha. The other wetland area is along the Western Port coastline, forming part of the internationally significant Western Port Ramsar Site, recognised for its diverse and extensive ecosystems.

European settlement on the Mornington Peninsula from 1860s onwards resulted in widespread vegetation clearance for housing and agriculture, resulting in increased demands on the natural environment. Increasing urbanisation and rising population have resulted in increased nutrients, sediments and pollutants entering our waterways and bays. Climate change is likely to exacerbate this pressure, with intense rainfall resulting in greater erosion and increased sediments discharging into the bays, disrupting ecosystem health. The health of our waterways is compromised by overflow of storm and groundwater, flooding and altered hydrological regimes. The pollution load by land uses are described in Section 4 (State of Our Water Resources).



We must prevent and manage stormwater pollution on the Mornington Peninsula to protect our waterways and bays. This will also open opportunities for beneficial re-uses of stormwater. Increased stormwater harvesting and infiltration is encouraged to reduce the impact of urban stormwater runoff on waterways. There is also an opportunity to cost-effectively reduce our pollutant loads by auditing, improving and maintaining our Water Sensitive Urban Design (WSUD) assets.

⁶ MP Shire's Biodiversity Plan 2019

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Managing Water through Regenerative Agriculture – Adaptation to Climate Change

70% of the Mornington Peninsula area is Green Wedge. The predominant land use in the Green Wedge is agriculture, with a concentration on high value production in market gardening, viticulture and broiler farming as well as more extensive areas of beef cattle grazing. If not managed properly, these agricultural activities can impair water quality through excess movement of soil, nutrients, salt, pathogens and chemicals from land to water.

With the onset of climate change, sustainable and regenerative farming practices which improve soil and waterway health, and increase biodiversity are becoming increasingly important. Regenerative agriculture is the application of agroecology principles to sustain production whilst building soil condition, leaving the land in a better state than before.

In addition to carbon sequestration, this practice can have positive impacts on the water cycle by:

- 1) Increasing capture of water and retention in the soil, thus increasing its resilience to drought
- 2) Reducing soil erosion and farm runoff during heavy rainfall, thus reducing water quality impact on the receiving environment (e.g. nearby waterways)
- 3) Slowing down flows, hence mitigating flood risk
- 4) Reduced reliance on irrigation and application of fertilisers and other systemics



Key strategies to deliver this outcome

- Reducing the flow of stormwater runoff entering the waterways and bays by encouraging infiltration and stormwater harvesting
- Reduce stormwater pollutants load entering the waterways and bays
- Continuous indigenous vegetation buffer along streams
- Promote sustainable water management in farming

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5.5 Strategic Outcome 5: Healthy and valued urban and rural landscapes



The landscapes of the Mornington Peninsula are highly diverse, ranging from the coastal mangrove fringe of Western Port and sandy bay beaches of Port Phillip Bay to the remnant natural woodlands and undulating rural landscape of Red Hill and Main Ridge. The Peninsula's settlement pattern is also distinctive, based on a number of townships, large and small, which have a strong relationship with the adjoining coastal and rural areas.

A relatively high level of vegetation cover within residential areas, particularly within the smaller coastal settlements, is a key element in the character of these areas. Shire policies seek to retain and enhance the benefits of a 'green' township environment through landscaping of public spaces, including road reserves. Better understanding the importance of using vegetation cover in urban design to reduce urban heat in summer and protecting the health of vulnerable communities will enable the Shire to identify areas where vegetation cover is most needed, and to allocate resources to increased vegetation cover connected to alternative water sources such as stormwater or recycled water.



Access to green open spaces is critical for maintaining liveability and supports community health and wellbeing. Green open spaces include passive open spaces such as reserves, parks and gardens as well as active spaces such as sporting ovals.

It is desirable to increase functionality of built stormwater treatment assets such as wetlands by linking with open spaces, joining encumbered with unencumbered land as well as consideration of accessibility and amenity.

Local sport and recreation is a way of life on the Mornington Peninsula. Our residents choose to lead active and engaged lifestyles, and participation in sport across the Shire is extensive.

The Shire is directly responsible for the planning, development and management of 34 sports reserves, comprising of 52 different sports fields and associated supporting infrastructure. According to the updated *Sports Capacity Plan 2019*, we are planning the creation of 22 new sports fields in the next ten years. This will add to the increasing pressure on our water supply to establish and maintain turf.

“...council can use recycled water (...) for irrigating it's parks and sports fields” – community

The Mornington Peninsula has an influx of tourism over the summer season due to its popular bay and ocean beaches and its abundance of nature-based recreational activities. Mornington Peninsula Shire received a total of 6.3M visitors in 2018, with 34% growth in day trippers since 2012. This temporary growth in population increases the level of service required to support liveability, including enhanced green spaces and access to the natural landscape.

Key strategies to deliver this outcome

- Increase access to alternative water supply to support urban greenery and reduce urban heat island effect
- Increase access to alternative water supply to support irrigation of public open spaces

5.6 Strategic Outcome 6: Community values are reflected in place-based planning



The Mornington Peninsula is characterised by unique townships, highly valued green wedge land, areas of national and international conservation significance and features around 10% of Victoria's total coastline.

As an area near to, but distinct from, the growing Melbourne metropolitan area, there are ever increasing pressures and demands placed on the Mornington Peninsula. Combined with the challenges of climate change, managing 'place' requires the careful balancing of the community's key values.

Settlement patterns on the Mornington Peninsula are characterised by a series of distinct townships and villages, with a green break between settlements. The majority of residents live in townships located along the east and west coastlines.

The townships of the Mornington Peninsula are expected to accommodate moderate and generally low levels of housing growth, with many smaller towns and villages intended to accommodate very limited further development. Although moderate, future development within townships needs to be managed to carefully respect unique township characteristics, amenity and sense of place. Integrated water management provides opportunities to support and enhance the liveability of townships. Water can play an important role in defining neighbourhood character and enhancing amenity through integration of blue green infrastructure such as wetlands, waterways and other stormwater assets.

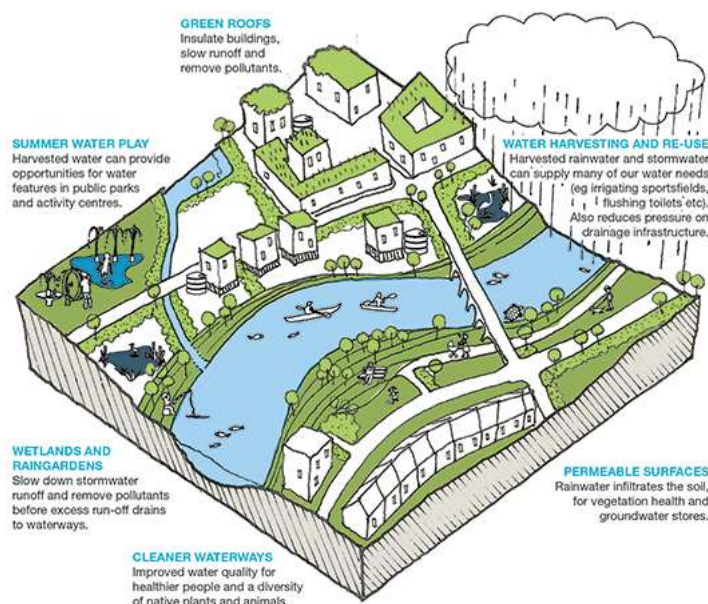


Figure 11: Water Sensitive Urban Design in town planning can reduce the impact of urbanisation on our waterway and bay health, reduce potable water use, recharge our groundwater and support green spaces (Source: Ciria)



The natural environments of the Mornington Peninsula encompass a diverse range of landforms and ecosystems, from coastal areas supporting sandy beaches and dunes, intertidal flats and rocky shores, to ridges and escarpments with woodlands and forests, wetland and waterways. There is a high level of community connection and commitment to the natural environment, including

waterways and the bays, on the Mornington Peninsula. Multiple community groups including Save

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Westernport, Balcombe Estuary Reserves Group and Save Tootgarook Swamp actively engage with the Mornington Peninsula Shire to preserve and enhance the unique natural values of the Mornington Peninsula for future generations.

Key strategies to deliver this outcome

- Empower community in doing their part in contributing to IWM solutions
- Increase community literacy and sense of connection with the water cycle
- Increase water cycle consideration in town planning
- Increase community health and wellbeing through creation of blue green infrastructure

5.7 Strategic Outcome 7: Diverse jobs, economic benefits and innovation



The Peninsula is also part of the second most valuable agricultural region in Victoria, which produces at least 15% of the total wealth generated from the State's agricultural industry from less than 4% of the state's farmland. The Green Wedge is one of Greater Melbourne's most important long-term assets and is an integral part of Melbourne's food bowl with large

volumes of high-quality produce stocking the shelves of major supermarkets and grocers year-round. Many small to medium growers and artisans take advantage of local markets to sell direct to consumers. More than 25 farm gates are scattered across the peninsula and many niche food manufacturers take advantage of the boutique and quality reputation of the region to market their products throughout the world.

There are approximately 14,000 businesses on the Mornington Peninsula in a strong economy which produces \$7.4 billion in gross regional product. Major industries include retail, manufacturing, construction and business services. The agriculture, food and beverage sector is an important contributor to the local economy and is rich in diversity and quality with an estimated value of \$1.3 billion per annum. Tourism is also significant to the economy contributing 11% to GRP via wineries, restaurants, small farms, attractions and accommodation. Approximately 6.3 million people visited the Peninsula in 2018 with a growth of 42% since 2012⁷.



The Mornington Peninsula is also a world-renowned wine region with over 1100 hectares of vineyards producing 5,000 to 6,000 tonnes of grapes (in 2018). The gentle maritime climate and favourable soils allow local winemakers to create a diverse range of terroir-driven wines with an internationally developed reputation for some of Australia's best Pinot Noir, Pinot Gris and Chardonnay. This reputation makes wine and food two of the most popular visitor attractions all year round. Additionally, the breweries and distilleries sector has experienced strong growth and is finding a permanent home on the Peninsula.

There are many agri-tourism experiences for locals and visitors alike, including the region's cellar doors. With around 7.5million visitors in 2018, approximately 500 registered food hospitality venues also thrive on this visitation and are also strongly supported by the region's 164,000 strong permanent population. Hospitality is one of the region's largest employers, employing more than 4,400 people in full time, part time and casual positions.

Secure and reliable water supply will be critical to support agricultural growth, businesses and tourism in Mornington Peninsula. The region's relative resilience to climate change is enhanced by its proximity to large volumes of recycled water, the South Eastern Outfall and Boneo Water Recycling Plant. There are opportunities to expand irrigation infrastructure that delivers reliable water supply to farmers and other beneficial uses in the green wedge areas. Safeguarding these opportunities and ensuring their future viability will require the effective alignment and integration of water and land use planning.

Key strategies to deliver this outcome

Support local economy and increase agricultural productivity in the Peninsula by:

- Securing alternative water supply to support local agricultural growth
- Securing alternative water supply to support local businesses and industry growth

⁷ MPSC Tourism Visitor Economy 2019

6 Measuring Our Achievements

A proposed list of targets has been developed to drive IWM beneficial outcomes. They serve as a measure on monitoring our progress on delivering the seven key strategic outcomes.

These targets are aligned with the Dandenong and Westernport Catchment Scale 2030 targets defined as part of the catchment scale IWM Forums, a collaboration between the state government, local governments, water authorities and catchment management authorities.

Mornington Peninsula Shire's IWM targets are categorised as follow:

1. 2030 targets for leading measures relevant to local government area (LGA) scale and driven by the Shire (see Table 2)
2. 2030 targets for leading measures relevant to Dandenong and Westernport Catchment scale and contributed to by council (see Table 3)

Table 2: Summary of 2030 desired state outcomes and targets for measures relevant to LGA scale

Strategic outcome	Leading measure	MPS desired state 2030 target
3. Existing and future flood risks are managed to maximise outcomes for the community	3.3 Percent of projects that cross-consider IWM and flood mitigation opportunities as part of their design	100% (current state no data available)
4. Healthy and valued waterways and marine environments	4.1 ML/year of mean annual runoff volume reduction	817 ML/yr (current state 380 ML/yr)
5. Healthy urban and rural landscapes	5.1 Percent of street trees that are supported with permanent (active or passive) irrigation from an alternative water supply	8% (current state 1%)
	5.2a. Percent of the total area of active public open space (sports fields and organised recreation) supported by an alternative water source	15% (current state 2%)
	5.2b. Percent of the total area of passive public open space (parkland and gardens) supported by an alternative water source	5% (current state 0%)
6. Community values are reflected in place-based planning	6.3 Rating of community literacy regarding the water cycle (out of 5)	5 (current state rated 3)
	6.4 Rating of whether water is a key element in city planning and design process (out of 5)	5 (current state rated 3)

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Strategic outcome	Leading measure	MPS desired state 2030 target
Enablers	E1 Rating of vision, leadership and long-term commitment through vision statement and objectives articulated in corporate documents (out of 5)	5 (current state rated 3.5)
	E2 Rating of knowledge, skills and organisational capacity (out of 5)	4.5 (current state rated 3.5)
	E3 Rating of cross-sector institutional arrangements and processes (out of 5)	4.5 (current state rated 3)
Council identified additional targets		
1. Safe, secure and affordable water supplies in an uncertain future	Council mains water use	≤ 220 ML/yr (current state 220 ML/yr)
4. Healthy and valued waterways and marine environments	% Properties connected to sewer	87% (current state 80%)
5. Healthy urban and rural landscapes	% Local farms adopting agroecological practices or transition to regenerative farming techniques	20% (current state ~ 5%)

Table 3: Summary of 2030 desired state outcomes and targets for measures relevant to Dandenong and Westernport Catchment

Strategic outcome	Leading measure	MPSC desired state 2030 target
1. Safe, secure and affordable water supplies in an uncertain future	1.1a. Residential water use in litres per person per day	155 l/p/d residential water use (current use 213 l/p/d)
	1.2b. GL/year of alternative water sources that substitutes potable mains water supply	n/a
2. Effective and affordable wastewater system	2.1a. GL/year of recycled water delivered to customers	500 ML/year of recycled water delivered to <u>council</u>
3. Existing and future flood risks are managed to maximise outcomes for the community	3.1 Dollar (\$) reduction in Annual Average Damage (AAD) delivered by flood management initiatives	\$2.6M reduction in Annual Average Damage (AAD) delivered by <u>council</u> flood management initiatives

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Strategic outcome	Leading measure	MPSC desired state 2030 target
	3.2 cubic meters (m ³) of effective flood storage volume created as part of multifunctional assets	
4. Healthy and valued waterways and marine environments	4.2a. Tonnes/year mean annual Total Suspended Solids (TSS) prevented from discharging to receiving waters	Reduce mean annual average total nitrogen (TN) load by ≥ 45 % at legal point of discharge ¹
	4.2b. Tonnes/year mean annual Total Nitrogen (TN) prevented from discharging to receiving waters	Reduce mean annual average total suspended solids (TSS) load by ≥ 80 % at legal point of discharge ¹
7. Jobs, economic benefits and innovation	7.1a. GL/year of alternative water supplied to agricultural production	Between 5,500 & 10,500 ML/yr of alternative water supplied to agricultural production

1. Load to be confirmed based on the potential identified future interventions across public and private land uses

Strategic Enablers (The Three Cs)

All seven outcomes need to be supported by three strategic enablers, which reflect the ability and willingness of organisations to implement IWM: Commitment, Collaboration and Capacity.

Catchment-scale indicator	Catchment-scale measure
Increase organisational commitment to IWM	Rating of vision, leadership and long-term commitment through vision statement and objectives articulated in corporate documents
Increase stakeholder capacity to successfully deliver IWM	Rating of knowledge, skills and organisational capacity
Increase collaboration and partnerships across industry and government	Rating of cross-sector institutional arrangements and process

7 Action Plan



The action plan was developed to achieve the IWM Plan vision and strategic outcomes

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Strategic Outcome 1: Safe, secure and affordable supplies in an uncertain future

Immediate Term: 2021/2022, **Short Term:** 2021-2025, **Medium Term:** 2026-2030, **Long Term:** Ongoing and/or beyond 2030

L = Low (up to \$100,000), **M** = Medium (\$100,000 to \$1 million), **H** = High (> \$1 million)

No	Action	Activities	Timing	\$
1.1a	Improve water efficiency for council assets	Ensure water sustainability (including sustainable water management practices) and best practice stormwater management is embedded in Council's proposed project planning and delivery framework, particularly in the early planning stages. These objectives are captured in the ESD Policy for Council Buildings and Civil Works. The following are desired through the implementation of the ESD Policy: • All new or refurbished Council facilities to have best practice water efficient fittings, appliances, toilets and rainwater tanks installed • Access to alternative water supply for green field sites (e.g. sportsfield) • Increased integration of small scale WSUD into Council projects (e.g. car parks, parks, streetscapes)	Long Term	L-H
b		Undertake a water efficiency audit on high water usage facilities (e.g. Pelican Park Recreation Center)	Short Term	L
c		Implement improvement actions from water efficiency audits	Medium Term	L-M
1.2a	Improve open space irrigation efficiency	All new or upgraded sportsgrounds without access to a sustainable water source to have • water efficient landscaping (e.g. use of warm season turf) and • water efficient, fit for purpose irrigation system and practices	Long Term	L-H

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No	Action	Activities	Timing	\$
b		Identify opportunities for conversion of sports ground to water efficient turf (eg. warm season grass), particularly for fields where the turf is irrigated with potable water and/or groundwater	Medium Term	L-H
c		Investigate need and opportunities for the application of synthetic/ hybrid turfs to supplement sport fields	Medium Term	L
d		Audit water efficiency in landscaping and irrigation system/practices at open spaces and sports ground. Review existing turf management practices. Turf management practices may improve existing surfaces during extended dry periods and include alteration of grass mowing height, application of wetting agents to dry soil and strategic aeration of soil to improve water, air and fertiliser uptake. Implement recommendations from audit report.	Short Term	L
e		Introduce and/or expand use of water saving sensors (e.g. weather stations and soil moisture sensors) to minimise water wastage for irrigation	Short Term	L
f		Install flow meters to track water consumption where there are gaps in irrigation data. For example, flow metering for stormwater harvesting schemes.	Short Term	L
1.3	Plant drought tolerant vegetation	Review indigenous species planting guides to incorporate climate change and highlight key drought tolerant species.	Refer to the Biodiversity Conservation Plan 2018	L
1.4	Review existing stormwater	Audit and enhance operation of existing council owned stormwater harvesting systems	Short Term	L-M

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No	Action	Activities	Timing	\$
	harvesting schemes			
1.5	Reduce community water use	Ensure water sustainability and best practice stormwater management is embedded in private developments through implementing either the proposed Planning Scheme Amendment C232morn ESD Policy, or an equivalent State ESD Policy	Immediate Term	N/A
1.6	Continue leak detection monitoring and response	Continue leak detection monitoring for high water usage council sites. This include rolling out to new facilities as required.	Long Term	L
1.7	Advocate for recycled water guideline review	Advocate for DELWP to investigate expansion of fit for purpose end use of recycled water, particularly for fire-fighting in residential areas and for roads maintenance and construction (dust suppression and cleaning)	Short Term	N/A
1.8	Increase recycled water for firefighting use	Advocate and invest in recycled water schemes to support creation of recycled water availability for firefighting, particularly in areas where there is no mains water supply	Short Term	H
1.9a	Promote regenerative	Promote and educate farmers on regenerative farming practices to increase the water retention capability of soil and sustainable water management.	Long term	L

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No	Action	Activities	Timing	\$
b	farming practices and sustainable water management in farming	Promote sustainable water management in farming including - improving water efficiency in irrigation, - reducing water quality impacts on streams and groundwater, including minimising erosion, rural/spray run off containing high concentration of fertilisers and pesticides - reducing water quantity impacts on streams and groundwater, including a review of non-fit for purpose farm dams (e.g. oversized and leaky farm dams)	Long term	L
c		Review the Shire's farming rates to incentivise regenerative farming practices and sustainable water management	As per the Food Economy and Agroecology Strategy	L-M
1.10	Reuse and recycle wastewater at council pools	Investigate reuse and recycling (greywater reuse) options for council swimming pools filter backwash water.	Medium Term	L
1.11a	Maximise use of alternative water in council buildings	All new Council facilities to maximise alternative water use, through project planning and implementing the Council ESD Policy for Council Buildings and Civil Works.	Long term	L-H
b		Identify existing council buildings which would benefit from rainwater tank installation. In addition to potable water savings, there could be other benefits including environmental health enhancement and flood mitigation.	Medium Term	L

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No	Action	Activities	Timing	\$
1.12a	Improve understanding and management of groundwater resources	Partner with Southern Rural Water to investigate aquifer recharge from private septic systems aquifer discharge from private groundwater usage.	Long Term	L
b		Work together with DELWP on Port Philip Bay Coastal Hazardous Assessment in assessing climate change impact on groundwater table level and quality (sea water intrusion).	Immediate Term	L
c		Review the need for a strategy to enable and manage the development of the hot springs industry on the Mornington Peninsula. If need is defined, partner with SEW and SRW to develop a hot spring area with regard to planning, wastewater treatment and water availability.	2022-2027	L
d		Review the distribution and volume of stormwater from council and Vic Roads assets discharging stormwater to aquifers.	Long Term	N/A
e		Review the need for aquifer storage and recharge (ASR) in the Peninsula. If need is defined, partner with Melbourne Water and Southern Rural Water to investigate ASR opportunities to protect existing and potential beneficial uses of groundwaters, particularly in the Nepean Province.	Short Term	L
f		Continue to support groundwater protection and infiltration of treated stormwater. Any future consideration of groundwater use in council would need to meet the criteria of sustainable yield and suitable salinity levels. (Discourage use where there is no data to support sustainable yield or poor water quality, e.g. highly saline)	Long Term	N/A
g		Advocate to responsible agencies to investigate water quality issues in groundwater. This include potential salinity issues from change in land uses.	Medium Term	N/A

Mornington Peninsula Our Water Future

No	Action	Activities	Timing	\$
1.13	Increase corporate commitment to Integrated Water Management	Embed Integrated Water Management in Council Plan 2021, council strategies and policy: integrate catchment scale and council IWM outcomes, objectives and targets	Immediate Term	N/A
1.14	Improve monitoring data	Review and implement actions to close monitoring gaps to enable and improve reporting on this Plan's performance indicators. Advocate to DELWP to seek support with monitoring requirements for the Catchment Scale IWM Plan.	Short Term	L

Mornington Peninsula Our Water Future

Objective 2: Effective and affordable wastewater system

L = Low (up to \$100,000), **M** = Medium (\$100,000 to \$1 million), **H** = High (> \$1 million)

No	Action	Description	Timing	\$
2.1	Increase number of sewer connections	Deliver Wastewater Management Plan 2018-2023 actions to increase the percentage of sewer connection in the peninsula region by: - ensuring the connection to sewer for all properties in sewer backlog areas where there is already funding for connections; - continuing to promote the Peninsula ECO (Early Connection Option) project to increase uptake in areas where sewer connection is available for domestic, commercial, and council and state government assets. Develop an annual education and inspection program in conjunction with South East Water - reviewing options for wastewater disposal in other high-risk areas currently without sewerage (e.g. Arthurs Seat) in conjunction with South East Water and the community. Options to include alternatives to on site wastewater systems. Review will assess environmental, public health and economic impacts and benefits. - finalising the next 5-year Memorandum of Understanding with South East Water for the funding of a proactive Wastewater Management Officer - linking Wastewater Management Plan Actions to the IWM to increase the sustainable reuse of treated wastewater - promoting the Environmental Upgrade Finance scheme to incentivise businesses and residents to connect to sewer South East Water is a key collaborative partner in the above initiatives.	Refer to the Wastewater Management Plan 2018	L-H

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No	Action	Description	Timing	\$
2.2	Improve management of on-site wastewater system	Deliver Wastewater Management Plan 2018-2023 Actions to manage on-site wastewater systems. Key actions include continuation of septic system audits, collection of data for long term planning, education on preventative septic maintenance, system and waterway monitoring, information management This may include educating landholders on septic system flooding prevention e.g. stormwater diversion. Educate septic system owners on increased maintenance obligations in the amended Environment Protection Act, effective from July 1 2021 Review and update the Shire's Wastewater Management Policy, in consultation with partners and the community, to implement the amended Environment Protection Act and Wastewater Management Plan actions	Refer to the Wastewater Management Plan 2018-2013 and Shire Wastewater Management Policy 2013	L-H

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Objective 3: Existing and future flood risks are managed to maximise outcomes for the community

L = Low (up to \$100,000), **M** = Medium (\$100,000 to \$1 million), **H** = High (> \$1 million)

No	Action	Description	Timing	\$
3.1a	Enhance flood management with IWM (storage and detention)	Develop a new flood mitigation strategy with incorporation of IWM objectives, particularly on stormwater harvesting and reuse opportunities.	Immediate Term	N/A
b		Determine Annual Average Damage (AAD) for each major drainage catchment	Short Term	L
c		Identify priority catchments/areas that would benefit from a large-scale implementation of smart rainwater tanks. Smart rainwater tanks enable controlled release of water to reduce peak flow impact and to extend the life of existing stormwater infrastructure.	Short Term	L-M
d		Implement the roll out smart rainwater tanks in priority area where assessed viable.	Medium Term	
e		Consider flood mitigation as part of stormwater harvesting system design	Long Term	M
f		Continue to promote use of leaky rainwater tanks in private development	Long Term	N/A

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Objective 4 Healthy and valued waterways and marine environments

L = Low (up to \$100,000), **M** = Medium (\$100,000 to \$1 million), **H** = High (> \$1 million)

No	Action	Description	Timing	\$
4.1a	Expand WSUD in private and public realm	Develop of a WSUD Masterplan for the public realm to identify a list of WSUD opportunities in the Peninsula to treat and/or harvest stormwater	Immediate Term	L
b		Further develop the priority projects listed in the WSUD Masterplan into design stage followed by implementation.	Long Term	M-H
c		Pilot voluntary stormwater in lieu contribution scheme to fund delivery of precinct scale WSUD projects, pending feasibility study outcome	Short Term	L

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No	Action	Description	Timing	\$
d		Develop a WSUD guideline and design standards for council projects • Build on Melbourne Water's and/or other councils' guideline and standards. • Guidance on asset selection type for a range of projects • Develop decision framework for road drainage ○ Develop a decision-making framework to attribute standards designs to road types and priorities. A decision support framework could guide the preferred design attributes (such as, designed with or without a saturated zone, lined or promote infiltration to underlying soils). ○ Develop guidelines for treating road runoff. Templates of different road typologies (ie unsealed roads, major access roads with informal drainage, local residential streets, commercial precincts, etc) with standard technical design drawings for each. • Develop specific guideline around unsealed road sediment management as well as the southern peninsula sand belt • Develop case studies or specific WSUD guidelines for sediment and nutrient treatment on council assets, particularly from sportsfields • Consider WSUD in coastal area, learning from flagship projects (Rye Elgan Ave)	Short Term	L
e		Existing road renewal program -integrated drainage Unmade roads have been identified as one of the main contributors of pollutant loads, directly affecting the health of our catchment and waterways. Identify roads upgrade and sealing of unsealed roads projects on our capital works program that are to be sealed or having drainage upgrades so that all runoff is treated prior to discharge into underground drainage or informal swale drainage remains in place for the conveyance of runoff to the receiving waterway.	Long Term	L-M

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No	Action	Description	Timing	\$
f		Existing road renewal – new WSUD Identify opportunities for the integration of WSUD into drainage or road upgrade and sealing of unsealed roads projects to increase infiltration and treatment of stormwater. This requirement is to be strengthened in the WSUD section of the revised ESD Policy. Desired outcome is to reduce the percentage of directly connected imperviousness (DCI%). Review capital work programs to develop a list of WSUD projects that are undertaken. These should be developed to functional-detailed design level so that they are ready to be constructed as the capital works projects are rolled out.	Long Term	L-M
4.4	Use innovation to manage road sediment	Continue to trial different approaches to unsealed road maintenance and grading to reduce sediment runoff and improve road condition. Consider use of enzymes or binders or sealing.	Short Term	L
4.5	Monitor WSUD performance	Include capability for water quality monitoring where possible in new large scale WSUD projects to monitor their performance. Undertake water quality monitoring to assess performance of existing WSUD assets.	Long Term	L
4.6	Improve maintenance of WSUD Assets	Review and update the WSUD Asset Management Plan (include condition assessment audits, planned maintenance and rectification) to improve effective management of WSUD assets. Desired outcome is for all priority WSUD assets are functioning as per design and asset life is prolonged. Timing: Recommendation report to be delivered by Dec 2021 to be able to inform maintenance contract renewal in 2023.	Immediate Term	L

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No	Action	Description	Timing	\$
4.7	Build Council's WSUD capacity and expertise	Build Council's capacity on planning, delivery and maintenance of WSUD assets Consider the use of direct engagement and building case studies to achieve this.	Long Term	L
4.8a	Proactive rollout of Amendment VC 154	To achieve a high level of success with this policy implementation capacity building and appropriate resourcing of statutory planners, planning and building compliance officers and ESD officers is crucial. This includes consideration of additional resourcing to undertake compliance and enforcement activities relating to ESD or establishing a self-reporting system	Long Term	L-M
b		Advocate for capacity building and implementation support from DELWP, beginning with a standard guideline and/or online decision support tool for planners to effectively implement Clause 53.18 (Stormwater management in urban development) which was introduced to the Victoria Planning Provisions in October 2018	Short Term	N/A
c		Advocate to DELWP to apply Clause 58.18 (Stormwater management in urban development) of the Victoria Planning Provisions to single dwelling development	Short Term	N/A
d		Advocate to State Government to ensure that Victoria's pending State-wide ESD planning and building framework (to be implemented via 'Environmentally Sustainable Development of Buildings and Subdivisions: A Roadmap for Victoria's Planning System' and associated initiatives) applies strengthened WSUD requirements for single dwelling development (not just multi-unit development).	Short Term	N/A
e		Advocate for strengthened WSUD requirements in the current review of the National Construction Code (NCC) which commenced in 2019, and any related reforms to the Victorian Building System.	Short Term	N/A

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No	Action	Description	Timing	\$
4.9	Ensure planning scheme requirements are met	Continue to ensure new development meets the planning scheme requirements (Clause 14.02-2S, 19.03-3S, 53.18, 56.07) through the subdivision, planning, and building permit process.	Long Term	N/A
4.10	Strengthen interdisciplinary platforms	Continue to develop and formalise cross-organisational collaboration on public realm IWM and WSUD initiatives. Foster internal relationships across WSUD/IWM supporting champions from different departments by formalising a WSUD working group to discuss issues-based projects and lead the delivery of identified actions outlined in this IWM action plan strategy. Formalise the group by convening a manager level steering committee (chaired by a relevant manager) or equivalent to guide the activities of the working group.	Long Term	N/A
4.11a	Trial blue-green infrastructure planning, design, and implementation	Deliver Action 11.2 Climate Emergency Plan 2020 to complete a Green Infrastructure Mapping project, to generate critical data to guide future projects, e.g. urban street tree program, bushfire fuel reduction, ecosystem protection.	Immediate Term	L
b		Pilot collaborative green (or blue-green) infrastructure planning, design and implementation approaches when preparing structure plans at major activities centres. This could be informed by the output from Action 4.11a Green Infrastructure Mapping project and Action 4.1a WSUD Masterplan. A trial will enable Council to build capacity in applying a green infrastructure approach more widely.	Short Term	L

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No	Action	Description	Timing	\$
4.12	Continue stormwater monitoring and enforcement	Deliver monitoring, enforcement and education program for small to medium size industrial premises. This program targets wastewater management and prevention of stormwater contamination. This include industrial estates in Capel Sound/ Rosebud, Dromana and Mornington. Advocate for continuation of the EPA OPLE funding program to assist with reducing waterway pollution from small to medium scale industry EPA are partners in this action	Long Term	N/A
4.13	Implement Biodiversity Conservation Plan 2019	Support and review the implementation of the Biodiversity Conservation Plan 2019, particularly actions that contribute to healthy waterway and bay. Key actions include action number 5.6 and 6.3.	Refer to the Biodiversity Conservation Plan 2019	N/A
4.14a	Support implementation of Healthy Waterway Strategy	Support the implementation of the 'Co-Designed Catchment Program for the Westernport and Mornington Peninsula Region' and facilitate co-operation between the Shire, local land managers, scientists, Traditional Owners and the community, to ensure a co-ordinated and adaptive approach to waterway management at the local scale, that aligns with the Program (refer to action 6.4 in the Biodiversity Conservation Plan)	Refer to the Biodiversity Conservation Plan 2019	N/A
b		Work with partners to investigate potential actions to help achieve the Healthy Waterway Strategy performance objective	Long Term	L-M
4.15a	Incentivise landowners to protect waterway health	Review and ensure effectiveness of the Shires conservation land rate incentive for private landholders to protect waterway wetland manage erosion (refer to action 2.1 in Biodiversity Conservation Plan)	Refer to the Biodiversity Conservation Plan 2019	N/A

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No	Action	Description	Timing	\$
b		Continue to promote Melbourne Water's Stream Frontage Grant for private landholders to encourage waterway and wetland protection activities on private land.	Refer to the Biodiversity Conservation Plan 2019	N/A
c		Continue to provide sustainable water management information package as part of conservation land rate rebate request	Refer to the Biodiversity Conservation Plan 2019	N/A
4.17a	Strengthen collaboration partnerships	Continue participation in Dandenong and Westernport IWM Forums	Long Term	N/A
b	Improve management of surface water-groundwater	Support Southern Rural Water (SRW) in developing a local catchment water management plan which could include Watsons Creek and Main Creek	Long Term (As per SRW's timeline)	N/A

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No	Action	Description	Timing	\$
4.18a	Water Quality Monitoring	Develop and implement a risk-based waterway monitoring program (refer to Appendix 7 for pollution hotspots), in partnership with South East Water, Melbourne Water and local environment groups. Plan to consider the following: • MPSC obligations and responsible teams/staff • Funding/budget • Training and expertise needed • Occupational Health and Safety/ SoP's • Locations and frequency • Parameters: micro, chemical, sediment, nutrients, heavy metals • Reporting: internal or external, frequency • Addressing non-compliant results: MPSC and agency funding, budget, responsibilities • Link to existing MPSC/South East Water/Melbourne Water and Water Watch sampling programs	Short Term	L-M
b		Conduct water quality monitoring as a verification tool in confirming council's risk management plan are effectively managing water quality risks for activities taken. This include application of chemicals onto sports fields for turf establishment, maintenance and weed killing.	As required	L

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No	Action	Description	Timing	\$
4.19a	Implement the Beyond Zero Waste Strategy 2030	Support the implementation of the Beyond Zero Waste Strategy 2030, particularly litter prevention actions that contribute to healthy waterways and bays. Key actions include the following: 4.1. Improve waste collection and resource recovery in public places 4.2. Deliver anti-litter behaviour change campaigns 4.3. Providing community engagement programs to encourage behaviour change regarding illegal dumping 4.4. Adopt a proactive prevention model that demonstrates best practice in illegal dumping compliance and enforcement	Refer to the Waste Strategy 2030	N/A

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Objective 5 Healthy and valued urban and rural landscapes

No	Action	Description	Timing	\$
5.1	Improve conditions of public open spaces	Investigate alternative water supply opportunities for existing high priority public open spaces (sportfields and event spaces) that are currently not being irrigated and are in poor condition.	Short Term	L
5.2	Irrigate new active recreation areas (such as sports grounds) with alternative water source	According to the Sports Capacity Plan 2019, 22 new sportsfield are identified for the next 10 years. Access to alternative water source is a criterion for greenfield site selection. Ensure water sustainability, including access to alternative water sources, is embedded in new sports field project planning and delivery framework. To prepare for this, investigate alternative water source opportunities for irrigation of future sports grounds. This should be included in the WSUD masterplan scope of works.	Short Term	L
5.3	Irrigate existing sports ground with alternative water source	Investigate opportunities to displace potable water use in irrigation with alternative water source. Locate sports fields that are near stormwater drains with large catchments and have space for harvesting systems. Sites which have been assessed as having potential urban drainage catchments of sufficient size should be investigated further for the viability of stormwater harvesting schemes. This should be included in the WSUD masterplan scope of works.	Short Term	L

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No	Action	Description	Timing	\$
5.4	Extend implementation of passive irrigation (integrate WSUD into streetscape projects)	Council projects shall consider passive irrigation opportunities (e.g. channelling of street and gutter run off into tree pits, raingarden and swales). Scenarios include: • New trees planting or trees renewal within established streets • Road, footpath and car park reconstruction • Civic projects This will support urban tree resilience and reduce stormwater runoff. Increased canopy coverage also has an impact on reducing urban heat island effect.	Long Term	M

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Objective 6 Community values are reflected in place-based planning

No	Action	Description	Timing	\$
6.1a	Build community water literacy	Implement education actions relating to water conservation, alternative water use, groundwater use and stormwater quality management in the Climate Change Community Education Strategy 2018 and the Climate Emergency Plan 2020 (Action 14.2) for community, industry and businesses.	Refer to the Climate Change Education Strategy 2018 and Climate Emergency Plan 2020	L
b		Provide greater WSUD information and guidance on Council's website to support improved water management in the private realm. Build capacity to enable increased compliance with Victorian Planning Provisions relating to IWM (including VPP Clauses 54.03-4, 55.03-4, 56.04-7 and 53.18) for urban development on private land. The Shire should use the opportunity when discussing on-site stormwater management policies with the community to build awareness and knowledge around design, installation and maintenance of WSUD assets typically used in the private domain. Opportunity to influence preferred WSUD treatment trains/ assets that maximises environmental outcome. Provide links to resources (checklists and development examples of compliance requirements and reporting) located on the Clearwater/ Melbourne Water website to support improved water management in the private realm. Clarify where and how community can make choices and contribute to solutions. Consider developing an online decision support tool (for applicants and assessors) on how to comply with stormwater management requirements.	Long Term	L

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No	Action	Description	Timing	\$
c		Campaign to improve awareness of WSUD to community at large. All priority Shire WSUD assets to have educational signage, informed by Melbourne Water's standard signage for WSUD in the public domain.	Long Term	L
6.2a	Support Community Stewardship	Continue to support the community in conducting water quality monitoring (e.g. Drain Detectives) and undertaking riparian restoration projects which will continue to foster a shared sense of responsibility for waterway assets (e.g. Melbourne Water's Stream Frontage Program, MPSC's 'Conservation Land Rate').	Long Term	L
b		Continue to support community driven projects on waterways health protection. This include support in grants application for funding.	Long Term	L
6.3	Capture traditional owner values in water planning and strengthen cultural awareness in organisation	Ensure Traditional Owner values are captured in water planning. Cultural values and uses of waterway, legal rights and traditional knowledge of natural resource management to be considered in processes and decisions. Inclusion of Traditional Owners and Aboriginal Victorians in these processes and decisions.	Long Term	L

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Objective 7 Jobs, economic benefits and innovation

No	Action	Description	Timing	\$
7.1	Expand access to recycled water for agricultural growth	Continue to strongly advocate for and invest in opening new areas of Melbourne's food bowl in Mornington Peninsula for irrigated agriculture using recycled water.	Long Term	L
		Implementation of the Green Wedge Management Plan, specifically on council's input into the Strategic Agricultural Land and protection as well as encouragement of rural farming in the green wedge zones. This will give more certainty to the feasibility of recycled water schemes.	Long Term	L
		Support agricultural/horticulture trial with recycled water. Use The Briars as a demonstration and research site to establish the viability of recycled water for ecological regeneration and agriculture, as a fit for purpose alternative water source to mains or rainwater.	Short Term	L

Place Specific Actions

No	Action	Description	Timing	\$
8.1	Protect Tootgarook Wetland	Partner with Melbourne Water in implementing the Tootgarook Wetland Management Plan (TWMP)	As per the TWMP	L-M
8.2	Balcombe Estuary Sediment Minimisation	Partner with Melbourne Water and the community in developing the Long-Term Management Plan for Balcombe Estuary Sediment Minimisation.	Short Term	L-M

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No	Action	Description	Timing	\$
8.3	Recycled Water to the Mornington Peninsula Hinterland	Partner with South East Water HEWS Inc. and other stakeholders in investigating the feasibility of delivering a recycled water scheme in the Hinterland region.	Short Term	L-M
8.4	Recycled Water to Tyabb and Somerville	Partner with South East Water to assess potential customers' willingness to pay for recycled water in Tyabb/ Somerville and for the development of the scheme's detailed design	Short Term	L-M
8.5	Recycled Water to the Briars and nearby green spaces	Develop detailed design and construct Class A recycled water distribution system to the Briars and further investigate the feasibility to extend the network to neighbouring green spaces.	Short Term	H

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Funding

Implementation of the IWM Action Plan is envisioned to be achieved via annual budget bids and external grants/ funding.

The Shire is also currently investigating the feasibility of a stormwater in-lieu contribution scheme to fund large scale Water Sensitive Urban Design (WSUD) projects. It is anticipated that this scheme will help Council accelerate delivery of these WSUD assets to meet stormwater quality targets.

There may also be a potential reduction of council rates in the private realm for initiatives that can be demonstrated to achieve IWM objectives.

Monitoring and Reporting

Monitoring and reporting of the IWM Strategy and Action Plan is as follows:

- Review of action plan every two years, with revisions as required. This allows adaptation to policy reforms as well as new opportunities and challenges
- Full review of strategy in 5 years, including reporting on progress towards targets
- New plan in year 2030

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8 Appendixes

Appendix 1. External Stakeholder Mapping

Stakeholder	Roles	Potential Advocacy and Collaboration Opportunities
DELWP	Regulation and policy Land use planning Facilitation of the Dandenong and Westernport IWM Forums and Working Group	- Recycled water schemes - Expansion of Clause 56 application - Funding
Victorian and Federal Government	Growth and job creation, stimulate urban renewal and drive economic reforms	- City Deals – partnership between three levels of government and the community - Funding
Melbourne Water	Waterway health Stormwater quality Flood management Major drainage systems Recycled water supply	- Waterway health, restoration and rehabilitation - Long term management plans for wetland and estuary - Community education and engagement - Funding
South East Water	Potable water supply Sewage collection, conveyance and treatment Trade waste Recycled water supply	- Recycled water schemes - Sewer connection - Septic Tank - Stormwater harvesting and reuse
Southern Rural Water	Groundwater management Surface water extractions Farm dam licenses	- Groundwater use - Managed aquifer recharge
Neighbouring Councils	Stormwater management Open space management Building and planning approvals Land use planning	Peer to peer learnings
Traditional Owners	Communicating aboriginal water values Cultural and heritage approvals	- Aboriginal values and knowledge in water planning - Support aboriginal access to water for economic development
Port Philip and Westernport Catchment Management Authority	Land, water and biodiversity management	Grants and landcare support

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Appendix 2. Benchmarking – Water Sensitive Cities Index

Water sensitive cities (WSCs) are resilient, liveable, productive and sustainable. They interact with the urban hydrological cycle in ways that: provide water security for economic prosperity through efficient use of diverse water resources; enhance and protect the health of watercourses and wetlands; mitigate flood risk and damage; and create public spaces that harvest, clean and recycle water. Its strategies and systems for water management contribute to biodiversity, community health and wellbeing, carbon sequestration and reduction of urban heat island effects.

The Cooperative Research Centre for Water Sensitive Cities (CRCWSC) has developed a tool driven by the best research to understand how far towards a water sensitive city places are so they can take steps and track progress toward that goal.

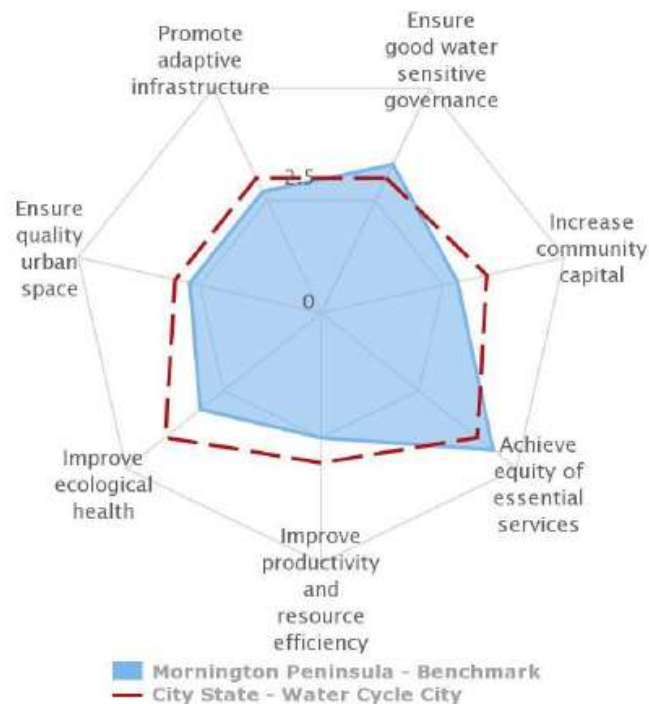


Figure 4. Performance against the 7 water sensitive goals

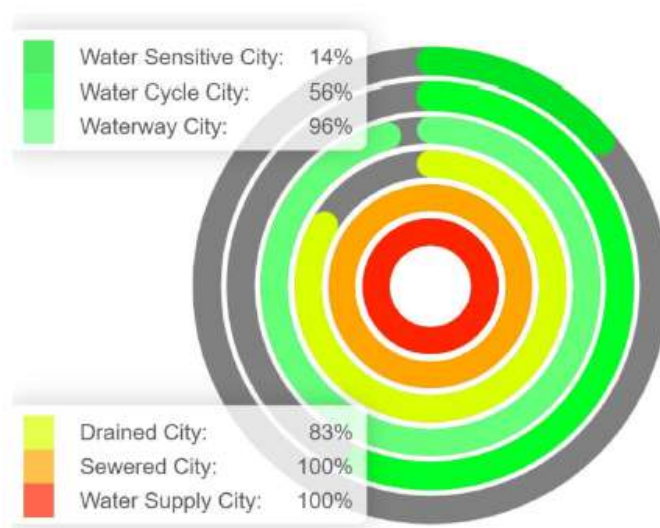


Figure 5. Benchmarking results for Mornington Peninsula Municipality

Figure 4 summarises the performance of the Mornington Peninsula Shire Council geographic area against the seven goals of a water sensitive city. The WSC Index results for the Mornington Peninsula Shire Council area is approximates that of a water cycle city benchmark. As the area becomes more water sensitive, its capacity to deliver liveability, sustainability, resilience and productive outcomes increases.

Equity of essential services and ensuring good water sensitive governance are key strengths across the region. There is a small deficit across the goals of promote adaptive infrastructure and ensure quality urban space. A greater deficit is evident across the goals of increase community capital, improve productivity and resource efficiency and improve ecological health.

The benchmarking results are used to inform current status on a number of indicators in this Plan, including the Strategic Enablers. They include the following indicators

Indicator 6.3 Improve communities' connection with and understanding of the water cycle

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Measure - Rating of community literacy (regarding the water cycle)

Indicator 6.4 Increase consideration of the water cycle in town planning

Measure - Rating of whether water is a key element in city planning and design process

Indicator E1 Increase organisational commitment to IWM

Measure - Rating of vision, leadership and long-term commitment through vision statement and objectives articulated in corporate documents

Indicator E2 Increase stakeholder capacity to successfully deliver IWM

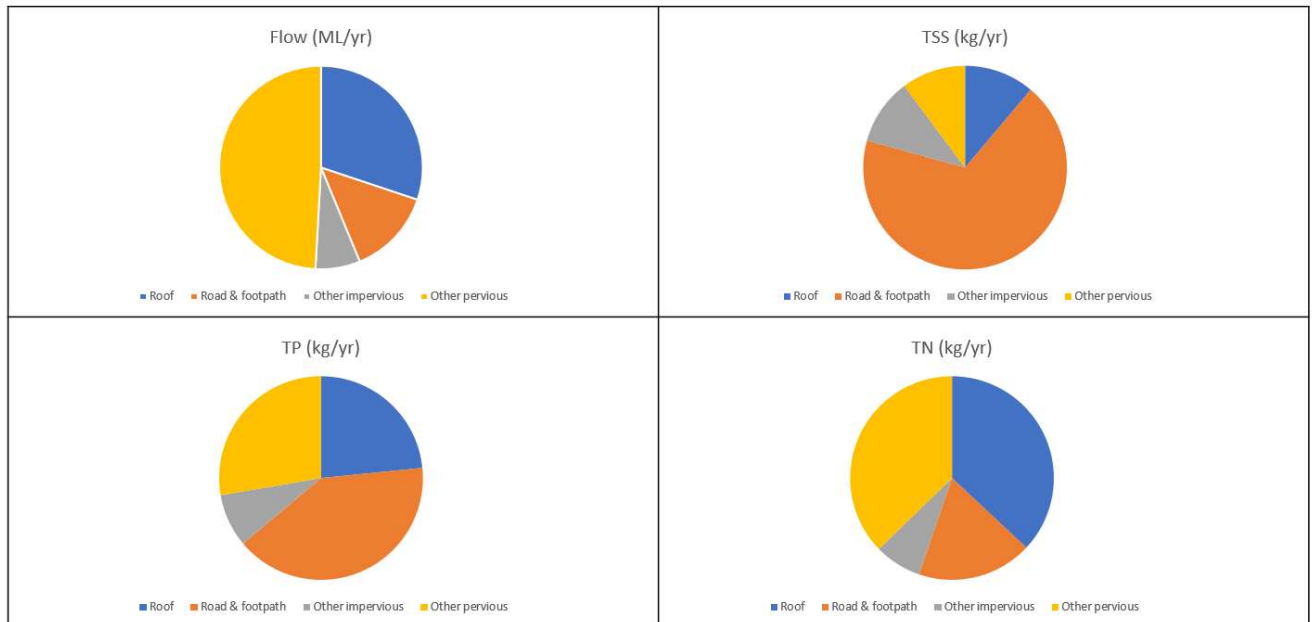
Measure - Rating of knowledge, skills and organisational capacity

Indicator E3 Increase collaboration and partnerships across industry and government

Measure - Rating of cross-sector institutional arrangements and processes

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Appendix 3: Pollutants by Surface Type



NOTE: Water and pollutant balance excludes private surface water diversions

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Appendix 5. Community ideas on what council could do to achieve IWM objectives:

What we have heard from the community (submission from a Discussion Paper 2019)

Theme	Example of Comments
Create more WSUD assets to a) protect the environment b) harvest water for reuse c) reduce flood risk by capturing excess water	<i>Create more swales and bioretention catchments rather than point source drainage infrastructure straight into waterways and the Bay</i> <i>invest in more stormwater capture to facilitate watering</i> <i>water quality monitoring, innovative GPT options, revegetation to reduce erosion and siltation</i> <i>Use of more bio-infiltration systems in adjacent parks and reserves when upgrading road infrastructure.</i> <i>Stormwater harvesting, tanks and bio-infiltration systems will aid in reducing flood risk.</i>
Use alternative source water for sporting grounds and parks	<i>"Use purple pipeline water (recycled water) only for irrigation of sports fields not Ground or Mains water."</i> <i>"rainwater catchment for irrigation of sporting facilities"</i> <i>"...council can use recycled water after buying at cheaper price from South East water for irrigating it's parks and sports fields"</i>
On site – water retention Increase permeable surfaces	<i>"Incentivise on-site water retention and treatment. Incorporate smart and integrated technology to use assets to address multiple objectives."</i> <i>"Rainwater retention and treatment on-site, use of permeable services"</i> <i>"storm water management, review planning requirements to encourage reuse and reduce hard surfaces"</i> <i>"In the past shire engineers have been preoccupied with getting water off your roof or off the road into a gutter, immediately connected to a drain which leads into a creek and hence to the sea as quickly as possible. This emphasis should be reversed. Water should be encouraged to stay nearby to where it falls for as long as possible, its progress slowed by holding mechanisms, and where possible kept in tanks or ponds for use on gardens or in passive irrigation, or to soak into the ground."</i>
Plant more trees	<i>"plant trees"</i> <i>"Flood risks can only be reduced by planting more trees, which can further increase overall health of Peninsula"</i>
Plant and retain indigenous vegetation	<i>"retention and replanting of indigenous vegetation"</i> <i>"Encourage residents to plant native flora. Council to develop recreation areas with more indigenous plants and not water non formal playing areas during extreme dry periods"</i>

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Theme	Example of Comments
Use of warm grasses for sporting fields	<i>all new fields to be warm season grass to reduce water use</i> <i>Plant warm weather grasses on all sports fields if not doing so already.</i>

Appendix 6. Community ideas on what they (the community) should do to achieve the same objectives and how council can support them:

Theme	Example of Comments
Incentivise water conservation and stormwater management initiatives	<i>"Subsidising such things as gutter guards, first flush units, downpipe takeoffs, mulch, water tanks etc."</i> <i>"Upgrade appliances and install additional features (including smart tech such as monitoring, smart tanks, on-site treatment), requiring Council support, grants and subsidies."</i>
Provide community education on water conservation and stormwater management	<i>"Community education on water conservation and stormwater control".</i> <i>"Providing designs for rain gardens, soakage pits and other stormwater infiltration systems".</i> <i>"Provide education to residents on how best to utilize storm water run offs and examples to make it easy for residents to replicate in home".</i> <i>"Education about ground water not being a infinite resource is essential".</i> <i>"Council could provide advice on what would be the most beneficial methods for home owners to implement IWM at the lot scale".</i>
Plant drought proof and native plants	<i>"Plant drought-proof gardens"</i>
Use rainwater tanks	<i>"Install rainwater tanks, plumbed for toilet flushing and garden watering".</i> <i>"Invest in more stormwater capture (i.e. tanks for homes) to facilitate watering, toilet use".</i>

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Appendix 7 Water Pollution Hot Spots

No	Location/ Catchments	Townships	Pollutants of Concern	Pollution Source	Evidence based (Y/N)
1	Watsons Creek	Tyabb/ Somerville	Pesticides Fertilisers/Organics Coliforms – human and cattle origin Heavy Metals	Market Gardens Industrial Estate – Somerville and Yaringa Harbour Domestic Septic Systems Sewer Spills	Y – historical reports for agricultural inputs Y – recent inspections and sampling of septic system N – industrial impacts are assumed
2	Chinamans Creek	Capel Sound/ Rosebud	Heavy Metals Hydrocarbons Litter	Industrial Estate	Y – External sampling reports MPSC and EPA inspections
3	Warrangine Creek	Hastings	Heavy Metals	Industrial estate Commercial premises	N - assumed
4	Tanti Creek	Mornington	Heavy Metals Hydrocarbons Sediment/Turbidity	Industrial Estate Commercial Premises Public reserves	Y – external sampling reports MPSC and EPA inspections
5	Martha Cove	Safety Beach	Sediment/Turbidity Litter	Construction activities Road run off Future dredging proposed	N – assumed Need to check planning permit requirements for monitoring
6	Dromana Drainage System and Outfall	Dromana	Hydrocarbons Heavy Metals Litter	Industrial Estate	Y – Shire sampling MPSC and EPA inspections
7	Port Phillip Bay Beaches	Mt Eliza to Portsea	E.Coli Faecal Streptococci	Sewer Spill Stormwater drains after rainfall Dry weather alerts from EPA – bather density, unknown sources	Y – EPA beach report forecasts and sampling
8	Western Port Beaches	Somers, Balnarring, Merricks, Point Leo,	E.Coli Faecal Streptococci	Sewer Spill Stormwater drains after rainfall	Y – MPSC sampling to 2007 to 2018

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9	Hastings South Catchment	Shoreham, Flinders Red Hill, Red Hill South, Merricks townships, drains and waterways	E.Coli Faecal Streptococci Organic Loading Suspended Solids	Septic systems (Point Leo over 2500 sq m allotments) Domestic and commercial septic systems	Point Leo septic inspections and sampling Y – MPSC sampling and inspections Refer Wastewater Management Plan
10	Safety Beach Catchment	Arthurs Seat	E.Coli Faecal Streptococci Organic Loading Suspended Solids	Domestic and commercial septic systems	Y – MPSC sampling and inspections Refer Wastewater Management Plan
11	Nepean Groundwater Aquifer	Rye to Portsea, St Andrews Beach, Cape Schanck	E.Coli Faecal Streptococci Nitrates Phosphates	Domestic and commercial septic systems Agricultural activities e.g. fertilizers (assumed)	Y – South East Water sampling (not public)