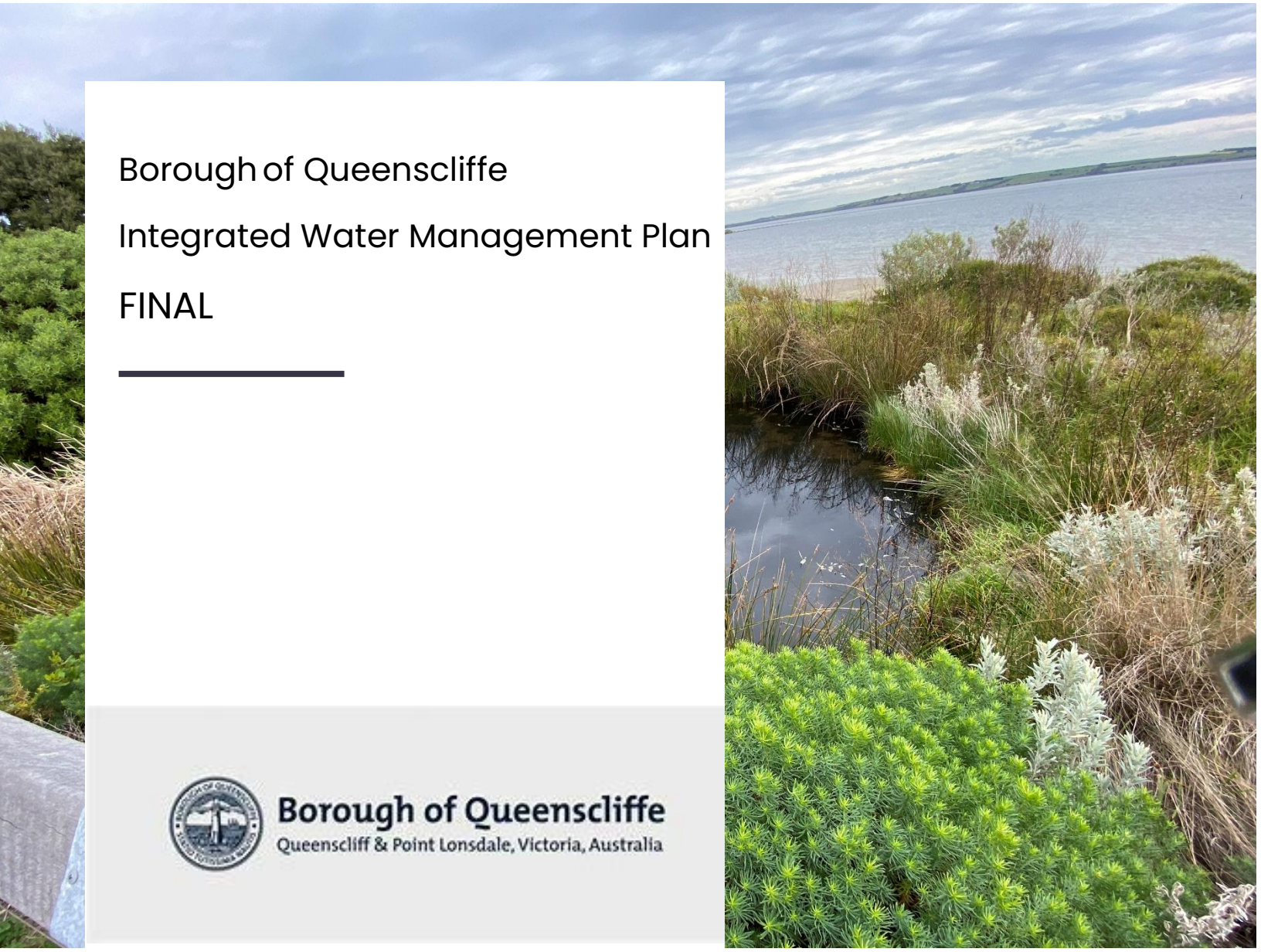
Borough of Queenscliffe

Integrated Water Management Plan

FINAL



Borough of Queenscliffe
Queenscliff & Point Lonsdale, Victoria, Australia

May 15

Prepared by:

TOverman Sustainability & Foresight Advisory

Borough of Queenscliffe Integrated Water Management Plan

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Acknowledgement

The authors acknowledge and pay our respects to the Wadawurrung peoples as the Traditional Owners of the lands to which this report applies. We also acknowledge their Elders, past and present, and recognise their ongoing cultural, spiritual, and educational practices. The authors also recognise the valuable contributions and advice of the Borough staff and stakeholders in developing the Plan.

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Contents

Introduction

The Borough of Queenscliffe is surrounded by water and unique natural habitats on three sides, and its water cycle system is a fundamental feature. Consequently, the municipality faces many water-related challenges.

One of the most significant issues is the detrimental impact of stormwater runoff from urban areas on the sensitive adjoining marine environments of the Swan Bay Ramsar Wetlands and the Port Phillip Bay Marine National Park.

Other critical water-related issues include regular land-based flooding caused by a stormwater and drainage network that often exceeds capacity, high use of potable water for irrigation, drinking water security, pressure on the sewerage network, and pressure on the unique green-blue infrastructure that characterises many of the attractive streetscapes of the two towns.

These issues ramp up significantly each summer when the population swells with holidaymakers, and most will become exacerbated over the longer term by climate change. Managing these water-related issues will be critical to the Borough's long-term livability and resilience.

This Integrated Water Management (IWM) Plan is the Borough's response to these and other significant water-related challenges in Queenscliff and Point Lonsdale. The scope of the plan includes:

- consumptive water use, including potable and alternative water sources
- wastewater
- stormwater, drainage, and flooding
- Waterways and marine environments impacted by the towns
- Water's role in valued, urban landscapes
- Water is considered in place-based planning that reflects traditional owner and community values
- The economic values of the water cycle system

The Plan supports the vision for an improved natural environment, a more liveable community, and reduced water-system-related risks, highlighting practical opportunities for the Council and its partners to make a positive impact.

Council developed this Integrated Water Management Plan in consultation with its regional IWM stakeholders in the Barwon Region IWM Forum and with financial support from the Department of Environment, Energy, and Climate Change.

Background

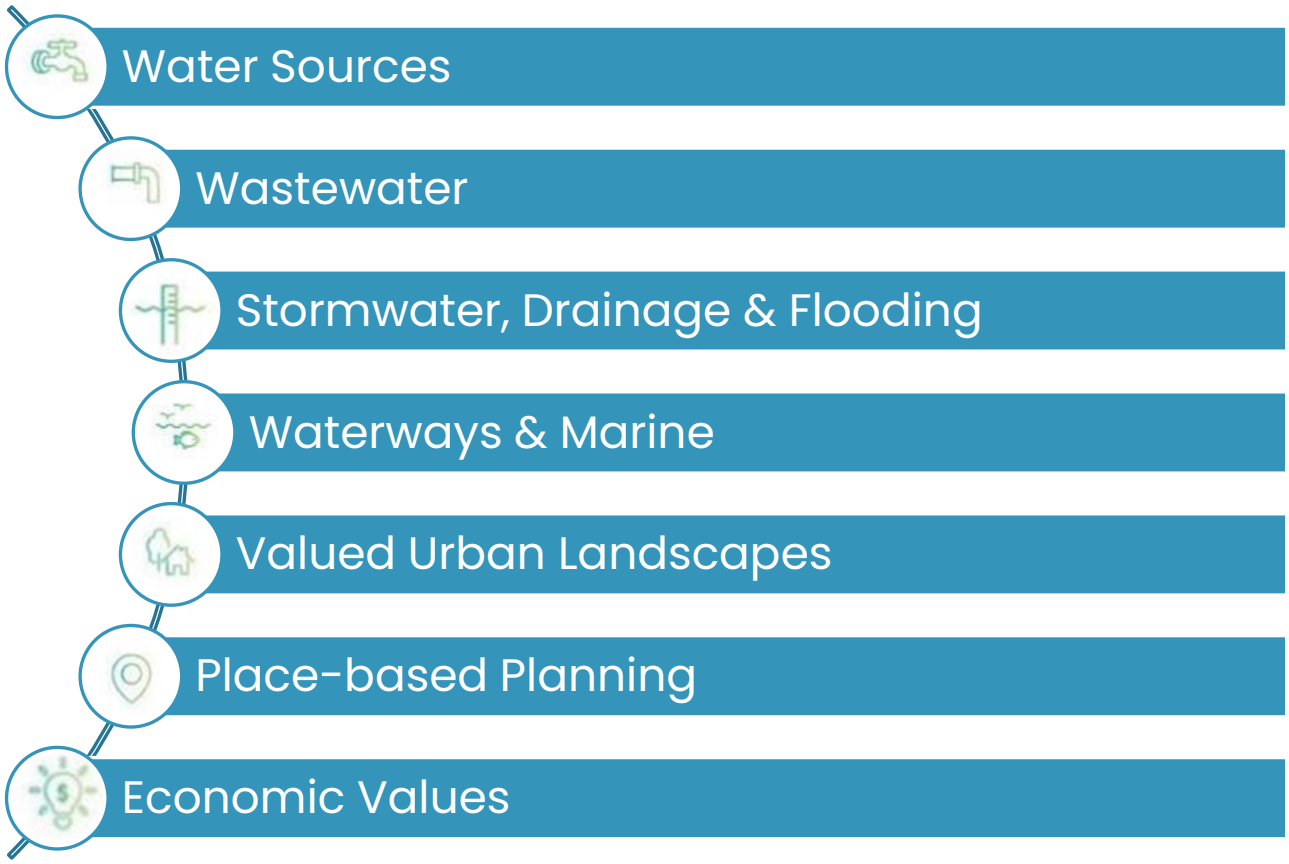
Integrated Water Management

IWM is based on the premise that the urban water cycle system is complex and interconnected with the urban landscape in multiple ways and scales and, therefore, requires a collaborative and integrated response. These complexities and interactions affect our cities and towns' environmental, social, and economic values. All parties must recognise, understand, and manage them holistically and collaboratively.

Historically, urban water management has been a highly fragmented endeavour across Victoria. Water Corporations have focused on the supply of drinking water and sewerage. Local Governments are responsible for stormwater management, and Catchment Management Authorities are the stewards of waterway health. This fragmented approach has contributed to confusion, conflict, and missed opportunities for innovative solutions.

Since 2018, regional IWM forums have been established across the state to drive this integrated approach to urban water management. The Borough of Queenscliffe is located within the Barwon IWM Forum Region, which works collaboratively to integrate seven interconnected aspects of urban water cycle systems, as shown in Figure 1.

Figure 1 Aspects of IWM (based on the Barwon IWM Strategic Directions Statement)



IWM Plan Aims and Scope

The Barwon Region IWM Forum identified the need for an Integrated Water Management (IWM) Plan to cover the townships of Queenscliff and Point Lonsdale in 2018. The plan aims to create a long-term vision for a greener and more liveable community by outlining plans to reduce potable water consumption and improve the health of our surrounding environment and waterways. The Plan is aligned with existing Council Strategies, Barwon Water's Water for Our Future, and the Water for Victoria Plan.

The IWM Plan's scope covers the Borough of Queenscliffe and specifically the towns of Queenscliff and Point Lonsdale, as shown in Figure 2. The urban water cycle system aspects within the plan's scope are outlined in the Barwon IWM Strategic Directions Statement (2022) and summarised in Table 1.

Figure 2 Borough of Queenscliffe IWM Plan area

Table 1 Scope of the BOQ IWMP (based on the Barwon IWM Strategic Directions Statement)

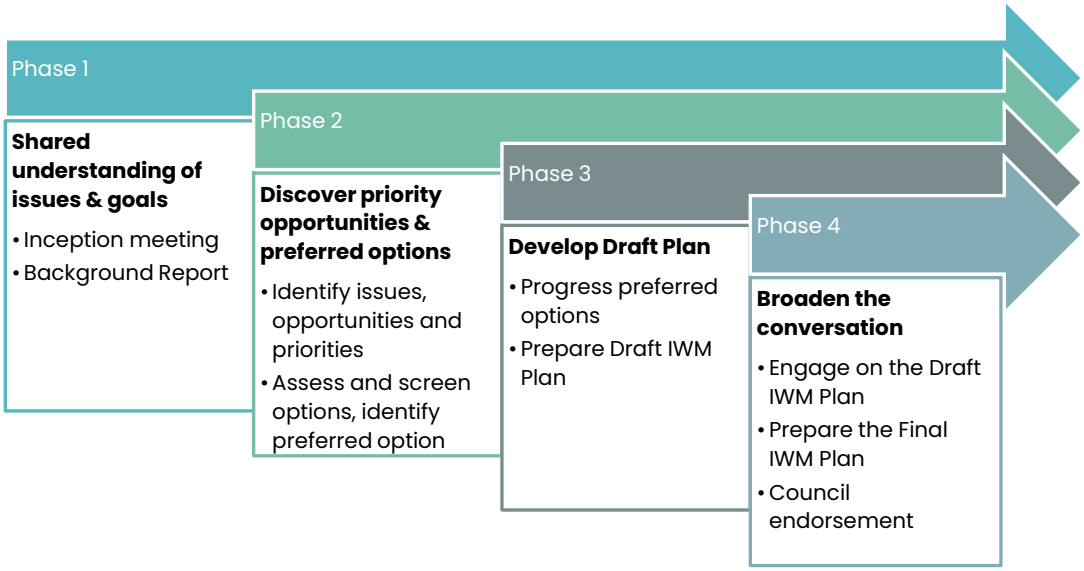
Icon	Water System Aspect	Outcome
	Water Sources	Safe, secure and affordable water supplies in a changing future
	Wastewater	Effective and affordable wastewater systems
	Stormwater, Drainage & Flooding	Manage flood risks
	Waterways & marine	Healthy and valued waterways and waterbodies
	Valued urban landscapes	Healthy and valued urban, rural, agricultural, and green landscapes
	Place-based planning	Traditional Owner and community values are reflected in place-based planning.
	Economic values of water	Jobs, economic opportunity and innovation

Developing the Plan

The method to develop the Plan comprises four phases that were designed to facilitate a collaborative and integrated approach (Figure 3):

- Phase 1: Create a shared understanding of the issues and goals based on systems thinking
- Phase 2: Discover the priority opportunities and develop agreed options to progress
- Phase 3: Develop a draft plan
- Phase 4: Broaden the conversation and develop the final plan.

Figure 3 BOQ IWM Plan Method

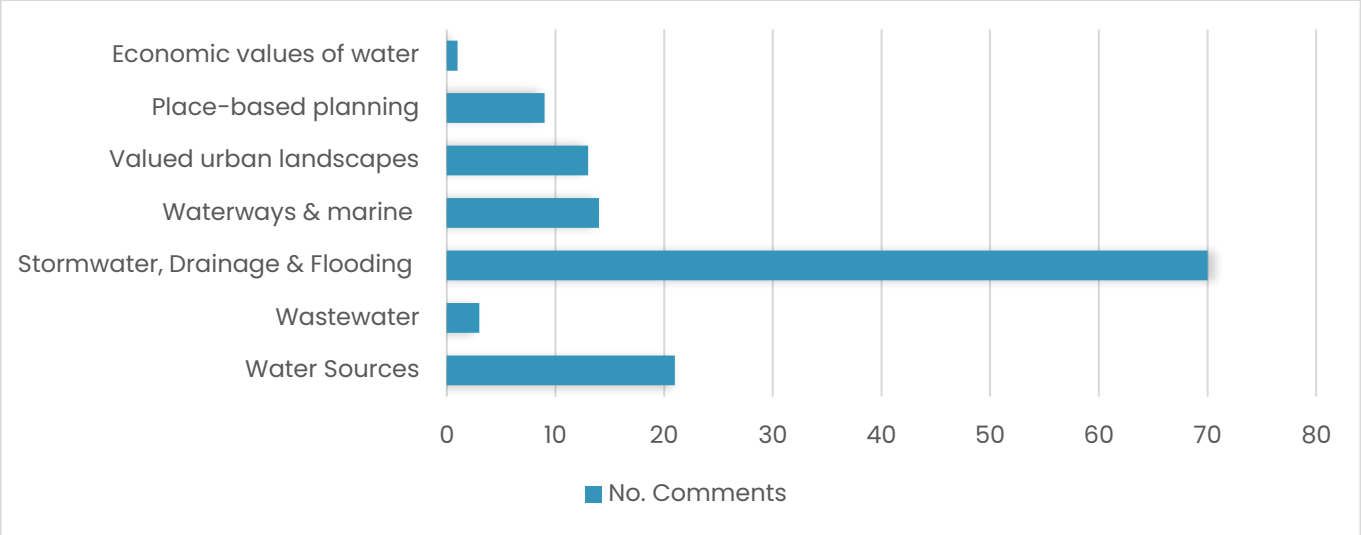


Significant IWM Issues

Understanding the issues and challenges facing the urban water cycle system across the Borough is fundamental to the IWM approach. This section provides an overview of each aspect within the plan's scope.

A desktop review of relevant documents, advice and anecdotal information from staff and other stakeholders identified over 100 comments related to IWM across the Borough. As shown in Figure 4, comments related to stormwater, drainage, and flooding issues were the most prominent.

FIGURE 4 DISTRIBUTION OF IWM-RELATED COMMENTS



Water Sources

Potable Water Security

The Borough is serviced with potable water via Barwon Water's Greater Geelong water supply system. Barwon Water's 2027 Urban Water Strategy (Water for Our Future) provides a long-term strategy for meeting local communities' water supply and sewer system demands. The strategy shows that the system can reliably supply water in the short term; however, under a worst-case scenario, an additional million litres of water will be required annually for the next 50 years. Barwon Water proposes to meet this need by accessing more water from the Victorian Water Grid and reducing demand by increasing water efficiency measures and increasing uptake of alternative water sources, such as recycled water and stormwater.

The Queenscliff Feeder Main (6.3 kilometres long) is the sole source of potable water for Queenscliff and Point Lonsdale. Barwon Water has begun significant upgrades to this asset to ensure its reliability, maintain current service levels, and avoid future unplanned service interruptions to these towns.

Water Use by the Borough

The Borough has a long track record of applying water use efficiency measures, but still relies extensively on potable water to irrigate sports grounds. The last municipal sustainable water use plan was developed in 2007, at the height of the millennium drought. The Borough has begun working with Barwon Water to improve water use consumption data and detect leaks and inefficiencies. Due to the municipality's highly confined nature, finding opportunities for on-site use of alternative water, such as stormwater, is challenging.

Wastewater

Wastewater is sewage generated by residential, industrial, and commercial users and disposed of in the sewerage system. Barwon Water provides wastewater management services to the Borough, which is connected to the regional wastewater treatment plant at Black Rock by a sewer main. Barwon Water has recently upgraded the Barwon Heads Sewer main, which connects to the Borough.

Stormwater, Drainage & Flooding

Stormwater is surface water generated from within the urban landscape. Falling on roofs and hard surfaces as rainwater, it becomes stormwater when it collects and is conveyed by the artificial stormwater network (kerbs, roadside drains, and underground pipes), then into larger drainage pipes and overland flow paths, and ultimately into receiving waterways and water bodies.

Stormwater systems convey flows via gravity to receiving water, and once in the underground pipe network, there is no opportunity for detention at the source. The stormwater infrastructure assets are typically designed to handle up to 20% Annual Exceedance Probability (AEP) flooding, a storm event that may be expected once every five years. Significant issues for stormwater, drainage, and flooding across the Borough include:

Stormwater Discharges to Swan Bay

Eleven stormwater outlets discharge into the sensitive marine environment of the Ramsar-listed Swan Bay wetlands. Stormwater discharge to these environments can increase nutrients, litter, and other pollutants. Most of these outlets have little or no treatment, except the Hesse St and Gellibrand outlets at the Boat Ramp, which have small end-of-line treatment wetlands and a Gross Pollutant Trap (GPT) upstream. Most other outlets discharge into a grassed table drain, providing minimal treatment.

Anecdotal evidence from Council staff and community members indicates that stormwater quality from these outlets is highly variable. This is reflective of the different treatment options located at each outfall. However, no quantifiable data is available, making it difficult to assess and prioritise these discharges individually. There are potential synergies and economies of scale for stormwater treatment across these assets as a portfolio opportunity.

Under the EPA's General Environmental Duty, the BOQ is responsible for reducing harm to human health and the environment from pollution and waste, including stormwater. *Note that the Point Estate outfall at Fellows Road is a significant source of stormwater discharge into Swan Bay that is under the direct control of the City of Greater Geelong.* Council will continue to liaise with the City of Greater Geelong regarding this source.

Ageing Stormwater and Drainage Infrastructure Assets

The Borough's stormwater and drainage infrastructure assets are aging. Significant areas of Queenscliff include heritage-listed bluestone kerbs and channels. Funding is available for regular maintenance; additional capital funds for renewals and upgrades are limited. Consequently, most stormwater and drainage works are reactive.

Land-Based Flooding

Localised flooding can occur in high-risk flood areas identified in the available flood modelling, namely Fisherman's Flats and The Springs. In both cases, flooding is caused by a combination of flat topography and low elevation relative to the receiving waters. Pumping is required to lift the stormwater to be discharged into the bay, but pump problems can lead to water backlogs. Infill development is now adding to the volumes

directed to the stormwater network, which could increase volume and flow rates and, consequently, detrimental environmental impacts.

Several other locations across the Borough that are outside of the high-risk flood areas identified above are subject to localised flooding, including:

- Egerton Street, Pentland Road, and Girvan Grove
- 14-16 King Street
- Laker Drive, north of Ocean Road
- Mercer Street, north of Stokes Street.
- Simpson Street.

The problem is often caused by inadequate maintenance or capacity in the drainage network. Improved maintenance addresses these problems somewhat, but asset upgrades may be another longer-term option.

Ganes Reserve, in Point Lonsdale, is a significant stormwater retardation and infiltration basin. It experiences periodic flooding of the surrounding parkland and playground, and risks to adjoining property after high rainfall events.

Use of Soakage Pits

Across much of Point Lonsdale, stormwater discharges directly to the sandy subsoil via pipes connected to localised soakage pits. However, there is limited understanding of the capacity and effectiveness of these pits under various rainfall events or the impact of stormwater on groundwater levels and quality.

Waterways and Marine

The primary impact on the Borough's waterway and marine environments that could be addressed through the IWM plan is the treatment of stormwater discharges before entering the receiving waters. Swan Bay is a wetland of international significance. It contains a variety of ecosystems that make it environmentally important for waterbirds and migratory waders, including salt marsh, intertidal mudflats, and seagrass beds (Corangamite Regional Catchment Strategy).

Valued Urban Landscapes

The Borough has extensive areas of public open space, notably the coastal reserves adjoining Swan Bay, Port Phillip Bay, and Bass Strait. There are 19 playgrounds and several sporting fields, and the streetscapes have significant public open space and active transport values. There is considerable pressure on the unpaved, highly permeable streetscapes, as greater traffic levels can drive the need for bitumen surfaces and hard-edge kerb and channel, which will change the amenity and feel of the place and reduce stormwater infiltration.

Strategic Context

Trends and Drivers

Urban Growth

BOQ is a highly space-limited municipality that is not growing significantly. Urban growth is mainly limited to infill development, mostly subdivisions of larger blocks for two or more standalone dwellings or units. For BOQ, the most significant IWM impact of urban infill is managing the increased volume of stormwater runoff and poor-quality water entering the receiving waters of Swan Bay and Port Phillip Bay.

Climate Change

Given the low-lying topography of many Queenscliff and Point Lonsdale areas, the projected impacts of climate change-induced sea-level rise will be increasingly critical challenges for BOQ. Table 2 shows these.

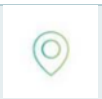
In 2016, the Bellarine Peninsula—Corio Bay Local Coastal Hazard Assessment outlined the extent of coastal inundation's impact within the Borough and recommended further work, including an assessment of assets to determine those at risk of damage or permanent loss and an investigation of potential engineering, environmental, and legislative options to mitigate the cumulative impacts of climate change.

Community Expectations

Urban liveability and amenities are becoming increasingly crucial for the Borough's community. Green open spaces, natural shade, and walkability are essential characteristics of a liveable community, and they are becoming even more so with the increasing number of extreme heat days per year, combined with an influx of visitors over the hot summer months.

Figure 5 Ganes Reserve Wetland, Point Lonsdale

TABLE 2 CLIMATE CHANGE-RELATED RISKS FOR BOQ

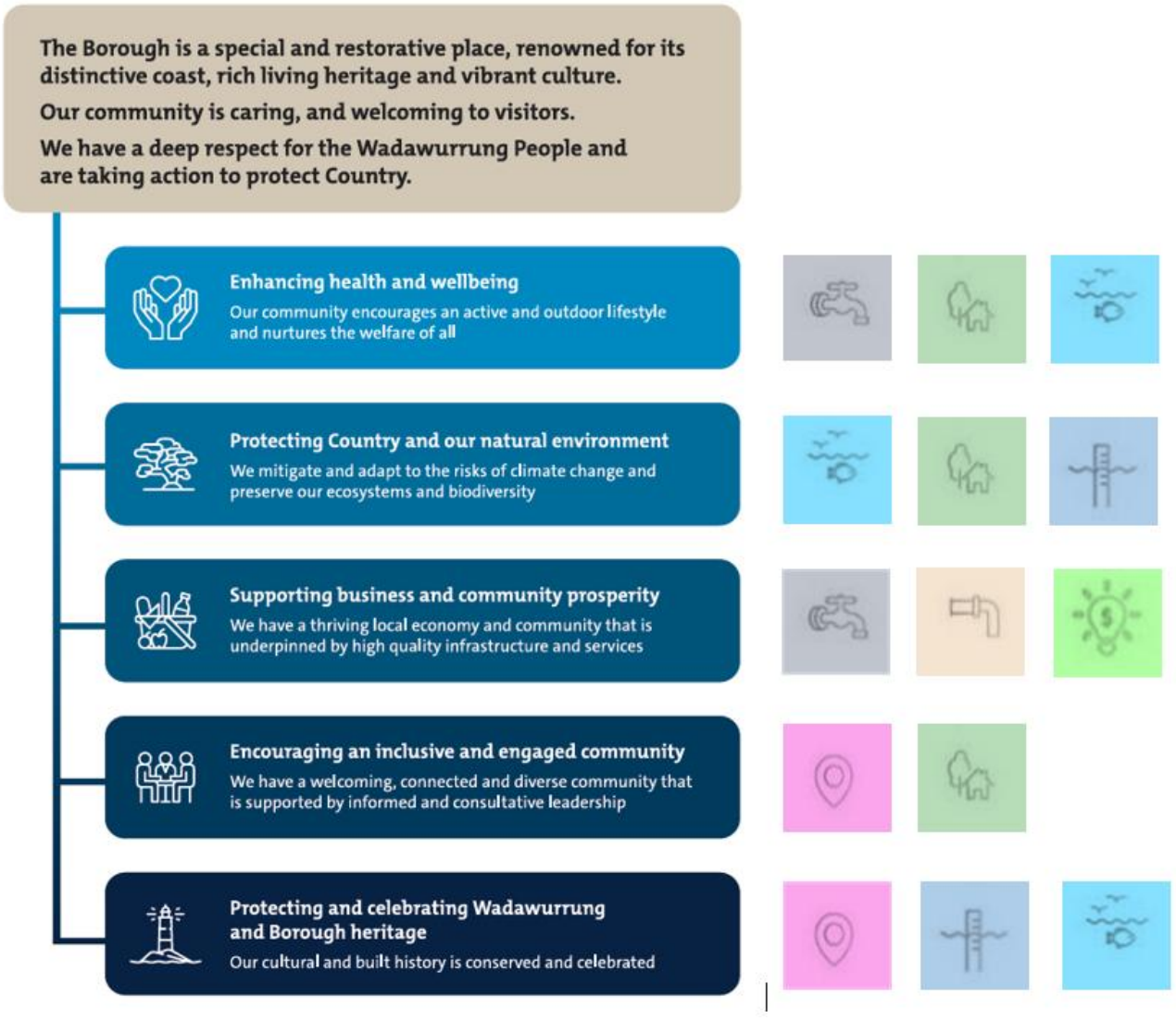
Climate Change-Related Hazard	Climate Change Risk Event	Affected IWM Outcome	Risk Consequences for BOQ	Hot Spots
Increased intensity of storms	The increased intensity of storms causes increased storm surges, leading to erosion and damage to coastal infrastructure.		Increased costs of maintaining and repairing council-managed natural assets. Coastal dune movement in the Queenscliff and Point Lonsdale areas.	The Narrows
			Inundation of residential areas; increased pressure on municipal stormwater and drainage infrastructure	Fisherman's Flat
Increased mean sea level	Increased mean sea level causes increased coastal flooding (particularly when combined with storm surge)		Stress on critical council drainage and stormwater infrastructure services assets, increased potential for localised flooding	Fisherman's Flat, Murray Road
			Increased interaction between marine animals and urban environments	Swan Bay
			Increased salinity and a rise in groundwater level	Queenscliff
Higher mean temperatures	Higher mean temperatures cause a reduced range of ecosystems and species		Loss of marine and terrestrial environments and biodiversity	Swan Bay
Higher maximum temperatures, more hot days, heat waves	Higher maximum temperatures, more hot days and more heat waves cause an increase in the urban heat island effect		Increased demand for urban green-blue infrastructure in built-up urban landscapes	Borough

Vision for IWM

The Borough of Queenscliffe Community Vision for 2021-2031 provides a broad, long-term vision for the local community. The Council Plan (2021-25) outlines the strategic direction for the Council during its term. Informed by the Community Vision and strategic planning within the Borough, the Plan outlines five portfolios, each with strategic objectives for service planning and delivery over four years.

The IWM Plan's vision is for a greener and more liveable community, which is directly aligned with the broader community vision and the five portfolios of the Council Plan, as shown in Figure 5.

FIGURE 6 ALIGNMENT BETWEEN THE COMMUNITY VISION, COUNCIL PLAN AND IWM PLAN



IWM Goals and Targets

Clear goals and targets are essential to achieving the IWM Plan vision. The IWM Plan goals and targets are based on the outcomes outlined in the Barwon Region IWM Strategic Directions Statement (Table 3).

TABLE 3 BOQ IWM PLAN GOALS AND TARGETS

Icon	Water System Aspect	Goal for the IWM Plan	Targets
	**Water Sources**	Increase the potable water conserved or alternative water volume supplied to meet an identified demand.	Reduce per capita potable water consumption by the Borough by 20%
			Increase the proportion of alternative water for fit-for-purpose uses.
	**Wastewater**	Ensure environmental and public health standards are met and maximise resource recovery.	Support Barwon Water's efforts to improve the sewerage system available to the Borough.
	**Stormwater, Drainage & Flooding**	Ensure stormwater and drainage networks meet levels of service requirements, reduce flood risk and promote measures that increase detention, retention, treatment and reuse of rainfall close to its source.	Implement the system-wide improvements to the stormwater and drainage network.
			Ensure all new BOQ developments optimise stormwater recovery and reuse options.
	**Waterways & marine**	Improve the ecological health of waterways and waterbodies	Reduce the detrimental impacts of discharge from council-controlled stormwater assets to marine environments
	**Valued urban landscapes**	Optimise the connectivity, accessibility and amenity of values of urban landscapes and support green-blue infrastructure.	Protect the extent of natural green assets within the Borough, enhance the quality of those assets and improve the connectivity of green and blue spaces for people and nature.
			Protect the water-sensitive permeable streetscapes across the Borough as significant measures to manage stormwater.
	**Place-based planning**	Involve communities in IWM planning and improve the capacity for people to be involved.	Support community involvement in IWM-related issues
			Increase the capacity of people to be involved in IWM-related issues.
			Increase involvement with Traditional Owner values in IWM initiatives.
	**Economic values of water**	Recognise and progress water-related opportunities that support economic growth.	

Priority Opportunities

The plan focuses on opportunities primarily within the Borough's scope of control. It includes several significant initiatives already underway. The priority of the opportunities reflects the importance in terms of impact and the likely effort to implement, as follows:

- High priority – likely high impact, potential to implement within 1-2 years
- Medium priority – likely high impact, but potential to implement within 3-5 years
- Low priority – likely lower impact, challenging to implement, longer-term required.

Table 4 summarises the priority opportunities. Opportunities marked with # will be led by a partner other than the Borough.

TABLE 4 BOQ IWM PLAN PRIORITY OPPORTUNITIES

Icon	Aspect	Opportunity	Priority
	Water Sources	WS1 Reducing risk to the Borough's water supply	High #
		WS2 Improving water use measurement and efficiency in BOQ facilities	High
		WS3 Supporting water use efficiency in schools	High#
		WS4 Emergency water supply points	Low #
	Wastewater	N/A	
	Stormwater, Drainage & Flooding	SDF1 Understanding soak pit effectiveness and impacts	High-link to SDF8
		SDF2 Weed management at selected outfalls	High
		SDF3: Monitoring and evaluating stormwater impacts	High
		SDF4 Reducing stormwater impacts on Swan Bay	High
		SDF5 Reducing stormwater impacts on Port Phillip Bay	Medium
		SDF6 Addressing flood risk at Ganes Reserve	Low
		SDF7 Proactive drainage condition assessments	Low
		SDF8 Stormwater surcharge risk assessment	Medium
		SDF9 Improving the GIS registry of stormwater assets	High
		SDF10 Stormwater policy for new developments	High link to SDF1
		SDF11 Flood risk at The Narrows	Low#– linked to VUL2
		SDF12 Localised land-based flooding	Medium
	Waterways & Marine	Refer to SDF2 & SDF3	
	Valued urban landscapes	VUL1 Follow-up heat mapping	High-link to VUL2
		VUL2 Resilience Action Plan	High-link to VUL1
	Place-based planning	PBP1 Traditional Owner Involvement	High
		PBP2 Community involvement	Medium
	Economic values of water	N/A	

Water Sources (WS)

WS1 Reducing Risk to the Borough's Water Supply

The Queenscliff Transfer Main is a 6km pipeline that provides the only potable water supply to Queenscliff and Point Lonsdale. This project is critical and essential to ensuring secure water services for these growing communities. The current pipe, constructed in 1945, is too narrow for current and future needs and is being replaced through a $6.6M upgrade, with construction due to begin in early 2025.

WS1.1	Queenscliff Transfer Main Upgrade						
IWM Aspect							
Priority	High						
Timeframe	2025						
Status	In progress						
Lead	#Barwon Water						

The Queenscliff Feeder Main is a related project to WS1.1 that feeds the reticulation network in Point Lonsdale and Queenscliff. This ageing feeder main is also being replaced for $12M to improve the town's supply security.

WS1.2	Queenscliff Feeder Main Upgrade						
IWM Aspect							
Priority	High						
Timeframe	2025						
Status	In progress						
Lead	#Barwon Water			Support: BOQ			

WS2 Improving Water Use Measurement and Efficiency in BOQ Facilities

This opportunity aims to improve data and knowledge of usage and reduction opportunities across the Borough's facilities to demonstrate leadership in water use efficiency and achieve cost savings on potable water use. The Borough is already working with Barwon Water on this opportunity through the WaterSmart Council program, which supports reducing potable water usage at Council-owned and managed public assets. This opportunity would build on that work and involve:

- metering and monitoring water usage in different areas and identifying losses
- educating BOQ staff and facility users about water conservation practices
- auditing water use and identifying opportunities for improvement
- maintaining water-using equipment and conducting ongoing research into water efficiency measures
- working with Barwon Water to educate the community on water use efficiency

WS2	Improving water use measurement and efficiency in BOQ facilities	
IWM Aspect		
Priority	High	
Timeframe	2025	
Status	In progress	
Lead	BOQ	Support: Barwon Water

WS3 Supporting Water Use Efficiency in Schools

All three schools within the Borough (St Aloysius', Queenscliff Primary, and Point Lonsdale Primary) are part of the Schools Water Efficiency Program run by Barwon Water for the state government. Barwon Water also offers a Schools Grant Program, under which Queenscliff PS successfully received a $2,500 grant in 2024 "to establish a nature play space designed to reflect, extend and invite our unique surrounding natural ecosystem—Swan Bay Wetlands—onto their school footprint." BW also offers a free Schools Education Program to all schools across its region. This opportunity continues to promote and support water use efficiency across the schools through the program with BOQ support.

WS3	Improving water use measurement and efficiency in BOQ facilities	
IWM Aspect		
Priority	High	
Timeframe	2025	
Status	In progress	
Lead	#Barwon Water	Support: BOQ

WS4 Emergency Water Supply Points

Emergency Water Supply Points (EWSPs) provide water carting for emergency stock and domestic purposes during severe dry seasonal conditions and surface water scarcity. Some sites also have equipment for supplying water to firefighting vehicles. Councils or water corporations are the primary managers of EWSPs. According to the DEECA map, no EWSPs exist on the Bellarine Peninsula. Whilst there are no immediate likely risks of a lack of EWSPs in proximity to the Borough, this issue could be canvassed in association with the proposed Resilience Action Plan, VUL2.

WS4	**Emergency Water Supply Points**	
IWM Aspect		
Priority	Low	
Timeframe	2029	
Status	Inactive	
Lead	#DEECA	Support: BOQ

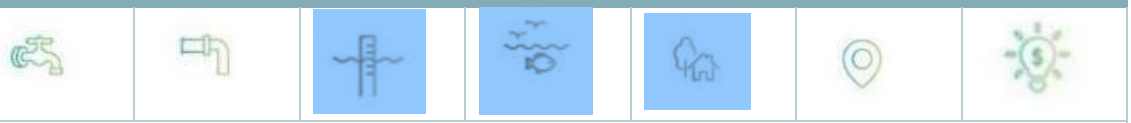
Stormwater, Drainage & Flooding (SDF)

SDF1 Understanding Soak Pit Effectiveness and Impacts.

Soakage pits, which allow for the direct infiltration of runoff into groundwater, are a standard method of stormwater detention in Point Lonsdale. These soakage pits can be owned and maintained by BOQ or private landholders. There is limited understanding of the impact on the level and quality of the receiving groundwater or the overall effectiveness of this stormwater disposal method, and any potential preventative controls need to be solidly based on reliable data.

The opportunity involves:

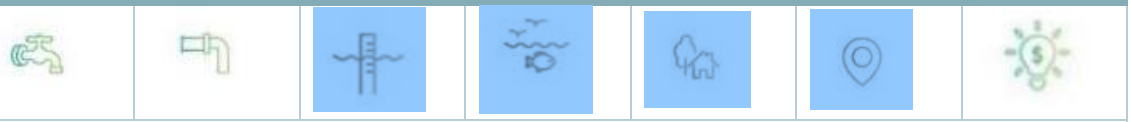
- Improving the knowledge base of the extent and effectiveness of council-owned and private pits
- Improving the knowledge base of the collective inputs from soakage pits to groundwater and potential impacts
- Requirements for maintenance, operation, and upgrades
- Recommendations on the need for controls to prevent future detrimental impacts from additional pits (linked to Opportunity SDF8)

SDF1	**Understanding soak pit effectiveness and impacts.**	
IWM Aspect		
Priority	High	
Timeframe	2026	
Status	Inactive	
Lead	BOQ	Support: DEECA

SDF2 Weed Management at Selected Stormwater Outfalls

Eleven stormwater outlets discharge into the sensitive marine environment of the Swan Bay Ramsar-listed wetlands; most have limited or no treatment and are weed-infested. Managing weed infestation of the adjoining coastal foreshore from these discharge sites is a significant issue for community groups. This opportunity involves:

- Engaging with relevant community groups to map the weed infestations adjacent to stormwater discharges along the Swan Bay coast and undertake selective weed removal at targeted discharges where appropriate

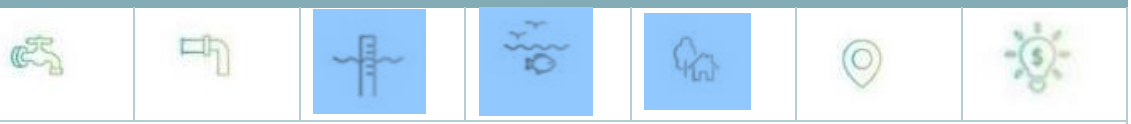
SDF2	**Weed management at selected stormwater outlets.**	
IWM Aspect		
Priority	High	
Timeframe	2026	
Status	Inactive	
Lead	BOQ	Support: Community

SDF3 Monitoring and Evaluating Stormwater Impacts

The discharge of untreated stormwater into the sensitive marine environment of Swan Bay and Port Phillip Bay is the most significant impact that the Borough has on its adjoining marine environment. However, due to insufficient data, there is limited understanding of the quantum of impact at different sites. To fill this knowledge gap, Council could monitor various physical, chemical, and biological parameters at multiple sites to establish a baseline before any treatment works are undertaken. The community could actively participate in this initiative through a citizen science approach. Parameters to be considered could include Physical (Turbidity, salinity, and flow), Chemical (N, P, ph, DO, heavy metal, hydrocarbons) and biological (E. coli).

This opportunity links directly to SDF4 and SDF5 and would involve:

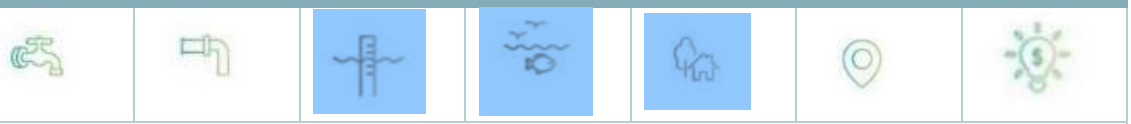
- Design and implement a BACI (Before-After-Control-Impact) monitoring program to assess stormwater impacts on adjacent marine environments of Swan Bay and Port Phillip Bay over an appropriate seasonal period
- Involve the community through citizen science methods
- Undertake modelling with actual and projected data to understand current and future impacts
- Collate the data, analyse the results, and identify critical opportunities for treatment.

SDF3	Monitoring and evaluating stormwater impacts	
IWM Aspect		
Priority	High	
Timeframe	2026	
Status	Inactive	
Lead	BOQ	Support: DEECA, Parks Vic

SDF4 Reducing Stormwater Impacts on Swan Bay

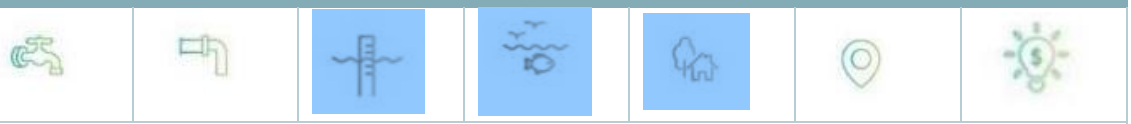
This opportunity involves the planning, designing, and installing stormwater treatment solutions at selected outfalls to Swan Bay. This action is identified in the Asset Plan 2022-32 (Task 7), Review discharge arrangements to surface waters, e.g. ocean outfalls. This opportunity would involve:

- Select appropriate Best Management Practices to reduce stormwater runoff and improve water quality at selected priority sites
- Secure community and stakeholder support for undertaking priority opportunities

SDF4	Reducing stormwater impacts on Swan Bay	
IWM Aspect		
Priority	High	
Timeframe	2026	
Status	Inactive	
Lead	BOQ	Support: DEECA, Parks Vic

SDF5 Reducing Stormwater Impacts on Port Phillip Bay

Seven stormwater outlets discharge into Port Phillip Bay, and most of them have little or no treatment. Similar to SDF4, this opportunity treats these outfalls collectively and would be similar in scope to SDF4. However, as the relative impact of stormwater on the deeper, larger waters of Port Phillip Bay is likely to be less than that of the confined, shallow Swan Bay, this opportunity is a medium rather than a high priority.

SDF5	Reducing stormwater impacts on Port Phillip Bay	
IWM Aspect		
Priority	Medium	
Timeframe	2028	
Status	Inactive	
Lead	BOQ	Support: DEECA, Parks Vic

SDF6 Addressing Flood Risk at Ganes Reserve

Ganes Reserve in Point Lonsdale is the most significant stormwater retention and treatment wetland in the Borough. The wetland has no outflow and relies on infiltration and evaporation to store runoff. However, localised flooding of adjoining parkland and properties is a significant risk after high rainfall events. The Borough partially desilted the wetland in 2023 and installed water level monitoring in 2024. This opportunity involves:

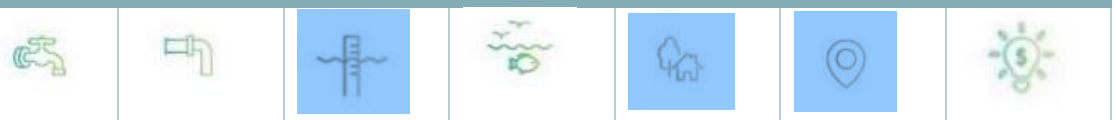
- Investigating the future management of the wetland to alleviate flood risk
- Developing a proactive maintenance program to minimise flood risk and enhance biodiversity
- Re-evaluate the feasibility of stormwater harvesting from the wetland and reusing it by the Point Lonsdale Golf Course

SDF6	Addressing flood risk at Ganes Reserve	
IWM Aspect		
Priority	Medium	
Timeframe	2028	
Status	Inactive	
Lead	BOQ	

SDF7 Proactive Drainage Condition Assessments

As identified in the Asset Plan 2022-32 (Task 5), this opportunity involves undertaking targeted proactive drainage asset condition assessments to improve understanding of condition distribution and accuracy of average renewal demand estimates. This opportunity involves:

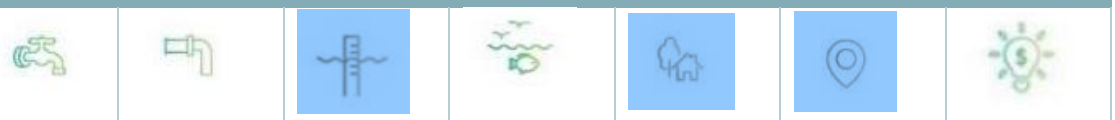
- Developing an achievable long-term, proactive, risk-based CCTV inspection program given the available budget and resources.

SDF7	Proactive Drainage Condition Assessments
IWM Aspect	
Priority	Low
Timeframe	Ongoing
Status	Inactive
Lead	BOQ

SDF8 Stormwater Surcharge Risk Assessment

As identified in the Asset Plan 2022-32 (Task 6), the Council recognises the need to improve its understanding of those properties that may be impacted by a stormwater surcharge on more than one occasion in a 5-year period. This opportunity involves:

- Developing a scope for a flood modelling survey and review of existing data (including LIDAR)
- Undertaking community engagement to inform potentially affected parties of the study and opportunities for involvement
- Securing funds to undertake the study
- Undertake the flood modelling required to identify and assess properties impacted and the adequacy of existing stormwater and drainage infrastructure under specific scenarios given new climate data
- Engage with the affected community and develop a range of responses to mitigate the risk and potential impacts (such as planning tools, civil works and landholder responses)

SDF8	Stormwater Surcharge Risk Assessment
IWM Aspect	
Priority	Medium
Timeframe	2028
Status	Inactive
Lead	BOQ

SDF9 Improving GIS Registry of Stormwater Assets

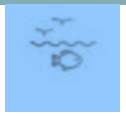
This opportunity involves the Borough improving its ability to record and access detailed data on its stormwater and drainage assets via its Geographic Information System (GIS). Enhanced data capture via the GIS is critical to helping facilitate SDF7 and SDF8, as well as various tasks identified in the Asset Plan 2022-32, including asset acquisitions (Task 3), service planning (Task 4), condition assessments (Task 5), and customer requests.

SDF9	Improving the GIS registry of stormwater assets						
IWM Aspect							
Priority	High						
Timeframe	2026						
Status	Inactive						
Lead	BOQ						

SDF10 Stormwater Policy for New Developments

Most infill development within the Borough involves the subdivision of larger blocks for two or more standalone dwellings or units. This leads to a larger area of impermeable surfaces such as roofs, concrete, and paving, which increases the volume of stormwater runoff to the existing drainage network, either to the receiving waters of Swan Bay and Port Phillip Bay or through additional soakage pits to the local groundwater.

The Borough identified this as an emerging issue in its Asset Plan 2022-32 (Task 8). It recommends developing a formal policy requiring new development to implement a retention system to manage peak stormwater flow. Opportunity SDF1 would need to inform the creation of this policy as it relates to soakage pits.

SDF10	Stormwater Policy for new developments						
IWM Aspect							
Priority	High						
Timeframe	2026						
Status	Inactive						
Lead	BOQ				Support: DEECA		

SDF11 Reducing Flood Risk at The Narrows

Flooding of the Bellarine Highway (B110) at the Narrows is a significant risk as it is the only vehicle access point for the Queenscliff community. A highway managed by the Department of Transport and Planning (DTP), this opportunity involves the Borough working with DTP to identify options to reduce flood risk and access issues. This opportunity would be closely linked to VUL2 and would involve:

- Support any risk assessments to be conducted by DTP to understand the specific vulnerabilities of road access, including historical flood data, topography, and potential future climate impacts
- Work with DTP to develop a Flood Mitigation Plan through engagement with stakeholders
- Advocate on behalf of DTP for grants to fund flood mitigation projects.

SDF11	Reducing Flood Risk at the Narrows						
IWM Aspect							
Priority	Low						
Timeframe	2030+						
Status	Inactive						
Lead	DTP#				Support: BOQ		

SDF12 Localised Land-Based Flooding

Several localities outside the high-risk flood areas identified in existing flood modelling (Fisherman's Flats and The Springs) are subject to localised, land-based flooding. These localised flooding problems can be caused by inadequate maintenance or limited capacity in the drainage network.

Improved maintenance addresses these problems to some extent, but asset upgrades may sometimes be required. Localities where this type of flooding can occur are identified through enquiries from residents and proactive condition assessments. Examples of localised, land-based flooding include:

- Egerton Street, Pentland Road, and Girvan Grove
- 14-16 King Street
- Laker Drive, north of Ocean Road
- Mercer Street, north of Stokes Street
- Simpson Street

This opportunity involves the Borough taking a staged approach to these sites, as follows:

- Confirm serviceability (the extent of any blockages) through CCTV inspections
- Undertake maintenance if required
- If serviceability is satisfactory, confirm the adequacy of the existing capacity of the stormwater and drainage network through drainage catchment analysis
- Plan for drainage upgrades if required

SDF12	Localised land-based flooding						
IWM Aspect							
Priority	Medium						
Timeframe	2028+						
Status	Inactive						
Lead	BOQ						

Valued Urban Landscapes (VUL)

VUL1 Follow-up Heat Mapping

The Borough's Climate Emergency Response Plan 2021-2031 identifies heatwaves as an increasing risk for the local community. Heat mapping was undertaken across the Borough in 2020, but follow-up mapping has been recommended. This opportunity involves undertaking a second heat mapping assessment to determine priority green-blue opportunities for providing shade and cooling in streetscapes to help mitigate future heatwave impacts. This opportunity would be closely linked to the VUL2 and would involve:

- Heat mapping to identify urban heat islands, patterns, and hotspots
- Identify areas where green-blue infrastructure options could be most effective (such as parks, trees, urban forests, and water features that can help mitigate heat)
- Develop a green-blue infrastructure portfolio that can be integrated into the Community Resilience Action Plan (VUL2).

VUL1	**Follow-up heat mapping**
IWM Aspect	
Priority	High
Timeframe	2026
Status	Inactive
Lead	BOQ

VUL2 Resilience Action Plan

Consistent with the Climate Emergency Response Plan, this opportunity involves supporting the community in developing and implementing a Resilience Action Plan, including reviewing the Our Coast project, Barwon Regional Partnership Project, and Queenscliffe Coastal Climate Project. This opportunity would involve:

- Scope the brief for the plan, secure support, and establish a stakeholder forum
- Review existing work and data to understand current risks and vulnerabilities for the community and critical infrastructure
- Work with the community and infrastructure providers to understand and agree on achievable goals and objectives for enhancing community resilience
- Develop agreed strategies and actions to enhance community resilience for priority issues
- Prepare a costed plan and secure support and resources to implement the plan

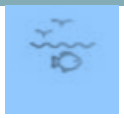
VUL2	**Resilience Action Plan**	
IWM Aspect		
Priority	High	
Timeframe	2026	
Status	Inactive	
Lead	BOQ	Support

Place-Based Planning (PBP)

PBP1 Traditional Owner Involvement

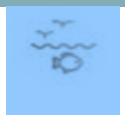
The Borough of Queenscliffe is committed to building strong relationships with all Aboriginal and Torres Strait Islander peoples. Integrated Water Management offers another tangible opportunity to improve its work with Traditional Owners. The Borough has developed the Reflect Reconciliation Action Plan.

When invited to participate in developing the draft plan, the Wadawurrung Traditional Owners Aboriginal Corporation (WTOAC) provided its IWM Position Statement. The Borough will work in alignment with this position statement and liaise closely with the WTOAC as necessary on specific IWM opportunities that may be implemented through this plan.

PBP2	Traditional Owner Involvement in IWM	
IWM Aspect	      	
Priority	High	
Timeframe	Ongoing	
Status	In progress	
Lead	BOQ	Support: WTOAC

PBP2 Increasing Community Involvement in IWM

With an active community interested in the natural environment, this opportunity would see the Borough actively involve interested community groups and members in various activities that support the IWM outcomes outlined in the plan, such as Community WaterWatch, drain stencils, and bin wraps at specific locations.

PBP2	Community Involvement in IWM
IWM Aspect	      
Priority	Medium
Timeframe	2028
Status	Inactive
Lead	BOQ

Monitoring Implementation of the Plan

This section presents an overview of how the Council can monitor and review progress in implementing the IWM plan. Note that the nominated timeframes for implementing the opportunities may change based on various factors, such as the project life cycle and alignment with other initiatives, BOQ's perceived priority, funding availability, commitment from different partners, etc.

Strong governance and commitment are essential to successfully implementing any plan or strategy. The Infrastructure & Environment Department will coordinate the plan's implementation, but collaboration across Council departments will be crucial.

The council may consider establishing a steering committee to oversee progress in implementing the plan priorities and integrate them with other strategies and plans. The committee would also address emerging IWM-related issues, consult with staff and the community, secure additional funding from internal and external sources, review targets, and benchmark performance.

The committee should report annually on progress in implementing the opportunities consistent with the priorities identified to the Council and to the Barwon Regional IWM Forum through the Manager of Infrastructure and Environment.

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Parks Victoria. 2006. Port Phillip Heads Marine National Park Management Plan

Wadawurrung Traditional Owners Aboriginal Corporation Undated. Statement and position on IWM projects, stormwater, recycled water, and new water sources.

Wadawurrung Traditional Owners Aboriginal Corporation 2020. Wadawurrung Paleert Djarrah Dja 2020-30 Healthy Country Plan