Banyule City Council Water Plan, 2019 – 2021

[Draft]



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Planet and Water

Banyule Council recognises the intrinsic value of the natural environment and aims to conduct its activities in a manner which ensures its diversity, protection and enhancement.

Council's Planet Policy and Strategy outlines five key directions to help achieve this outcome:

- Protect and enhance our natural environment
- Conserve water and improve stormwater management
- Lead in planning for, and responding to, climate change
- Avoid waste generation
- Be environmental stewards.

This Plan notably addresses the second key direction to 'conserve water and improve stormwater'. The overall strategic context is shown overleaf.

Council's overarching objective in this space is to:

- Minimise Council's water use, and
- Improve urban drainage and stormwater management.

Council approach to these objectives focus on integrating both conservation and stormwater improvement opportunities, the setting and attaining of targets, and the delivery of education programs.

Council Plan 2017 – 2021

Strategic Context Diagram:

| 1 AL | | Key Direct | tions: | | |
|-------------------------|--|----------------------------|------------------------------|------------------------|--|
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WATER PLAN:

Key Direction:

• Conserve water and improve stormwater quality and impact

Key Focus Areas:

- Minimise Council's water use, and
- Improve urban drainage and stormwater management.

Key Steps:

- Reduce water use
- Harvest and reuse alternative water sources
- Implement Water Sensitive Urban Design
- Deliver education and awareness raising programs
- Improve urban drainage and flooding

Targets

To improve water quality, to prepare for the likelihood of future dry periods in the face of climate change and to constrain rising water costs, this plan has the following water sustainability targets:

- Water conservation Permanently constrain annual Council potable water use to below 200 million litres
- Stormwater improvement Annually remove the following pollutants:
 - o 55 tonnes of litter
 - o 150 tonnes of sediment
 - o 930 kilograms of nitrogen

Policy and Situational Context

Water for Victoria is the Victorian Government strategic plan for a future with less water, as Victoria responds to the impact of climate change and a growing population. Notably the Plan outlines the need for partnerships with organisations including local governments, to identify future water related research needs, improve information on the availability of emergency water supply points, improve wastewater management and work with communities to build regional partnerships and tackle local issues and priorities.

Alongside this plan, there have been developments particularly in relation to greater collaboration between water corporations, local and state government authorities. Integrated Water Management Forums, for example, have been established by the Department of Environment, Land, Water and Planning (DELWP) to identify, coordinate and prioritise opportunities and areas that would most benefit from collaborative water cycle planning and management. The Forums are designed to help local governments, water corporations, catchment management authorities, the Victorian Planning Authority (VPA) and Traditional Owners work together to ensure the water cycle efficiently contributes to the liveability of a region.

Supporting this approach to Water Policy is overarching legislation notably the:

- Water Act (1989)
- Local Government Act (1989)
- Planning and Environment Act (1987)
- Environment Protection Act (1970), and
- Catchment and Land Protection Act (1994).

Implementation

The Water Plan establishes a four-year framework to guide environmental action across the Council. The action plans detailed in Appendix A will be embedded within the working requirements of relevant departments and be reported on annually.

Many actions will be implemented using existing resources, as part of general staff responsibilities or through reoccurring budgets. Some actions will be subject to the securing of additional internal or external funds, such as capital works initiatives like wetlands or Water Sensitive Urban Design (WSUD) features.



Figure 1 A Raingarden in Were St Montmorency jointly funded by Banyule City Council and Melbourne Water's Living Rivers Program. This raingarden will feature in a Victorian High School curriculum text with 800,000 copies to be printed over the next 10 years.

Council's Approach

Council's approach to water conservation, stormwater management and urban drainage is guided by the key steps to:

Reduce water use

Harvest and use alternative water sources Implement Water Sensitive Urban Design Deliver education and awareness raising programs Improve urban drainage and flooding

Importantly Council is able to undertake effective action in this space by using a partnership model, which recognises that Council, the community and the many varied water stakeholders, need to work together to identify and implement water management initiatives.

Climate change and its projected impacts play a key influencer in Council's approach to water management.

As the effects of climate change intensify, Melbourne is set to see reduced rainfall and increased average summer temperatures and a greater incident of weather extremes. This will put pressure on our potable water supplies, our creeks and rivers, as well as our stormwater management. Increasing intensity storm events will lead to further flash flooding which is why we are working to improve urban drainage infrastructure. The warmer temperatures will increase precipitation, lowering the flows to our creeks and rivers, these reduced flows will affect the volume of water we have available to ensure the health of our parks, trees and green spaces. Banyule's continuing work on building stormwater harvesting facilities will ensure we are prepared for the future.



Figure 2 Spotted – A platypus at the local Darebin Creek (Photo curtesy of Tom Crawshaw)

Council's Water Profile

Water consumption

Council's four year water consumption trends are shown in Table 1, alongside a breakdown of this annual amount. The majority of Council's water use relates to the maintenance of reserves and parks, the provision of community facilities (halls, community centres), sports and recreational facilities (e.g. Sporting pavilions) and Child Care and Material Health service centres. Banyule's three pools (Watermarc, Ivanhoe Olympic and Yarra Plenty) unsurprisingly account for a significant amount of water use.

Table 1 Council's Historic annual water use (ML)

| 286 ML |
|--------|
| 283 ML |
| 299 ML |
| 276 ML |
| 263 ML |
| |

Understanding Council's water consumption profile is helpful in identifying where Council is best placed to direct water conservation and management measures. Progress in reducing our consumption is monitored regularly and reported annual through the State of Environment (SOE) Report.

Water Quality

Water quality is also an important component of Council's appropriate management and treatment of stormwater. Council is able to positive impact water quality by:

- Adopting best practice management of stormwater
- Implementing capital works that incorporate Water Sensitive Urban Design treatments
- Managing any septic tanks within the municipality
- Undertaking awareness and education programs designed to promote effective management of the health of waterways
- Conservation of native vegetation through bushland management programs in Council parks and reserves
- Provision of incentives and assistance for bushland improvement on private land.

Community groups play an important role in the achievement of water quality improvements, as well as providing valuable data monitoring services across the municipality through Melbourne Water's Waterwatch program. Melbourne Water is the responsible agency for waterway health in Melbourne, and the Waterwatch program is a long running citizen science program that measures key water quality parameters in rivers and creeks under Melbourne Water's responsibility. Parameters measured include levels of nitrogen, phosphorus, dissolved oxygen, pH, temperature and salinity. Pollution incidents in creeks like foam and oil spills are also often reported. This data assists Melbourne Water, the Environmental Protection Authority, and local governments to identify pollution hotspots.



Community groups also play a vital role in helping to revegetate the creek and river banks in Banyule with appropriate local native plants that help prevent erosion and provide shade to avoid deoxygenation in waterways. Banyule supports many Friends of Groups along our waterways – if you'd like to join a group focussed on protecting local waterways in Banyule, search Banyule's website for "Friends groups".

Case Study Water for Biodiversity – Banyule Swamp and Banyule Billabong

Banyule Swamp and Banyule Billabong are situated in Viewbank, alongside the Yarra River. The Swamp and Billabong comprise an area of State level conservation significance, having been cited in numerous Banyule City Council and Melbourne Water studies. Banyule Swamp is visited by international migratory birds such as Lathams Snipe, and Banyule Billabong is one of the most important billabongs remaining in the Yarra River system.

Both ecosystems are subject to various processes that threaten their integrity, such as polluted stormwater inputs, changing volumes of water, weed and pest animal invasion, and potential impacts of the North East link road project. Banyule City Council, Melbourne Water and Parks Victoria have been working collaboratively to identify opportunities to restore and protect some of the ecological values of these sites.

In 2016, 62 million litres of water was granted from the Yarra River Water Entitlement to trial an environmental watering process for Banyule Billabong, which no longer receives the regular flooding it requires from the Yarra. The trial project was a success, demonstrating that a more permanent solution to getting an appropriate water regime for the Billabong is warranted. Banyule Swamp also has an Environmental Management plan recommending a water and vegetation management regime to support internal migratory birds. Banyule, Melbourne Water and Parks Victoria are continuing to develop plans to integrate ecological and water management benefits at these two key sites on the Yarra.



Case Study Water Sensitive Urban Design for Gresswell Forest Nature Conservation Reserve

Gresswell Forest Nature Conservation Reserve is a Parks Victoria managed reserve in the City of Darebin, also bordered by Banyule City Council suburbs of Watsonia, Macleod and Bundoora. The Salt Creek arises within the Reserve flowing down through Macleod, Rosanna and Heidelberg before it enters the Yarra River.

Stormwater from Banyule and Darebin Council drains enters the Gresswell forest, and Banyule City Council is therefore working with Melbourne Water and Parks Victoria to develop Water Sensitive Urban Design (WSUD) infrastructure to protect the nature conservation reserve from Banyule drains. Three different WSUD design treatments have been identified for the Banyule drains to slow down the flow of stormwater, reduce erosion and remove stormwater pollutants such as oils, garden fertilisers and sediment that are typical in residential catchments. Community stormwater education information is also planned to assist in understanding of the impact of stormwater on the environment.

This site is an excellent example of the opportunities that arise with a multi-stakeholder approach to solving stormwater issues, as is being encouraged in Banyule's Water Plan, and the State Government's Water for Victoria Policy.

Reducing water use and harvesting stormwater

Water reduction target:

• Permanently limit annual Council potable water use below 200ML.

Annual stormwater pollutant removals targets:

- 50 tonnes (t) of litter removal
- 130t of sediment removal
- 800 kilograms (kg) of nitrogen removal

There are a range of assets that Council assumes operational control over. As previously stated, sports and recreation facilities, sports grounds and other open space are notable water uses. Measures which Council adopts to reduce water use in these areas include:

- Improvement of irrigation efficiency
- Conversion of tennis courts to reduce the need for watering
- Conversion of sports grounds to low water use warm season grasses.

Council has been proactive at implementing these type of water-saving measures at sportsgrounds, including installing weather responsible sprinkler systems that ensure irrigation only occurs when required (e.g. not after heavy rain) and repairing of leaks. There is a current program to refurbish grounds with drought tolerant grasses and a further need to develop a sound understanding of assessing the quality of water required to efficiently irrigate open space and how to factor this into future planning.

Stormwater harvesting involves collecting, treating, storing and using stormwater runoff from urban areas. It differs from rainwater harvesting as the runoff is collected from drains rather than roofs. Typically it is done on a larger scale than rainwater harvesting and represents the greatest opportunity to achieve water conservation targets.

Stormwater harvesting projects have a significant amount of benefits and as such are the primary approach of council when exploring harvesting and reuse water sources. Notably these projects:

- Achieve larger cost saving from larger potable water reduction
- Focus on open space from which people derive direct and readily understood benefits
- More readily measurable water sustainability outcomes compared to community education and Council can lead by example in encouraging community sustainability
- Are often the recipient of financial support from Federal and State Government bodies.

In pursuing new harvesting opportunities, Council undertakes a triple bottom line assessment to determine:

- Potential water sustainability gains
- Ease and cost effectiveness of harvesting and treating stormwater, and
- Demand for water and community use associated with open spaces.

From this triple bottom line assessment, the following stormwater harvesting projects have been implemented to date:

• Chelsworth – Chelsworth Park and Ivanhoe Golf Course in Ivanhoe

- Kalparrin Kalparrin Gardens, Partingtons Flat, Whatmough Park and Chelsworth Park in Greensborough
- DeWinton DeWinton Park in Rosanna.

Together, these projects have the potential to make significant inroads into Council's water quality and conservation targets. Future projects, such as the planned Olympic Park Stormwater Harvesting Project featured in the Case Study, will strengthen Council's performance. More information about Banyule's National Award winning approach to stormwater harvesting can be found on Banyule's website under "Stormwater Harvesting".

Community Education

Water saving initiatives serve as important projects that enable real life demonstrations to occur. Council undertakes education about these projects and the overarching issue of water conservation by:

- Delivering tours of WSUD projects
- Installing signage at key project locations, explaining the technologies and approaches being used, and
- Delivering water focused grant and community workshop programs.

Water plan – Case Study – Olympic Park SHP concept

Olympic Park in Heidelberg West is intended to be the site for Banyule's next storm water harvesting project. Water will be harvested from a 22.8 ha residential catchment area around Heidelberg West. Stormwater will enter the system from the storm water pipe at the corner of Liberty Parade and Dougharty Road Heidelberg West. The water will travel through a treatment train as follows:

- Stormwater enters a gross pollutant trap at the western end of Dougharty Rd, which will remove heavier items of litter such as sediment, plastic bottles, cans and other rubbish and recyclables
- storm water will then flow into a sedimentation basin which will allow 95 % of heavy metals attached to sediment particles to settle at the bottom of the basin
- a HDPE gravity pressure main will convey storm water into a natural wetland system which will use plants to perform biofiltration, removing nutrients, smaller sediment particles and other contaminants from the water
- the stormwater will flow from the wetland into a unique 1 mega litre underground water storage facility beneath the northern end of Olympic Park
- the stormwater will be pumped from the underground storage facility into a treatment shed where it will receive further treatment in the form of sand filtration and UV light treatment before being used to safely irrigate the sports fields at Olympic Park.
- In storm events, treated water will overflow from the underground storage tank and return to the Darebin Creek, ensuring better water quality in the creek
- A series of bio-retention swales/rain gardens around the playing fields will ensure nutrient laden water running off the playing fields is reused and treated before flowing into the Darebin Creek, further improving water quality

The project is expected to have a range of positive environmental impacts for Council. These will include:

- Ensuring 81.4% irrigation service reliability, which translates to a saving of 15.4 mega litres of potable water for Council annually (assuming current climate conditions).
- 5,647 kg/year reduction in litter or 4.3% of Council's annual litter reduction objective
- 131 kg/year reduction in nitrogen or 16.4% of Council's annual nitrogen reduction objective
- Indigenous vegetation around the wetland and bio-retention swales will provide the dual functions of bio-filtering the stormwater and providing habitat for water fowl and other native fauna.

This climate change mitigation measure will ensure there is water available to irrigate Olympic Park in the increasingly dry periods expected as Climate Change effects become the new norm.

Figure 2. Show here is one of many located at Kalparrin Gardens. This features a mixture of infographics and facts about the stormwater treatment process.



Urban Drainage and Flood Mitigation

The drainage network

Council is responsible for the care and maintenance of the local public stormwater drainage network. The Council drainage network includes components such as:

- Inlet pits within the roadway;
- Kerb and channel in roadways;
- Underground drainage in roadways and easements (except private drain systems);
- Junction pits in easements (except private drain systems);
- Open drains in some areas;
- Gross pollutant traps;
- Water Sensitive Urban Design (WSUD) rain gardens on public land; and

Property owners are responsible for all drainage infrastructure related to the drainage of private property. This also includes sections of pipe in the road reserve that discharge stormwater to the kerb or pipe connections to a Council drain. The property owner is responsible for ensuring that their storm water pipes are connected to the Council nominated Legal Point of Discharge.

The existing local Council drainage network has been designed with sufficient capacity to contain runoff from frequent, low rainfall intensity storms. This local network is intended to prevent nuisance stormwater entering properties and limit the frequency and quantity of surface water on roadways to a level that is safe and acceptable to the community. The local network is typically designed to cater for flows up to a 1 in 5 year Average Recurrence Interval (ARI). By current best practice the 5 year ARI is widely considered the minimum standard for local drainage design and protection. On average, drains designed to this standard will contain the storm flows for up to 80% of the rainfall events which occur each year.

During storm events that exceed the drain capacity, the surplus stormwater will flow overland along roads and possibly through private properties in low lying areas. In extreme cases these overland flows can result in flash flooding. The storm events of December 2003, December 2011 and December 2016 are examples of three of the worst flash flooding events that the City of Banyule and the surrounding region has experienced in recent years. During events like these flooding of properties in some low lying areas is unavoidable.

However, damage and loss caused by such events can be reduced if property owners and residents in low lying areas are aware of possible overland stormwater flow paths within their properties and keep these areas clear and free of obstructions that may block the flow of stormwater.

All Property owners can prevent or minimise localised flooding within their properties during extreme weather events by:

- Checking and maintaining their private drainage systems to ensure they are functioning well;
- Keeping gutters, down pipes and pits cleared of leaves and debris; and
- Make provisions that in the event of a blockage excess stormwater can escape via an appropriate overland flow path.

If your property is known to be flood prone, the following are some tips on how to best prepare for extreme weather events:

- Maintain overland flow paths through your property. Water tanks, gates, side and boundary fences are significant obstructions to stormwater travelling overland and will exacerbate the effects of flash flooding on properties and dwellings;
- Council encourages the use of permeable fencing in known flood areas. This style of fencing will allow flood waters to pass through and not 'back up' to unacceptable depths, whilst still maintaining security for children and pets;
- Tree roots, leaves, gravel from paths & driveways and mulch from garden beds are common causes of blockages within drainage systems. Try to limit the use of mulch and gravel in vulnerable areas;
- Relocate garden sheds containing valuable items clear of known flood extents; and



Residents can help to reduce the risk of flash flooding by notifying Council of blocked pits in the roadway and Council drainage network. Contact Councils Customer Service on 9490 4222 to report blocked pits and drainage hazards, or to find out if your property may be subjected to overland flooding during extreme rainfall events.

Flood Mapping and Mitigation

In 2013 Council undertook a municipal-wide Stormwater Capacity Analysis and Flood Mitigation Study to plan strategically for system wide improvements. This study addressed the following:

- The major causes of property inundation in Banyule;
- A shortlist of prioritised stormwater mitigation works across 8 major drainage catchments and 60 individual locations;
- The appropriateness of investing in stormwater mitigation works to address stormwater inundation associated with minor rainfall events; and
- The appropriateness of the development and implementation of a Special Building Overlay into the Banyule Planning Scheme to better plan for development in areas identified in the Municipal Wide Flood Mitigation study.
- Drainage Improvements Program Priority Locations

Areas that have been identified as experiencing moderate to high overland stormwater flows during minor rainfall events (up to a 1 in 5 year classification) have been short listed for further investigation to determine what measures are needed to mitigate or possibly eliminate the occurrence of overland flows affecting properties and existing habitable dwellings in line with Councils desirable minimum standard for drainage protection. A total of 60 locations have been identified of varying size and severity and a preliminary total cost estimate of these mitigation works is \$17.8 million.

This priority list is in a state of constant evolution as projects are completed, and as more information is collected relative to the site conditions, floor level surveys, and downstream hydraulic capacity of identified and new sites.

ESD in the Planning Scheme

Banyule's Planning Scheme establishes environmentally sustainable development policy requirements for developments, including consideration of integrated water management (through Amendment C73). Objectives here support the objectives of the Water Plan:

- To reduce the impact of stormwater run-off
- To improve the water quality of stormwater
- The achieve best practice stormwater quality outcomes
- To incorporate the use of water sensitive urban design, including stormwater reuse.

The ESD Policy applies throughout the City of Banyule to residential and non-residential development that requires a planning permit. It complements a range of non-statutory measures aimed at encouraging environmentally sustainable development. These measures include educating residents and applicants, assisting applicants to use Environmentally Sustainable Development (ESD) tools, leading by example with Council projects, promotion of exemplary private projects and promotion of use of materials with favourable life cycle impacts.

Action Plan

| Initiative | Timeframe | Lead Department |
|--|------------|------------------------------|
| Provide ongoing development and maintenance of warm season grassed playing surfaces and irrigation systems, including: Continue the Warm Season Grass Conversion program on our sports fields Install a new subsurface drainage system and renew the existing irrigation system at De Winton Park Plan and design a new subsurface drainage system and renewed irrigation system at Gabonia Avenue Reserve Upgrade irrigation controllers across the municipality | Year 1, 2 | Developments & Drainage |
| Continue design work for the next Stormwater Harvesting project (Olympic Park) to meet the Sustainable Water Use Plan priorities | Year 2 | Major Projects |
| Build our capability for integrating water sensitive urban design (WSUD) and treatments in the delivering and renewing our infrastructure including at Gresswell Forest Nature Conservation Reserve, and Olympic Park and Malahang Reserve carparks | Year 1 - 4 | Environment |
| Continue to operate, monitor and optimise capabilities of the Stormwater Harvesting Systems at Chelswork Park, Kalparrin Gardens and De Winton Park to deliver efficient water supplier to Council assets | Year 1 - 4 | Assets, Parks and Gardens |
| Continue the investigation and implementation of the Capital Works Program at Priority locations identified by the Municipal Wide Drainage Network Capacity Study, including: Stormwater Management Catchment Program Mitigation Works: Improve the capacity of the drainage network around Brixton Avenue, Eltham North and the Lower Plenty drain catchment. Minor drainage works including pipe augmentations and associated pit improvements to address localised drainage issues Drainage hot spots including pit replacements and modifications to improve stormwater capture | Year 1 - 4 | Developments & Drainage |
| Implement the stormwater harvesting community engagement program. | Year 1-4 | Environment |
| Continue the delivery of environmental water for biodiversity benefits at Banyule Billabong , in partnership with Melbourne Water and Parks Victoria and community groups | Year 2 - 4 | Environment |
| Evaluate the ESD in the Planning Scheme project with a view to incorporating it permanently into Banyule's Planning Scheme | Year 4 | Planning |