Casey's Stormwater Harvesting Journey

Our Journey Over a decade

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Casey Context

- Situated in Melbourne's south-eastern suburbs, approximately 28 to 60 kilometers from the Melbourne CBD.
- Population of approximately 405,415 (2024)
- One of the fastest growing municipality in Victoria, reaching over 600,000 by 2046.
- Falls within two major drainage catchments: Port Phillip Bay and Western Port Bay.
- Key waterways include Dandenong Creek, Eumemmerring Creek, and Cardinia Creek.

Water Management Challenges

Leader

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NEWS

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NEWS 11 JUN 08 @ 10:01AM | BY STAFF WRITER

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CASEY schools have been barred from casual sports ground use as the city tries to salvage its drought-ravaged reserves.

Robyn Bowen, from Casey Arts and Leisure, said the temporary restriction from casual bookings would start in term 3 and be reassessed before term 4.

"Due to the ongoing drought conditions many of the council's sports grounds require careful management to ensure the ongoing availability of safe playing surfaces for use by Casey's community sporting clubs," Ms Bowen said.

"While the council endeavours to accommodate the sporting activities of schools, it is important to consider that the Department of Education and Early Childhood Development is responsible for the provision of the sporting infrastructure required to support school-based activities."

The 35 casual school bookings during term 2 were mostly for football and soccer events, Ms Bowen said. "There are currently only two casual bookings for term 3 and these relate to athletics and will be honoured by the council," she said.

Cross-country events are not affected.

Casey Parks and Reserves manager Trevor Griffin said an intensive maintenance program had started to restore sportsground conditions across the city.

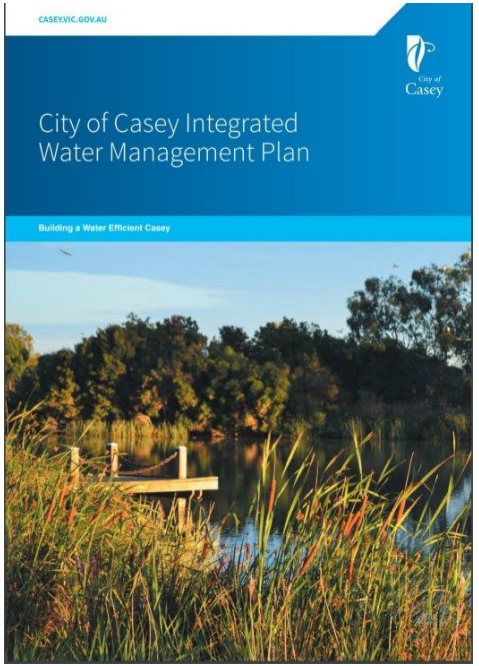
"There is also a program to convert sportsground surfaces to drought-tolerant grasses which use 50 per cent less water than traditional grasses," he said.

Integrated Water Management Plan

“Create A Water Efficient City”

Target

- 30% reduction from Council's projected 2030 potable water use
- All Council WSUD assets are maintained and renewed as required by 2025



Stormwater Harvesting – Over a Decade !

Case Study – 1: Sweeney Stormwater Harvesting Project

Completion: 2014
Duration: 2011- 2014
Capacity : Up to 12 Million Liters per year
Cost: Approximately $1,081,400

Design Features:

- Diversion weir from MW Drainage/Creek
- Gross pollutant trap (GPT) and sediment pond for sediment removal
- Bioretention system for nutrient removal
- Open storage pond for irrigation water supply
- Filtration and UV treatment prior to irrigation
- Potable water back up

What Worked Well:

- Delivered an alternative water source to support irrigation
- Multi-stage treatment approach aligned with best practice
- Raised awareness of stormwater harvesting potential within Council
- Increased amenity benefits for community with greener, cooler spaces

Stormwater harvesting at Sweeney Reserve. Anti-clockwise: sediment catchment pond for water coming from Melbourne Water's drains, raingarden removing gross pollutants, storage pond at the top.

Case Study – 1 Sweeney Stormwater Harvesting Project

City of Casey

2015

2025

Case Study – 1 Sweeney Stormwater Harvesting Project

Challenges & Issues:

- High maintenance burden for bioretention system (sediment accumulation, vegetation management)
- Lack of access track
  No Inspection opening for the agi pipes within Raingarden
- Algal blooms in the open storage pond, particularly in warmer months
  Limited monitoring made performance assessment difficult

Key Learning:

- Filter media configuration and hydraulic conductivity to be considered during design phase
- Long term asset maintenance and handover to appropriate teams
- As- constructed plans
- Difficult to manage sites with no active monitoring

Case Study – 2 Wilson Botanic Stormwater Harvesting

Completion: 2022

Duration: 2019- 2022

Capacity : Up to 100 Million Liters per year

Cost: Approximately $934,000
including the irrigation network

Case Study – 2 Wilson Botanic Stormwater Harvesting

Design Features:

- Diversion channel to divert stormwater from MW Drain
- Storage tank
- Gross pollutant trap (GPT) for sediment removal
- Pump pit to pump water up the hill using a rising main
- Bioretention system for nutrient removal
- Open storage pond for irrigation water supply
- Pump shed and Filtration prior to irrigation
- Potable water back up

What Worked Well:

- Alternative Water Source: Supported passive open space
- Cost Savings: Utilized existing assets as storage
- Algal Bloom Control: Managed algal blooms in the storage pond
- Flood Mitigation: Reduced nuisance flooding
- Community Benefits: Increased amenity with greener & cooler spaces

Case Study- 2 Wilson Botanic Stormwater Harvesting System

City of Casey

2022

2025

Case Study- 2 Wilson Botanic Stormwater Harvesting System

Challenges & Issues:

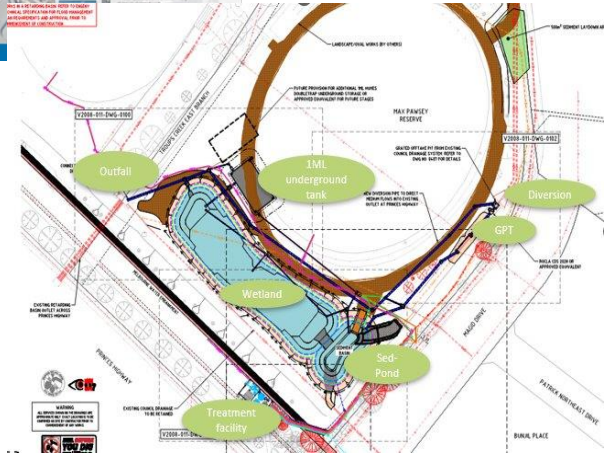
- Power supply
- Presence of services i.e., sewer line crossing
- Impact on trees by rising main & diversion system
- Construction during COVID

Key Learnings:

- Opportunity for dual pump
- Extensive Stakeholders Collaboration
- Active maintenance improves the quality of stormwater harvesting
- Non- traditional rain garden inlet design

Case Study 3 – Max Pawsey Stormwater Harvesting

Completion: 2025
Duration: 2015 - 2025
Capacity : Up to 100 Million Liters per year
Cost: Approximately $4,782, 653



Design Features:

- Diversion pit to divert stormwater flow from Council drain
- Gross pollutant trap (GPT) and sediment pond for sediment removal
- Wetland pond for nutrient removal and with storage within the EDD
- Water from storage pond enters into a 1 ML underground tank
- Filtration and Pumped to 30 KL storage tank within pump shed
- UV treatment prior to irrigation

What Worked Well:

- Collaboration and Funding
- Future focused design
- Input from maintenance and open space teams
- Improved handover process
- Activation of key community space

Case Study 3 – Max Pawsey Stormwater Harvesting

City of Casey

Construction Phase




2025





Case Study 3 – Max Pawsey Stormwater Harvesting

City of Casey

Challenges & Issues:

- Significant cost variation
- Construction within retarding basin
- High groundwater issue
- Meeting stakeholder requirement and standards
- Low water level in the sediment pond causing algal bloom during summer
- Water quality testing
- Maintenance of rocks over the weir wall
- No access track for GPT

Key Learning:

- Collaboration and external funding
- Handover process to correct personal is essential
- Water Quality testing to be continued
- Potential cost savings to bring forward elements of later stage of the project i.e. electrical connection , slab of treatment shed , full wetland and underground storage

Summary:

- No One-Size-Fits-All Solution: Tailor approaches to specific site conditions and project requirements.
- Collaboration with Stakeholders: Engage all relevant parties, operation teams and experts, to ensure successful outcomes.
- Active Monitoring and Testing: Regularly check water quality to maintain standards and identify any issues early.
- Active and Regular Maintenance: Sites with consistent maintenance perform better. Regular upkeep ensures efficient operation, early issue detection, and prolonged system lifespan.
- Variable Treatment Train: Adapt treatment processes based on the specific needs of each site, considering factors like pollutant types and levels.
- Understand Catchment Characteristics: Analyze the area's features, such as land use, soil type, and hydrology, to inform planning and design. i.e. high groundwater level
- Approvals and Assessments: Be prepared for potential delays due to regulatory processes and ensure all necessary permits are obtained.
- Budget Variations: Plan for unexpected costs with a high contingency to avoid financial shortfalls.
- Irrigation Network: Establish an effective irrigation system to utilize harvested stormwater efficiently.
- Pump failures are common , assess option for dual pumps

Questions

City of Casey

Thank You