

# Stormwater Harvesting Partnership Fund



Macedon Ranges Shire Council

## Opportunities emerging from the Southern Macedon Ranges Integrated Water Management Plan

April 2024

### Priority projects for the Souther Macedon Ranges catchment for the next 1 to 3 years

Over the 2024-2025 financial year Macedon Ranges Shire Council will be seeking Partnership opportunities to progress the installation of water harvesting and water reuse infrastructure for irrigation in accordance with the Southern Macedon Ranges Integrated Water Management (IWM) Plan

#### Gisborne and New Gisborne have been identified as locations within the Shire offering Blue-Green infrastructure development opportunities with the construction of new sports precincts and public open space.

Existing infrastructure supplies irrigation to a number of Council and private users via a network of small diameter pipes along Jacksons Creek delivering water to the bowling club, a number of Council parks along Jacksons Creek and terminating at the golf club where water is supplied into dams and then irrigated on the golf course. The total contracted volume is 160 ML/yr, of which 40 ML/yr is for the golf club.

Discussions with Western Water engineers indicate the newer scheme has the capacity to allow new extensions to be made to service open space. This opportunity proposes the supply of additional and proposed open spaces with irrigation.

New opportunities for open space irrigation include;

1. Proposed Macedon Ranges Regional Sports Precinct
2. Growth areas in New Gisborne
3. New Gisborne Primary School
4. Ross Watt Reserve
5. New development areas in New Gisborne
6. New development areas in Gisborne

Irrigation demand varies from year to year depending on the season but a volume of 5 ML//ha/year should be sufficient to water turf. Assuming 6% of development land becomes irrigated public open space, **there is potential new demand of 165 ML/year across 33 ha of open space.**

New winter storage lagoons will need to be built as part of this scheme. A site has been chosen for this study on Magnet Hill next to one of Western Water's existing potable water tanks. The equivalent of approximately 10 months demand is needed for a 90%ile containment scheme in this climate.

A storage of 140 ML could have dual benefits in Gisborne:

1. Store more winter flows for reuse and help avoid Gisborne treatment plant exceeding discharge license in wet years.
2. Store excess summer flows and help avoid ecologically unhelpful summer base flow discharges to Jacksons Creek.

Extending the water reuse scheme north to New Gisborne is similar in principle to extending the scheme in old Gisborne. The new network shown in Figure 2 has 11km of water mains.

The existing pumping station at the RWP should be able to lift water to Magnet Hill (RL 510m) because the highest customers in the Gisborne South scheme are above (RL 500m). However, this and all other engineering assumptions would need to be confirmed.

#### Stormwater Harvesting with a Regional Approach;

A number of Gisborne sites that can be linked to form a regional-scale stormwater harvesting scheme to harvest flows from the wetlands and transfer flows to Rosslynne Reservoir (possibly linking to neighbouring scheme in Sunbury) have been investigated.

Using GIS, sites were investigated with consideration of topography, public land availability, known development sites, major existing stormwater drains, and Melbourne Water Drainage Schemes.

Three sites were chosen as part of this scheme:

1. Willowbank Rd Development (major development area, DS 6851, Central Creek Drainage Scheme)
2. Robertson Rd Reserve (public land near town centre, major stormwater pipe draining to Jacksons Creek)
3. Jacksons Creek Reserve (public land near town centre, major stormwater pipe draining to Jacksons Creek) – this is referred to as the 'Adventure Playground' site in the Gisborne WSUD Masterplan

Each site is proposed to include a harvesting wetland, specifically designed to maximize volume reductions and harvesting yields, as per the design solutions for Sunbury. The sites will also include UV treatment and pumped low flow outlet to direct flows to the trunk main transfer pipes.

Harvested flows from the wetlands will then be transferred to the storage and treatment facilities on Riddells Rd, in Sunbury North, before sending treated flows to Rosslynne Reservoir to supplement potable supply.

The majority of the cost associated with this regional approach to harvesting comes from pipework and transfer pumps required to send harvested flows from the wetlands to Riddells Road for storage and further treatment. If more sites could be connected to the scheme, this would help offset the cost of the pipe and pump infrastructure. If other opportunities arise for harvesting sites, these should be included in the scheme. It also worth considering creating a local additional treatment step in Gisborne to reduce the cost of pipework.

The option assumes it will be integrated with the IWM Plan for Sunbury, including storage and treatment at Riddells Rd and the trunk infrastructure from Riddells Rd to Rosslynne Reservoir. The option also assumes the treatment wetlands proposed at Willowbank Rd through DS 6851 can be retrofitted into harvesting wetlands.

#### Wetlands sized based on available land at each site and to include:

1. Q5 high flow bypass
2. Daily demand rate set to draw down wetland extended detention volume over three day (achieved through pumped low flow outlet)
3. 300 mm permanent pool volume
4. 500 mm extended detention depth



Figure 1 Stormwater Harvesting sites from Gisborne to then be transferred to Rosslynne Reservoir

#### Key analysis assumptions and infrastructure requirements:

- Network designed to deliver 165 ML/year Class B recycled water from Gisborne RWP to 33 ha of new public open space.
- New recycled water mains – 11 km, average size 150 mm, Capex \$300/m, Opex 0.5% pa.
- Winter storage at Magnet Hill – 140 ML, Capex \$15k/ML, Opex 0.5% pa.
- Irrigation areas – cost not included, as this would be required for potable irrigation
- Water pumping – \$/m head /ML. Lift from RWP to Magnet Hill ~ 110m, Volume 165 ML/year.
- Water pump – 120 m head (= 110 m static lift + 10 m friction loss) @ 0.5 ML/day and 60% efficiency, so Power = (120 x 6)/(102 x 0.6) = 12 kW, Capital Cost = \$31,580\*12^0.6299 = \$150,000. Opex 1.5% pa.
- Wetlands sized based on available land at each site
- Willowbank Rd wetland size based on proposed wetlands shown in DS 6851
- Stormwater harvesting configured to maximise yield, as per concept designs for Sunbury's harvesting wetland.

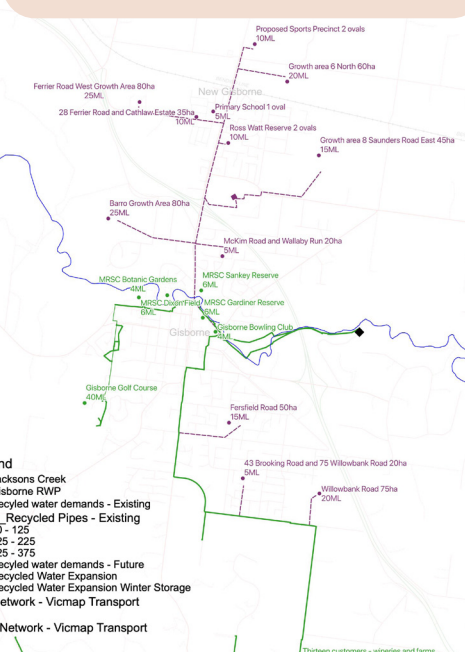


Figure 2 The extent of the existing water network and a summary of the existing total contract volumes in green

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