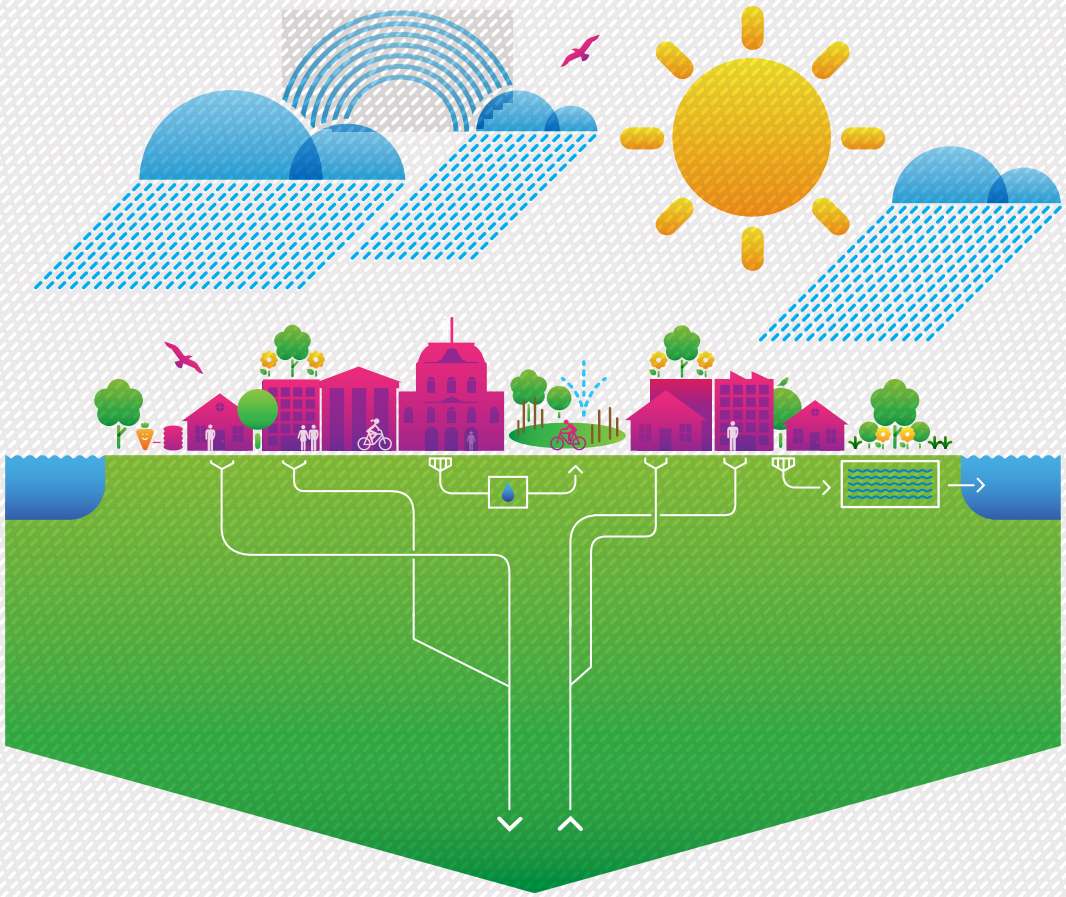
Moreland City Council



Moreland Watermap 2020

Moreland's path to a water sensitive city

Moreland Watermap 2020

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Definitions

Fit for purpose water – a quality of water that is appropriate for the purpose it is intended to be used for.

GL – Gigalitres. One thousand, million (1,000,000,000) litres

Integrated Water Cycle Management (IWCM), Integrated Water Management (IWM), Whole of Water Cycle Management (WoWCM) – all refer to the same approach to water management that considers the entire urban water cycle, rather than its individual elements in isolation.

kL – Kilolitres. One thousand (1,000) litres.

ML – Megalitres. One million (1,000,000) litres.

Water sensitive city – a water sensitive city is a city which undertakes best practice integrated water cycle management.

Water sensitive urban design (WSUD) – design and design approach that integrates the urban water cycle, including stormwater, groundwater and waste water management and water supply, into urban design to minimise environmental degradation and improve aesthetic and recreational appeal.

Image: Launch of the Charles Mutton Stormwater Harvesting System. From left to right: Dr Paul Pretto, Acting Managing Director Melbourne Water, Cr Lambros Tapinos, Mayor of Moreland, Hon Peter Walsh MP, Minister for Water, Hon Craig Ondarchie MP.

Mayor's message

I am very pleased to introduce the Moreland Watermap 2020, which provides a plan for Moreland's transition to a water sensitive city.

A water sensitive city is one that is healthy, green, productive and resilient. To make this vision a reality requires a collaborative effort with commitment from residents, businesses, community groups, all levels of Government and many others across our community.

This plan shows how we can continue to create high quality public spaces and landscapes and provide the water security essential for community health and economic prosperity. WaterMap 2020 has set ambitious goals including Council leading by example through a number of operational targets such as:

» reducing Council's total potable water usage by 30% from 2001 levels

» developing local stormwater harvesting infrastructure supplying 30ML/a of treated water for open space irrigation by 2020

Watermap 2020 also includes a clear implementation plan, identifying specific projects which contribute towards more efficient use water resources, protection and enhancement of our waterways and wetlands and mitigating flood risk and damage.

Support for community action to reduce community potable water consumption and increase the number of households with an installed rainwater tank is also a key area for ongoing action.

Moreland is proud to embrace a comprehensive and progressive approach integrated water cycle management and become a Water Sensitive City through Moreland Watermap 2020.

I would like to thank everyone involved in the development of WaterMap 2020 throughout 2014 and look forward to working alongside key partners and community members to achieve the vision of a water sensitive city.

Cr Lambros Tapinos,
Mayor of Moreland

Executive summary

Balancing access to water suitable for our needs and the needs of the ecosystems we depend on is critical to our future resilience, liveability and prosperity.

The Millennium Drought provided first hand experience of the challenge of managing this balance in a changing climate, and was a catalyst for the evelopment of more innovative and collaborative water management solutions.

Council plays a vital role in water cycle management both directly through public assets management and indirectly through influencing the community's actions and working with relevant stakeholders and regulators. Given these multiple interfaces Council is well placed to deliver integrated water cycle management (IWCM) solutions, either through Council's capital works program or through partnerships and advocacy with the community and other external stakeholders.

The vision of Moreland Watermap 2020 is for the City of Moreland to become a water sensitive city in which Council leads by example and supports community actions to manage water resources in an environmentally, socially and financially responsible manner.

Framed around the seven targets outlined below, the plan includes a program of carefully considered projects to achieve this vision.

IWCM solutions at all scales have been matched to sub-catchments within the municipality based on the existing water cycle opportunities and constraints.

The actions involve both hands-on and advocacy approaches with success relying upon active partnerships with the Moreland community and key stakeholders such as water authorities.

The plan will be monitored annually to ensure that the priority settings remain correct and emerging opportunities for delivery and management are integrated as appropriate. Progress towards the vision and delivery of the targets will be reported annually.

This is an exciting step change in the evolution of Moreland's approach to water management and will provide the platform for the creation of a water sensitive city that ensures our future resilience and prosperity.

Council's 2020 Targets

Council leading by example

01

Reduce Council's total potable water usage by 30% from 2001 levels (400ML/a) to 280ML/a by 2020.

02

Treat 11% of Council's stormwater catchments to best practice by 2020.

03

Implement water sensitive urban design into all Council capital works projects.

04

Advocate IWCM to and on behalf of the community.

05

All new residential developments of greater than 2 dwellings and non-residential developments greater than 100m² to incorporate best practice water efficient fittings, water reuse and/or recycling and stormwater management.

Council supporting community action

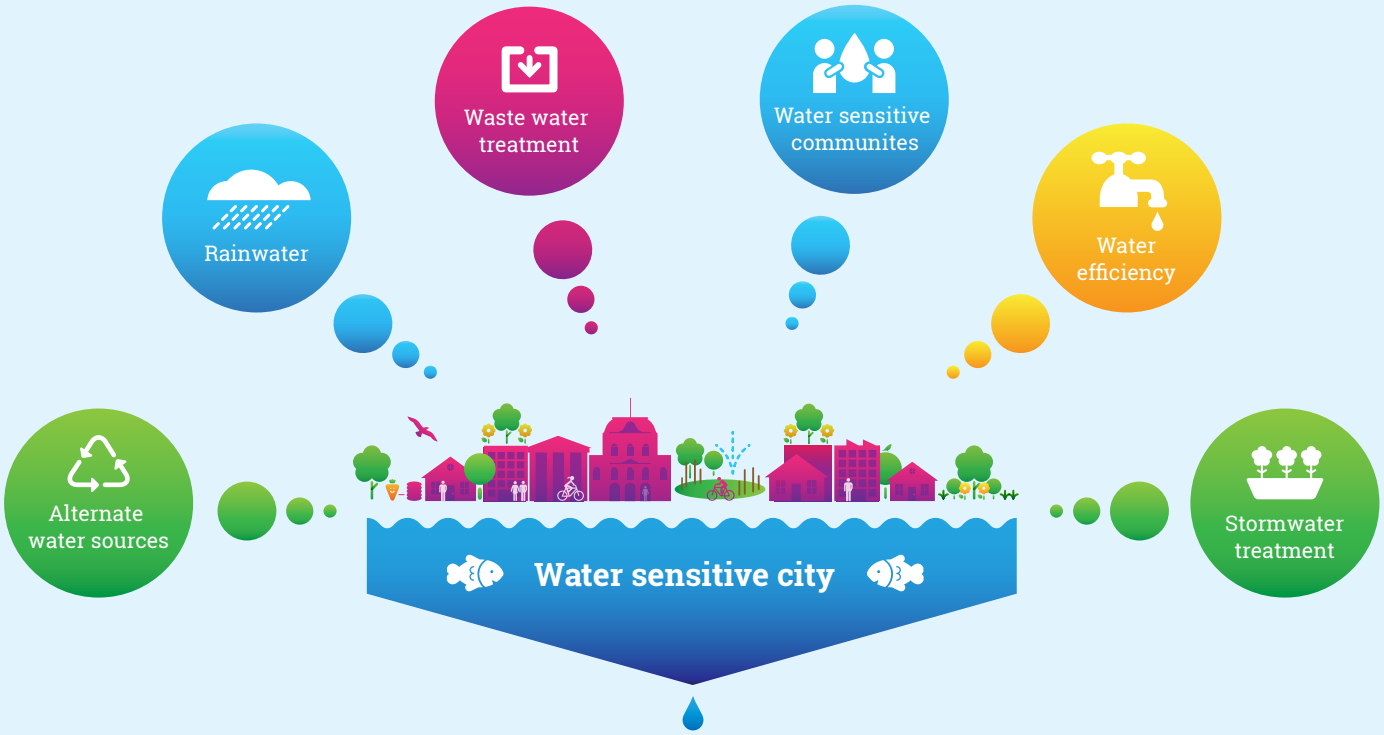
06

25% reduction in community potable water consumption from 2001 baseline consumption to 10.1GL/a by 2020.

07

50% of Moreland households have an installed rainwater tank by 2020. 25% of Moreland households have an on-lot stormwater treatment raingarden or other stormwater treatment mechanism by 2020.

Key elements of a water sensitive city



A water sensitive city is a city is which water cycle management is integrated into all aspects of the city. A water sensitive city is created though collaboration between our community, Council and key stakeholders. It is a city that is healthy, green, productive and resilient.

WATER SENSITIVE CITIES INTERACT WITH THE WATER CYCLE IN WAYS THAT

Create high quality green public spaces and landscapes

+

Provide water security essential for economic prosperity through efficient use of the diversity of water resources available

+

Enhance and protect the health of watercourses and wetlands

+

Mitigate flood risk and damage

THE THREE PRINCIPLES OF WATER SENSITIVE CITIES ARE

Cities as water supply catchments:

Access to suitable water through a diversity of sources from a diverse range of supply scales – small local scale supply solutions through to mains water supplied to Moreland

Cities providing ecosystem services:

The built environment supplements and supports the function of the natural environment including local biodiversity through to using or replicating natural water treatment systems

Cities comprising water sensitive communities:

Communities are engaged with decision makers and enabled to participate in creating a water sensitive city through political support and their own local actions

Background

This plan is based on careful consideration of Moreland's interaction with and influence over the water cycle.

The water cycle includes the flows of water into and through the City; the use, treatment and management of these flows and the loss of water through waste water, stormwater and evaporation.

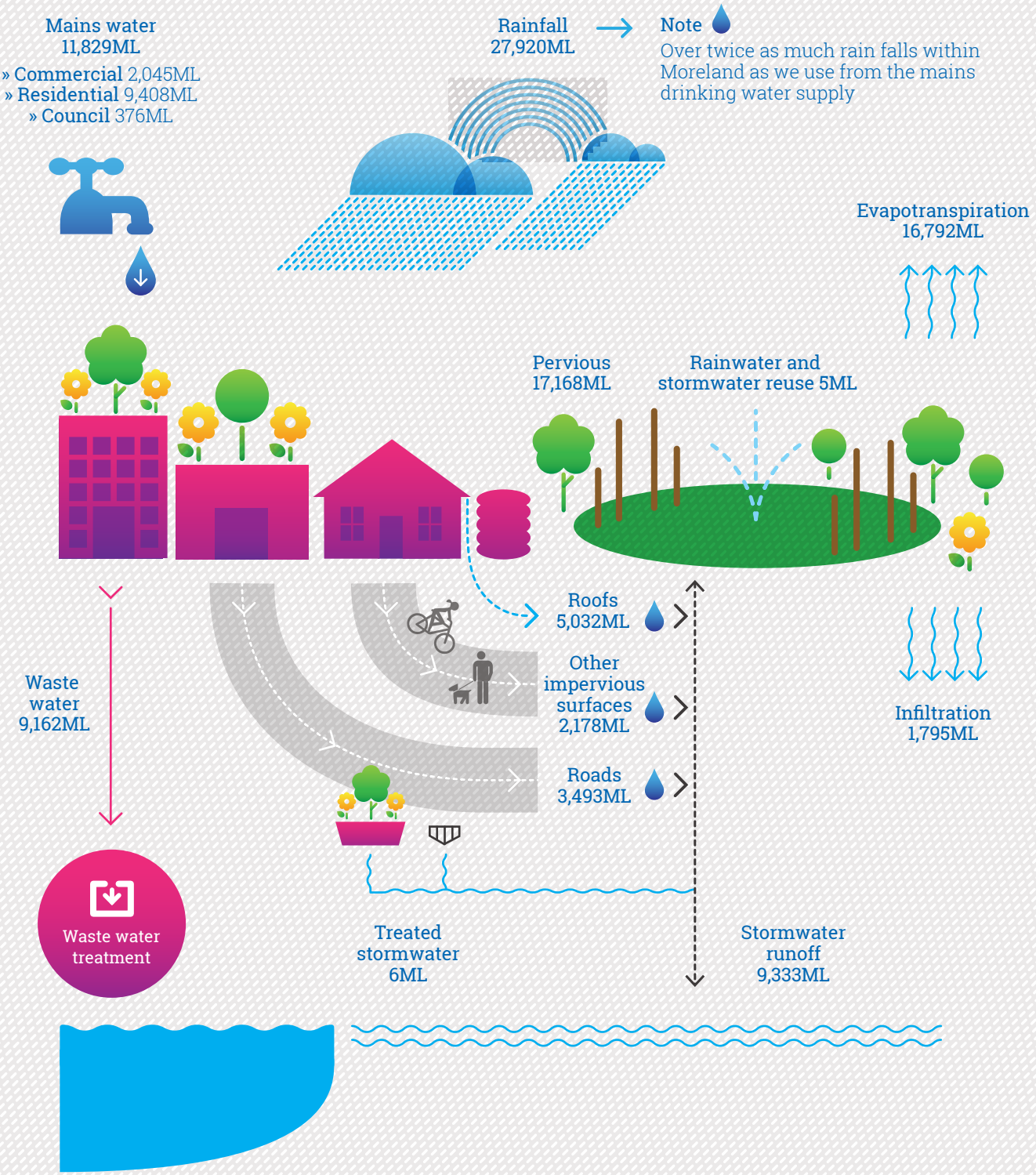
To address the whole of the Moreland water cycle, Council's Watermap 2020 identifies targets and actions within our channels of influence to lead Moreland towards becoming a water sensitive city by 2020. These channels can be split into two themes:

Council leading by example – areas of direct Council control such as reducing the potable water usage of Council's operations, increasing the quantity of treated stormwater used for sportsfield irrigation and improving the quality of stormwater runoff to our creeks.

Council supporting community action – areas of indirect Council control where Council can support or influence the community to take action such as reducing the total water consumption by the community, increasing the uptake of rainwater tanks within the community and encouraging on-lot stormwater treatment.

Image: Sugarloaf Reservoir, one of Melbourne's dams that supply Moreland with drinking water. Image supplied courtesy of Melbourne Water.

Moreland's water balance in 2012-13



Climate change and water use

Due to human generated greenhouse gas emissions, southeastern Australia is projected to warm during the 21st century, along with other changes in climate[1]. Annual rainfall is also expected to decrease[1], with projections of up to a 40% decline in average annual runoff for southeast Australia[1].

Along with future changes in Melbourne's climate and it's water catchment regions, Melbourne's population is also expected to grow by a further 3.5 million people to be a city of 7.7 million people by 2051[2]. Taking into account this increase in water demand, combined with a possible 40% reduction in rainfall runoff, it is predicted that further desalination plants will be required to be constructed meet Melbourne's water demand by 2050[3].

Furthermore, Yarra Valley Water investigations into demand from sports field irrigation noted that days in which the maximum temperature exceeds 35°C have a large effect on increasing irrigation volumes. Associated with a warming climate, more frequent hot extremes are anticipated for southeastern Australia[1]. As such, Moreland is very likely to experience an increase in days over 35°C, resulting in significant increases in required irrigation volumes, even with the implementation of efficiency measures.

In the face of both an uncertain rainfall future with likely runoff declines, as well as increased water demands due to population growth and warmer temperatures increasing irrigation demands, alternate, non-potable water supplies are a key component to securing Moreland's future water supply needs.

1. IPCC, 2014: Chapter 25: Australasia [Blair Fitzharris and David Karoly (eds.)]. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Paulina Aldunce, Jean Pierre Ometto, Nirivololona Raholijao, Kazuya Yasuhara (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

2. Plan Melbourne, Metropolitan Planning Strategy. The State of Victoria, Department of Transport, Planning and Local Infrastructure, 2014. Accessed from: http://www.planmelbourne.vic.gov.au/

3. Melbourne's Water Future. Victorian Government Department of Environment and Primary Industries, November 2013. Accessed from: http://www.livingvictoria.vic.gov.au/mwf

Image: Stormwater harvesting system at Sewell Reserve, Glenroy

An integrated water cycle management approach

The protection and efficient management of our water resources is critical to the ongoing resilience, liveability and prosperity of our community.

The water security pressures caused by Melbourne's recent 13-year drought have fundamentally changed the way we use water. The drought detrimentally stressed our trees, parks and gardens and decreased the liveability of Moreland for our community. During this time it was common place to see brown and dead sportsfields, trees and open space and to experience extreme urban heat.

The drought identified that in the face of climate change if we are to maintain the liveability of Moreland to the standards our community expects with green open spaces, safe community sportsfields, healthy trees and a cool urban environment, then an approach that considers and best manages the whole of the water cycle is necessary.

Watermap 2020 moves Moreland beyond a water security focused approach, to a liveability focussed approach. This approach focussed on:

» Making best and most efficient use of drinking water

» Where drinking water is not required to be used, replace it with the right alternate water source such as rainwater, treated stormwater or treated waste water

» Maintaining and improving the health of our local and broader natural systems such as waterways through best managing stormwater runoff and pollution

This approach will lead Council to maintain healthy landscapes that in turn provide heat mitigation, liveability and health benefits to the community, and transform Moreland into a water sensitive city.

Moreland as a water sensitive city

Becoming a water sensitive city will bring many benefits to Moreland

Water sensitive community attitudes and values

» A shared community understanding of the need for careful use of high quality drinking water, appreciation of our waterways, and embracing the use of “fit for purpose” water where-ever possible

Cities as water supply catchments

» Local “fit for purpose” water systems supplying water across the municipality and passive irrigation for street scapes

A water sensitive built environment

» Buildings that include: raingardens, green roofs, rainwater tanks, permeable surfaces and stormwater infiltration and water efficient fittings, fixtures and whitegoods as standard

Greener streets and high quality open spaces

» Constructed wetlands and raingardens, passive irrigation systems, tree pits, increased tree canopy and urban biodiversity, efficient irrigation systems and increased permeability

Grassed sportsfields

» Maintained to high standards even during periods of drought

Cleaner, less polluted waterways

» WSUD and other stormwater treatment measures to reduce stormwater pollution entering our waterways

Improved liveability and amenity

» High-quality open space, waterways and natural areas providing attractive options for recreation, relaxation and connecting with nature

Community health and well being

» Cool, green streets and parks and high quality open spaces encouraging community participation and interaction

A city more adapted to heatwaves and other weather extremes in a changing climate

» Mitigation of urban heat island effects by increased tree canopy and urban greenery, reduced effects of flash flooding and access to alternate water supplies that reduce demand for drinking water in times of low rainfall

Ecological and biodiversity benefits

» Increased habitat and biodiversity through healthy natural waterways and wetlands, increased streetscape vegetation and constructed stormwater treatment wetlands and biofiltration systems

Financial savings and avoided costs

» Savings on water utility costs and drinking water infrastructure upgrades through reduced drinking water consumption and the use of “fit for purpose” water supplies

Image: Stormwater harvesting system under construction at Charles Mutton Reserve, Fawkner

Image: Knobby Club-rush ready for planting in a raingarden

What would a water sensitive Moreland look like?

A water sensitive Moreland is a city where this precious resource is highly valued, carefully managed to best practice standards and accessed equitably by all users to protect ongoing liveability and sustainability.

The elements of a water sensitive Moreland will be visible in our values and in our natural and built environments.

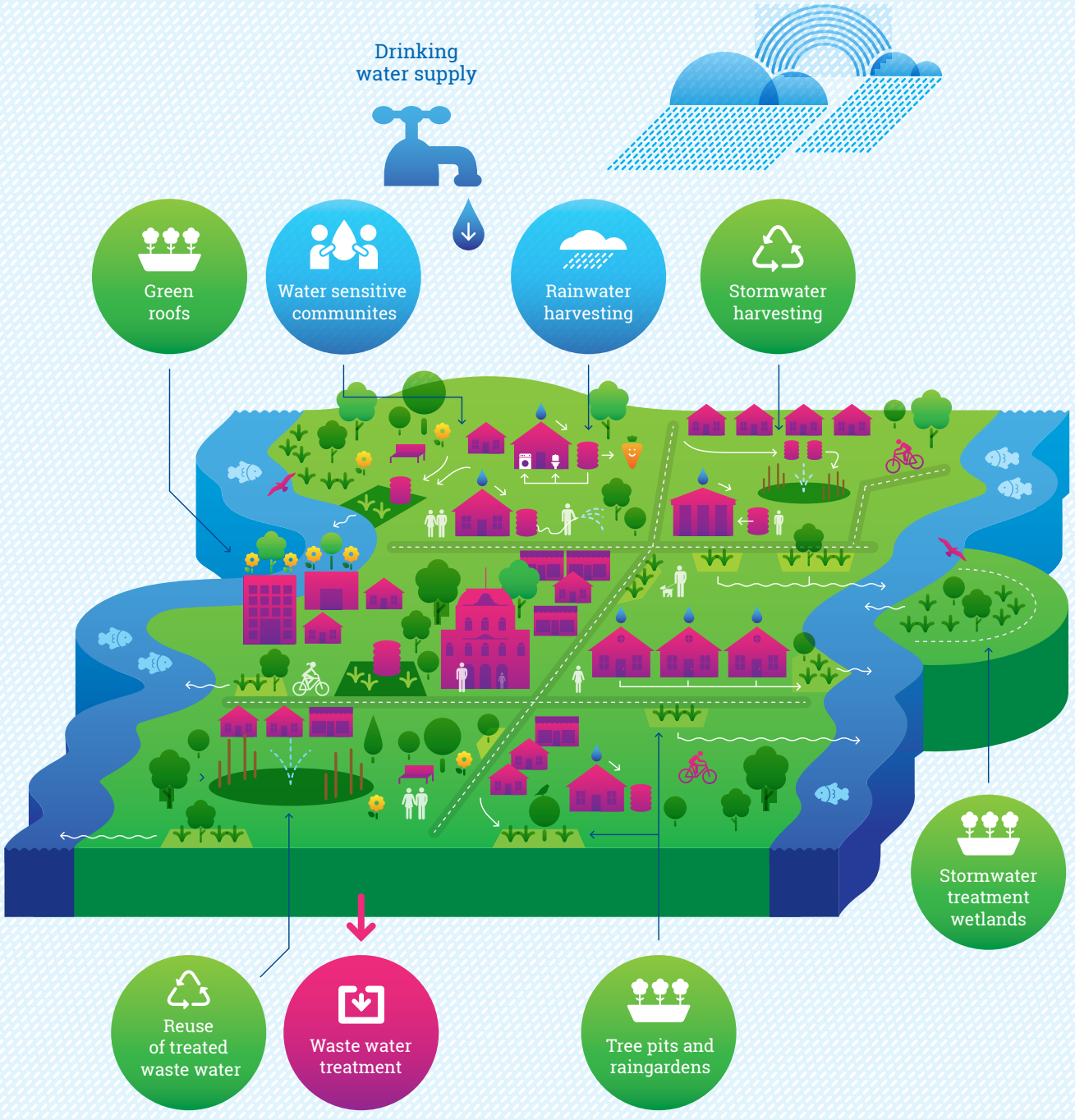


Image: Construction of a raingarden at Anderson Road shopping strip, Fawkner

An integrated Council approach

An integrated approach to water management requires an integration with Councils existing policy context and cross-Council departmental objectives. Watermap 2020 is a key plank of the Council Plan 2013-17 as identified in:

» Theme: Environmentally Sustainable Moreland Strategic Action 12.4: Implement the Integrated Water Management Plan and Stormwater Quality Targets Study

Watermap 2020 supports the other themes of the Council Plan that are reliant upon the sustainable management of water across the community.

Watermap 2020 supports the following Council strategies through addressing sustainable water management:

Council strategy	Support / alignment	Council strategy	Support / alignment
Active Moreland	Irrigation to support sportsfields and healthy open spaces.	**Litter Trap Action Plan**	Implementation of litter traps to reduce stormwater pollution.
Carbon Management Strategy and Zero Carbon Evolution Climate Action Plan	Fit for purpose water and passive watering to support urban vegetation.	**Merri Creek and Environs Strategy**	Improvement of creek health.
Drainage Asset Management Strategy	WSUD reducing flooding.	**Open Space Strategy**	Irrigation to support sportsfields and healthy open spaces.
Flood Management Plan	WSUD reducing flooding.	**Street Landscape Strategy**	Fit for purpose water and passive watering to support urban vegetation.
Health and Well-being Strategy	Irrigation to support sportsfields and healthy open spaces.	**Waste and Litter Strategy**	Reducing litter entering our waterways.

Image: Completed raingarden at Anderson Road shopping strip, Fawkner

"Merri Creek Management Committee strongly supports the intent of this document as Moreland's path to becoming a water sensitive city. We acknowledge and support the targets that are win-win for both reduction in potable water use and stormwater impacts, such as wide adoption of rainwater tanks."

Merri Creek Management Committee

An integrated stakeholder and partner approach

Achieving Watermap 2020 implementation requires the engagement, cooperation and compliance with a broad range of key stakeholders and regulators. It also acknowledges that genuinely holistic approach to IWCM inherently requires the consideration of the water cycles at our local scale and those that extend beyond the boundaries of the municipality. Council must ensure that our opportunities and obligations to work with these key stakeholders and regulators are always considered when delivering the objectives, strategies and actions outlined in this plan.

Key stakeholders include:

» Moreland households, businesses and community groups

» Creek committees and "Friends of" groups

» Melbourne Water – Wholesaler of Melbourne's water supply, responsible for managing the catchments, treating water and transferring it the three retail water companies

» Yarra Valley Water – Water retailer servicing the Moreland municipality

» The Office of Living Victoria (OLV) – A Victorian Government body tasked to deliver urban water reform in Victoria

» Environmental Protection Authority (EPA), Victoria – Government environmental regulator

» Department of Health, Victoria – Government body responsible for setting standards of acceptable water quality

» Council's upstream and adjacent to Moreland's waterways including Darebin and Whittlesea Councils (Merri and Edgars Creeks), Hume Council (upper Merri and tributaries and Moonee Ponds Creek) and Shire of Mitchell (upper Merri and tributaries)

Moreland Watermap 2020

4.1 Vision

The vision for this strategy is for the City of Moreland to become a Water Sensitive City in which Council leads by example and supports community actions to manage water resources in an environmentally, socially and financially responsible manner.

4.2 Goals

Key goals fall within the following two themes

Council leading by example

- Reduce Council's total water consumption to the minimum amount required in order to maintain Council's services to the community
- Displace the use of potable water consumption with fit for purpose alternate water sources
- Reduce the pollution carried by stormwater originating from within the Moreland municipality
- Implement and encourage the uptake of water sensitive urban design across the City of Moreland
- Advocate for the efficient use of water resources and implementation of integrated water cycle management to the community and to external bodies such as water providers and wholesalers on behalf of the community
- Reduce potable water consumption, increase water reuse and recycling and reduce stormwater pollution coming from new developments within the Moreland municipality that require a Council Planning Permit

Council supporting community action

- To reduce potable water consumption with the community through water saving measures and displacement with fit for purpose water use
- To reduce stormwater pollution originating from residential lots

4.3 Targets

To fulfil our goals, Council has set a number of targets:

Council leading by example

01

Reduce Council's total potable water usage by 30% from 2001 levels (400ML/a) to 280ML/a by 2020.

Subtarget 1.1 – Increase Council's use of alternative water sources through:

» 30ML/a of community sportsfield or open space irrigation water to be reuse water from local stormwater harvesting infrastructure by 2020

» Sourcing additional alternative "fit for purpose" water supplies to the above where feasible

Subtarget 1.2 – Improve community sportsground irrigation efficiency to 75% for 100% of class A sportsfields and irrigated parks by 2020.

Subtarget 1.3 – All Council facilities to have best practice fittings, appliances and toilets and rainwater tanks installed where possible.

02

Treat 11% of Council's stormwater catchments to best practice by 2020. Post 2020, continue to make proportional progress to treat 100% of catchments to best practice by 2070.

03

Implementation of WSUD into all Council capital works projects.

04

Advocate IWCM to and on behalf of the community.

05

All new residential developments of greater than 2 dwellings and non-residential developments greater than 100m² to incorporate best practice water efficient fittings, water reuse and/or recycling and stormwater management.

Council supporting community action

06

25% reduction in community potable water consumption from 2001 baseline consumption to 10.1GL/a by 2020.

07

50% of Moreland households have an installed rainwater tank by 2020. 25% of Moreland households have an on-lot stormwater treatment raingarden or other stormwater treatment mechanism by 2020.

Mapping implementation

To effectively guide the delivery of the targets Council has mapped the sub-catchments making up the Moreland municipality based upon their suitability for different IWCM treatments.

The treatment identified for each catchment was based upon the opportunities and constraints that each catchment presented. This map then forms the basis for directing the implementation of the plan's targets and key actions.

Stormwater harvesting is the process of treating and reusing stormwater, provides dual benefits of reducing stormwater pollution and displacing drinking water usage for "non-premium" water uses such as community sportsfield irrigation. Areas where this is feasible require a suitable catchment and an opportunity for treatment and reuse.

Large-scale stormwater treatments use wetlands or large raingardens to treat stormwater before it enters our creeks.
They typically provide the most economical way of reducing stormwater pollution per hectare of catchment treated whilst also providing habitat for wildlife and improving amenity.

In areas where neither stormwater harvesting or large-scale treatments are feasible, achieving the stormwater treatment targets will rely upon streetscape and household scale water sensitive urban design (WSUD) such as tree-pits, raingardens and rainwater tanks.

Alongside reducing stormwater pollution, WSUD also provides numerous benefits such as reduced potable water consumption, increased tree canopy, increased green spaces and reduced urban heat island effect. It is now common to see WSUD treatments in areas with high stormwater pollutant loads such as shopping strips.

Bringing together these treatments will provide the infrastructure required for Council to meet our stormwater treatment target and help transform Moreland into a water sensitive city.

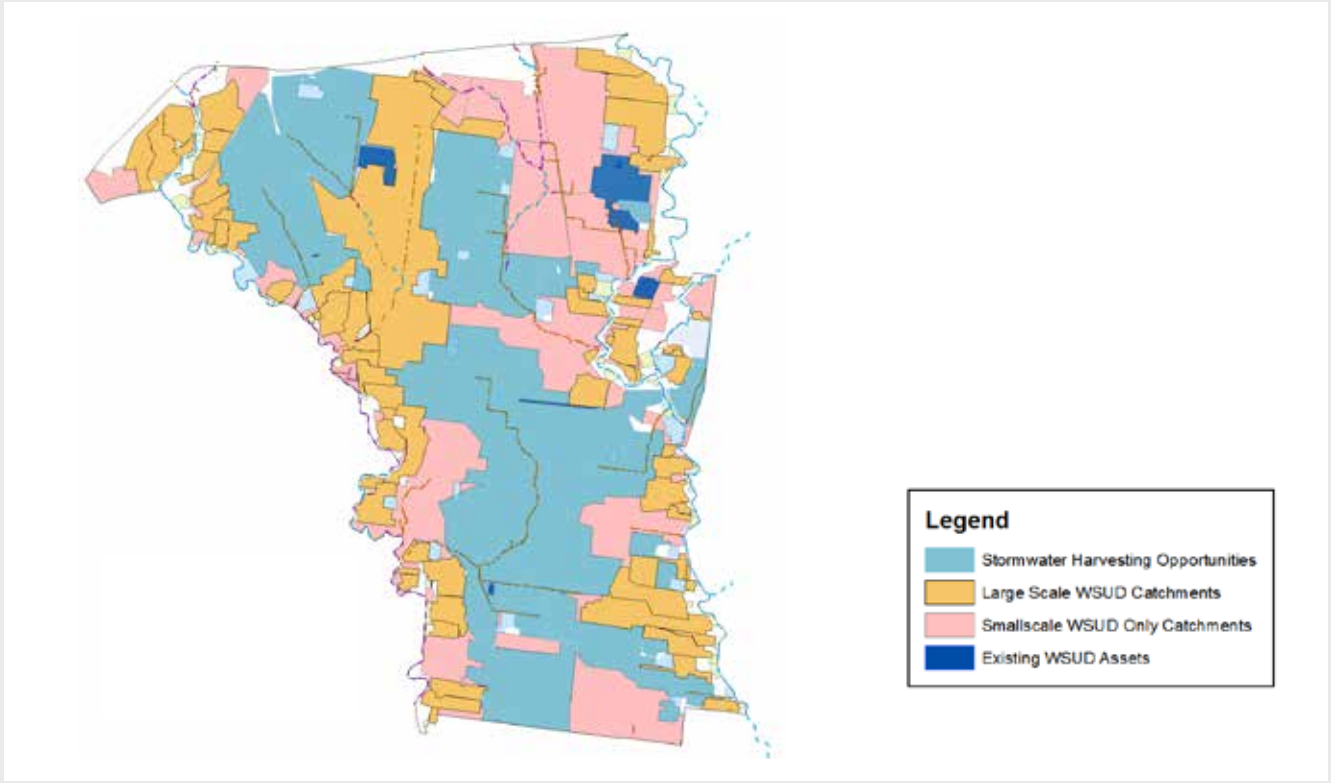
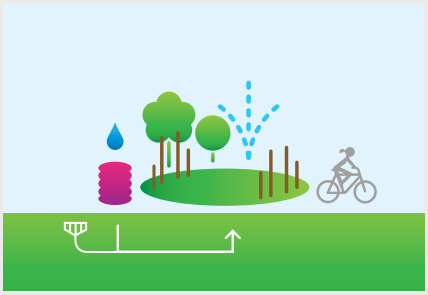


Image: Map of Moreland's stormwater catchments and proposed treatments

THE BUILDING BLOCKS OF A WATER SENSITIVE CITY

01 ---------->

Alternative water sources (stormwater harvesting)



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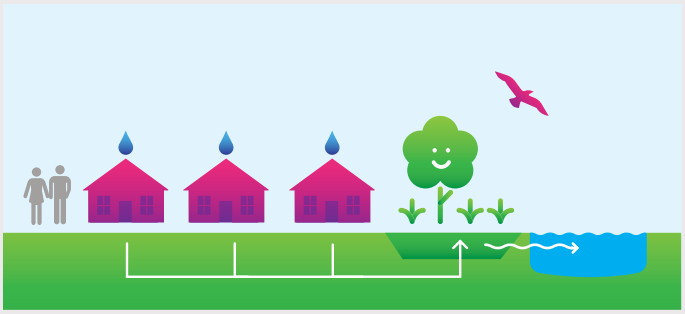
Large-scale stormwater treatments



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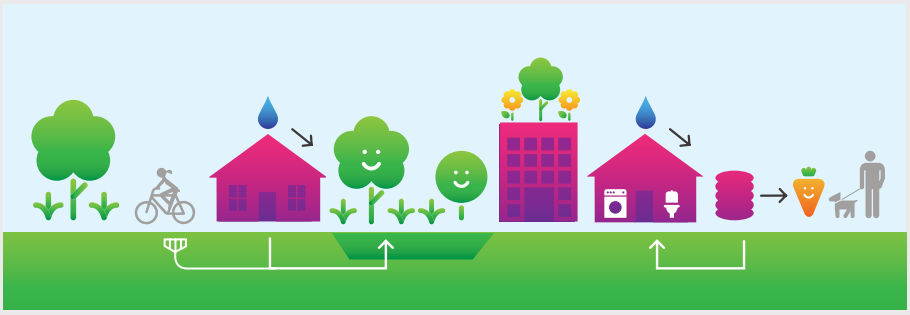
Water sensitive urban design



Water sensitive communities ↓

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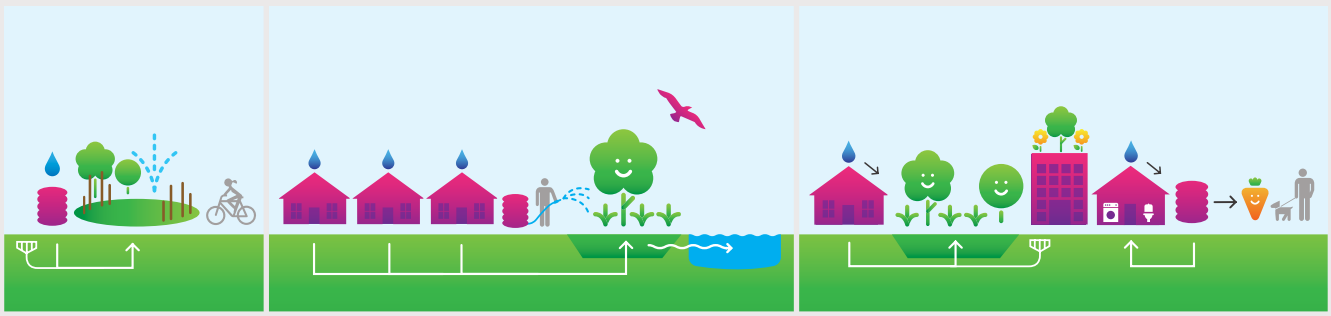


Delivering on targets

Council leading by example

01 Reduce Council's total potable water usage by 30% from 2001 levels (400ML/a) to 280ML/a by 2020.

Council requires a certain amount of water to maintain healthy open space and its services to the community. However access to water is limited and as such Council needs to make the best use of all sources of water including drinking water, rainwater, stormwater and recycled waste water. Council's two year average potable water usage for 2011-12 – 2012-13 was 301ML/a, a 25% reduction from the 2000-01 – 2001-02 two year average of 400ML/a.

The IWMP 2009-2013 set a potable water reduction target of 50% from the 2000-01 - 2001-02 two year average of 400ML/a. Investigations have found that whilst this target may be achieved during wet summer years when there is low demand required from Council irrigation, the only means of achieving this target during summers of average or below-average rainfall is through turning off the irrigation to a large number of sportsfields and open space.

This is illustrated in the graph below which shows that the 50% reduction in potable water consumption target was achieved during the 2007-08 – 2010-11 period. The achievement was during a period of water restrictions, in which irrigation was reduced or turned off at many Community sportsfields. This action resulted in many community sportsfields becoming unusable or dangerous to play on.

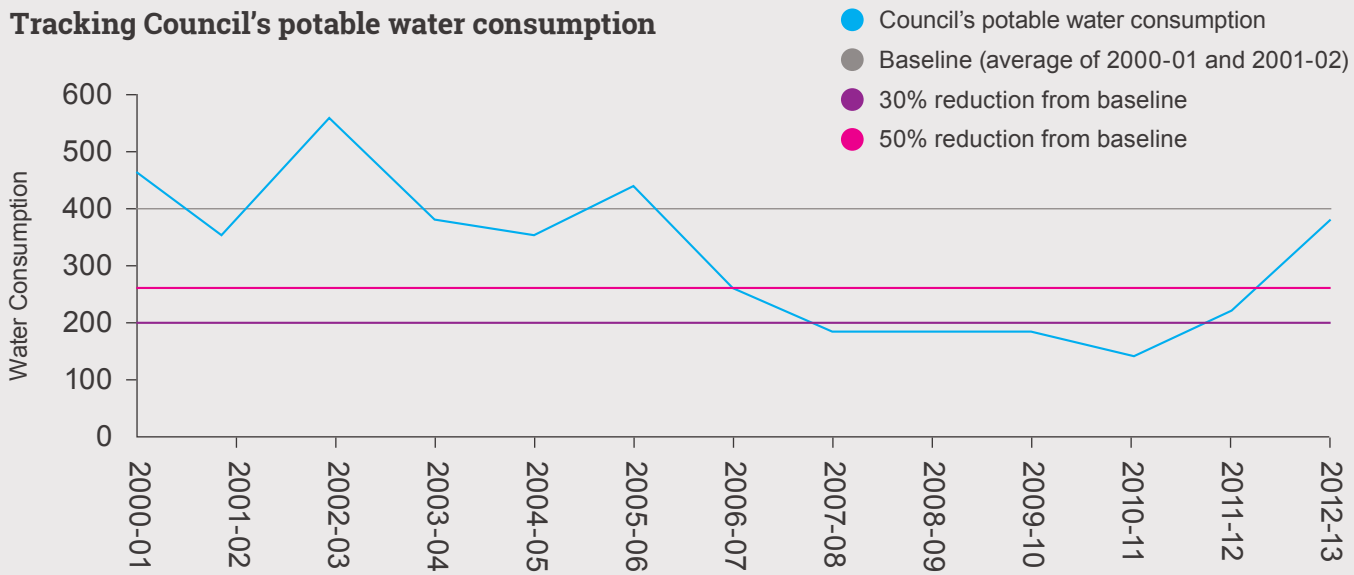
More recently, the 2012-13 "angry summer" (as described by the Climate Council) which was characterised by below average rainfall and above average temperatures has seen a rapid increase in Council's potable water usage with irrigation consumption increasing 70% over the 2011-12 summer.

Increasing potable water consumption is reflected in increasing water charges. Council's water charges have increased by 3.2 times from $211,414 in 2007-08 to $688,704 in 2012-13.

Investigations have found reducing Council's potable water consumption to a target of 280 ML/a can be sustainably achieved through focusing upon constructing stormwater harvesting infrastructure to replace the use of potable water, improving the efficiency of community sportsfield irrigation and reducing Council building water usage.

Based upon the cost of potable water to Council in 2014 ($2.53/kL), such a reduction would save Council $303,600 in potable water usage charges every year compared to the continuation of 2000-01 – 2001-02 consumption.

Tracking Council's potable water consumption



Sub-Target 1.1:

Increase Council's use of alternative water sources through:

» 30ML/a of community sportsfield or open space irrigation water to be reuse water from local stormwater harvesting infrastructure by 2020
» Sourcing additional alternative fit for purpose water supplies to the above where feasible

Key action:

Construct stormwater harvesting infrastructure supplying 30ML/a of irrigation water by 2020.

Benefit: significant progress towards Targets 1, 2 and 3
Timing: three year cycle, year one = design, year two and three = construction
Responsibility for implementation: City Strategy and Design

Council has already commenced construction of stormwater harvesting infrastructure to displace the use of potable water for sportsfield irrigation with fit for purpose treated stormwater.

At Sewell Reserve, Glenroy, a 5ML/a system was constructed in 2012. This system was followed by a 10ML/a system at Charles Mutton Reserve, Fawkner, constructed in 2014, bringing Council's total stormwater harvesting capacity to 15ML/a.

Increasing this total to 30ML/a by 2020 will make substantial progress towards reducing Council's potable water usage to 280ML/a and provide Council greater water security for irrigation during future periods of restricted potable water usage.

Atleast two new projects will be required to achieve this goal. Projects are to be prioritised based upon ground class (A, B or C) and total potable consumption at the ground.

Stormwater harvesting

Stormwater harvesting infrastructure provides multiple benefits to Council:

» Reduced potable water consumption
» Reduced potable water charges
» As a non-potable water source – secures access to irrigation water during future periods of drought
» Reducing stormwater pollution – also contributing to Target 2

Reuse of waste water

The reuse of treated waste water provides a significant opportunity for Council to use "fit for purpose" water in addition to stormwater harvesting. Community sportsfield irrigation and industry are two key areas with Moreland that could benefit through the supply of treated waste water.

The supply of treated waste water is a multi-stakeholder issue. As such Council will advocate to and work with external stakeholders such as Yarra Valley Water, Melbourne Water and the Office of Living Victoria to explore the supply of treated waste water as a resource to Moreland.

Image: Stormwater harvesting system under construction at Charles Mutton Reserve, Fawkner

Sub-Target 1.2:

Improve community sportsground irrigation efficiency to 75% by 2020 for 100% of class A sportsfields and irrigated parks.

Key action:

Undertake an audit of Council's class A community sportsfields and irrigated parks with irrigation infrastructure older than 10 years, review Council's irrigation control system and implement a program of irrigation upgrade works between 2015 and 2020.

Benefit: Significant progress towards Target 1
Timing: 2015-16 audit of irrigation systems
Post 2016: implement upgrade program of irrigation infrastructure
Responsibility for implementation: City Infrastructure

Playing fields and irrigated parks are Council's largest consumer of potable water. The improvement of irrigation efficiency has the potential to significantly reduce Council's potable water consumption whilst maintaining (or improving) the condition of the sportsgrounds for use by the community.

An investigation into Council's sportsfield irrigation infrastructure has found that approximately 60% of Council's class A and B community sportsfields have irrigation infrastructure over ten years old and likely to be performing at well below best practice irrigation efficiency. The number of sportsgrounds with irrigation infrastructure greater than ten years old total:

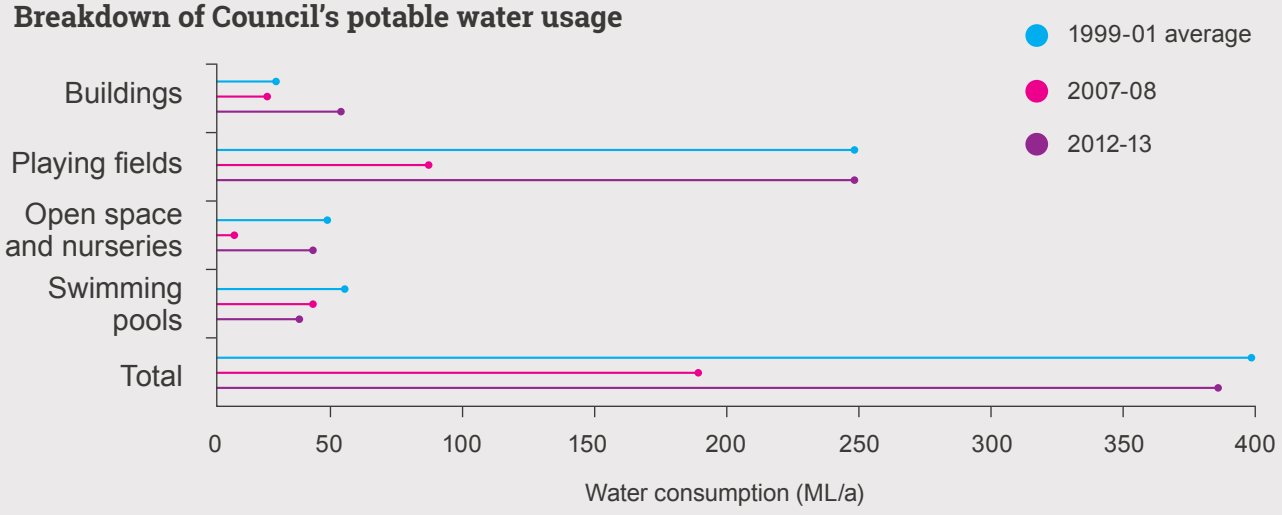
» Class A = four
» Class B = 12

Reductions in total irrigation water consumed are only likely to be achieved at existing class A grounds. Current class B and C grounds are likely to have an incomplete irrigation infrastructure and therefore any irrigation upgrades are likely to increase the area irrigated, and whilst efficiency will be improved, overall water consumption is likely to increase. Such action will increase water consumption, however they will also contribute to other Council goals such as the Recreation and Open Space Strategies and mitigation of the Urban Heat Island Effects and thus bring other benefits of IWCM.

If best practice irrigation efficiency is implemented at all class A grounds Council's potable water irrigation consumption can be reduced by approximately 12ML/year – a reduction of approximately 5% of total irrigation demand. A reduction in potable water consumption of 12ML/year equates to $30,360 per year in water savings.

Class A community sportsgrounds and irrigated parks are most valued by the community, and in periods of water restrictions, these are the open space areas that the community want maintained most. Thus, in addition to the potable water savings, undertaking efficiency upgrades should be prioritised to ensure that they can continue to operate in future water restriction scenarios.

Breakdown of Council's potable water usage



Sub-Target 1.3:

All Council facilities to have best practice fittings, appliances and toilets, and rainwater tanks installed where possible.

Key action:

Continue to implement the Council building water efficiency program every year between 2014 and 2020.

Benefit: Significant progress towards Target 1
Timing: Design and construction undertaken within each financial year
Responsibility for implementation: City Strategy and Design

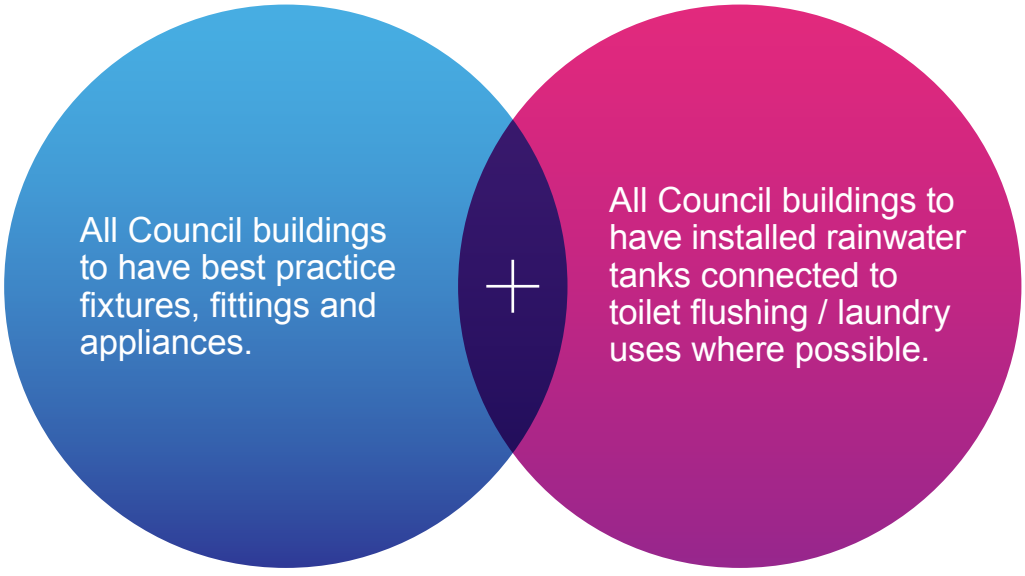
Council's building stock makes up a significant proportion of Council's total water usage. In particular Council's Aquatic Centres and major Civic buildings are high consumers of water. Since 2009 Council has been running a building water efficiency program to reduce potable water usage within these buildings through upgrading fittings, fixtures and appliances to best practice water efficiency. Between 2009 and 2013, over 25 Council buildings have had water efficiency audits and installations.

The building water efficiency program aims for:

» All Council buildings to have best practice fixtures, fittings and appliances

» All Council buildings to have installed rainwater tanks connected to toilet flushing / laundry uses where possible

THE BUILDING WATER EFFICIENCY PROGRAM AIMS FOR:



02 Treat 11% of Moreland's stormwater catchments to best practice by 2020. Post 2020, continue to make proportional progress to treat 100% of catchments to best practice by 2070.

Best practice is to be defined as the Environmental Management Guidelines (BPEM) stormwater pollutant reduction targets. As of 2014 these targets are:

Total Suspended Solids removed	80%
Total Phosphorus removed	60% (Moreland adopted target)
Total Nitrogen removed	45%
Litter	70%
Flows	Maintain discharges for the 1.5 year ARI at pre-development levels

Key action:

Implement large scale stormwater treatment and water sensitive urban design across all Council operations to treat 11% (170ha of impervious areas) of Moreland's stormwater catchments to best practice by 2020.

Benefit: Significant progress towards Targets 1, 2 and 3
Timing: Design and construction undertaken each year
Responsibility for implementation: City Strategy and Design, City Infrastructure

Image: Raingarden and tree pits at Michael Street, Brunswick

In order to meet the targets by 2070, stormwater treatment measures treating 1.8% of Moreland's stormwater catchments to best practice each year are required to be implemented. Over the 56 years following 2014, this will see Council treating 100% of Moreland's stormwater catchments to best practice by 2070.

To direct implementation in the most efficient manner, the map of WSUD catchments in mapping implementation has been developed. The map identifies the WSUD treatment to be undertaken each of Moreland's catchments based upon a priority of:

1. Stormwater harvesting
2. Large-scale end-of-line WSUD treatments
3. Small-scale distributed WSUD treatments.

Stormwater harvesting is prioritised due to the dual benefits of reducing stormwater pollution and displacing potable water usage through provision of "fit for purpose" treated water. This provides a direct economic benefit as well as the benefit to stormwater quality.

Large scale WSUD treatments are prioritised second, as they provide the most economical way of reducing stormwater pollution.

Small scale distributed WSUD treatments are used where neither stormwater harvesting nor large-scale WSUD treatments are available for use. They may also be used to pre-treat areas with high pollutant loads such as shopping strips before further large scale treatment is undertaken downstream. On-lot stormwater treatment will substantially assist Council's objectives. In particular for the "small scale" treatment areas, however it will help everywhere and should be encouraged.

An important note is that alongside construction of stormwater treatment assets, an adequate maintenance program must be implemented. Unless adequate maintenance is undertaken, WSUD assets can quickly fall into disrepair and cease to provide the level of treatment to which they are designed – this may result in the target being missed despite adequate assets being constructed.

Council's stormwater obligations

Councils play a significant role in improving the environmental management of urban stormwater. This includes obligations under the State Environment Protection Policy (Waters of Victoria) to:

» Develop stormwater management plans and implement effective management practices, particularly for new developments and drainage systems

» Prevent waste water discharges to stormwater drains

» Monitor and report to the community and relevant stakeholders on the impact of stormwater drains on surface waters

» Ensure new and retrofit developments include effective design measures and practices to manage stormwater run-off volumes and minimise pollutant run-off in stormwater

» Provide educational material on stormwater management and pollution avoidance

Image: Jones Reserve stormwater runoff pond

03 Implementation of WSUD into all Council capital works projects.

Key action:

Implement water sensitive urban design into all Council capital works projects, specifically:

» **Streetscape upgrades**
» **Open space capital works projects**
» **Shopping strip renewal projects**
» **Drainage upgrade and replacement works**
» **Retrofit projects (Open Space, Streetscape, Buildings etc)**

Benefit: Significant progress towards Targets 1, 2 and 3

Timing: Design and construction undertaken each year

Responsibility for implementation: City Strategy and Design, City Infrastructure, Open Space Maintenance

Water sensitive urban design (WSUD) is an approach to integrate water cycle management into urban planning and design to improve stormwater quality, reduce potable water consumption and improve public amenity at the same time.

WSUD works at all levels. At the lot level, street and precinct levels, as well as regional scales, with the aim of protecting and improving waterway health by mimicking the natural water cycle as closely as possible. As such it is a key component of a becoming a water sensitive city and links closely with Council's Flood Management Plan.

Components of WSUD can include (but are not limited to):

» Rain gardens, rooftop greening and urban forests
» Rainwater tanks – stormwater harvesting and reuse
» Gross pollutant traps, wetlands and sediment ponds
» Grassed or landscaped swales
» Infiltration trenches and bio-retention systems
» Grey water harvesting and reuse
» Tree pits and passive watering
» Porous pavements
» Aquifer recharge and reuse

The benefits of implementing WSUD can be seen across the water cycle including:

» Reduced potable water consumption
» Improved stormwater quality
» Improved urban greenery, tree canaopy and mitigation of the Urban Heat Island Effect

Implementation of WSUD can be undertaken in across Council including:

» Shopping strip renewals
» Streetscape upgrades
» Drainage upgrades / renewals
» Streetscape / landscape works
» Street tree planting
» Capital works building / landscape projects
» Open Space capital works projects such as reserve upgrades / amenity projects
» Retrofit projects such as Open Space, Streetscape, Buildings etc

04 Advocacy of IWCM to and on behalf of the community.

Key action:

- **Advocate to the community for the efficient use of water resources and implementation of IWCM within/by the community**
- **Advocate for Melbourne Water and Yarra Valley Water to implement IWCM when supplying potable and "fit for purpose" water within Moreland and managing the treatment of waste water generated from Moreland**
- **Demonstrate the efficient use of water resources and implementation of integrated water cycle management through the inclusion of WSUD in high profile works such as shopping strip upgrades, and accompanying these projects with interpretive signage**
- **On an as-needs basis write formal letters or take other action on behalf of the community supporting the implementation of IWCM by external state and federal government bodies**

Benefit: Significant progress towards Targets 4, 5, 6 and 7
Timing: Ongoing, as-needs basis
Responsibility for implementation: City Strategy and Design, City Infrastructure

Advocacy to and on the behalf of the community is an essential step towards the engagement of the community in IWCM and moving Moreland towards becoming a water sensitive city. Such advocacy helps to foster the behaviour and infrastructure changes that are required for Moreland to become a water sensitive city.

Advocacy is required in two main areas: to the community and on behalf of the community.

Advocacy to the community is required in order to engage the community on the journey towards becoming a water sensitive city. A water sensitive city requires its citizens to think broadly and smartly about the use of water in their everyday lives. As such Council has a large role to play in assisting the community develop these attitudes.

Advocacy on behalf of the community is required in order to engage other organisations involved in the Moreland water cycle on the journey towards becoming a Water Sensitive City. Such organisations include Melbourne Water and the Water Retailers who can influence and construct the water cycle infrastructure used to supply Moreland's drinking water and dispose of the waste generated from within the Moreland municipality.

Maintaining support and engagement with Moreland's strong "Friends of", Waterwatch and Creek Management Committees community groups, will greatly assist with this target.

Image: Raingarden at Snell Grove, Oak Park

05

All new residential developments of greater than two dwellings and non-residential developments greater than 100m² to incorporate:

» Best practice water efficient fittings, toilets and appliances
» Best practice water reuse and/or recycling
» Best practice stormwater management

Key action:

Support development, adoption and implementation of Amendment C71 Environmentally Sustainable Development (ESD) Policy.

Benefit: Significant progress towards Targets 5, 6 and 7

Timing: Ongoing, as-needs basis

Responsibility for implementation: City Strategy and Design, Planning and Economic Development, City Development

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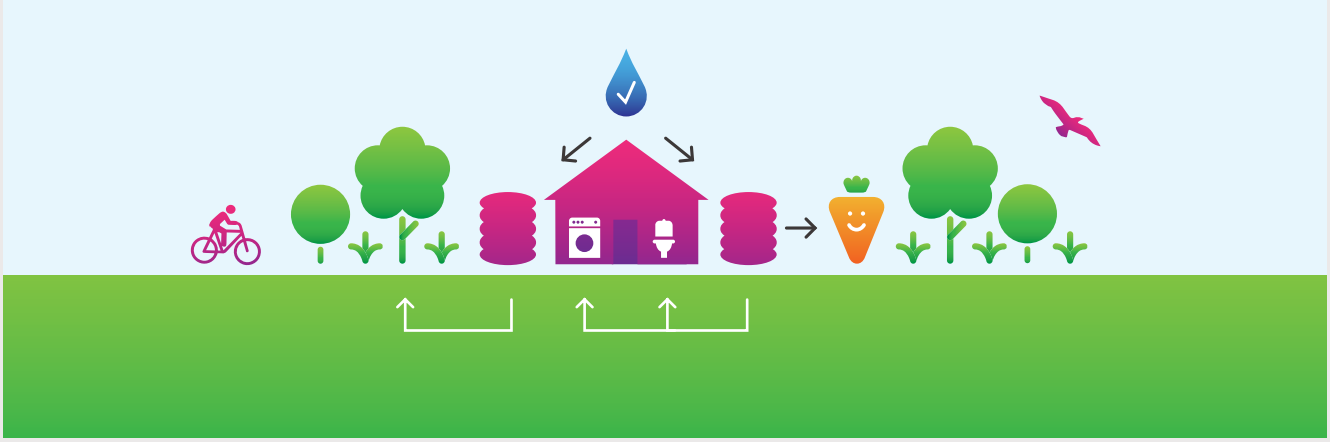
The implementation of Amendment C71 provides a significant opportunity to implement IWCM into all new buildings within Moreland. The ESD policy recognises the importance of considering environmentally sustainable design at the time of planning approval for new development so as to maximise sustainable design outcomes and minimise costs associated with retrofit and poor design.

Council currently supports the development, adoption and implementation of Amendment C71 Environmentally Sustainable Development Policy. The ESD policy provides objectives and planning application requirements for residential developments of two or more dwellings and non-residential developments of more than 100m². Applications will need to respond to design objectives for best practice ESD outcomes including water resources and storm water management.

When enacted the amendment will require:

» Best practice water efficient
» Best practice water reuse and/or recycling
» Best practice stormwater management



Melbourne's water future

Produced by the Office of Living Victoria this strategy aims to implement IWCM across Melbourne. The strategy sets out general IWCM outcomes to aspire towards achieving and a framework of local, regional and metropolitan IWCM plans. This plan takes into account the aims and objectives of Melbourne's Water Future and its targets have been developed to support the goal of achieving IWCM across the Melbourne metropolitan area.

Image: Council staff undergoing maintenance training for the stormwater harvesting system at Sewell Reserve, Fawkner

Council supporting community action

06 Reduce the Moreland Community's total potable water usage by 25% from 2001-02 levels (13.5GL/a) to 10.1GL/a by 2020.

Key action:

Council to partner with community organisations to promote implementation of IWCM within Moreland's community and businesses.

Benefit: significant progress towards Targets 5, 6 and 7
Timing: Pilot program commencing 2014-15. Larger roll out following pilot program results.
Responsibility for implementation: City Strategy and Design

The table below shows potable water consumption within the Moreland municipality.

It is apparent that although there was a significant decrease in total water consumption within Moreland between 2001 and 2007-08, there has since been a rise in consumption between 2007-08 and 2012-13.

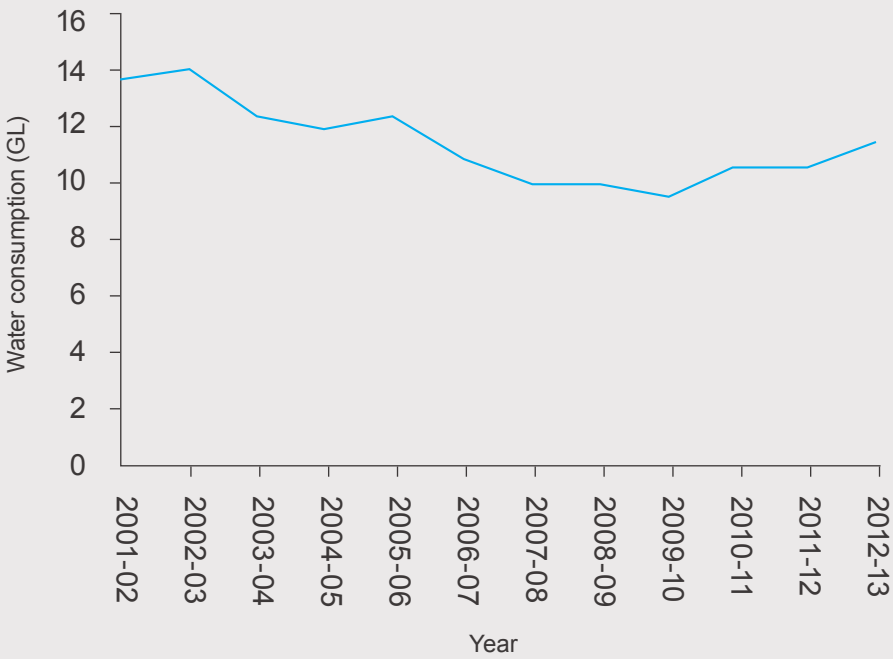
The average water use per property shows that although total water consumption has increased between 2007-08 and 2012-13, average use per property has remained steady. This is likely due to increasing density of dwellings within Moreland during this time.

Council will seek to play a leading role in supporting the implementation of community / household IWCM. Council will aim to partner with community organisations to develop a pilot community scale IWCM project. The pilot will aim to identify ways to implement IWCM within a trial Moreland community, and if successful may be expanded across the entire Moreland municipality.

	2001 baseline	2007-08	2012-13
Residential	10.7GL	8.8GL (-18%)	9.4GL (-12%)
Commercial	2.8GL	1.9GL (-32%)	2.0GL (-29%)
Total	13.5GL	10.7GL (-21%)	11.4GL (-16%)

	2001-02	2007-08	2012-13
Average water use per property per year	190kL	140kL (-26%)	141kL (-26%)

Moreland community water consumption



07 50% of households have an installed rainwater tank by 2020.
25% of households have an on-lot stormwater treatment raingarden or other stormwater treatment mechanism by 2020.

Key action:

Council to partner with community organisations to promote implementation of IWCM within Moreland's community and businesses.

Benefit: significant progress towards Targets 5, 6 and 7
Timing: Pilot program commencing 2014-15. Larger roll out following pilot program results.
Responsibility for implementation: City Strategy and Design

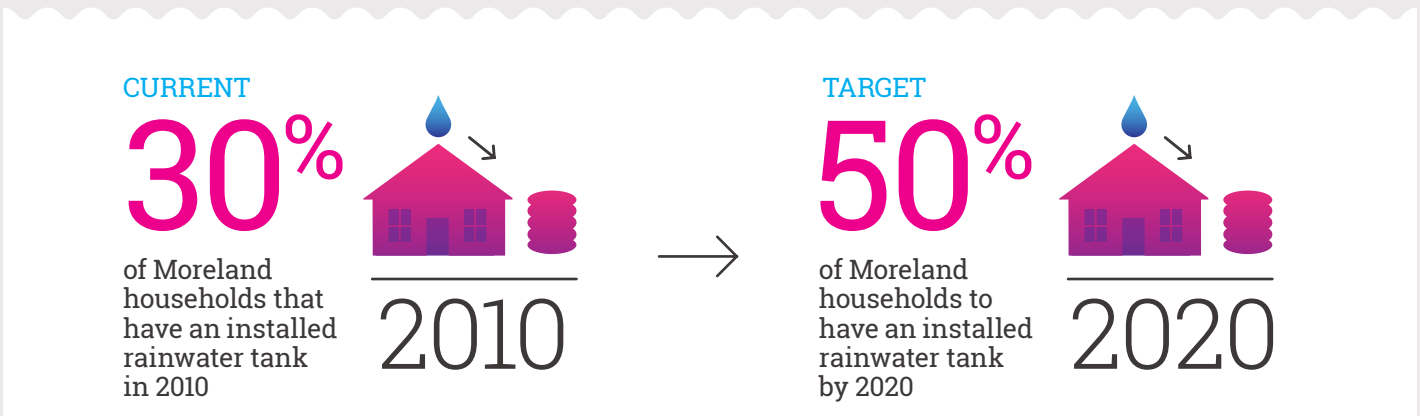
The uptake of IWCM at the household scale is an essential part of Moreland becoming a water sensitive city as it will provide a significant boost to achieving the community potable water reduction target and the stormwater treatment target.

Two key components of IWCM at the household scale are rainwater tanks and on-lot stormwater treatment.

Rainwater tanks can reduce community water consumption and stormwater pollution at the same time through reducing the quantity of stormwater leaving a property. To ensure displacement of potable water year round, a rainwater tank should ideally be installed for internal household uses such as toilet flushing and laundry purposes as well as used for garden watering reducing a household's water consumption by up to 70%. In addition to reducing the consumption of potable water, water sourced from rainwater tanks has a lower carbon footprint, is more sustainable and reduces stormwater pollution.

On-lot stormwater treatment, most commonly in the form of a raingarden, may either be a stand alone treatment or complement an installed rainwater tank. Stormwater treatment measures suitable for use "on-lot" include household raingardens, vegetated swales and downpipe diverters. Such treatments will remove pollutants from the stormwater exiting a property and contribute towards Council's stormwater quality targets.

The 2010 Greenlight Report found that 30% of Moreland households have a rainwater tank. This figure is also supported by Yarra Valley Water data. Target 7 aims to increase the proportion of Moreland households with an installed rainwater tank from 30% up to 50% and for half of the households with a rainwater tank to have an additional stormwater treatment measure.



Counting every drop

monitoring, reporting and data management

Monitoring and data management

Adequate and accurate management of data and information on water consumption, water reuse and recycling and water quality is central to measuring progression towards water the targets.

Council is able to monitor water consumption and water quality through a variety of means and it is important that consistent methods are established so that accurate benchmarking and comparison can occur over the long term. A number of these monitoring and reporting systems were established under Council's Integrated Water Management Plan 2009-10 – 2012-13.

The existing and future data management and reporting actions that will be carried out during the life of this plan are as follows:

1. Continue data management process for potable water use from Yarra Valley Water bills or database that incorporates targets and indicators.
2. Continue updating the monitoring database for water quality improvements based on modelling of Council projects and information submitted in planning applications.
3. Continue monitoring program for WSUD treatment systems to determine effectiveness relative to modelled treatment predictions.
4. Develop a monitoring database to quantify impacts of sustainability initiatives included in developments and measure relative to targets.
5. Install separate metering for large scale water reuse projects.
6. Investigate the installation of sub-metering at aquatic centres.

Review and reporting

Reporting on our progress under this plan is a critical part of our accountability, stakeholder engagement and best practice integration process. It also enables us to review our priorities based on a range of external influences and opportunities as they emerge during implementation. Reporting and review will be underpinned by our monitoring and data management processes and include the following key actions:

1. Annual reporting of our progress towards the Vision and the Targets of the plan to Council.
2. Annual review of the schedule of project priorities, scheduling, partners and delivery capacity.
3. A mid plan review and update completed after three years of implementation.

Image: A household-scale raingarden (Melbourne Water). Image supplied courtesy of Melbourne Water.

Image: Raingarden swale in Snapshot Drive, Coburg North

Moreland City Council

Moreland City Council's
Integrated Water Management Plan
2014 - 2020

Appendix A
Implementation Plan

Overview

The purpose of Appendix A is to define the approach to implementation of the actions set out in Watermap 2020.

Projects and costs are defined including the project's contribution towards delivering the targets and vision for Watermap 2020. The implementation plan will be reviewed annually to ensure the actions and strategies, and their priority for delivery remain correct. The prioritisation of actions will be measured against the criteria outlined below.

Timeframe for implementation

The schedule below provides an overview of the timing for implementation of the key actions and will be updated annually based upon the outcomes from the annual review process.

Action	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Stormwater harvesting	D	C	C	D	C	C
Audit of irrigation infrastructure		P				
Upgrades to irrigation infrastructure			P	P	P	P
Implement building water efficiency program	X	X	X	X	X	X
Implementation of water sensitive urban design program	X	X	X	X	X	X
Advocacy	X	X	X	X	X	X
Amendment C71	X	X	X	X	X	X
Community IWCM program	Pilot	P	P	P	P	P

Key:

C = Construction D = Design X = Action (Design and construction within the same year)
P = Priority for consideration in this year unfunded. Subject to Council business case.

Project prioritisation

The prioritisation of the actions set out in this plan is based on the following criteria:

- » Benefit to the community
- » Contribution to meeting Watermap 2020 targets
- » Capital outlay and return on investment
- » Ability to attract external grant funding
- » Alignment with other Council strategies and priorities
- » Additional benefits provided by the project (e.g. mitigation of Urban Heat Island Effect, increased community amenity)

Cost estimates

The cost estimates provided for implementation have been developed based upon Melbourne Water's WSUD life cycle costing data and previous projects that Council has undertaken.

Melbourne water WSUD life cycle costing data

Asset	Asset Parameters	Planning, Design and Construction costs	Ongoing Maintenance costs
Wetlands	< 500m² 500 to 10,000m² > 10,000m²	$150/m² $100/m² $75/m²	$10/m²/yr $2/m²/yr $0.5/m²/yr
Streetscape raingardens	< 50m² 50 to 250m² > 250m²	$2,000/m² $1,000/m² $500/m²	$30/m²/yr $15/m²/yr $10/m²/yr
Bioretention basins (end-of-line raingardens)	< 100m² 100 to 500m² > 500m²	$1,000/m² $350/m² $250/m²	$5/m²/yr
Tree pits	< 10m² total 10 to 50m² total > 50m² total	$8,000/m² $5,000/m² $1,000/m²	$150/asset/yr

Previous Council projects

Project	Cost	Date	Details
Sewell Reserve stormwater harvesting	$64,485 (design) $518,487 (construction)	2012	5ML/a. Treatment raingarden. Gravity fed from stormwater drain. Above ground tanks.
Charles Mutton Reserve stormwater harvesting	$89,650 (design) $913,868 (construction)	2014	13ML/a. Treatment raingarden. Pump extraction from stormwater drain. Combination of above and below ground tanks
Charles Mutton Reserve raingarden only	~$327,000	2014	25m² above ground raingarden + site costs.

Please note that the projects for which cost estimates have been specified on following pages have only had preliminary feasibility investigations completed. As such the costs estimates are highly uncertain (~ +/- 50%)

Key Action Implementation

Key action:

Construct stormwater harvesting infrastructure supplying 30ML/a of irrigation water by 2020.

Benefits: Target 1.1 = Provides 30ML/a of "fit for purpose" water. When combined with existing projects (Sewell Reserve and Charles Mutton Reserve), this meets Council's 2020 target and equates to saving
of $111,320/a in water charges.

Target 2 = Provides between 9% – 75% progress towards meeting Council's stormwater quality targets.

Timing: three year cycle, year one = design, year two and three = construction

Responsibility for implementation: City Strategy and Design and City Infrastructure

Partners: Community, Sportsclubs, Engineering, Open Space Design and Development, Open Space Maintenance, Melbourne Water, Yarra Valley Water, Office of Living Victoria.

The following three priority projects have been identified: AG Gillon, City Oval and Dunstan Reserve. A preliminary implementation timetable and costings is proposed below to construct two systems:

Action	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Allocated five year budget	$100,000	$350,000	$350,000	$100,000	$350,000	
City Oval	$100,000	$350–$475,000	$350–$475,000			
AG Gillon Oval				$100,000	$350–$475,000	$350–$475,000

Stormwater harvesting project #1: AG Gillon Oval

Supply of 6.1ML/a of "fit for purpose" water for irrigation purposes at AG Gillon Oval and Reaburn Reserve.

Progress towards the 2020 stormwater quality target:
» Stormwater harvesting only = 3.4ha (2% of target)
» Stormwater harvesting + treatment of whole catchment = 37.6ha (22% of target)

Timeframe:
Design 2014-15. Construction 2015-16.

Design and construction cost estimate:
» Stormwater harvesting only = $600,000 – $900,000
» Stormwater harvesting + treatment of whole catchment = $1.2m – $1.8m

Maintenance cost estimate:
$2,000 – $5,000/year

AG Gillon Oval is a class A oval within Moreland with a significant potable water demand and recreation areas.

Image: AG Gillon Oval stormwater harvesting catchment

Stormwater harvesting project #2: City Oval

Supply of 11.2ML/a of "fit for purpose" water for irrigation purposes at City Oval.

Progress towards the 2020 Stormwater Quality target:
» Stormwater harvesting only = 6.8ha (4% of target)
» Stormwater harvesting + treatment of whole catchment = 88ha (52% of target)

Timeframe:
Design 2016-17. Construction 2017-18.

Design and construction cost estimate:
» Stormwater harvesting only = $700,000 – $950,000
» Stormwater harvesting + treatment of whole catchment = $1.2m – $1.8m

Maintenance cost estimate:
$2,000 – $5,000/year

The project has the potential to be expanded to supply the Coburg Activity Centre. Such a project would require collaboration with Yarra Valley Water, Melbourne Water and other stakeholders.

Image: City Oval stormwater harvesting catchment

Stormwater harvesting project #3: Dunstan Reserve (alternate system for construction)

Supply of 8.7ML/a of "fit for purpose" water for irrigation purposes at Dunstan Reserve.

Progress towards the 2020 Stormwater Quality target:
» Stormwater harvesting only = 5.1ha (3% of target)
» Stormwater harvesting + treatment of whole catchment = 652ha (384% of target)

Design and construction cost estimate:
» Stormwater harvesting only = $900,000 – $1,000,000
» Stormwater harvesting + treatment of whole catchment = $1.7m – $2.5m

Maintenance cost estimate:
$2,000 – $5,000/year

The catchment is extremely large, however treating it does have the potential to significantly reduce stormwater pollution loads. Such a project would require collaboration with external stakeholders in order to proceed.

Image: Dunstan Reserve stormwater harvesting catchment

Key action:

Undertake an audit of Council's class A community sportsfields and irrigated parks with irrigation infrastructure older than 10 years, review Council's irrigation control system and implement a program of irrigation upgrade works between 2015 and 2020.

Benefit: Target 1.2 = Upgrading these systems is estimated to reduce irrigation potable water consumption by 12ML/a – 5% of total irrigation demand and equating to $30,360 per year in savings.

Timing: 2015-16 = audit of irrigation systems
Post 2016: Design and construction of seven systems in the 2016–20 period

Responsibility for implementation: City Infrastructure

Partners: Community, Sportsclubs, Engineering, ESD, Open Space Design and Development, Open Space Maintenance

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A preliminary implementation timetable and costings is proposed below:

Action	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Allocated five year budget	$40,000	$40,000	$40,000	$40,000	$40,000	
Review process		$25,000				
Irrigation upgrades			$100,000	$100,000	$100,000	$200,000

Undertake an audit of class A community sportsfields with irrigation infrastructure 10 years or older and develop an implementation timeframe in conjunction with usage patterns and the Open Space Strategy in 2015-16.

Following the audit, undertake design and implementation for four reserves between 2016 and 2020. The average cost of a system upgrade is approximately $100,000.

Four reserves (totalling six grounds) have been identified as an class A community sportsfield with irrigation systems greater than 10 years old.

Upgrading these systems is estimated to reduce irrigation potable water consumption by 12ML/a, a reduction of approximately 5% of total irrigation demand and equating to $30,360 per year in savings.

The above program of works is not funded. A 2015-16 business case to undertake the audit is to be considered by Council, with business cases for system upgrades to be proposed in 2016-17 and beyond.

A reserves

AG Gillon
City Oval
Dunstan Reserve North (class A) and South (B class)
Hosken Reserve North (B class) and South (class A)

B reserves

Charles Mutton Reserve West
Hollbrook Reserve
JP Fawkner West
Oak Park Reserve East and West
Parker Reserve
Rayner Reserve
Reddish Reserve
Wallace Reserve North and South

Key action:

Continue to implement the Council building water efficiency program every year between 2014 and 2020.

Benefit: Target 1.3 = Upgrading the buildings listed below will achieve the target of all Council facilities having best practice fittings, fixtures and appliances, and rainwater tanks installed where possible.

Timing: Design and construction undertaken within each financial year

Responsibility for implementation: City Strategy and Design

Partners: Community, Sportsclubs, City Infrastructure, Open Space Maintenance

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Council's building water efficiency program aims for all of Council's buildings to have best practice water efficient fixtures, fittings and appliances. The program has been run since 2009. An implementation program for the continuation of the water efficiency program is outlined

Action	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Allocated five year budget	$50,000	$50,000	$50,000	$50,000	$50,000	
Implementation of building water efficiency program	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000

Priority buildings identified for water efficiency works include:

- Coburg Civic Centre, Coburg
- Council Operations Centre, Hadfield
- Moreland Community Child Care Coop, Brunswick
- Coburg Senior Citizens Club, Coburg
- Mechanics Institute, Brunswick
- Senior Citizens Club, West Brunswick
- Dunstan Reserve Pavilion
- HE Kane Kindergarten and Maternal Child Health Centre, Hadfield
- Fleming Park Hall, East Brunswick
- Oak Park Hall, Oak Park
- West Brunswick Maternal and Child Health Centre, West Brunswick
- Clarrie Wohlers Senior Citizens Club, Brunswick
- Bain Reserve Pavilion, Merlynston
- Hadfield Hall, Hadfield
- Jessie Morris Hall, Pascoe Vale
- Gillon Oval Pavillion, Brunswick

Individual buildings for each financial year will be selected in line with the building operation

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Key action:

Implement large scale stormwater treatment and water sensitive urban design across all Council operations to treat 11% (170ha) of Moreland's stormwater catchments to best practice by 2020.

Benefit: Target 1 = Implementation of the identified projects will reduce potable water use through stormwater harvesting (see key action: stormwater harvesting)

Target 2 = Implementation of the identified projects will achieve the Target 2 stormwater quality targets for 2020

Target 3 = The proposed projects are forms of WSUD and make progress towards the implementation of WSUD into all Council capital works projects

Timing: Design and construction undertaken each year

Responsibility for implementation: City Strategy and Design, City Infrastructure, Open Space Design and Development

Partners: Community, Sportsclubs, Engineering, Open Space Maintenance, Melbourne Water, Yarra Valley Water, Office of Living Victoria

In order to meet the stormwater quality target for 2020, a number of large-scale stormwater treatment measures have been identified. The treatment measures consist of large scale biofiltration (raingarden) systems and a constructed wetland system. Combined these treatments will provide the stormwater treatment necessary in order to meet the 2020 targets:

	Area treated (ha)	TSS (t)	TN (kg)	TP (kg)	% progress towards targets	Design and construction cost estimate	Maintenance cost estimate
AG Gillon expanded stormwater harvesting system	37.6	21.0	165.0	12.0	22%	~$500,000 in addition to SWH only cost	
Edgars creek confluence wetland	17.4	9.7	76.3	14.3	10%	~$750,000	$2,000/yr
City Oval expanded stormwater harvesting system	88	43.1	337.8	63.5	52%	~$500,000 in addition to SWH only cost	
Glenlyon raingarden	13	7.3	57.0	10.7	8%	$200–$500,000	$650/yr

Partnership projects with Melbourne Water, Yarra Valley Water and Living Victoria Fund are to be explored where possible to assist with the delivery of this program of works.

Based upon these projects a capital works program of large-scale end-of-line stormwater treatment measures has been proposed.

Action	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Allocated five year budget	$220,000	$750,000	$250,000	$250,000	$250,000	
Glenlyon raingarden	$220,000					
Edgars creek confluence wetland		$750,000				
City Oval – expanded stormwater harvesting system			$250,000	$250,000		
AG Gillon Oval					$500,000	

Construction of these large scale WSUD assets also has an associated annual maintenance cost with them. Melbourne Water estimates the annual maintenance costs to be:

» Large-scale raingardens: $2,000 (raingarden only) – $5,000 (stormwater harvesting system) per asset per year (based upon an average 400m² raingarden)

Currently these costs are being absorbed within the existing maintenance budgets, however as more WSUD assets are constructed and become Council's maintenance responsibility additional maintenance funding will be required.

Stormwater quality treatment project #1: Edgars Creek Confluence Wetland Stormwater Treatment System

Treated catchment size: 17.4 ha

Treatment measure: single large end-of-line wetland treatment system

Progress towards the stormwater treatment target: 10%

Design and Construction Cost Estimate: $500,000 – $700,000

Maintenance Cost Estimate: $2,000/year

Located at the Edgars Creek and Merri Creek confluence this wetland will provide significant amenity and improving wildlife habitat whilst also providing significant stormwater quality benefits.

Image: Edgar's Creek confluence wetland stormwater catchment

Stormwater quality treatment project #2: Glenlyon Road Catchment End-of-line Treatment System

Treated catchment size: 13ha

Treatment measure: single large end-of-line bioretention system (approx 170m² in size)

Progress towards the stormwater treatment target: 8%

Design and Construction Cost Estimate: $300,000 – $500,000

Maintenance Cost Estimate: $650/year

This end-of-line bioretention / raingarden system will intercept and treat the currently untreated Council stormwater drain running down Glenlyon Road before it reaches Merri Creek.

Image: Glenlyon Road stormwater catchment

Key action:

Implement water sensitive urban design into all Council capital works projects and operations where possible, specifically:

» **Streetscape upgrades**
» **Open space capital works projects**
» **Shopping strip renewal projects**
» **Drainage upgrade and replacement works**
» **Retrofit projects (Open Space, Streetscape, Buildings etc)**

Benefit: Target 1 = Implementation of the identified projects will reduce potable water use through stormwater harvesting (see key action: stormwater harvesting)

Target 2 = Implementation of the identified projects will achieve the Target 2 stormwater quality targets for 2020

Target 3 = The proposed projects are forms of WSUD and make progress towards the implementation of WSUD into all Council capital works projects

Timing: Design and construction undertaken each year

Responsibility for implementation: City Strategy and Design, City Infrastructure, Open Space Design and Development

Partners: Community, Sportsclubs, Engineering, Open Space Maintenance, Melbourne Water, Yarra Valley Water, Office of Living Victoria

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Implementation of WSUD across Council operations is most cost effective when undertaken alongside other scheduled works. Works suitable to having WSUD included in them include:

» Shopping strip renewals

» Streetscape upgrades

» Tree planting

» Stormwater drainage upgrades / replacement works

» Open space works

Previous Council projects have estimated that the additional cost to the above projects is approximately $2,000 per raingarden and $1,000 per tree pit – usually resulting in a $5,000 to $10,000 increase in the overall capital costs.

Potential projects for inclusion of WSUD average five per year, resulting in an average $35,000 cost to Council.

Specific projects within each of these areas will be identified during the capital works program planning each year with the appropriate budget increases requiring budgeting for when project mandates and business cases are made.

Construction of WSUD assets also has an associated annual maintenance cost with them. Melbourne Water estimates the annual maintenance costs to be:

» Streetscape raingardens: $150 per asset per year (based upon an average 5m² raingarden)

» Tree pits: $150 per asset per year

Currently these costs are being absorbed within the existing maintenance budgets, however as more WSUD assets are constructed and become Council's maintenance responsibility (for example the 48 streetscape raingardens at the Coburg Hill development) additional maintenance funding will be required.

Key action:

Advocacy and demonstration:

» **Advocate** to the community for the efficient use of water resources and implementation of integrated water cycle management within/by the community

» **Advocate** for Melbourne Water and Yarra Valley Water to implement whole of water cycle management when supplying potable and "fit for purpose" water within the Moreland municipality and managing the treatment of waste water generated from the Moreland municipality

» **Demonstrate** the efficient use of water resources and implementation of whole of water cycle management through the inclusion of WSUD in high profile works, shopping strip upgrades and drainage upgrades, and to be accompanied with interpretive signage

» On an as-needs basis write formal letters or take other action on behalf of the community **advocating** for the implementation of IWCM by external state and federal government bodies

Benefit: The identified advocacy and demonstration actions will achieve Target 4 (advocacy of IWCM to and on behalf of the community) and support adoption of Amendment C71 (Target 5), reducing the Moreland Community's total potable water usage (Target 6), and uptake of rainwater tanks and on-lot stormwater treatment mechanisms by the community (Target 7)

Timing: Ongoing, as-needs basis

Responsibility for implementation: City Strategy and Design, City Infrastructure

Partners: Community, Communications, Engineering, Melbourne Water, Yarra Valley Water, Office of Living Victoria

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Advocacy of IWCM is a high impact yet low cost action that Council can undertake to support the broader implementation of Watermap 2020. Methods for advocacy include:

» Educational material provided to the community on the benefits of IWCM and why Council is striving to become a water sensitive city

» Council and Council Officers advocating to external stakeholders for the adoption of IWCM by external organisations

» Council writing formal letters supporting the adoption of IWCM by external stakeholders

» The implementation of interpretive signage at Council WSUD projects educating the community on the benefits of IWCM and why Council is striving to become a water sensitive city

» Partner with existing community groups such as the "Friends of", Waterwatch and Creek Management Committees

The costs of these actions are all low, however they can assist in creating large-scale change.

Key action:

Support development, adoption and implementation of Amendment C71 Environmentally Efficient Design.

Benefit: Implementation of Amendment C71 will see best practice water efficiency, water reuse/recycling and stormwater management required for all new residential developments of greater than two dwellings or mixed-use and non-residential developments greater than 100m². This will result in reduced stormwater pollution from within the Moreland municipality (progress towards Target 2), reduced community potable water consumption per dwelling (progress towards Target 6) and increase the number of rainwater tanks and on-lot stormwater treatment measures implemented within the community (Target 7), whilst achieving Target 5.

Timing: Ongoing, as-needs basis

Responsibility for implementation: City Strategy and Design, Planning and Economic Development

Partners: Community, Planning, Melbourne Water, Yarra Valley Water

Adoption and implementation of Amendment C71 by Council will require all new residential developments of greater than two dwellings or mixed-use and non-residential developments greater than 100m² to incorporate:

» Best practice water efficient fittings, toilets and appliances

» Best practice water reuse and/or recycling

» Best practice stormwater management

As detailed above these changes will make significant progress towards achieving IWCM on the dwelling scale. The actions required by Council for the realisation of Amendment include:

» Implementation of the amendment following adoption by Council and the Minister for Planning.

At this stage costs for 2014-15 are to be absorbed within existing budget, with a business case for additional resourcing for 2015-16 to be considered by Council.

Key action:

Council to partner with community organisations to promote implementation of IWCM within the Moreland community.

Benefit: The pilot program will directly target households within Moreland to implement IWCM. The program will make implementation of best practice IWCM more accessible and achievable for households, directly supporting achieving Target 5, Target 6 (reducing Community potable water usage) and Target 7 (uptake of rainwater tanks and on-lot stormwater treatment mechanisms by the community)

Timing: Pilot program commencing 2014-15. Larger roll out following pilot program results

Responsibility for implementation: City Strategy and Design

Partners: Community, Moreland Energy Foundation Limited (MEFL), Communications, Engineering, Melbourne Water, Yarra Valley Water, Office of Living Victoria

Council is supporting the Moreland Energy Foundation Limited's (MEFL) Living Victoria fund application for 2014-15. The application is to fund the design and implementation of a community / household scale IWCM pilot project.

The pilot project will look to identify the most appropriate methods to implement IWCM within the community at the household scale. Examples of household scale measures to investigate include water efficient shower heads, flow restrictors, rainwater tanks and downpipe diverters. The pilot will investigate potential methods to increase the uptake of IWCM by households. Methods for investigation may include a referral program (similar to Positive Charge), a bulk purchasing and/or financial incentives.

A monitoring and review process will be undertaken at the conclusion of the pilot project assessing the project's successes and short-comings, and if found to be feasible, propose methods to roll out a large scale version of the program.

The cost of the pilot program to Council will be $10,000 in the 2014-15 year to be absorbed within existing ESD budgets. Funding requirements and sources for future years will be identified during the pilot program however is estimated to be $50,000 / year.

Moreland language link

有關摩爾蘭德市政廳的詳情請致電	9280 1910
Per informazioni sul Comune di Moreland telefonare a	9280 1911
Για πληροφορίες σχετικά με το Δήμο Moreland τηλεφωνήστε στο	9280 1912
للحصول على معلومات عن بلدية مورلاند اتصلوا على الرقم	9280 1913
Moreland Belediyesi hakkında bilgi almak için aranabilecek telefon	9280 1914
Nếu muốn biết thêm chi tiết về Hội đồng Thành phố Moreland, xin quý vị gọi số	9280 1915
मोरलैंड सिटी काउंसिल के बारे में जानकारी प्राप्त करने के लिए फोन करें	9280 1918
要进一步了解Moreland市政府的信息，请拨打	9280 0750
ਮੋਰਲੈਂਡ ਸਿਟੀ ਕੌਂਸਲ ਬਾਰੇ ਵਧੇਰੀ ਜਾਣਕਾਰੀ ਲਈ ਕ੍ਰਿਪਾ ਕਰਕੇ ਫੋਨ ਕਰੋ	9280 0751

All other languages including

ગુજરાતી	සිංහල
Croatian	Español
Tagalog	ትግርኛ
Indonesia	اردو
Polski	9280 1919

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Moreland City Council

Moreland City Council's Integrated Water Management Plan **2014 - 2020**

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