



MARRICKVILLE  
council

# WATEREVOLUTION

Funded by the Marrickville community through the Stormwater Charge

## Marrickville Council - Waterevolution Tennyson Street Subcatchment Management Plan 2009



*“Tennyson Street Subcatchment  
is a model of sustainable urban  
water management and the  
Cooks River is our pride and joy”*

Tennyson Street Community Water Vision 2050	1
1. Planning the Tennyson Street Subcatchment	2
1.1 Background to subcatchment planning	2
Collaborative and integrated planning approach	2
1.2 How we planned Tennyson Street Subcatchment	3
Collaborative planning	3
2. About the Tennyson Street subcatchment	6
3. Tennyson Street Subcatchment 2050 Vision, Goals, and Action Plan	18
4. Tennyson Street Masterplan Options for On-ground Works	28
5. References	30

Front cover: Historical photo from Robert Hutchinson Collection  
© COPYRIGHT Marrickville Council 2009. All Rights Reserved.

DISCLAIMER The Tennyson Street Subcatchment Management Plan has been compiled from various sources and the publisher and/or contributors accept no responsibility for any injury, loss or damage arising from its use or errors or omissions therein.

# Tennyson Street Subcatchment Vision 2050

*Tennyson Street Subcatchment is a model of sustainable urban water management and the Cooks River is our pride and joy.*

*Significant investment started in 2008. Action started in our subcatchment to reach our vision. Since then, people have worked together with a shared understanding of the way our catchment and community works so everyone (businesses, schools, residents) understands the vision for the Tennyson Street Subcatchment water cycle. Our vision has evolved to match community needs and values. Marrickville Council has fulfilled its commitment to being an inner city centrepiece of ecologically sustainable development and governments have actively managed catchments sustainably so that now...*

**Our people** are comfortable, secure and healthy because we plan and make decisions together, sharing our knowledge and ideas. Our people value water and have affordable, locally generated resources.

**Our buildings, homes, schools and businesses** are self-sufficient because they are designed to meet cooperatively developed building sustainability standards. We can see sustainable technology and practices everywhere we look. Water is a valued resource.

**Our catchment** integrates (natural) water systems, energy and transport networks. Watercourses are reinstated and visible. The GreenWay and the Cooks River are widely used to move around and are a key part of a number of shared spaces for people, plants and animals. Our green networks support self sufficiency. Water systems in our area are designed to suit their locations and use.

We can swim and fish in **Our River** that is alive with wildlife. When you stand on the banks of the Cooks River on a summer's afternoon, everything shines.



The Tennyson Street Subcatchment, Dulwich Hill.



Volunteers at the Hill Street Rain Gardens planting day, November 2007.



# 1. Planning the Tennyson Street Subcatchment

## 1.1 Background to subcatchment planning

The *Waterevolution Subcatchment Planning* program is funded by the Marrickville Stormwater Management Service Charge. It aims to collaboratively plan each of the 22 subcatchments found in the Marrickville local government area in order to manage water sustainably in this highly urbanised environment.

### Collaborative and integrated planning approach

The *Waterevolution* approach to water management by Marrickville Council has resulted from the *Urban Stormwater Integrated Management* (USWIM) joint research project of Monash University and Marrickville Council.

Beginning in 2002, the USWIM project worked closely with the community and government stakeholders to integrate water management approaches in Marrickville. This means incorporating Water Sensitive Urban Design (WSUD), stormwater and rainwater harvesting, and addressing management of water quality, conservation and volume. The project trialled a new 'collaborative' planning process (Brown, 2003) that:

1. *Focuses on subcatchments* as appropriately sized areas for planning for integrated sustainable urban water management
2. *Carries out detailed social, biophysical and organisational studies* to have a good understanding of the subcatchment characteristics and the planning context
3. *Includes people from a range of disciplines* in identifying problems and solutions - engineers, social planners, environmental scientists, educators, parks and recreation managers
4. *Involves a wide spectrum of stakeholders* including residents, businesses and other government agencies to come up with visions and plans and help to implement them.

The resulting plans are designed to allow 'adaptive management' so are flexible enough to include new information, practices and technologies as they arise. Importantly, by working with citizens and businesses, this approach encourages planning in the private domain and builds Council and community relationships, recognising that sustainability is a whole of community issue that government cannot address alone. It is beyond Council's capacity to achieve all that is required for sustainable urban water management.

In 2003, Council joined with the Illawarra Road Subcatchment community in Marrickville South and other stakeholders and created Marrickville's first subcatchment management plan in 2006. Council began working in the Tennyson Street Subcatchment in Dulwich Hill in 2008. The subcatchment plans will be reviewed annually to track progress and will have a major review every five years by Council and subcatchment stakeholders, including the subcatchment working groups.

## The Waterevolution

The aim of the *Waterevolution* is to work across the local government area (LGA), in both the public and private domain, to implement sustainable urban water management. To achieve this aim, Council is using a multidisciplinary approach, working collaboratively with the people of Marrickville to achieve the following objectives of Stormwater Management:

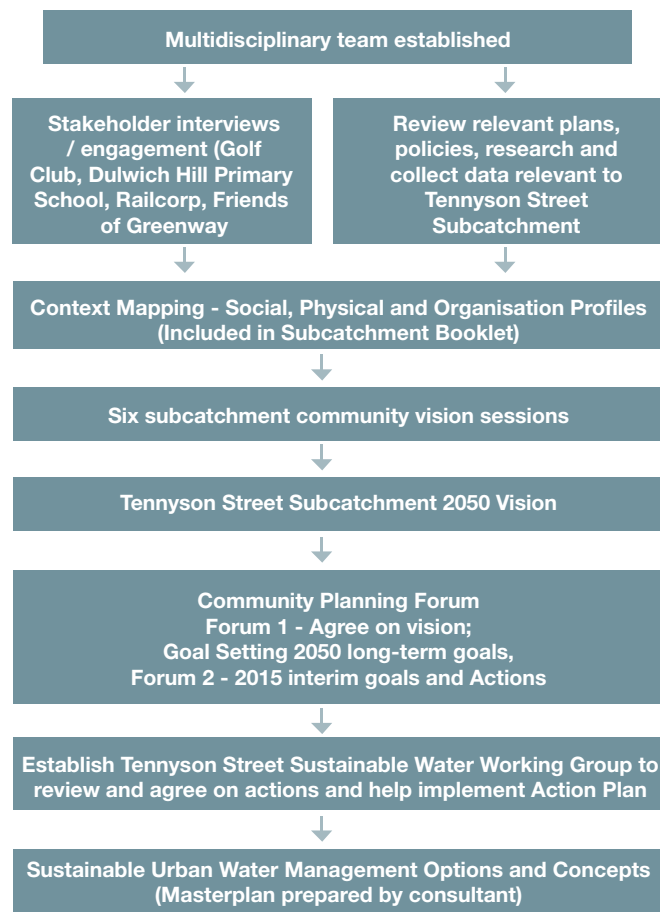
1. Apply the best practice governance to:
  - a. work with the people who live and work in the subcatchments;
  - b. build the organisational capacity, e.g. skill development, data collection and sharing, evaluation and learning;
  - c. integrate projects and planning in order to achieve value for money; and
  - d. communicate progress and results to internal and external stakeholders.
2. Apply the principles of sustainable water management to:
  - a. improve the quality of stormwater entering receiving waters;
  - b. reduce the quantity of stormwater entering receiving waters;
  - c. mitigate flooding; and
  - d. use water in fit-for-purpose applications, e.g. irrigation.

*(From Stormwater Management Service Charge Management Framework, 2008b)*

## 1.2 How we planned Tennyson Street Subcatchment

### Collaborative planning

The goal of collaboration is to partner with the community and other stakeholders in each aspect of decision making, including developing alternatives and identifying preferred solutions. It means actively seeking direct advice and innovation in finding solutions and using the advice and recommendations into the decisions to the maximum extent possible (from IAP2, 2004).



The collaborative planning process in Tennyson Street Subcatchment (Adapted from Equatica, 2009).

The collaborative planning process (shown left) has produced the Tennyson Street Subcatchment Management Plan that includes the subcatchment planning context (social, biophysical, organisational), long-term vision and goals and the actions to achieve the goals.

#### *Multidisciplinary team*

The multidisciplinary team of Council staff and consultants mainly included engineers, environmental managers, and social scientists with planners and asset managers involved as required.

#### *Context mapping*

*Waterevolution Subcatchment Planning* is an integrated approach where the plans are tailor-made to suit local conditions. For sustainable water management to be a reality, it is necessary to understand the context of the subcatchment and its community (Brown, 2003; Marsalek, et al 2001).

Context mapping provides all participants with the broad spectrum of relevant information about the subcatchment. It captures the way the subcatchment 'looks' to the local community and sustainable water management team at the time of planning. For Tennyson Street Subcatchment, the team looked at the subcatchment history, determined the current social, water and other biophysical contexts, as well as the organisations and policies influencing decision making in this area.

With the planning team and subcatchment planning participants having a good common understanding of this context, an environment was created for effective communication and decision making between technical and non-technical people, and all the other participants in the planning process.

#### *Stakeholder engagement*

Consultants and staff identified the major land managers, water users and decision-makers to discuss their participation in the planning and possibilities for works and non-structural initiatives. In the Tennyson Street Subcatchment, the Marrickville Golf Club, Dulwich Hill Public School, RailCorp, and the Friends of the GreenWay were involved.

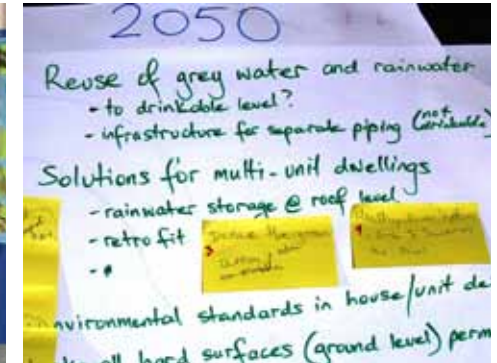
*Community vision sessions*

All citizens and businesses in Tennyson Street Subcatchment were invited to attend visioning sessions in June and July 2008. All participants were provided with the *Planning the Tennyson Street Subcatchment* booklet (Marrickville Council, 2008a) to ensure all participants had a common understanding of the planning area.

The *Tennyson Street Subcatchment 2050 Vision* is the result of the ideas contributed at six vision sessions held with citizens and businesses. Over 40 people took part including separate sessions with Greek residents, and young people. Local businesses were represented through the Dulwich Hill Main Street Committee. The vision represents community desires, and forms the main reference point for subcatchment planning.



**Left: Tennyson Street Subcatchment community vision session July 2008.**



**Right: Key words and concepts for 2050 from one vision session.**



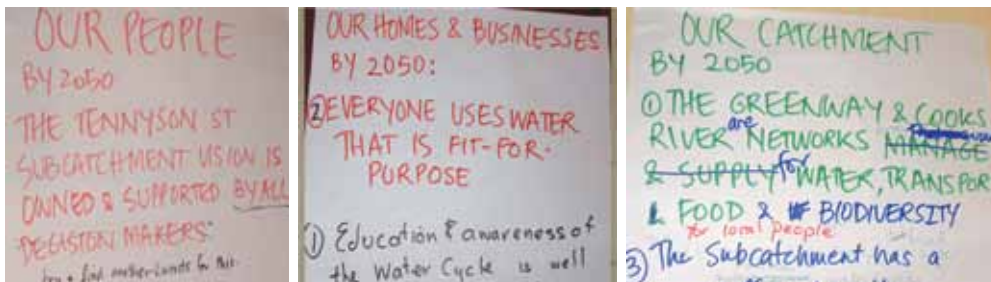
**Tennyson Street Subcatchment Planning Forum August 2008.**

*Planning Forum*

The community vision formed the basis of the Tennyson Street Subcatchment Planning Forum held over two evenings in August 2008. The Planning Forum comprised two parts – goal setting and action planning. The forum process provided the opportunity for collaborative development of specific goals to achieve the community vision, as well as potential actions.

*Tennyson Street Subcatchment Working Group*

Following the vision sessions and forum, a subcatchment working group of community representatives was established to refine and implement the actions. This Subcatchment Management Plan for Tennyson Street was finalised in collaboration with the working group.



**Forum participants came up with draft goals for 2050 and 2018.**

The visioning and planning sessions also gave insight into community receptivity to water reuse and treatment techniques, and raised awareness about sustainable water management. The combining of information compiled during context mapping with local knowledge of water issues, gave a broader understanding of the solutions that will be most appropriate for the community, environment and economy of the subcatchment.



## 2. About the Tennyson Street Subcatchment

Tennyson Street Subcatchment is located in the western part of Marrickville local government area, as shown in the map, and drains to the Cooks River with a 200-metre boundary on the river. It is approximately 70 hectares in area and is predominantly residential (38 ha).

The Tennyson Street Subcatchment has a population around 3,800, just over 5% of Marrickville's estimated population of 75,500 (ABS, 2006).

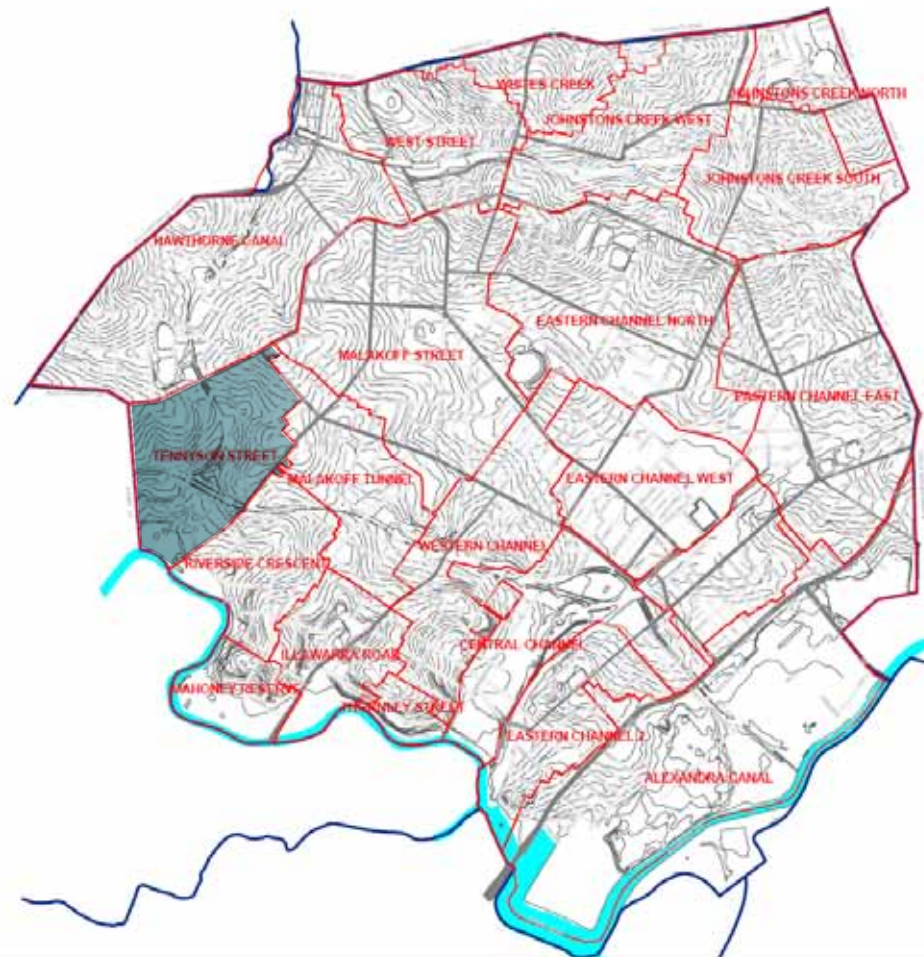
### The GreenWay

The Rozelle goods line is a key stormwater drainage feature and is also the subject of a proposal to create a "GreenWay" – a shared transport and biodiversity corridor – now that it is no longer needed for goods transport.



The Cooks River to GreenWay corridor stretches from the Cooks River near Wardell Road, Earlowood, then northwards for about 5km to Iron Cove at Leichardt.

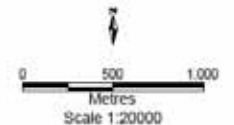
The GreenWay project has the potential to link key elements of the catchment including the local public school, the river, transport hubs such as the railway station and New Canterbury Road, and the different residential areas (see [www.greenway.org.au](http://www.greenway.org.au)).



Subcatchments in Marrickville LGA with Tennyson Street highlighted.



Subcatchments  
in Marrickville LGA



Projection: Map Grid of Australia  
Datum: GDA 94

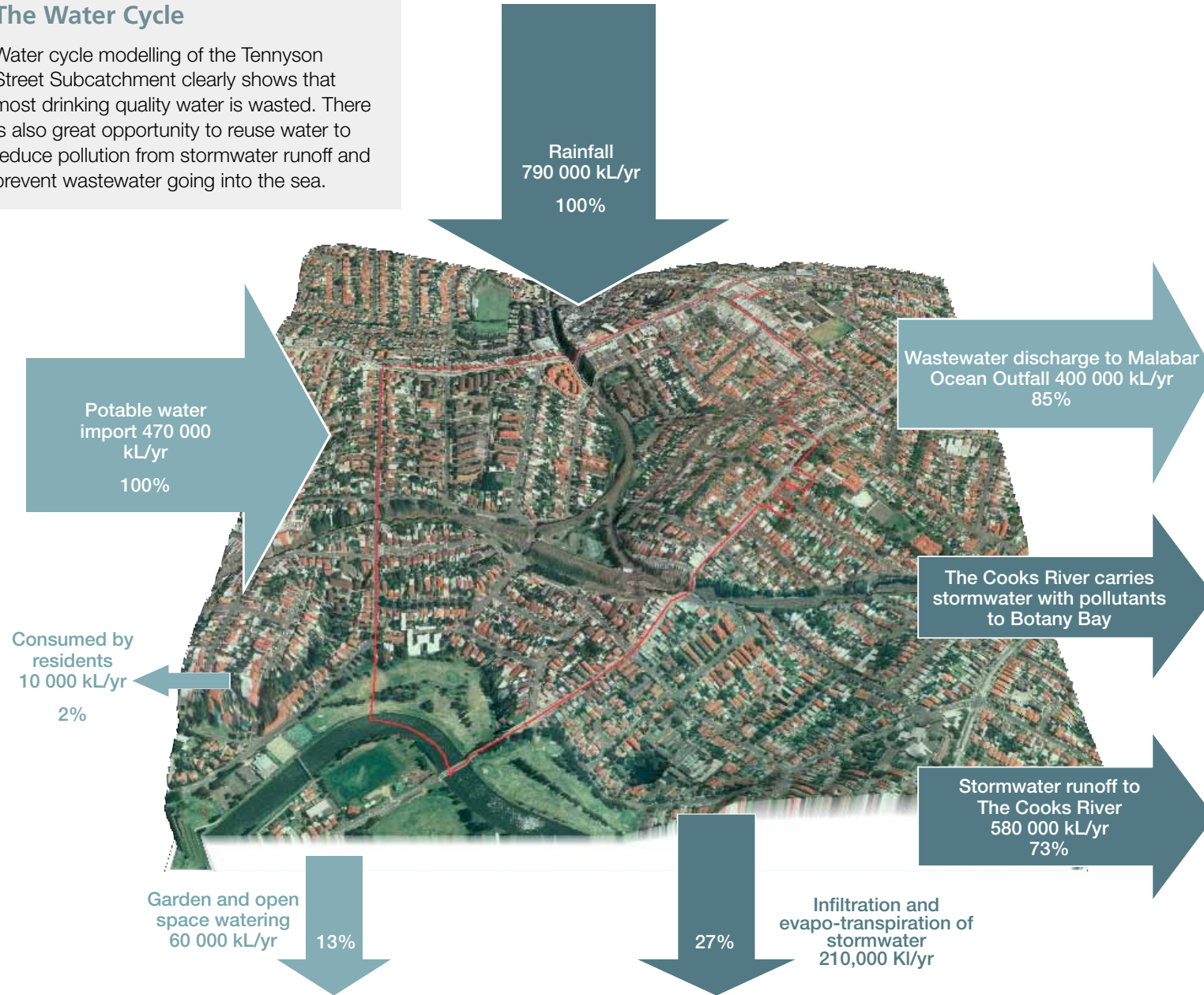
PRODUCTION DATE  
03/03/2009

- LEGEND**
- CATCHMENT BOUNDARY
  - CONTOURS 5m INTERVALS
  - MARRICKVILLE LGA BOUNDARY
  - MAJOR ROADS
  - ROADS
  - RIVER

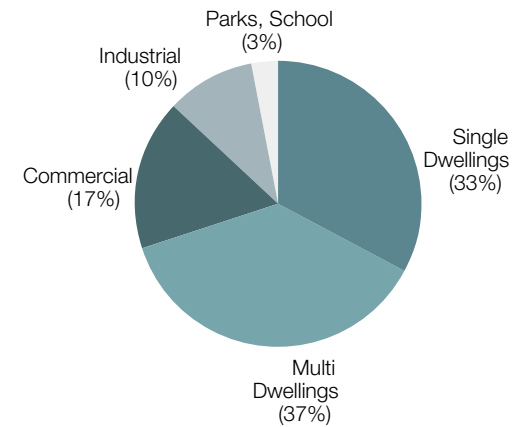
# Tennyson Street Subcatchment Water Cycle

## The Water Cycle

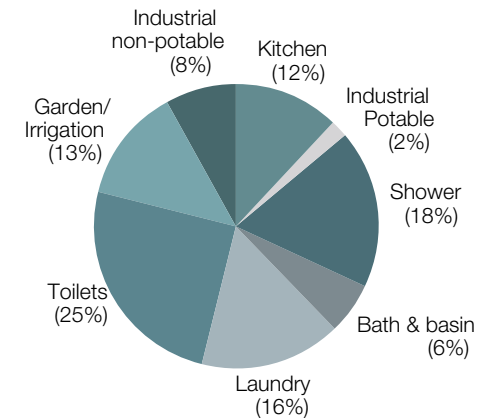
Water cycle modelling of the Tennyson Street Subcatchment clearly shows that most drinking quality water is wasted. There is also great opportunity to reuse water to reduce pollution from stormwater runoff and prevent wastewater going into the sea.



## Consumption by Sector

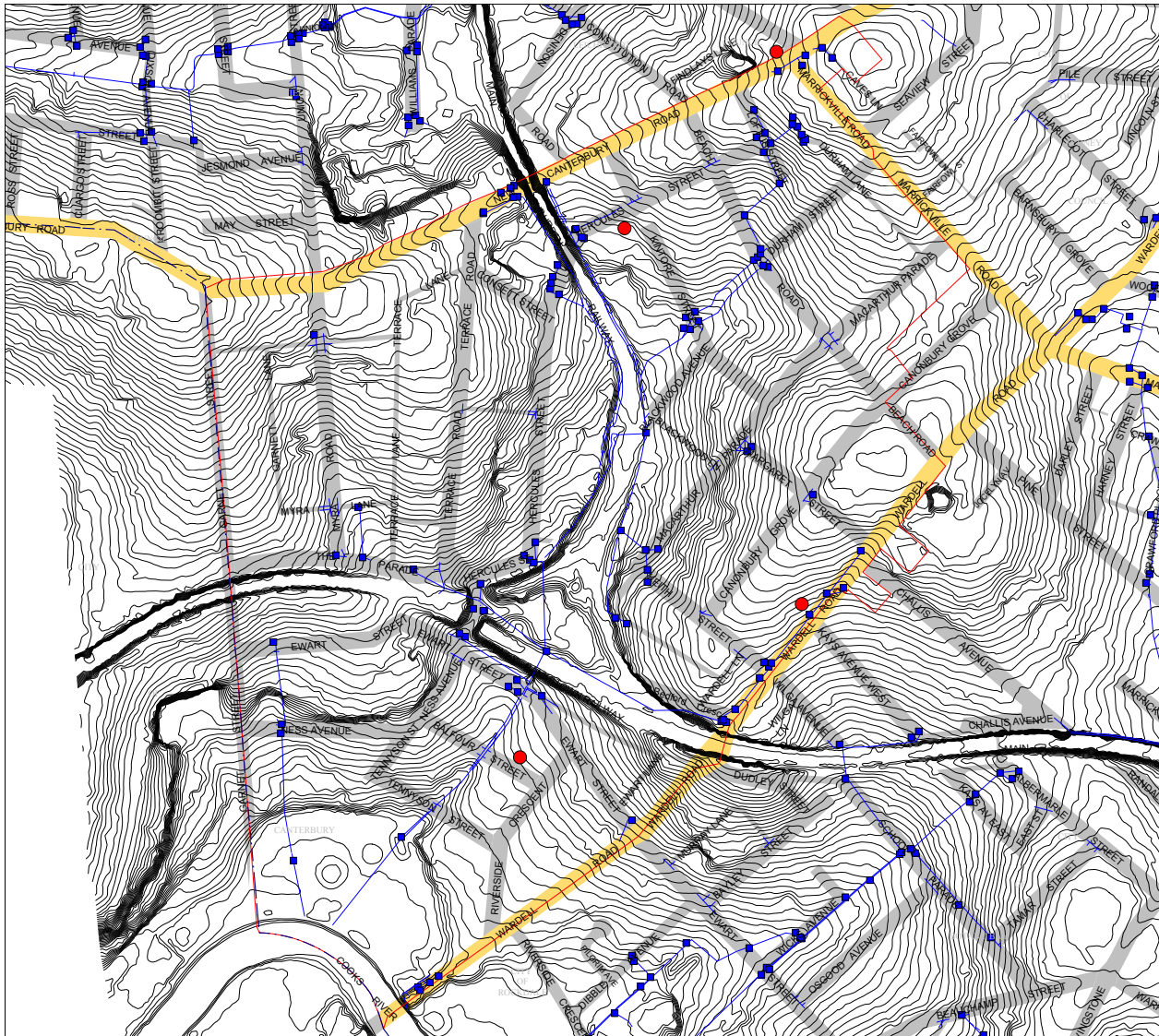


## End Use Consumption



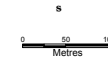


# Contour Map of Tennyson Street Subcatchment



The contour map clearly shows the gradient of the valley and how the rail corridor trisects the subcatchment. Locations of gross pollutant traps (GPTs) and the stormwater drainage pits and pipes are also shown.

- Drainage Pits
- Drainage Pipes
- Contour Line
- Tennyson Street Subcatchment Boundary
- Marrickville LGA Boundary
- Major Roads



Localised flooding in Hercules Street after downpour in September 2008.



## Residential Dwelling Types

Subcatchment Size – 71.5 Hectares  
Number of residential dwellings – 1520



34%  
Separate houses



29%  
3 storey block – flat, unit, apartment



27%  
1 or 2 storey block – flat, unit, apartment



5%  
1 storey semi, row, or terrace house



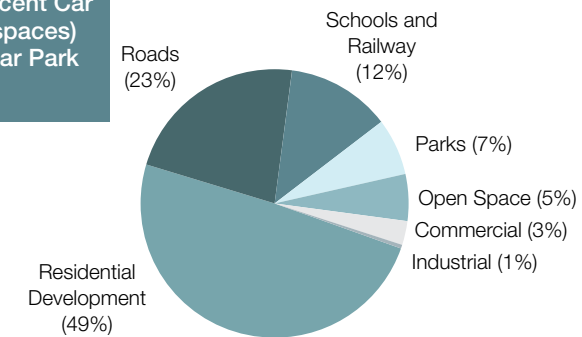
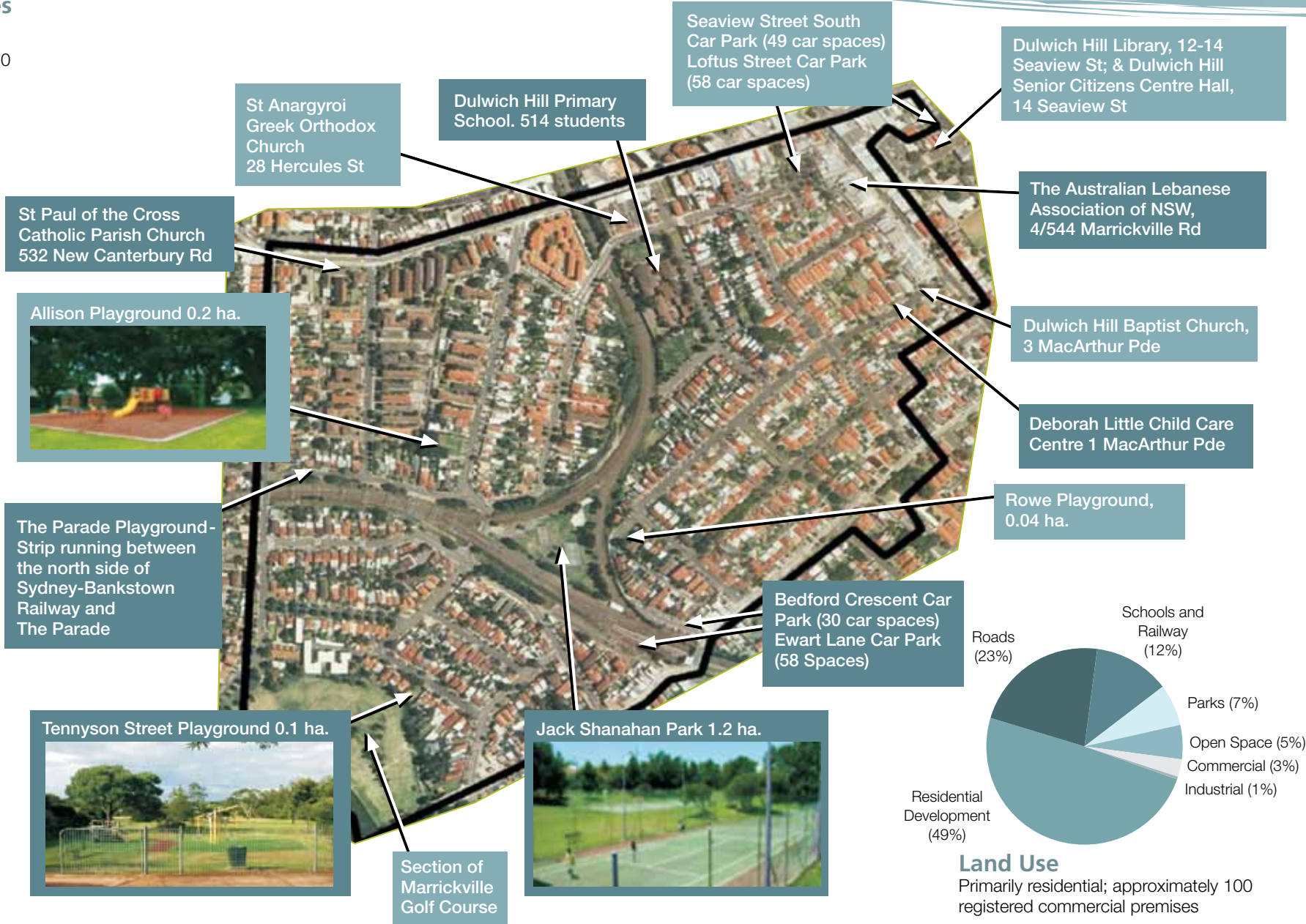
3%  
House or flat attached to shop



2%  
2 storey semi, row, or terrace house



1%  
4 storey block – flat, unit, apartment



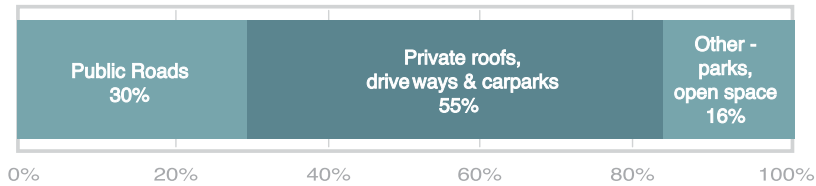
### Land Use

Primarily residential; approximately 100 registered commercial premises

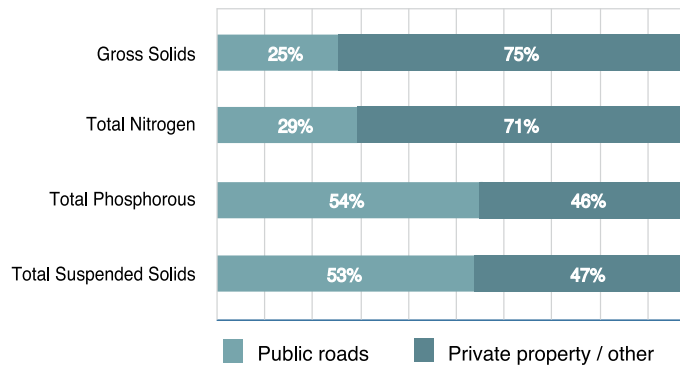
# Pollutants and Hard Surfaces

Approximately 70% of the catchment is impervious, reflecting the high density residential character of the subcatchment. Public roads, roofs, driveways and car parks make up about 85% of the impervious area.

**% Impervious Areas**



Water quality modelling determines the relative pollutant contributions from the subcatchment based on a breakdown of the impervious area.



**Cleaning out the CDS unit in Balfour Street that traps some gross pollutants heading for the Cooks River.**



**Hard surfaces increase the volume and speed of stormwater runoff that carries pollutants to the Cooks River.**



**Sediment escaping from building sites enters into the stormwater system that discharges to the Cooks River.**

Private property contributes significantly to gross pollutant and nitrogen loads due to the large volume of stormwater runoff from these areas. Reducing the flow volume would reduce the amount of gross pollutants and nitrogen mobilised into waterways.

Public roads collect a disproportionate amount of phosphorous and suspended solids. The stormwater drainage network combines runoff from public roads and runoff from private property. It is therefore important to target both public roads and private areas in order to reduce the transport of stormwater pollutants into waterways.



# Hot Spots

This diagram shows the stormwater issues and hot spots as identified in interviews with Council and local people

## Water Ponding

Water ponding problem areas are typically low points or 'sags' where water cannot drain quickly. Pondered water can spread across the road and into adjacent properties.

- Beach Road / Durham Street intersection
- Kintore Street upstream of school grounds
- Blackwood Avenue / Blackwood Lane intersection
- MacArthur Parade near intersection with Keith Street
- Hercules Street at entrance to RailCorp property
- Two low points on Ewart Street
- Low point on Balfour Street
- Low point on Tennyson Street
- Low point on Ness Avenue

Major illegal dumping and litter sites along major thoroughfares, New Canterbury Rd and at fast food outlets.

Litter collects along The Parade

## Pollution



Carpark behind shops is a source of litter. EnviroPods have been installed in the carpark



Commercial waste in Durham Ln behind shops on Marrickville Rd. Litter is also an issue in the commercial area on Marrickville Rd



Various gross pollutant traps (●) are installed in the subcatchment

- EnviroPods on Wardell Rd and Hercules St
- CDS Unit on Balfour St



Marrickville Golf Course located on the banks of the Cooks River is subject to flooding. The Golf Course also provides an opportunity for stormwater harvesting within the subcatchment.



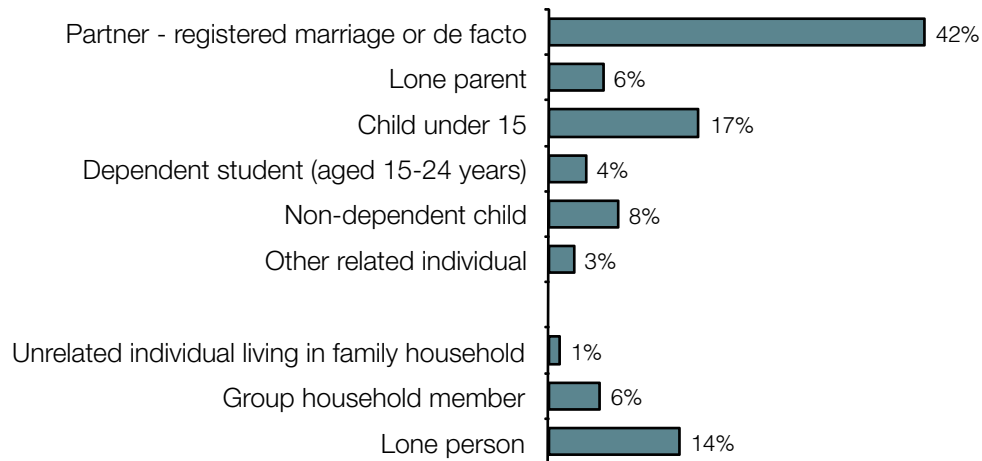
There is a large section of State Rail reserve trisecting the subcatchment, which impacts on Council drainage due to:

- poor maintenance practices that do not dispose of construction waste appropriately
- local drains blocked with litter and weeds

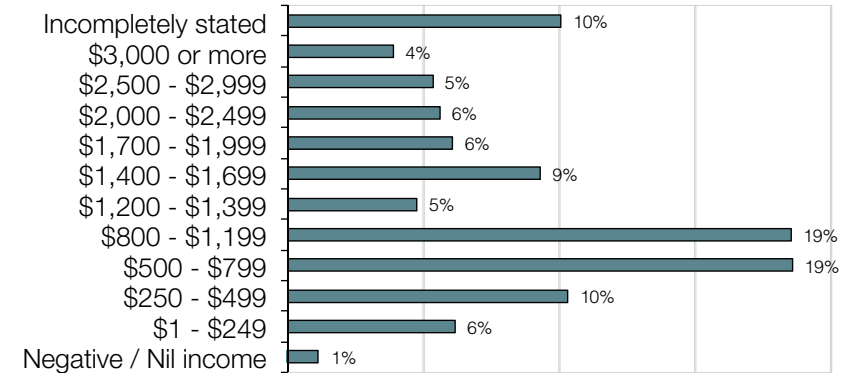
## Key Statistics

- Population – 3809 residents
- Origin – 46% born overseas; Greece (4.3%), Vietnam (3.3%), Lebanon (2.7%), New Zealand (2.5%), China (2.4%)
- Languages at home – 50% non-English, Greek (9%), Arabic (7%), Chinese Languages (5%), Vietnamese (4.5%)
- Religion – Catholic (35%), Eastern Orthodox (12%), Anglican (8%), Islam (7%), Buddhist (5%)
- Travel to work – Car (56%), Train (28%), Bus (15%), Walk (4%)

## Household Types

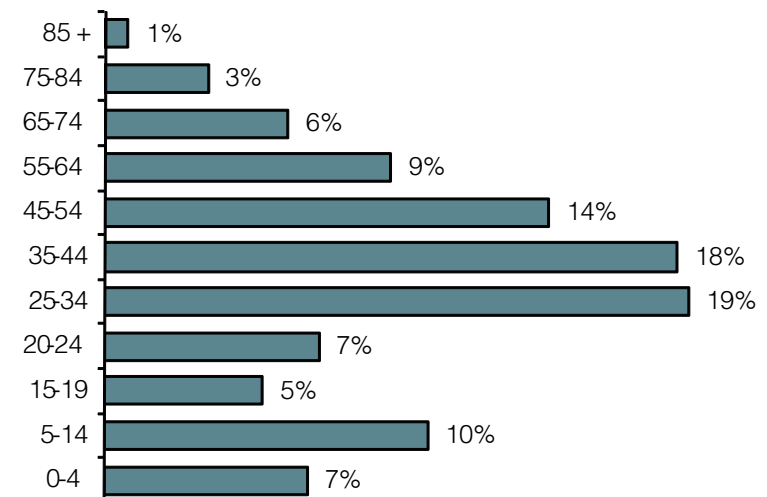


## Weekly Household Income



Household income - almost 55% of households have income below Marrickville median of \$1160 per week.  
- 15% have income above \$2000 per week.

## Age Distribution



## Education

- Educational attendance - 32% (1,202 people)
  - Preschool 3%, Infant /Primary 19%, Secondary 16%, Technical or Further Education Institution 11%, University or other Tertiary Institution 16%, Institution not stated 32%
- Non-school qualifications 44% (people over 15 years)
  - University 24%, other 20%

## Employment

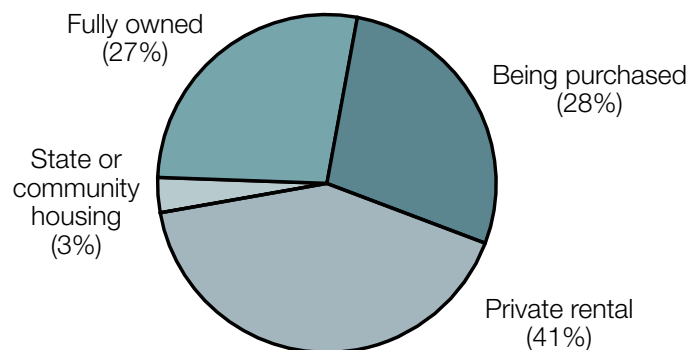
Of the total labour force (1,970 people):

- full-time – 65%
- part-time – 23%
- unemployed – 7%

## Residency Time

- 84% lived at the same address 1 year ago
- 58% lived at the same address 5 years ago

## Household Tenure



## Citizen Action

The implementation of the Tennyson Street Subcatchment Management Plan can only happen if citizens make practical changes on their properties (see for example 2018 Goal 14, p25)

### Community Depaving

The idea of “depaving” is gathering momentum in the USA, especially in Portland, Chicago and Berkeley. With the permission of a landowner, paved areas are removed and replaced with vegetated areas. In Portland, a community organisation called Depave.org has led depaving projects in private backyards, school yards and parking lots. These images are from some of their projects:



Volunteers remove pavement from a corner lot at North Williams Ave and NE Fargo Street in North Portland



A backyard in Portland, before and after depaving  
(All information and photos taken from Equatica, 2009).



## Who answered the survey?

266 households in March 2008 (15% response rate)

Gender	63% Females 37% Males
Origin	62% Born in Aust. (8.3% - U.K.)
Language	18% Non-English speaking at home
Education	61% University educated 23% Other tertiary 16% School only
Age	30-39 years = 27% 40-49 years = 26% 50-59 years = 19%
Household Type	31% Couple with children 30% Single living alone 21% Couple no children
Tenure Type	48% Fully own home 27% Buying home 23% Private rental
Dwelling	49% Flat, unit, apartment 40% Separate house 11% Semi, terrace, townhouse
Time in Current Residence	36% - 1-5 years 17% - 6-10 years 17% >20 years
Individual Gross Weekly Income	28% \$1000-\$1499 15% >\$1500 14% \$600-\$799

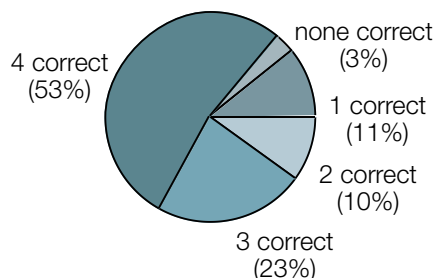
## Knowledge of urban water systems

1. In Marrickville, the rainwater in the street drains normally goes:

- 85% Nearest waterway (correct)
- 14% Sewerage System
- 2% The sea

2. Water from which of the following would normally end up in the street drains?

- kitchen sink
- driveways / footpaths
- the toilets
- excess water from the garden
- the washing machine
- the shower
- other paved areas
- rainwater from the roof



3. On average, how many litres of water does a typical Marrickville household use per day?

- 42% underestimate
- 11% correct range (400-500L)
- 14% overestimate

## Behaviour

Of 266 people:

### 1. Rainwater Tanks

- 9.5% (25 people) have a rainwater tank, 60% (15) of these are smaller than 2000L
- 96% (23 people) use for garden; 85% (21) toilet

### 2. Greywater Systems

- 8% (21 people) have a greywater system
- 100% use for garden, 14% (3 people) toilet

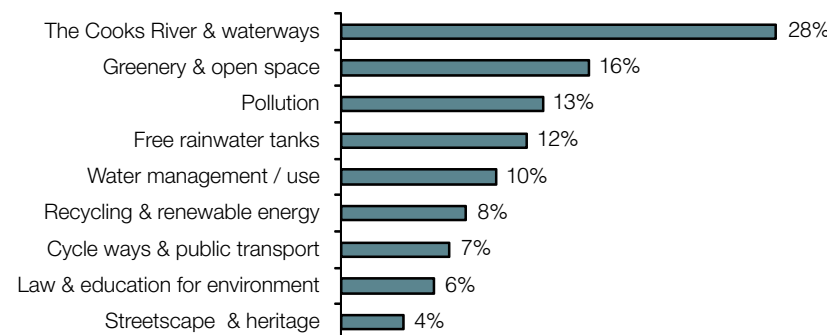
### 3. Water Saving Devices

- 79% (209 people) have water saving devices

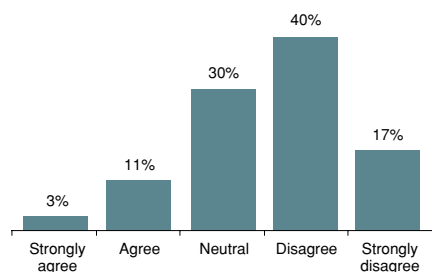
## Willingness to reuse water

	Filtered Rainwater	Treated Recycled Water
Cooking	34%	12%
Drinking	33%	10%
Showering	54%	34%
Washing clothes	70%	57%
Flushing toilet	83%	85%
Washing car	78%	79%
Watering garden	83%	85%
Nothing	11%	9%

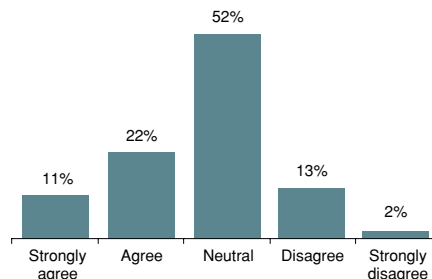
## Major improvements wanted in the next 20 years



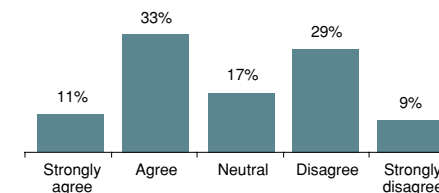
## Attitudes to the Waterway Environment



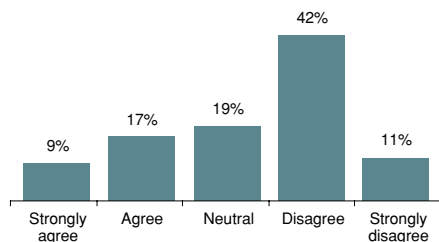
a) 'Jobs are more important than the environment'



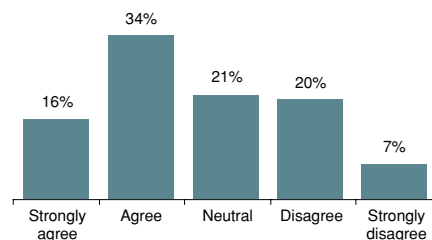
b) 'Access to a healthy natural environment is more important than access to community facilities'



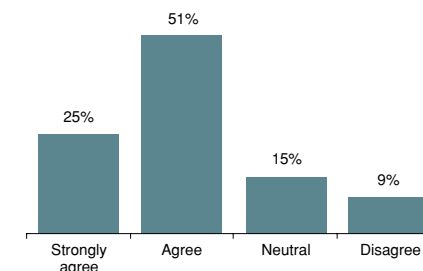
c) 'My daily activities have little negative impact on the waterway environment'



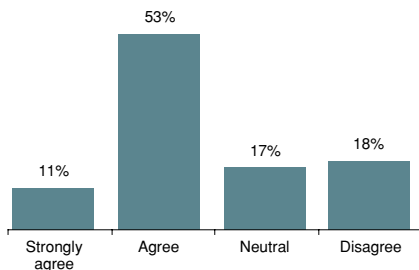
d) 'Government agencies should have the main responsibility for the waterway environment rather than the individual.'



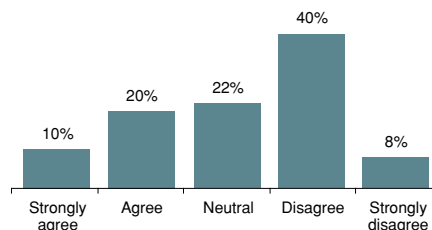
e) 'We should aim for the same waterway conditions as before the Europeans arrived over 200 years ago.'



f) 'I would reduce my shower time by half to save limited water resources.'



g) 'Most people want to help improve the health of the waterway environment.'



h) 'Laws are more effective than education for protecting the waterway environment.'

## Schools

- Dulwich Hill Primary School - Kintore Street, 514 students. Substantial green space.
- St Paul's Catholic Primary School - 16 May Street, 300 students, (school outside subcatchment area.)
- St Marouns Primary and High Schools - 192 Wardell Rd, 650 students (school just outside subcatchment area.)



## Churches & Spiritual Organisations

Organisation	Activities	Location
St Paul of the Cross Parish, Catholic Church	Services in English, Polish, German	532 New Canterbury Rd
Dulwich Hill Baptist Church	Services in Romanian and English	3 MacArthur Pd
St Anargyroi Greek Orthodox Church	Greek and English services	28 Hercules St
Salvation Army Christian Church and Community Services Centre	Worship and Bible based teachings	54 Dulwich Street (outside catchment boundary)
Siddha Yoga Foundation	Regular classes	50 Garnet St

## Community Services

Organisation/Operation	Activities/Management	Location
Dulwich Hill Library	Administered by Marrickville Council's Library Services	12 -14 Seaview St
Dulwich Hill Senior Citizens Centre & Hall	Managed by Marrickville Council's Community Services Centre	14 Seaview Street
Alcoholics Anonymous (AA) Dulwich Hill	Alcohol counselling services	12-14 Seaview St
Gamblers Anonymous	Gambling counselling services	12-14 Seaview St
Stepping Stone House	Homeless adolescents' accommodation	227 Wardell Rd



**The Seaview Street Hall is used for community meetings, exercise classes and small informal gatherings**

## Childcare

- Deborah Little Child Care Centre, 1 Macarthur Parade. Managed by Marrickville Council's Family & Children's Services.
- Dulwich Hill Early Childhood Health Centre, 12 Seaview Street. Access to a variety of child healthcare services.

## Commercial

About 100 commercial businesses in Tennyson Street Subcatchment are concentrated along Marrickville Road, New Canterbury Road, and Wardell Road.

Marrickville Council's Urban Centres Program builds on partnerships between business, the community and Council to improve the amenity of the urban centres. These centres are a vital element of the local culture and life in the Marrickville area. Local committees, comprising businesses and property owners, provide advice and recommendations to Council about issues affecting their centres including environmental matters



## Authorities

### Sydney Water

Controls wastewater and potable water infrastructure and delivery within the subcatchment.

### Rail Infrastructure Corporation

Owns and manages the Bankstown Railway Line and Rozelle Goods Line. Owns Jack Shanahan Park.

### Roads and Traffic Authority

Responsible for New Canterbury Road and jointly manages Marrickville Road with Marrickville Council.

### NSW Maritime

Consent Authority for water-based developments on the Cooks River. Responsible for the River below high tide, managing moorings and major aquatic events.

## Departments

### Housing NSW

Provides affordable housing for low-income families in 1% of dwellings in the subcatchment.

### Department of Environment Climate Change and Water

Provides funding and regulates Sydney Water and RTA to make sure their activities do not negatively affect the environment.

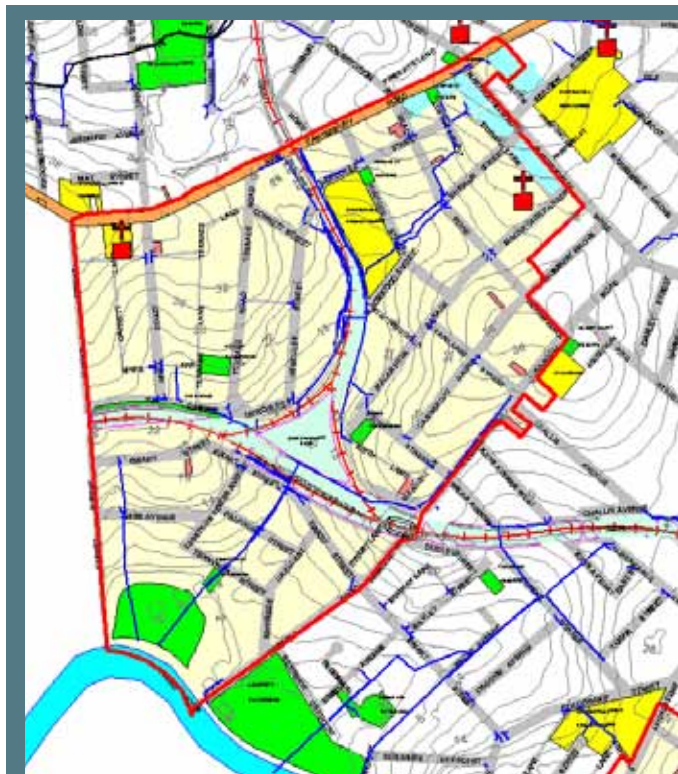
### NSW Office of Water

A separate office within the DECCW. Coordinates the development of metropolitan water policy, monitors the quantity, quality, and health of aquatic ecosystems and water extractions.

## Car Parks

Managed by Marrickville Council's Property Services Section.

- Loftus Street 8 car spaces
- Seaview Street (South) 49 spaces
- Ewart Lane 58 car spaces
- Bedford Crescent 30 car spaces



This diagram represents the range of authorities and major landusers in the catchment.



## Parks, Playgrounds & Reserves

All parks and reserves managed by Marrickville Council's Parks and Reserves Section.

Allison Playground	Play equipment, platform with slide and sand play items
Jack Shanahan Park	1.2 ha. Owned by the Rail Infrastructure Corporation
Rowe Playground	0.4 ha. Seating and shaded area
Tennyson Street Playground	0.1 ha. Playground equipment, seating, a shaded area and bubbler
The Parade Playground	Green strip between north side of Sydney-Bankstown Railway and The Parade
Loftus Street Closure	Intersection of New Canterbury Rd & Loftus St
Marrickville Golf Course	21.5 ha. Leased from Marrickville Council



Tennyson Street Playground, Dulwich Hill, adjacent to Marrickville Golf Course.

In April 2007, Marrickville Council adopted *The Marrickville Urban Strategy* that provides the planning context for future development across the Marrickville local government area. For more information, see the strategy is also available online at: <http://www.marrickville.nsw.gov.au/council/plans/marrickvilleurbanstrategy.htm>

## 1. Marrickville Centres

Areas identified for future renewal:

### Dulwich Hill Shops

#### Character

- Retail and commercial centre based around the intersection of New Canterbury Road and Marrickville Road.
- Includes 2-3 storey fine grain retail with active street frontages and continuous cantilevered awnings.
- Higher quality retail and public domain on Marrickville Road, which has retained its fine grain; less traffic results in a more pedestrian friendly environment.
- Public domain upgrades with widened footpaths and landscape treatment have occurred.
- Poorer amenity on New Canterbury Road; vacant tenancies due to a high volume of traffic.
- The western end of New Canterbury Road has some new medium density residential developments. Other surrounding residential streets have mainly single-storey detached dwellings.
- Bus services on New Canterbury and Marrickville roads.
- Johnson Park important community focal point.

#### Opportunities

- Potential for increased dwellings and improved urban amenity.
- Provide incentives for investment.
- Encourage a more diverse retail mix.
- Build on the village atmosphere.
- Potential for new civic space.
- Focus for renewal

## 2. Neighbourhood Centres

### Dulwich Hill Station

#### Character

- Small neighbourhood business centre on the north side of Station.
- Generally good quality public domain, with surrounding tree-lined streets.
- Adjacent residential area contains predominantly single storey detached dwellings.
- Access to Dulwich Hill Station and bus services.
- Close to the Cooks River and Marrickville Golf Club.

#### Opportunities

- Key location along proposed “GreenWay” from the Cooks River to Hawthorne Canal.
- Provide incentives for increased investment in retail and services.
- Potential for increased dwellings.
- Focus for renewal.



Dulwich Hill Shops, New Canterbury Road.



Dulwich Hill Shops, Marrickville Road.



Shops at Dulwich Hill Station along Wardell Road.

# 3. Tennyson Street Subcatchment Vision, Goals and Action Plan



## 3.1 Tennyson Street Subcatchment Vision

The key vision statement for the subcatchment is: “Tennyson Street Subcatchment is a model of sustainable urban water management and the Cooks River is our pride and joy”

The vision was expanded into four themes – our people, our buildings, our catchment and our river. These four themes were carried through the planning forum, where forum participants were grouped according to these themes and asked to identify goals for the catchment relating to their particular theme. The 2050 goals were set as broad higher level aspirations while the 2018 goals were required to be more specific, measurable and achievable within the timeframe.

### The Tennyson Street Subcatchment 2050 vision is:

*Tennyson Street Subcatchment is a model of sustainable urban water management and the Cooks River is our pride and joy.*

*Significant investment started in 2008. Action started in our subcatchment to reach our vision. Since then, people have worked together with a shared understanding of the way our catchment and community works so everyone (businesses, schools, residents) understands the vision for the Tennyson Street Subcatchment water cycle. Our vision has evolved to match community needs and values. Marrickville Council has fulfilled its commitment to being an inner city centrepiece of ecologically sustainable development and governments have actively managed catchments sustainably so that now:*

Our people are comfortable, secure and healthy because we plan and make decisions together, sharing our knowledge and ideas. Our people value water and have affordable, locally generated resources.

Our buildings, homes, schools and businesses are self-sufficient because they are designed to meet cooperatively developed building sustainability standards. We can see sustainable technology and practices everywhere we look. Water is a valued resource.

Our catchment integrates (natural) water systems, energy and transport networks. Watercourses are reinstated and visible. The GreenWay and the Cooks River are widely used to move around and are a key part of a number of shared spaces for people, plants and animals. Our green networks support self sufficiency. Water systems in our area are designed to suit their locations and use.

We can swim and fish in Our River that is alive with wildlife. When you stand on the banks of the Cooks River on a summer's afternoon, everything shines.

The four themes of the vision have corresponding 2050 and 2018 goals.

## 3.2 2050 Water Goals

1. The Tennyson Street Subcatchment Vision is owned and supported by all where knowledge and skills are shared to sustain and protect our resources
2. Planning and decision-making is collaborative and benefits all our people.
3. The Tennyson Street Subcatchment community is aware and understands the role of buildings in the water cycle
4. All buildings meet high level building sustainability standards
5. Everyone uses water that is fit for purpose
6. The GreenWay and the Cooks River are networks for water, transport, food, local people, and biodiversity
7. Public areas are accessible and available to support:
  - a. Water Sensitive Urban Design
  - b. activities and needs of all the community
  - c. connected ecological communities
  - d. improved micro climates
8. The Subcatchment has a self-contained water supply
9. The Cooks River is rehabilitated to a ‘naturalised’ state and
  - a. Water entering the River is clean
  - b. has restored foreshores
  - c. is a healthy ecosystem
  - d. we can swim and play in the River



### 3.3 Tennyson Street Subcatchment Action Plan

#### Role of Actions

One of the messages that emerged from the community planning sessions was the need for subcatchment actions to meet multiple goals. In addition to water management goals (e.g. water conservation, wastewater minimisation, water quality and drainage/flooding issues), Tennyson Street Subcatchment citizens are particularly interested in actions that would also address broader sustainability goals (e.g. sustainable transport, biodiversity, amenity, community involvement and good governance).

The overall management plan for the subcatchment is therefore focused on meeting the community's goals, and addressing broader sustainability goals wherever possible.

The Tennyson Street Subcatchment Action Plan is a working document that will undergo regular review by Council and the Tennyson Street Subcatchment Working Group.

#### Changing Streets for Multiple Goals

Wide streets could be redesigned to include a central median swale when they are resurfaced.

Wide streets could also be redesigned by extending the nature strip on either side and narrowing the paved area. In this street, this would bring the street trees within the nature strip.



A vegetated garden bed within the streetscape could be designed as a passive irrigation or bioretention system.  
(Photos and text, Equatica, 2009)

## Tennyson Street Subcatchment Action Plan

### Goal 1

The Vision is available and accessible to all.

#### Actions

- a. Create information in simple, plain English that is:
  - i) accessible
  - ii) available in community languages where appropriate ,
  - iii) linked to the climate change debate,
  - iv) ongoing, reinforced, and maintained.
- b. Establish a 2-way network to:
  - i) investigate the best mode of delivery,
  - ii) communicate between Council, agencies and the community,
  - iii) develop neighbourhood learning.
- c. Hold a subcatchment event to celebrate and communicate the vision and Cities as Water Supply Catchments.

### Goal 2

The subcatchment community demonstrates support of the vision by adopting water sensitive systems and practices.

#### Actions

- a. Provide simple solutions and practical resources, e.g. links to green and enviro-plumbers, workshops.
- b. Extend and promote the Sustainable Water Ambassadors program.
- c. Communicate and work with local plumbers and hardware suppliers to promote:
  - i) Council's water management approach,
  - ii) rainwater tanks
- d. Develop communication plan to keep the community informed on the Tennyson Street Subcatchment Management Plan, achievements, progress, and IUWM.

### Goal 3

Dulwich Hill Public School is a strong partner in achieving the Tennyson Street Subcatchment Vision.

#### Actions

- a. Establish a partnership with Dulwich Hill Public School to facilitate on-ground works and water education.
- b. Review potential water-saving initiatives within the school.
- c. Encourage the school to promote the Tennyson Street Subcatchment 2050 Vision.
- d. Implement a WSUD demonstration project in the school grounds.

### Goal 4

The subcatchment community is more satisfied with community engagement and participation, and has increased knowledge and capacity for implementing IUWM.

#### Actions

- a. Carry out community water surveys every 5 years (2013, 2018) to find out residents' and businesses':
  - i) satisfaction with community engagement and participation including whether opportunities are genuine,
  - ii) knowledge,
  - iii) attitudes,
  - iv) behaviours.



Citizens finding out about Marrickville Council Sustainable water Management programs at the Sustainable Water Showcase at the 2009 Cooks River Eco Fest.

## Goal 5

A community group representative of the subcatchment community has been in place for 10 years.

### Actions

- a. Form the Tennyson Street Subcatchment Working Group in 2008 that is representative of diversity of the subcatchment.



Jenny and John Whitmarsh, participants of the Tennyson Street subcatchment working group, discuss subcatchment planning with Mayor, Cllr Sam Iskander at the Sustainable Water Showcase at the 2009 Cooks River Eco Fest.

## Goal 6

Collaborative planning & decision making is the norm for:

- a. on-ground works,
- b. new plans and policies,
- c. changes to land use.

### Actions

- a. Ensure long-term capital works plans are prepared with transdisciplinary input.
- b. Develop guidelines for Council that focus on the process of collaboration and shared decision making to make it easier for people to engage in local subcatchment issue.
- c. Develop a Council policy that all works, locally applicable plans and zoning changes must consider and address the relevant subcatchment(s) profiles.
- d. Map all Sustainable Urban Water Management projects / developments by subcatchment on Council's web site.

## Goal 7

Residents' behaviour towards water has changed so that:

- There has been a 20% reduction in consumption of imported water in all buildings within the subcatchment.
- 100% of new buildings have dual reticulation systems built into them.
- 20% of all existing buildings have dual reticulation systems built into them.
- 100% of households have some aspects of water conservation and/or reuse installed.
- 85% of households are receptive to using recycled water for gardens, car washing, toilet flushing, laundry and showering.

### Actions

- a. Implement a comprehensive and regular education campaign on cities as water supply catchments that promotes:
  - fit-for-purpose water use,
  - water saving technologies and practices,
  - dual plumbing,
  - recycled water,
- b. Create 'Sustainable Streets' program to showcase water sensitive urban design (WSUD).



## Goal 8

8. Stormwater runoff from all new buildings meets best practice water quality levels with reduction on 2008 levels in:

- Gross Pollutants by 90%;
- Total Suspended Solids by 80%;
- Phosphorus by 60%;
- Nitrogen by 45%

### Actions

- Ensure new Development Control Plan (DCP) requires:
  - all new buildings to treat stormwater (through biofiltration systems)
  - all new building to measure water quality and volume (stormwater)
  - new developments to reduce impervious surfaces by requiring the incorporation water sensitive urban design principles e.g. vegetated roofs and walls and wetlands

## Goal 9

The majority of people within the subcatchment understand the concept of fit-for-purpose water use.

### Actions

- Use sites of various WSUD devices e.g. rain gardens (bioretention systems), porous paving, greywater systems to demonstrate how to use water that is fit for its purpose.

## Goal 10

The GreenWay is used as an established environmental corridor by local residents and wildlife.

### Actions

- Ensure the Tennyson Street Subcatchment Working Group includes representatives of the GreenWay to work specifically within the subcatchment.
- Promote GreenWay and support Friends of the GreenWay through information on Council's web site.
- Integrate water management into the GreenWay.



Rain garden built by Catriona Pyner, participant in Illawarra Road Sustainable Water Working Group and a Sustainable Water Ambassador, on her property.

## Goal 11

Water sensitive urban design (WSUD), such as rain gardens, is established:

- on the golf-course
- in the GreenWay (rail lands)
- in school grounds

### Actions

- a. Work with subcatchment stakeholders to implement on-ground works:
  - establish partnerships – agree on priorities,
  - seek funding,
  - collaborate on design,
  - construct,
  - promote and evaluate.



## Goal 12

All works in the subcatchment are designed to have multi-purpose benefits including:

- flood mitigation
- amenity
- water quality improvement
- biodiversity

### Actions

- a. Establish training program to up-skill Council staff and contractors in best practice stormwater management, water sensitive urban design and compliance with new planning requirements.
- b. Require skills in environmental sustainability and design in job descriptions for Council staff.
- c. Implement Council's current Asset Management Policy and Strategy with input from Council's internal Integrated Urban Water Management Group (IUWMG).



## Goal 13

A network (trellis) of green streets is defined

### Actions

- a. Map current vegetated areas in Tennyson Street Subcatchment.
- b. Develop a plan to create links e.g. incorporate Jack Shanahan Park and GreenWay into "Trellis" green streets integrating with any sustainable streets program.

**Recipients of 2008 Target Sustainability @ Marrickville program Environmental Awards receiving award from Deputy Mayor, Cllr Fiona Byrne.**



## Goal 14

Changes in behaviour, land use and land management have reduced impacts on subcatchment water quality, with reductions in:

- Gross Pollutants by 90%;
- Total Suspended Solids by 80%;
- Phosphorus by 60%;
- Nitrogen by 45%

### Actions

- Develop a program for modelling pollutant loads every 5 years (2013 and 2018).

## Goal 15

Five WSUD and microclimate projects identified for the public domain have been built.

### Actions

- Review, prioritize and seek funding for the design and construction of on-ground options proposed for:
  - Jack Shanahan Park,
  - The Parade,
  - Tennyson Street,
  - Bedford Street,
  - Ewart Street,
  - The GreenWay,
  - Marrickville Golf Course.

## Goal 16

A plan for integrated self-contained infrastructure is in place and works have started for:

- rainwater harvesting
- stormwater harvesting
- wastewater management and reuse

### Actions

- Implement a rebate program for rainwater tanks.
- Investigate stormwater harvesting at Dulwich Hill Public School and Marrickville Golf Course.



Hill Street rain gardens built in October 2007 as a result of the Illawarra Road Subcatchment Planning. Photos April 2008.



## Goal 17

Effective planning controls are in place to treat 5% of the subcatchment.

### Actions

Covered by Action 8a.



Participants of WSUD tour at Hill Street Rain Garden on corner of Illawarra Rd, June 2009.

## Goal 18

WSUD is implemented on public lands (parks, roads) to treat 10% of the subcatchment.

### Actions

- a. Incorporate WSUD into public works and operational programs.



## Goal 19

A 10 metre (multi-purpose) riparian zone along the Cooks River foreshore has been integrated into adjoining land uses.

### Actions

- a. Work with subcatchment community and stakeholders along the Cooks River to:
  - i) identify the riparian zone,
  - ii) plan and prioritise design and works,
  - iii) seek funding,
  - iv) implement restoration.

## Goal 20

Plans for the Cooks River bank 'naturalisation' and the reconnection of Tennyson (Russell) Creek to the Cooks River have been established.

### Actions

- a. Create a plan with the subcatchment community and stakeholders along the Cooks River to
  - i) naturalise river bank, foreshore and Russell Creek
  - ii) re-establish Russell Creek to skirt the Marrickville Golf Course

## Goal 21

All works in the subcatchment are designed to have multi-purpose benefits including:

- flood mitigation
- amenity
- water quality improvement
- biodiversity

### Actions

- a. Establish training program to up-skill Council staff and contractors in best practice stormwater management, water sensitive urban design and compliance with new planning requirements.
- b. Require skills in environmental sustainability and design in job descriptions for Council staff.
- c. Ensure Council's IUWM Group has input at the initial budgeting phase when works are being planned.
- d. Ensure 2050 Subcatchment Plan goals inform capital works program.



Sustainable Water Ambassadors Jan and Michael Kerans taking part in the Sustainable Water Showcase at the 2009 Cooks River Eco Fest.

## Definition of Terms in the Action Plan

**Biofiltration systems**, such as rain gardens and swales (vegetated drains with gently sloping sides) reduce the velocity and filter pollutants from water by using vegetation and special soil media to capture and biologically degrade pollutants.

**DCP** - The Development Control Plan is made under Section 72 of the Environmental Planning and Assessment Act 1979. The new DCP outlines Council's detailed planning policies for land uses and the design of new development.

**Dual reticulation** means plumbing with two separate pipe networks to supply water, connecting to both the drinking water network and a recycled water network. For easy identification, the recycled water network is coloured purple including water mains, meters, pipes, taps and hoses.

**Gross pollutants** include domestic plastics such as plastic bags and clingwrap, industrial packaging, metals such as aluminium, sediment, plastic bottles, paper (including cigarette butts), and organics (e.g. grass and garden clippings).

**IUWM - Integrated Urban Water Management** takes a holistic approach to urban water management and planning. Water supply, stormwater and wastewater are all seen as parts of an integrated physical system that is influenced by the social characteristics, organisational framework, and the natural landscape that inform decision making where there is high uncertainty.

**SUWM - Sustainable Urban Water Management** (see page 2, The Waterevolution)

**WSUD - Water Sensitive Urban Design** is the design and use of sustainable water management through intelligent and integrated design. It looks at the urban water cycle as a whole, taking into account all urban water sources: potable water, wastewater, groundwater and stormwater.



**WSUD at Wharf 11 in Sydney includes a vegetated roof that has the multiple benefits of filtering rainwater, cooling the building and providing habitat. (Photo WSUD.org).**



## 4. Options for on-ground projects

### Development of Options

The subcatchment planning forum developed a range of potential on-ground works for specific locations to improve stormwater runoff into Cooks River. These include the proposed GreenWay, Jack Shanahan Park, Dulwich Hill Public School and Marrickville Golf Course as shown on the map this page. These ideas for works were further developed to:

- find how feasible they are;
- look at opportunities and constraints;
- work out potential reductions in pollution to Cooks River; and
- calculate approximate water savings that could be achieved.

Further assessment was carried to develop a strategy to improve stormwater runoff into the Cooks River as outlined in the consultant's report (Equatica 2009).



Sites with Tennyson Street Subcatchment with preliminary concept designs (Equatica, 2009).

As part of the feasibility study, the costs of possible on-ground works were estimated (Equatica, 2009):

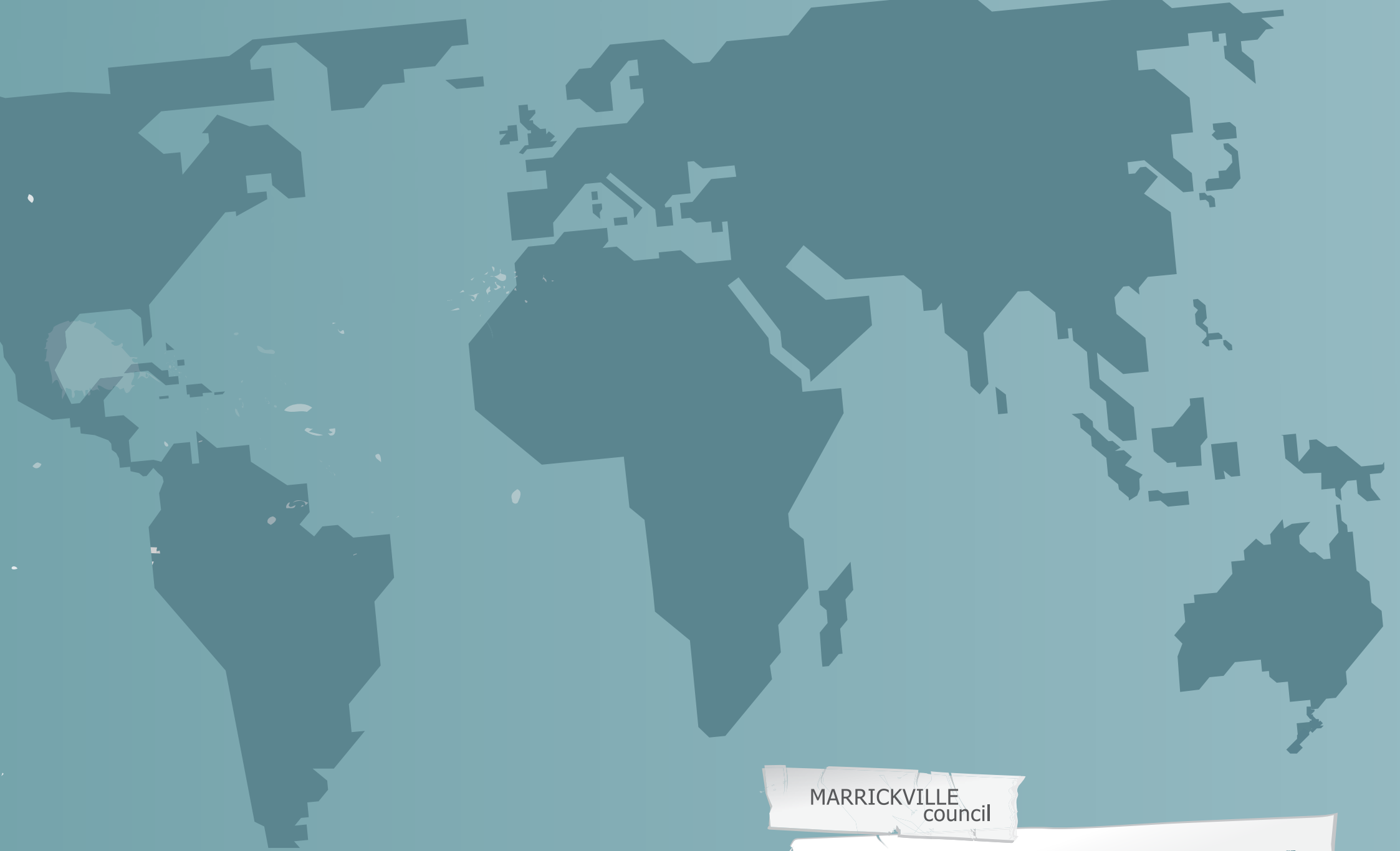
Location	Action	Estimated capital cost	Totals
The GreenWay	Bioretention swales in the GreenWay (690 m total length, including 1,380 m <sup>2</sup> bioretention filter area)	\$930,000	\$930,000
Jack Shanahan Park	Bioretention system in Jack Shanahan Park (300 m <sup>2</sup> )	\$110,000	\$260,000
	Urban forest in Jack Shanahan Park (1,700 m <sup>2</sup> )	\$110,000	
	Car wash bay in Jack Shanahan Park	\$40,000	
Dulwich Hill Public School	Bioretention system at Dulwich Hill School (600 m <sup>2</sup> )	\$165,000	\$245,000
	Stormwater harvesting at Dulwich Hill School (35 kL above-ground storage)	\$80,000	
Marrickville Golf course	Bioretention system in eastern golf course (400 m <sup>2</sup> )	\$120,000	a) \$1,710,000 or b) \$1,420,000
	a) Wetland in central golf course (3,400 m <sup>2</sup> ) or b) Bioretention in central golf course (m <sup>2</sup> )	\$650,000 or \$360,000	
	Urban forest in golf course (10,300 m <sup>2</sup> )	\$540,000	
	Stream restoration	\$400,000	
Streetscapes	Bedford Crescent (swale + bioretention system)	\$100,000	\$340,000
	The Parade	\$70,000	
	Ewart Street	\$50,000	
	Tennyson Street	\$120,000	
<b>Total Cost</b>	<b>All actions</b>		<b>a) \$3,485,000</b> <b>b) \$3,195,000</b>

Actions to achieve 40%, 65% and 85% reduction in water consumption in residential dwellings is discussed in detail in Section 8 of the consultant's report (Equatica 2009). Strategies to achieve significant water savings in water consumption in the catchment need to be targeted at residential water consumption.

## 5. References

1. Australian Bureau of Statistics, 2007, *2006 Census Community Profiles*. Available online: <http://www.censusdata.abs.gov.au/>
2. Brown, R., 2003, *Institutionalisation of integrated urban stormwater management: multiple-case analysis of local management reform across metropolitan Sydney*, PhD Thesis, School of Civil and Environmental Engineering, UNSW.
3. Equatica, 2009, *Draft Tennyson Street Subcatchment Management Plan* Draft report prepared for Marrickville Council with detailed physical profile, strategy and explanations for on-ground options.
4. International Association for Public Participation (IAP2), 2004, *IAP2 Public Participation Spectrum* available online; <http://www.iap2.org.au/sitebuilder/resources/knowledge/asset/files/36/iap2spectrum.pdf>
5. Marrickville Council, 2008, *Planning the Tennyson Street Subcatchment*
6. Marrickville Council, 2008b, *Stormwater Management Service Charge Management Framework*
7. Marrickville Council, 2007a, *Subcatchment Planning for Sustainable Water Management – Guidelines for Councils*
8. Marrickville Council, 2007b, *Marrickville Urban Strategy*
9. Marsalek, J., Rochfort, Q., and Savic, D., 2001 “Urban Water as a part of Integrated Catchment Management”, in Maksimovic, C., and Tejada-Guibert, J.A., eds, *Integrated Catchment Management and Frontiers in Urban Water Management: Deadlock or Hope*, IWA Urban Water.





[www.marrickville.nsw.gov.au](http://www.marrickville.nsw.gov.au) | ph. 9335 2222

MARRICKVILLE  
council

**WATER3VOLUTION**  
Funded by the Marrickville community through the Stormwater Charge