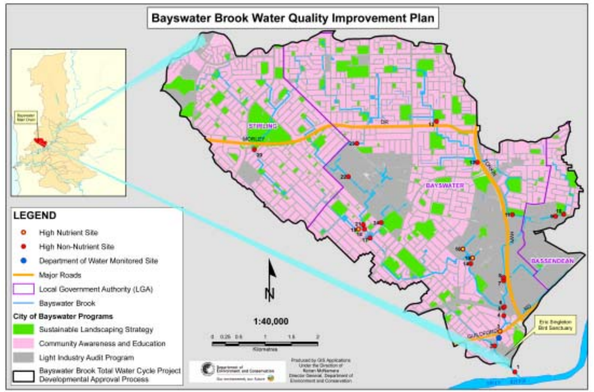
Maps



Links to regional planning:

Swan River Trust Healthy Rivers Program

Swan Catchment Council Swan Region Strategy for NRM

Coastal Catchments Initiative

In June 2006 the Swan Canning river system was identified as a hotspot for water quality issues as part of the Australian Government's Coastal Catchments Initiative (CCI). The Swan River Trust is responsible for preparing the Water Quality Improvement Plan (WQIP) for the Swan Canning river system.

The WQIP will provide a roadmap for reducing nutrient levels in the river system using scientific models and decision support tools prepared under this new initiative.

By integrating science and management actions, CCI and an accredited WQIP will underpin a long-term investment strategy to improve water quality in known hotspots such as the Swan Canning river system.

Steps to develop a local WQIP

1. EXISTING ACTIVITY GAP ANALYSIS	Define the water course and catchment area Identify current programs improving water quality in the catchment Analyse current program effectiveness to meet the water quality targets Identify program gaps
2. CONDITION	Investigate the condition of the water course - identify pollutants and water quality issues
3. VALUES OBJECTIVES TARGETS	Set environmental values for the water course Set objectives for the water course Identify target annual pollutant loads
4. IMPLEMENTATION	Develop management strategies and implementation actions to achieve water quality targets, including timelines, costs and responsibilities
5. MONITORING AND REVIEW	Monitor and review the effectiveness of actions undertaken to achieve the water quality targets

This Water Quality Improvement Plan has been developed in consultation with the following stakeholders.

ACT NOW FOR THE FUTURE

Department of **Environment and Conservation**
Department of **Water**
Department for **Planning and Infrastructure**
Western Australian **Planning Commission**

SWAN RIVER TRUST

swan catchment council

nrmc

WATER

Australian Government

For further information contact: **City of Bayswater** Tel: 9272 0622 www.bayswater.wa.gov.au

Caring for the Swan and Canning rivers

Current as at March 2008

Local Water Quality Improvement Plan
Bayswater Brook

ACT NOW FOR THE FUTURE

SWAN RIVER TRUST

swan catchment council

Background

The Swan River Trust aims to reduce the amount of nutrients and other contaminants entering the Swan and Canning rivers.

The Trust is developing **Water Quality Improvement Plans** (WQIP) to provide local councils and communities with guidance in improving water quality in a priority catchment.

The plans trace the pathway of nutrients through catchments from their source to the point of discharge.

Outcomes of the Water Quality Improvement Plans are to:

- Identify current ecological condition, water quality and pollutant loads.
- Identify environmental values of water bodies and the water quality objectives required to protect the values.
- Identify and commit to a set of cost-effective management measures to achieve and maintain those values and objectives.

Bayswater Brook Water Quality Improvement Plan

The Bayswater Main Drain is a permanently flowing drainage network with open and covered sections. It is the largest urban catchment, 27,000 hectares, in the Perth metropolitan area. The lower end of the drain, originally referred to as Bayswater Brook, was a natural watercourse linking numerous creeks and swamps throughout the catchment and flowing into the Swan River. In the 1920s the brook was modified for use as a drainage system to enable development of the area.

The long-term vision is to improve the ecological function and community enjoyment of this waterway. In moving towards this vision, the waterway is called the Bayswater Brook in this plan.

The City of Bayswater has a long history of leadership in catchment management through the North Metro Conservation Group - formerly Bayswater Integrated Catchment Management Group (BICM). The City plans to enhance the brook through the Bayswater Brook Project, taking a total water cycle management approach to the Bayswater Catchment, to improve water quality for the benefit of the community.

Bayswater Brook is recognised under the Healthy Rivers Program as one of the eight priority catchments in the Swan Canning river system. Swan Catchment Council and Water Corporation have already invested significant resources.

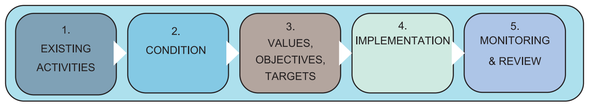


Figure 1: Steps to develop a local WQIP

1. Existing Activities

What are we doing to improve water quality?

Local Water Quality Improvement Plans link to existing projects and programs in the target area. They draw together activities contributing to improved water quality and target future investment for optimal water quality outcomes. Projects are based on partnerships with local governments, community and shared stakeholders.

Examples of existing key stakeholder programs in the Bayswater Catchment include:

BAYSWATER BROOK TOTAL WATER CYCLE PROJECT

A holistic approach is taken to managing and improving water quality in the Bayswater Catchment, through drainage management, remediation initiatives, applying best management practice to landscaping, and community engagement.
Partners: City of Bayswater, Water Corporation, Swan River Trust, Swan Catchment Council, Department of Water, North Metro Conservation Group and the community.
OUTCOMES: High improvement in water quality.

LIGHT INDUSTRY AUDIT PROGRAM

By regularly auditing light industry, this program aims to improve environmental performance through regulation and education. This contributes to waste minimisation and improving water quality in the Bayswater Brook.
Partners: City of Bayswater, Swan Catchment Council, Department of Environment and Conservation, North Metro Conservation Group and the community.
OUTCOMES: High improvement in water quality.

DEVELOPMENT APPROVAL PROCESS

The local development approval process provides a mechanism for improving water quality by managing residential and industrial subdivisions and industrial site remediation.
Partners: City of Bayswater, Department of Planning and Infrastructure, WA Planning Commission, Department of Environment and Conservation, Swan Catchment Council, Swan River Trust, industry and the community.
OUTCOMES: High improvement in water quality.

SUSTAINABLE LANDSCAPING STRATEGY

This program is working towards minimal fertiliser and water use in the city's management area, through plant selection, soil amendment, alternative management strategies and community education.
Partners: City of Bayswater, North Metro Conservation Group, Swan River Trust, Eastern Metropolitan Regional Council, ICLEI Water Campaign, Swan Catchment Council and the community.
OUTCOMES: Medium improvement in water quality.

COMMUNITY AWARENESS AND EDUCATION

The city aims to build community capacity by incorporating sustainable households, waterwise and fertilise-wise gardening, and community-led environmental projects.
Partners: City of Bayswater, North Metro Conservation Group, Swan River Trust, Water Corporation, Department of Environment and Conservation, Swan Catchment Council and the community.
OUTCOMES: Low immediate and high long-term improved water quality.

LOCAL BIODIVERSITY STRATEGY

This is a collaborative project between the Bayswater, Belmont and Bassendean councils to identify and preserve the biodiversity values in a regional context. This program integrates water quality improvement with biodiversity enhancement.
Partners: Bayswater, Belmont and Bassendean councils, Eastern Metropolitan Regional Council and Swan Catchment Council.
OUTCOMES: Low improvement in water quality.

2. Condition

What are the water quality issues in Bayswater Brook?

High levels of nitrogen, phosphorus and non-nutrient contaminants

Water quality is monitored fortnightly by the Department of Water on behalf of the Swan River Trust, and reported to the community through Nutrient Report Cards on the Trust website (www.swanrivertrust.wa.gov.au).

Samples were taken from Bayswater Brook by the North Metro Conservation Group in a one-off snapshot event in July 2007. Twenty-four sites in residential and industrial areas were tested to determine the water quality in the catchment.

These two sampling programs identified levels of nutrient and non-nutrient contaminants that exceeded the ANZECC Guidelines for ecosystem health.

Water quality issues	Pollutant indicators	Pollutants of concern
Contaminants - High nitrogen loads from point source - High phosphorus loads from point source - High levels of non-nutrient contaminants - Potential remobilisation of pollutants from sediments	**Contaminants** - High nutrient and non-nutrient concentrations - High colour, suspended solids and turbidity	**Nutrients** Total phosphorus Total nitrogen – failing long-term target **Non Nutrients** * Heavy metals: aluminium, chromium, cadmium cobalt, copper, iron, lead, zinc Polycyclic aromatic hydrocarbons Sediment Microbial hazards Herbicides
Biotic – Nuisance growth of aquatic plant scums, algal blooms - Odour from decaying algae - Death/stress of desirable aquatic organisms and plants - Microbial contamination	**Biotic** - Frequency and extent of algal blooms - Absence of desirable aquatic plants and animals, loss of biodiversity - Odour from decaying algae	

* Preliminary monitoring has indicated high levels of heavy metals. Further investigation is recommended.

What are the water quantity issues in Bayswater Brook?

Maintaining seasonal flow variability

The quantity of water entering the Swan River from the catchments is important to maintain the environmental values in the river. Current data on Bayswater Brook indicates the annual flow during a 20 year period is highly variable, ranging from 2.9 - 15.3 gigalitres. With climate variability this trend is likely to continue.

3. Values, objectives and targets

What would we like to achieve in Bayswater Brook?

Water Quality Improvement Plans identify local environmental targets, water quality and river flow objectives, and establish an implementation plan.

VALUES	OBJECTIVE
River flow Flows in Bayswater Brook provide an important flushing mechanism.	Maintain existing seasonal flow variability to: • maintain or restore ecological processes and biodiversity of water dependent ecosystems; • protect natural low flows; • maintain natural rates of change in water levels; and • manage groundwater for ecosystems.
Aquatic ecosystem health The Bayswater Brook is highly modified, with some ecological value. The drain is likely to support a functional, well adapted ecosystem. By achieving ecosystem health in the brook, other environmental values will be achieved.	Maintain, protect and enhance the aquatic ecosystem integrity of Bayswater Brook.
Recreation and aesthetics Bayswater Brook has recreation and aesthetic values developed through the long-standing partnership between the City of Bayswater and North Metro Conservation Group. During the 1990s the Recreating the Catchment project developed living streams and rehabilitated compensation basins into wetlands at a number of locations along the brook. This raised the aesthetic and, in some locations, the recreational value of the drain.	Maintain and enhance the recreational opportunities and aesthetic values of the Bayswater Brook.
Cultural and spiritual **Indigenous –** Bayswater Brook and the surrounding catchment has a number of identified Aboriginal sites of significance, including the Bayswater camp sites. **European –** One site located in the Bayswater Brook Catchment – Halliday House, is listed on the State Register of Heritage Places. Various other properties are listed on the City of Bayswater Municipal Inventory (2006), under a range of management categories.	Protect and enhance the cultural and spiritual integrity of the Bayswater Brook.

TARGETS

Bayswater Brook is meeting the Trust long-term phosphorus target, but not the long-term nitrogen target.

The Healthy Rivers Program aims for a 30 per cent reduction in nutrient loads in priority catchments.

Non-nutrient contaminants to meet ANZECC guidelines for environmental health at all sites.

Contaminant	*Current annual load	**Target annual load by 2015	Target annual concentration
Nitrogen	9.56 tonnes	6.69 tonnes	0.7mgL^{-1}
Phosphorus	0.93 tonnes	0.65 tonnes	0.07mgL^{-1}
Chlorophyll *a*			6.12ugL^{-1}
Dissolved Oxygen (surface)			75.1% saturation

*based on median flow data over 20 years
**target to achieve a 30% reduction in nutrients by 2015

4. Implementation

How do we achieve the water quality targets?

The Bayswater Brook WQIP aims to reduce nutrient loads into the Swan River through nutrient intervention and changed management practices. By using a treatment train approach, a combined set of management actions are applied along nutrient pathways to minimise nutrient losses to waterways.

TREATMENT TRAIN APPROACH	MANAGEMENT STRATEGIES	IMPLEMENTATION ACTIONS	LEADING ORGANISATION	SUPPORTING PARTNERS	TIMING
Prevention Land use and planning	Implement local planning policies, strategies and planning conditions that incorporate best management practices	• Implement best management practice through City of Bayswater statutory processes to reduce nutrient inputs from new developments and as opportunities occur, redevelopments and subdivisions • Implement State Government Codes of Practice and legislation at the local level	City of Bayswater	Department for Planning and Infrastructure, WA Planning Commission, Swan Catchment Council	Commencing 2008
Minimisation Ecoefficiency	**Fertiliser minimisation and management****	• Educate the community in the use of slow release, low water-soluble fertilisers • Support the use of alternative fertilisers at the point of sale • Implement best management practices for fertiliser use through sustainable landscaping	City of Bayswater Swan River Trust	Swan Catchment Council	Commencing 2008
Reduction Source control	**Undertake soil investigation and relevant amendments****	• Conduct an acid sulphate soils (ASS) analysis in identified sites of concern • Develop an ASS management plan • Implement soil amendments to reduce nutrient run-off and infiltration to the groundwater	City of Bayswater	Swan Catchment Council, Department of Water, Department of Environment and Conservation	Commencing 2009
	Reduce community outputs through building community capacity	• Educate the community in the use of soil amendments and sustainable landscaping practices • Raise community awareness through involvement in revegetation activities • Integrate with opportunities for biodiversity and recreation enhancement	City of Bayswater Swan River Trust	North Metro Conservation Group Swan Catchment Council	Ongoing
	Reduce industry outputs through regulation and education	• Regulate and educate small to medium enterprise • Monitor and manage industrial site remediation with Environmental Management Systems	City of Bayswater Swan Catchment Council	Department of Environment and Conservation	Ongoing
	Reduce council outputs through local management practices**	• Implement best management practices for the management of public open space • Review current management practices including street sweeping regimes and gross pollutant traps	City of Bayswater		Commencing 2008
Amelioration Conveyance and transmission	Nutrient intervention and improved drainage	• Design and construct a nutrient stripping wetland at the Eric Singleton Bird Sanctuary • Develop a series of nutrient stripping basins and living streams along the Bayswater Main Drain • Progress Bayswater Integrated Drainage Management Strategy	City of Bayswater Swan River Trust Water Corporation	Swan Catchment Council	Commencing 2008
Treatment - Reuse - Disposal	Full connection to infill sewerage	• Full connection of all current serviced properties including industrial areas, to infill sewerage	City of Bayswater	Water Corporation	Ongoing

** new management actions

5. Monitoring and review

The lead organisations and supporting partners will implement this Water Quality Improvement Plan within the constraints of existing budgets and resource levels, but we are committed to working together to actively seek new resource opportunities.

How do we measure our success?	The Swan Catchment Council's 2007 Water Quality Monitoring Program and the Swan River Trust's annual Catchment Nutrient Reports provide a baseline for water quality condition. • Conduct a water quality monitoring snapshot at the replicate sites during winter 2008, measuring the bioavailability of the nutrients and non-nutrient contaminants to indicate the impact on ecological health. • Conduct sampling to measure changes in the macro-invertebrate populations by implementing the Local Biodiversity Strategy, including habitat creation in the Bayswater Brook. • Conduct a human health risk assessment study on the Bayswater Brook. • Install a monitoring station downstream of the Eric Singleton Bird Sanctuary to measure water quality and nutrient load at the outlet to the Swan River. • Measure the levels in community awareness and behaviour change following implementation of capacity building programs. • Implement Nutrient Irrigation Management Plans and continue to assess Public Open Space for appropriate nutrient and water requirements	Swan River Trust, City of Bayswater Swan Catchment Council	North Metro Conservation Group Department of Water	Commencing 2008