

Not Scanned

**Southern Grampians
Shire Council**

Hamilton Stormwater Management Plan

Volume 1



**September
2001**



ID&A

Natural Resource Managers • Environmental Scientists & Engineers
OPERATING THROUGHOUT AUSTRALIA & ASIA PACIFIC
(Part of the Fisher Stewart Group)



**Quality
Endorsed
Company**
AS 9001 LIC 1859
Standards Australia

Southern Grampians Shire Council

Hamilton Stormwater Management Plan

Job 2900061.003

Contents

1	Introduction	1
1.1	Purpose of the Stormwater Management Plan	1
1.2	The Need to Manage Stormwater Quality	1
2	How the Plan was Developed.....	2
2.1	The Overall Process	2
2.2	Stakeholder Involvement.....	2
2.3	Risk Assessment Method.....	2
2.4	Outcomes from the Plan	3
3	Stormwater Management Issues in Hamilton	4
3.1	Values to be Protected	4
3.2	Receiving Waters And Values.....	4
3.3	Subcatchments.....	6
3.4	Threats to Stormwater Quality	7
3.5	Priority Stormwater Risks	10
4	Reactive Management Strategies	11
4.1	Reactive Strategy 1 – Industrial Land Use Runoff.....	12
4.2	Reactive Strategy 2 – Residential Land Use Runoff.....	13
4.3	Reactive Strategy 3 – Animal Wastes.....	14
4.4	Reactive Strategy 4 – Commercial Land Use Runoff	15
4.5	Reactive Strategy 5 – Upstream Inflows.....	16
4.6	Reactive Strategy 6 – Sewage Issues	17
5	Management Framework Review.....	18
5.1	Land Use Planning.....	18
5.2	Controls on Developments	18
5.2.1	Water sensitive urban design.....	19
5.3	Council Services and Operations.....	19
5.4	Education and Awareness	20
6	Management Framework Strategies.....	21
6.1	Management Framework Strategy 1 – Human resources	21
6.2	Management Framework Strategy 2 – Stormwater Policies.....	22
6.3	Management Framework Strategy 3 – Staff Awareness	22
6.4	Management Framework Strategy 4 – Council Maintenance Operations	23
6.5	Management Framework Strategy 5 – Controls on Small Developments.....	24
6.6	Management Framework Strategy 6 – Controls on Multi-Lot Developments	25
7	Implementation of the Plan	26
7.1	Responsibilities	26
7.2	Timelines and Priorities.....	26
7.3	Funding	27
8	Conclusions	28

1 Introduction

1.1 Purpose of the Stormwater Management Plan

The purpose of the Stormwater Management Plan is to protect and enhance the local waterways by improving the quality of stormwater draining from the urban areas in Hamilton.

The main waterways that receive stormwater runoff in Hamilton are Lake Hamilton and the Grange Burn.

To achieve this purpose the Plan:

- identifies the priority issues for management of stormwater quality in Hamilton;
- presents strategies for reducing the main threats to stormwater quality; and
- presents strategies for integrating best practice environmental management of stormwater into Council's management and planning activities.

Volume 1 of the Stormwater Management Plan provides a summary of how the plan was developed and details the recommended strategies. Volume 2 provides further details of the processes followed and the background information used to arrive at the strategies.

1.2 The Need to Manage Stormwater Quality

Stormwater is produced on a catchment wide basis. Urban development, such as in the township of Hamilton, increases the area of impervious (or sealed) surfaces within catchments. Because of the sealed surfaces and drainage pipes, water is transported more quickly to receiving waters.

Human activities in the catchment provide many materials that can pollute the environment. Again, the large extent of sealed surfaces increases the amount of materials that are washed off into the drainage system and to the receiving waters. There are many forms of pollutants which can cause adverse impacts on the environment and the receiving waters.

Management of stormwater quality aims to reduce any adverse impacts on the environmental and other values of the receiving waters. Strategies can include changes to the management of activities within the urban area to improve stormwater quality, through policies and procedures. Structural treatment measures can also be implemented to minimise pollutants being carried to the environment.

2 How the Plan was Developed

2.1 The Overall Process

The approach used in developing the Stormwater Management Plan follows the process detailed in Chapter 3 (revised September 2000) of the Best Practice Environmental Management Guidelines (CSIRO, 1999).

There are a number of key elements within the process for developing a stormwater management plan. A series of four workshops are included that allow the issues to be debated and the knowledge from a range of stakeholders to be incorporated into the plan. A review of current Council practices in relation to stormwater quality was also undertaken. The process also involves a risk assessment method for determining the priority risks to be managed. The main outcomes from the process are two types of strategies; reactive strategies and management framework strategies.

These elements are described further in the following sections.

2.2 Stakeholder Involvement

Development of the stormwater management plan was overseen by a Steering Committee comprising representatives from the Southern Grampians Shire, Glenelg Hopkins Catchment Management Authority and the Environment Protection Authority.

The Project Working Group was involved at four workshops throughout the study. In addition to the above members, this group consisted of further Council officers (engineers, planners and technical staff), members of environmental groups (Grange Burn Land Care Group, Friends of Eastern Barred Bandicoot) and representatives from Glenelg Region Water Authority, Southern Rural Water, and Deakin University.

2.3 Risk Assessment Method

In the context of the stormwater management plan, risks are defined as activities within the catchment that can have an adverse impact on waterways or water bodies and their associated values. Potential impacts are usually as a result of pollutants transported by stormwater.

The method for determining risk priorities can be summarised by the following relationship:

$$\text{Risk} = \text{Threat} \times \text{Value} \times \text{Sensitivity}$$

Where:

- A threat is an activity in the catchment that can pollute stormwater quality;
- The waterway or water body that receives stormwater flows (the receiving waters) is valued for a range of factors including environmental, aesthetic, cultural and economic factors; and
- The sensitivity is a measure of how much of an impact would occur to the waterway values if the pollutants were transported there by the stormwater.

This method was used through the workshop process to determine the highest risks for management. The highest risks are those activities within the urban catchment that have the most potential to cause adverse impacts on the values of the receiving waters.

2.4 Outcomes from the Plan

The main outcomes from the process are two types of strategies.

Reactive management strategies are recommended for responding to the priority risks to the receiving waters that have been identified through the workshop process.

Management framework strategies are recommended for improving the management and planning activities of the Council in stormwater quality. These strategies will reduce stormwater pollution effects across all parts of the urban area.

3 Stormwater Management Issues in Hamilton

3.1 Values to be Protected

The purpose of the Plan is to protect the values of the receiving waters from any impacts of polluted stormwater. The waterways have a range of values and beneficial uses for people as well as other environmental values. These values can be adversely affected by polluted stormwater.

The values were categorised under the following headings:

Environment	In stream habitat
	Riparian flora and fauna
Heritage	European
	Indigenous
Amenity	Recreation
	Aesthetics and Landscape
Stormwater	Flood conveyance
	Water quality treatment
Economic	Property values
	Other values, eg tourism

3.2 Receiving Waters And Values

The urban area of Hamilton has a network of piped drains and small open channels that carry stormwater to the natural waterways and water bodies. Three receiving waters have been identified within the developed area of Hamilton.

The study team and the Project Working Group determined the more important values of the receiving waters. The key values are described below and reflect the consensus on the relative importance of the values.

Figure 1 also shows the main values for the receiving waters.

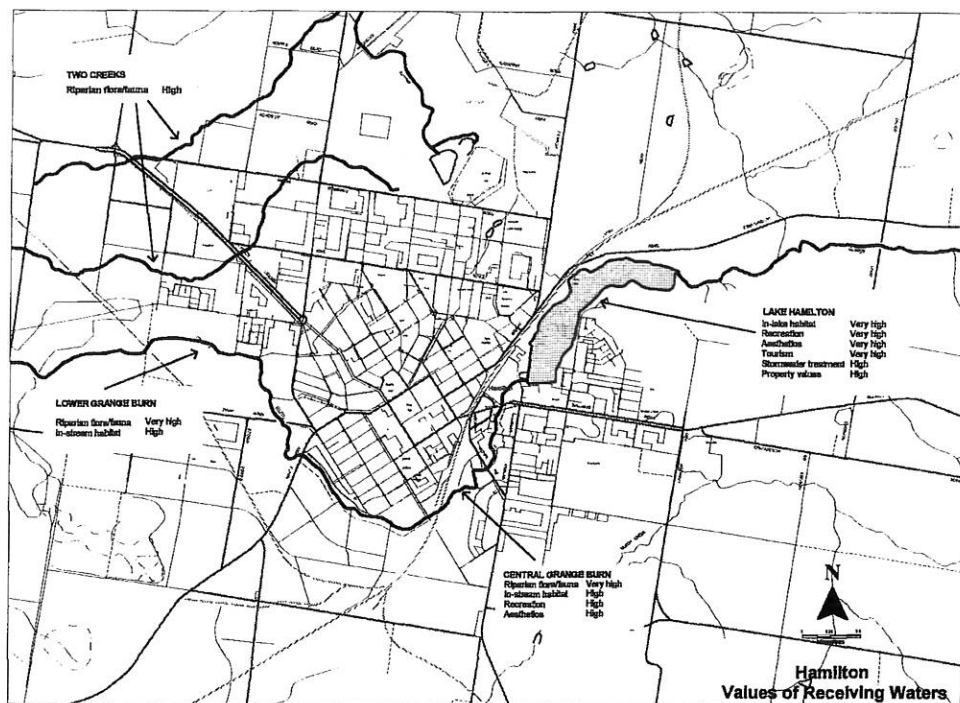


Figure 1 - Values of the Receiving Waters

Lake Hamilton is a man-made lake that is a key feature of the township. The lake is valued very highly as a recreational facility for boating and swimming. It is recognised that the lake provides economic benefits to Hamilton from tourists and other users of the lake. The lake is also highly valued as an attractive landscape feature and for providing habitat to species living in and on the water of the lake.

The **Grange Burn** is the main waterway flowing through the centre of Hamilton. The creek has been considered in two sections to reflect the range of beneficial uses.

The central Grange Burn from Lake Hamilton downstream to the Henty Highway provides habitat for fish and aquatic species and is valued highly for its riparian vegetation which provides habitat for a variety of birds and animals including the Eastern Barred Bandicoot. This section of the creek is commonly used for walking, cycling and other passive recreation as well as providing an aesthetic landscape feature for local residents.

The lower Grange Burn, downstream of the Henty Highway, is valued for its riparian zone that provides a source of food, habitat and breeding sites for many species. The creek waters are also valued highly as they provide habitat for fish and aquatic species.

The third receiving waters identified were **two creeks** (small unnamed drainage lines) that flow across the north west corner of Hamilton township. Pipe drains in the north west of Hamilton township carry stormwater to the two creeks that drain in a westerly direction before entering the Grange Burn further downstream. The two creeks only flow intermittently and sections of them are piped. The main value associated with the creeks is their riparian vegetation and particularly the remnant stands of old red gums.

3.3 Subcatchments

For the purposes of the study, the developed area of Hamilton has been divided into seven subcatchments. Subcatchments have been identified on the basis of land use patterns, receiving environments and hydrological boundaries.

The seven subcatchments are referred to throughout the study process and they form the basis of identifying threats and formulating management strategies.

The seven subcatchments are shown in Figure 2.

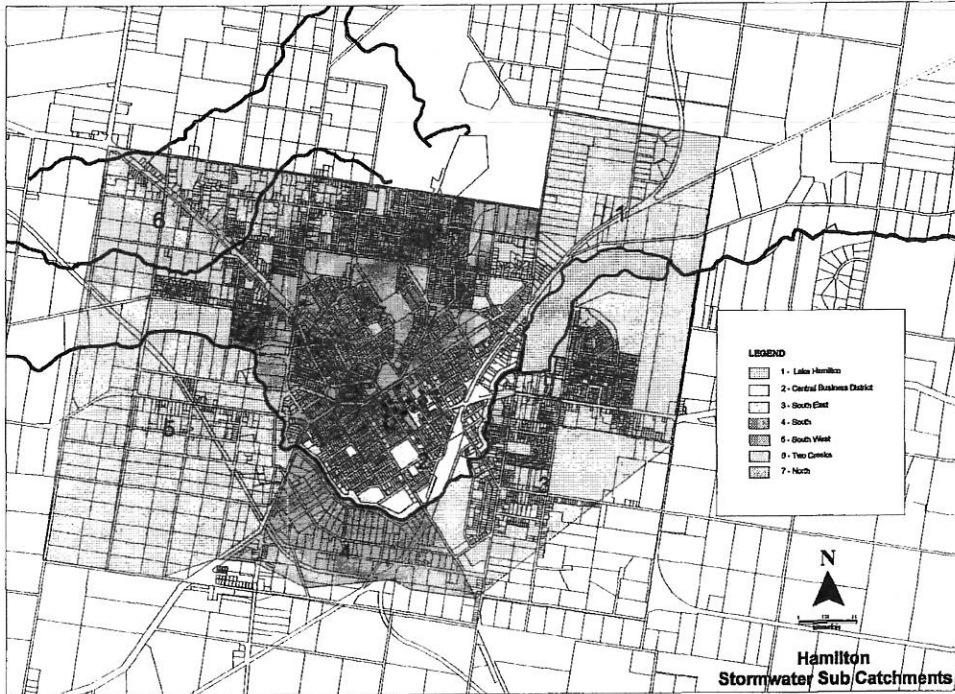


Figure 2 – Hamilton Subcatchments

3.4 Threats to Stormwater Quality

Activities undertaken in each of the subcatchments were reviewed to assess the potential threats to stormwater quality. The threats were generally categorised under the main types of land use, eg commercial area runoff.

A range of pollutants can be generated from the various catchment activities, and these are detailed in Volume 2. As with most towns, there is very little data or recorded information on the sources and extents of stormwater pollution within the urban area. Therefore, the assessment of threats relies on local knowledge and observations, combined with the general understanding from many urban areas of the typical pollutants carried by urban runoff.

The study team and the Project Working Group determined the levels of the threats, and decided on the more severe threats. Table 3.1 summarises the main threats to stormwater quality for each of the subcatchments.

Table 3.1 – Main Threats to Stormwater Quality in Hamilton

Subcatchment	Main threats to stormwater quality
Lake Hamilton	<p>Very high threats</p> <p>Open space runoff from the large open areas close to the lake as well as ovals and tennis courts could contain fertilisers and nutrients. Littering can occur because of the high usage of recreation areas around the lake, with litter being washed into the lake.</p> <p>High threats</p> <p>Runoff from the adjacent railway line could contribute oils. Runoff from the significant residential areas in this subcatchment may contain a range of pollutants. Significant threats to the lake water quality have been identified through upstream inflows from the rural areas of the upstream catchment. Animal wastes occur from dogs walked near the lake, cattle in close proximity to the lake and birds feeding at the lake.</p>
Central Business District	<p>Very high threats</p> <p>There are several industrial sites located close to the Grange Burn, including mechanical repair sites, service stations, fuel stores and manufacturing sites. The subcatchment contains the main part of the CBD and the commercial areas can produce a range of stormwater pollutants. There is also a significant residential area with potential to pollute stormwater from a range of activities.</p> <p>High threats</p> <p>Litter has been identified as a significant threat to stormwater quality in this subcatchment because of the large number of people using the CBD. Major roads are located close to the Grange Burn in this subcatchment.</p>
South East	<p>Very high threats</p> <p>Industrial sites include mechanical repair facilities, a chemical spray warehouse and manufacturing sites.</p> <p>High threats</p> <p>Parts of the subcatchment are unsewered and sillage problems have been observed (sewage issues). Other high threats identified were from the residential areas, the impacts of dog droppings and open spaces close to the creek, and the railway line runoff.</p>

Subcatchment	Main threats to stormwater quality
South	<p>Very high threats</p> <p>Runoff from the industrial areas could contain a range of pollutants. Sites include a wool scouring plant, mechanical repair facilities, a petrol station and manufacturing sites. The saleyards are situated in the south of this subcatchment and part of the site drains towards the central Grange Burn. Animal wastes from this site, as well as from other grazing land are considered very high threats to stormwater quality.</p> <p>High threats</p> <p>The Henty Highway (major road runoff) carries a large amount of traffic and crosses the Grange Burn. Runoff from the railway is another potential threat in this subcatchment.</p>
South west	<p>High threats</p> <p>The main developed land use in the subcatchment that could impact on water quality is the industrial zone along Henty Highway. The Hamilton landfill is also located in this subcatchment and is a potential source of litter. There are farms (rural land use) located adjacent to the Grange Burn posing potential threats from animal wastes and cattle eroding the creek banks.</p>
North	<p>Very high threats</p> <p>This subcatchment contains the largest residential area within Hamilton. It also contains part of the CBD and the associated commercial areas. Both areas can contribute pollution to stormwater.</p> <p>High threats</p> <p>Litter from the CBD is regarded as a high threat. There are several major roads through this subcatchment. Dog droppings (animal wastes) from the many dogs in the residential areas are another threat. The subcatchment is seweraged but there is an identified overflow point and a pump station that has experienced overflows (sewage issues).</p>
Two creeks	<p>Very high threats</p> <p>The subcatchment encompasses an industrial estate that could generate stormwater pollution.</p> <p>High threats</p> <p>There are a couple of school sites that are potential sources of litter to the drains. A major highway runs through the subcatchment.</p>

The main threats for each of the subcatchments are summarised in Figure 3.

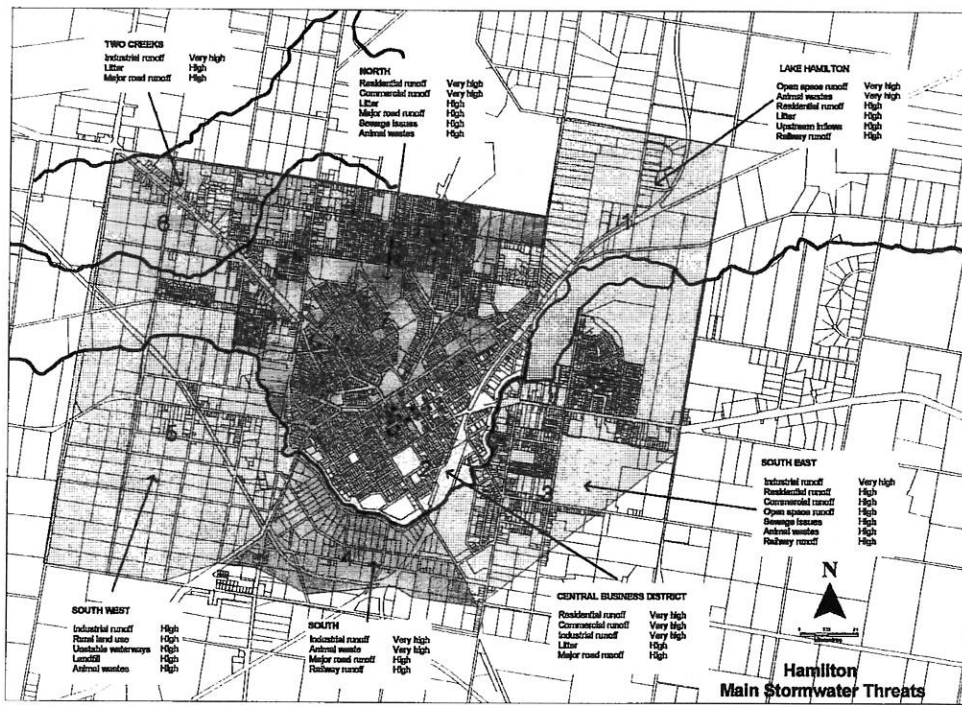


Figure 3 – Main threats to Stormwater Quality

3.5 Priority Stormwater Risks

The priority risks were determined using the risk assessment method described previously. This involved allocating scores to the values of the receiving waters and to the threats from the urban catchment land uses. Scores were also allocated for the sensitivity of the receiving waters to each particular threat.

All risk combinations were then compared and the highest scores indicated the priority stormwater risks to the receiving waters. The results for the top six priorities are listed in order in the following table.

Table 3.2 – Priority Stormwater Risks in Hamilton

Priority Risk	Threat	Subcatchments
1	Industrial Land Use Runoff	CBD South east South South west
2	Residential Land Use Runoff	Lake Hamilton CBD North
3	Animal Wastes	Lake Hamilton South
4	Commercial Land Use Runoff	CBD North
5	Upstream Inflows	Lake Hamilton
6	Sewage Issues	South east North

4 Reactive Management Strategies

Reactive management strategies have been developed to respond to the priority risks determined through the risk assessment process. There are many potential management actions that could be undertaken and they can be categorised as follows.

- Education and awareness
- Site specific strategies and plans
- Structural treatment measures
- Information and data collection
- Regulation and enforcement
- Source controls

The reactive management strategies consist of groups of actions. A method of selection and assessment was undertaken to arrive at the strategies, and this is explained in greater detail in Volume 2. Initially, the potential actions were screened to remove those that were clearly not applicable to managing the risk. Then a more detailed assessment was made of potential actions, considering a number of factors including cost, effectiveness and feasibility. The most effective actions were then selected to form part of the strategies.

The reactive management strategies are presented below for each of the 6 priority risks. Each strategy has a balance of structural and non-structural actions. The list of strategies includes a description of each action, estimated cost allowances and the authority responsible for implementing the action. Finally, it is indicated whether the action applies to a specific location or whether it is effective across all the relevant subcatchments.

4.1 Reactive Strategy 1 – Industrial Land Use Runoff

This strategy responds to the highest priority risk issue in Hamilton. There are risks that runoff from industrial land uses may impact adversely on the values of the Grange Burn.

Action Number	Management Action Description	Capital cost	Ongoing Cost	Responsibility	Extent
PRI 1-1	<p>Inspection and Assessment</p> <p>Inspection of industrial sites (from street level) to assess higher risk industries and to establish basis for further management approaches.</p>	\$15,000		SGSC / EPA	Local
PRI 1-2	<p>Distribution of Guidelines</p> <p>Distribute brochure or guidelines to industries regarding the storage and control of chemicals and wastes that could pollute stormwater. Use guidelines available from other sources, or identify information gap.</p>	\$8,000		SGSC / EPA	Township
PRI 1-3	<p>Individual/Organisation Consultation</p> <p>Meet with individual industries and review practices and advise on improvements.</p>	\$12,000	\$2,000	SGSC / EPA	Local
PRI 1-4	<p>Filter strip</p> <p>Construct a filter strip at the drain outlet from Mt Napier Rd next to the Grange Burn</p>	\$15,000	\$1,500	SGSC	Local
PRI 1-5	<p>Monitoring of receiving waters</p> <p>Monitoring of water quality and biology of the Grange Burn. This could assist in prioritising areas for future management.</p>	\$8,000	\$5,000	SGSC / GHCMA	Township

4.2 Reactive Strategy 2 – Residential Land Use Runoff

This strategy responds to risks that runoff from residential areas may impact adversely on the values of Lake Hamilton and the Grange Burn.

Action Number	Management Action Description	Capital cost	Ongoing Cost	Responsibility	Extent
PRI 2-1	<p>Distribution of Guidelines</p> <p>Distribute information brochures for households regarding best practices for stormwater issues. Use brochures available from other sources, or identify information gap.</p>	\$8,000		SGSC / EPA	Township
PRI 2-2	<p>Media release</p> <p>Use local newspapers to run a number of articles on the SWMP and its outcomes, including best practices for householders.</p>	\$3,000		SGSC	Township
PRI 2-3	<p>Signage</p> <p>Additional stencilling of drain pits near the lake and within the CBD.</p>	\$5,000		SGSC	Local
PRI 2-4	<p>Litter monitoring</p> <p>Monitoring of litter quantities and locations in the Grange Burn and Lake Hamilton.</p> <p>This would be an extension of the Grange Burn water quality monitoring (PRI 1-5).</p>	\$5,000	\$3,000	SGSC / South West Region Waste Group	Local
PRI 2-5	<p>Street sweeping</p> <p>Additional street sweeping mainly to collect autumn leaf falls.</p>	\$8,000	\$5,000	SGSC	Township
PRI 2-6	<p>Constructed wetland</p> <p>Constructed wetland at outlet of main drain near Hamilton Place. (Catchment area 190 ha, wetland area 2 ha). This land has been purchased recently by the Shire and provides a suitable location for a wetland to treat a large part of the developed areas of Hamilton.</p>	\$500,000	\$8,000	SGSC / GHCMA	Local

4.3 Reactive Strategy 3 – Animal Wastes

This strategy responds to risks that wastes from animals including cattle and dogs may impact adversely on the values of Lake Hamilton and the Grange Burn.

Action Number	Management Action Description	Capital cost	Ongoing Cost	Responsibility	Extent
PRI 3-1	<p>Distribution of Guidelines</p> <p>Distribute information brochures for households regarding collection of dog droppings. Use brochures available from other sources, or identify information gap.</p>	\$6,000		SGSC	Township
PRI 3-2	<p>Water quality management strategy</p> <p>Continue Council's involvement in the development of the Lake Hamilton management strategy. The strategy includes broader catchment issues as well as urban stormwater.</p>	\$5,000		SGSC	Township
PRI 3-3	<p>Signage</p> <p>Additional signs and dog bag dispensers around the lake and along creek for dropping collection.</p>	\$10,000	\$2,000	SGSC	Local
PRI 3-4	<p>Improved Waterway Management</p> <p>Support the CMA in encouraging better management of stream side land (fencing, revegetation). Council to assist in consultation with local landowners.</p>	\$5,000	\$3,000	SGSC	Township
PRI 3-5	<p>Environmental Improvement Plan</p> <p>Develop an Environmental Improvement Plan for the saleyards addressing site aspects including animal waste collection, treatment and reuse, and truck movement management.</p>	\$15,000		SGSC / EPA	Local

4.4 Reactive Strategy 4 – Commercial Land Use Runoff

This strategy responds to risks that runoff from commercial areas may impact adversely on the values of the Grange Burn.

Action Number	Management Action Description	Capital cost	Ongoing Cost	Responsibility	Extent
PRI 4-1	Signage No littering signs within the CBD. (stencilling of drain pits recommended in PRI 2-3)	\$5,000		SGSC	Local
PRI 4-2	Waste and refuse collection Inspection of shop sites to ensure correct waste management practices.	\$5,000	\$7,000	SGSC	Local
PRI 4-3	Side entry pit traps Install traps throughout CBD.	\$15,000	\$6,000	SGSC	Local
PRI 4-4	Monitoring of receiving waters Monitoring of water quality and litter from French Street drain outlet. Additional to previous monitoring program (refer to PRI 1-5 and 2-4).	\$2,000	\$3,000	SGSC	Township
PRI 4-5	Gross pollutant trap Install in line GPT on French St drain, (600mm). The need for the GPT will depend on the effectiveness of the previous two actions.	\$80,000	\$4,000	SGSC	Local
(refer to PRI 2-6)	Constructed wetland Constructed wetland at outlet of main drain near Hamilton Place.				

4.5 Reactive Strategy 5 – Upstream Inflows

This strategy responds to risks from upstream inflows of the Grange Burn that may impact adversely on the values of Lake Hamilton.

Action Number	Management Action Description	Capital cost	Ongoing Cost	Responsibility	Extent
(refer to PRI 3-2)	<p>Water quality management strategy</p> <p>Continue Council's involvement in the development of the Lake Hamilton management strategy.</p>				
PRI 5-1	<p>Waterway management strategy development</p> <p>Encourage the CMA to develop a waterway strategy for the Grange Burn upstream of Hamilton. Council staff to form part of the strategy team.</p>	\$3,000	\$3,000	SGSC / GHCMA	Township
PRI 5-2	<p>Media release</p> <p>Use local newspapers to run an article on the influence of upstream inflows on Lake Hamilton. Include best practices for farmers.</p>	\$2,000		SGSC / GHCMA	Township
PRI 5-3	<p>Consultation with local Landcare group</p> <p>Attend Landcare group meeting and discuss water quality impacts on the lake and improvement measures. Continue to consult at regular intervals.</p>	\$3,000	\$2,000	SGSC / GHCMA	Township

4.6 Reactive Strategy 6 – Sewage Issues

This strategy responds to risks from sewer overflows and unsewered areas that may impact adversely on the values of the Grange Burn.

Action Number	Management Action Description	Capital cost	Ongoing Cost	Responsibility	Extent
PRI 6-1	<p>Spill prevention and containment plans</p> <p>Assist in the development of an emergency response plan for sewer overflows.</p>	\$8,000		SGSC / GRWA / EPA	Township
PRI 6-2	<p>Distribution of Guidelines</p> <p>Distribute information brochures for households regarding management of septic tanks. Use brochures available from other sources, or identify information gap.</p>	\$6,000		SGSC	Township
PRI 6-3	<p>Wastewater Management Plan</p> <p>Develop Domestic Wastewater Management Plan, including consultation with residents. Assess sewerage of septic tank areas.</p>	\$15,000		SGSC / GRWA / EPA	Local
PRI 6-4	<p>Land owner enforcement</p> <p>Environmental officer to inspect drains and off site effects from septic tanks and enforce clean ups if required.</p>	\$6,000	\$3,000	SGSC / EPA	Local
PRI 6-5	<p>Filter strip</p> <p>Filter strip at the drain outlet from Rippons Rd area, near Grange Burn.</p>	\$25,000	\$3,000	SGSC	Local
(refer to PRI 2-6)	<p>Constructed wetland</p> <p>Constructed wetland at outlet of main drain near Hamilton Place.</p>				

5 Management Framework Review

In this section, current council practices in stormwater management are reviewed. The Council's management framework covers the planning and management activities undertaken by Council officers that can influence the quality of stormwater runoff from the Hamilton township. The framework includes planning functions, approvals and controls on developments, management of assets and the provision of services.

Emphasis on the management of stormwater quality has only become an issue in recent years. Prior to this, the emphasis has been on conveying stormwater rapidly away from houses and streets to the local waterways often through gutters, pipes and other hard surface infrastructure. Therefore, it is to be expected that current council practices will, in many cases, be below best practice standards for stormwater quality management.

5.1 Land Use Planning

A primary means of improving stormwater management processes and outcomes for Hamilton is through the Council's land use and development planning framework. This framework is governed by the provisions of the *Planning and Environment Act 1987* and the *Southern Grampians Planning Scheme*.

The Southern Grampians Planning Scheme consists of:

- State Planning Policy Framework, zones and overlays and particular provisions.
- Local Planning Policy Framework, comprising a *Municipal Strategic Statement* and local planning policies; as well as issue-specific schedules to the standard zone and overlay controls.

The Municipal Strategic Statement (MSS) describes the role of the municipality in a regional context, sets out a broad vision for the future and links the objectives of the MSS to the Council's Corporate Plan. It also establishes objectives for land use and development and provides strategies for achieving these objectives.

Currently in the MSS, fairly minimal reference is made to stormwater management and its impact on wider catchment issues. There is no reference to urban development and associated stormwater runoff and its impact on water quality and the protection of watercourses.

Equally, none of the local policies refer directly to stormwater management in Hamilton. The provision of appropriate drainage infrastructure is generally mentioned as a requirement for development but only in this very broad manner.

5.2 Controls on Developments

The construction phase of houses, building and developments involves land disturbance and the use of chemicals and other potential pollutants of stormwater. This can be at the scale of a large development with new roads and services or at the scale of an individual house construction.

The main management method for developments currently available to Council is through planning controls. The issuing of planning permits with associated conditions can be required for subdivisions, developments requiring planning zone changes and other developments. This process involves internal referrals between planners and engineers, and can also require referrals to external authorities. However, the main conditions applied relate to drainage points of discharge and areas of inundation. There are currently no controls applied in relation to stormwater quality.

Similarly, the Council does not presently implement any requirements or controls on single lot developments in relation to stormwater quality issues.

5.2.1 Water sensitive urban design

A different design approach to new residential and other urban developments can greatly improve stormwater quality and reduce environmental impacts. Water sensitive urban design (WSUD) is the best practice approach to urban development in relation to water issues. The objectives and approach are summarised below:

- Protect natural systems – retain natural drainage systems within urban developments;
- Integrate stormwater treatment into the landscape – e.g. through the use of vegetated open drains as part of the treed landscape;
- Protect water quality – e.g. by minimising impervious areas; and
- Add value while minimising development costs.

The majority of the developed areas in Hamilton are drained with pipe drains and do not involve WSUD principles.

5.3 Council Services and Operations

Council staff are responsible for the cleaning of streets, footpaths and car parks throughout Hamilton township. Mechanical cleaning occurs on an irregular basis as required or when requested by local residents. Over 100 kilometres of kerb and channel are cleaned and approximately 40 -50 tonnes of leaf litter, litter and aggregate are collected each year during street sweeping activities. Manual cleaning of footpaths, roadside kerbs and drains is also conducted on a regular basis especially in the CBD area.

The Council manages Contractors that provide kerbside waste and recyclable collection services. Domestic waste is collected weekly and recyclable materials are collected fortnightly. Services for the collection and disposal of domestic toxicants are also provided.

There are no formalised procedures that could minimise sediment generation and pollution during maintenance of drains, roads, parks and reserves.

5.4 Education and Awareness

Southern Grampians Shire operates in conjunction with Glenelg Hopkins Catchment Management Authority in educating and improving the knowledge of the local community on stormwater threats and other related issues.

Stormwater education activities occurring within Hamilton are listed below:

- Provision of funding for drain stencilling for schools;
- Council Officers available to visit schools, community groups to discuss waste and litter reduction initiatives;
- Council demonstrations of waste removal and gutter cleaning; and
- Council information booklets and pamphlets.

Southern Grampians Shire has powers to enforce the control of littering and other potentially polluting activities through the State Litter Act and Local Laws.

6 Management Framework Strategies

Following from the review of current Council practices, a number of recommendations have been made for improvements in relation to stormwater quality management. Management framework strategies are outlined in this section.

The order of implementation is proposed across the strategies, with each individual action listed as a very high, high or medium priority.

6.1 Management Framework Strategy 1 – Human resources

It is essential that staff within Council are given the responsibility to ensure that the strategies of the management plan are implemented. Additional resources may be needed to implement specific aspects of the plan.

Actions	Responsibility	Priority
Nominate a coordinator with the responsibility for implementing the strategies of the stormwater management plan.	Council	Very High
Form a committee of Council staff to oversee and review the progress of the strategies. The committee should include a number of Council staff, and preferably external members such as representatives from the CMA, EPA and others from the current working group.	Council	Very High
Allocate additional resources for the enforcement of planning and building permit conditions.	Planning and Physical Services.	Medium

6.2 Management Framework Strategy 2 – Stormwater Policies

At present the Council's policies do not specifically address stormwater quality management. The policies should be updated to provide the commitment and basis for implementing the strategies of the stormwater management plan.

Actions	Responsibility	Priority
The Municipal Strategic Statement (MSS) to specifically address stormwater quality issues. The MSS could include a profile of Hamilton's urban stormwater system and reference to the Stormwater Management Plan. This change would best occur during an overall review of the planning scheme.	Planning	High
A policy and/or local law to support the management of stormwater quality and the enforcement of appropriate developments through planning and building permits. This policy would be included in the Local Planning Policy Framework.	Planning and Legal	High
A policy to encourage the adoption of water sensitive urban design in the Shire. This policy would be included in the Local Planning Policy Framework.	Planning	Medium

6.3 Management Framework Strategy 3 – Staff Awareness

Many of the opportunities for improvement can be made within the existing management framework. However, this requires that the Council staff are aware of stormwater issues.

Actions	Responsibility	Priority
Clarification of the referral process for planning applications. Develop guidelines for the referral of planning applications that may require consideration of drainage and stormwater quality issues. This would apply to internal and external referrals.	Planning and Physical Services. Possibly through a Consultant.	Very high
Training of staff regarding stormwater management issues. Internal workshops should involve staff from planning, physical services, health and building services.	Various departments. Possibly through a Consultant.	Very high
Staff induction process to be amended to cover stormwater quality aspects, where appropriate.	Human services.	Medium

6.4 Management Framework Strategy 4 – Council Maintenance Operations

Improvements in the procedures followed for the maintenance of Council assets, such as roads and drains, will lessen the impacts on stormwater quality across the Hamilton township. The design of any new assets or upgrades should also consider best practice stormwater aspects.

Actions	Responsibility	Priority
Develop procedures for maintenance of roads and drains that address stormwater quality. The procedures would address excavation practices, material stockpiles and machinery maintenance.	Physical Services. Possibly through a Consultant.	Very high
Develop procedures for park and garden maintenance. The procedures would address use of chemicals, especially near waterways, and the management of vegetation cuttings.	Physical Services. Possibly through a Consultant.	High
Council asset designs to consider stormwater quality aspects. Designs should consider pervious areas and the treatment of runoff. Examples include the design of car parks, and replacement of pipe drains with open types, where applicable.	Physical Services.	Medium

6.5 Management Framework Strategy 5 – Controls on Small Developments

Additional controls on house constructions and building developments on single lots can significantly reduce impacts on stormwater quality.

Actions	Responsibility	Priority
Provide an information brochure on best environmental practices for site management for use by builders and landowners. Existing brochures from other sources could be used directly or amended to suit Hamilton.	Physical Services, through a Consultant.	Very high
Building inspectors to ensure implementation of site environmental management plans , where appropriate. The plans would need to address the management of stormwater runoff, rubbish, and sediments on site. Need to consult with private building inspectors.	Physical Services and Legal.	High
Provide an information brochure that encourages stormwater collection and reuse on house lots, such as through the use of rainwater tanks. Existing brochures from other sources could be used directly or amended to suit Hamilton.	Physical Services, through a Consultant.	Medium

6.6 Management Framework Strategy 6 – Controls on Multi-Lot Developments

Whilst multi-lot developments are not common in Hamilton, they have potential to contribute large amounts of sediments and other pollutants to stormwater runoff. Controls on such developments will minimise these threats.

Actions	Responsibility	Priority
Planning permits to include requirements on stormwater quality aspects . Design requirements may include site impervious areas, runoff volumes and stormwater quality treatment methods. Permits will also require environmental management plans for the construction phase of the development.	Planning and Physical Services.	High
Prepare an information brochure on water sensitive urban design. This would be available to developers and landowners.	Physical Services, through a Consultant.	High
Increase enforcement of planning permit conditions in relation to requirements during the construction phase. The extent and method of enforcement needs to be decided and supported by a Council policy.	Physical Services.	Medium

7 Implementation of the Plan

The stormwater management plan contains a significant number of strategies and recommended management changes for Hamilton. There needs to be a commitment to ensure that these strategies are implemented and that improvements to the valued waterways in Hamilton are achieved.

7.1 Responsibilities

It is anticipated that the involvement of the various organisations in developing the Plan will continue into the implementation phase. The main responsibility for implementation lies with Southern Grampians Shire Council, but support is also required from Glenelg Hopkins Catchment Management Authority and the Environment Protection Authority. Ongoing support from the community as demonstrated through the Project Working Group will be very beneficial.

The following roles are recommended for the implementation of the Stormwater Management Plan:

- A **coordinator** with the responsibility for maintaining commitment to the implementation of the stormwater management plan.
- A **committee** of Council staff to oversee and review the progress of the strategies. The committee should include a number of Council staff, and preferably external members such as representatives from the CMA, EPA and others from the current working group.

7.2 Timelines and Priorities

Implementation of the reactive and management framework strategies is expected to require a period of five to ten years. This is dependent on the level of commitment allocated to the Plan in terms of funds and resources.

Priorities have been proposed for the reactive strategies and they respond to the priority risks that were identified for the receiving waters. Similarly, levels of priority have been proposed for the management framework strategies. The priorities provide Council with guidance for the order of implementation.

However, it is recognised that there needs to be some flexibility to reflect the availability of funds and coordination with other activities. A number of the framework strategies would be best implemented at times when internal reviews of policies and procedures or training programs are being conducted.

Therefore, it is recommended that an initial task of the implementation committee should be to develop a more detailed schedule for implementation of the strategies. This schedule could then be reviewed and updated annually in line with the Council's other planning activities.

A more complete review of the priorities should not be required for a number of years, given the processes involved in preparing the current plan. However, a review in three to five years time is suggested to consider improvements to the receiving waters and any significant changes in the extent and type of threats to stormwater quality.

7.3 Funding

Council will need to allocate a significant level of funds if the strategies are to be implemented successfully. If this is done, it will demonstrate Council's commitment to the process and will subsequently assist in obtaining additional funds from other sources.

Southern Grampians Shire Council is able to apply for funding through various government programs.

The Victorian Government has allocated \$22.5 million over a three year period for improved management of stormwater quality across the State through the Victorian Stormwater Action Program. With the completion of the Hamilton stormwater management plan, Council is in a position to apply for funds to assist in the implementation of the priority strategies identified in the plan.

Another potential source of funds is through the Natural Heritage Trust. Commonwealth government funds have been extended for the program that contributes to many environmental projects around the nation.

In relation to litter issues, some funds may be available through EcoRecycle Victoria.

Several of the strategies involve actions with overlapping responsibilities, such as the water quality monitoring. Cost sharing with the Catchment Management Authority or other authorities should be pursued in these cases.

8 Conclusions

Hamilton's Stormwater Management Plan provides a framework for protecting and enhancing Lake Hamilton and the Grange Burn through improvements to urban stormwater quality.

Priorities for management have been determined through a workshop process involving key staff from the Council as well as representatives from other authorities and local interest groups. Therefore, the outcomes from the Plan have been determined from a broad range of inputs and the implementation of the strategies should be successful if the commitment is maintained.

The values of Lake Hamilton and the Grange Burn that are most important to the community have been determined. Strategies have been developed for responding to the priority risks to stormwater quality that could impact on these receiving waters.

Recommendations have also been developed for integrating best practice environmental management of stormwater into Council's management and planning activities.

The Stormwater Management Plan provides Council with the basis for obtaining external funds to support its commitment to the strategies. Primarily, the Plan sets out a framework for implementing changes that will improve the environmental conditions and protect the values of the waterways in Hamilton.

Attachments – if required

