

Mornington Peninsula Shire Council Stormwater Management Plan Volume III

Prepared For: Mornington Peninsula Shire Council

Prepared By: WBM Oceanics Australia

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Synopsis:	This report constitutes the third volume of the Stormwater Management Plan developed for the Mornington Peninsula Shire Council. This report provides details of Appendices relating to Volume II.	

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1 INTRODUCTION

WBM Oceanics Australia was commissioned by Mornington Peninsula Shire Council to develop a Stormwater Management Plan (SWMP) for the municipality. The SWMP has been developed to guide Council in improving the environmental management of stormwater throughout the municipality.

The SWMP provides a framework for integrating stormwater management as part of Council's existing management and planning activities. In this regard, the SWMP is intended to provide the basis for an ongoing process to protect and enhance receiving environmental values currently threatened by stormwater runoff. In most municipalities the primary aim of the SWMP is the management of runoff from urban areas, however, the unique nature of Peninsula has required the development of a SWMP that considers the range of landuses within the municipality. In this regard the SWMP considers the entire municipality, with particular reference to the impacts of urban stormwater on receiving environments.

The Stormwater Management Plan has been prepared in 3 volumes with this report constituting Volume II. **Volume III** provides Appendices that accompany Volume II.

The following information is presented in Volumes I and II of the plan:

- **Volume I** – this is an executive summary document which provides a precis of the overall Stormwater Management Plan.
- **Volume II** – . provides detailed information on:
 - the approach adopted in developing the Plan;
 - recommendations aimed at responding to existing threats to environmental values; and
 - suggested improvements to Council's management framework to limit the occurrence of stormwater threats in the future

APPENDIX A: PROJECT WORKING GROUP DISCUSSION PAPERS

APPENDIX B: PROJECT WORKING GROUP MEMBERS

Table B.B.1 Project Working Group Members and Affiliations

Name	Organisation
Alan Mackenzie	MPSC
Alex Atkins	MPSC
Allan Cowley	MPSC
Barry Pankhurst	MPSC
Bill Mallinson	MPSC
Bruce Douglas	MPSC
Craig Cinquegrana	MPSC
Emily Kinns	MPSC
Garrigue Pergl	MPSC
Gordon Fry	MPSC
John Annear	MPSC
John Turner	MPSC
Paul Healy	MPSC
Rebecca Thurman	MPSC
Sandra Davis	MPSC
Simon Thorning	MPSC
Sotirios Katakouzinis	MPSC
Vanessa Petrie	MPSC
Mark Batty	Melbourne Water
Stewart Burte	EPA

APPENDIX C: DETAILED THREATS AND VALUES ASSESSMENT

APPENDIX D: RESULTS OF RISK ASSESSMENT

Table D.1 Risk Analysis for Watsons Creek

Watsons Creek			Residential Land Use Runoff	Commercial Land Use Runoff	Industrial Land Use Runoff	Major Road Runoff	Unsealed Road Runoff	Residential Development	Building Site Runoff (Lot Scale)	Unstable and Degraded Waterways	Flow Modification	Landfill and Contaminated Sites	Septic and Sewer Leakage
			2.0	1.0	1.0	1.0	2.0	1.0	1.0	3.0	2.0		2.0
Environmental	In-Stream Habitat	1.0	3	3	4	3	3	4	2	3	3	2	2
	Riparian Habitat	1.0	2	3	3	2	2	3	2	3	4	1	1
	Geomorphology	1.0	2	3	2	2	2	2	2	4	4	1	1
	Groundwater	3.0	2	2	3	2	1	1	1	1	1	4	4
Cultural	European Heritage		3	3	3	2	2	2	2	1	3	1	1
	Indigenous Heritage	1.0	3	4	3	1	2	2	2	3	4	2	2
Amenity	Recreational	1.0	3	3	3	2	3	2	3	2	2	2	3
	Visual/Landscape	2.0	3	3	2	2	3	3	4	2	2	2	2
Stormwater	Flood Conveyance	1.0	2	2	2	1	3	3	1	2	3	1	1
	Water Quality Treatment		3	3	3	2	3	3	1	2	3	1	1
Economic	Property Value	1.0	2	2	2	1	1	2	2	1	3	2	3
	Irrigation Supply	2.0	1	1	1	1	3	1	1	3	4	3	2
Receiving Environmental	Local (estuarine)	4.0	3	3	3	2	3	4	1	2	2	2	2
	Regional	4.0	2	2	3	2	3	3	1	2	2	2	2

Legend
 Risk = Value x Threat x Sensitivity
 Sensitivity is indicated in the upper right hand corner of each box.

Threat	Score	Value	Score	Sensitivity	Score
Very High	4	Very High	4	Very High	4
High	3	High	3	High	3
Medium	2	Medium	2	Medium	2
Low	1	Low	1	Low	1

Table D.2 Risk Analysis for Olivers Creek

Olivers Creek			Residential Land Use Runoff	Commercial Land Use Runoff	Industrial Land Use Runoff	Major Road Runoff	Unsealed Road Runoff	Residential Development	Building Site Runoff (Lot Scale)	Unstable and Degraded Waterways	Flow Modification	Landfill and Contaminated Sites	Septic and Sewer Leakage
			2.0	1.0	1.0	1.0	3.0	1.0	1.0	2.0	3.0	2.0	2.0
Environmental	In-Stream Habitat	1.0	3	3	4.0	3.0	3.0	4.0	2.0	3.0	3.0	2.0	2.0
	Riparian Habitat	1.0	2.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	4.0	1.0	1.0
	Geomorphology	1.0	4.0	3.0	3.0	2.0	2.0	2.0	2.0	9.0	8.0	1.0	1.0
	Groundwater	2.0	4.0	3.0	2.0	2.0	6.0	2.0	2.0	12.0	8.0	4.0	4.0
Cultural	European Heritage		3.0	3.0	3.0	2.0	2.0	2.0	2.0	1.0	3.0	1.0	1.0
	Indigenous Heritage		3.0	4.0	3.0	1.0	2.0	2.0	2.0	4.0	4.0	2.0	2.0
Amenity	Recreational	2.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0	2.0	3.0
	Visual/Landscape	2.0	12.0	6.0	6.0	4.0	18.0	4.0	6.0	12.0	8.0	2.0	12.0
Stormwater	Flood Conveyance	3.0	2.0	2.0	2.0	1.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
	Water Quality Treatment		3.0	3.0	3.0	2.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
Economic	Property Value	1.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	3.0	2.0	3.0
	Irrigation Supply	1.0	4.0	2.0	2.0	1.0	3.0	2.0	2.0	3.0	6.0	3.0	6.0
Receiving Environmental	Local (estuarine)	4.0	2.0	1.0	1.0	1.0	9.0	1.0	1.0	9.0	8.0	2.0	4.0
	Regional	4.0	3.0	3.0	3.0	2.0	2.0	4.0	1.0	2.0	2.0	2.0	2.0

Legend
 Risk = Value x Threat x Sensitivity
 Sensitivity is indicated in the upper right hand corner of each box.

Threat	Score	Value	Score	Sensitivity	Score
Very High	4	Very High	4	Very High	4
High	3	High	3	High	3
Medium	2	Medium	2	Medium	2
Low	1	Low	1	Low	1

Table D.3 Risk Analysis for Kings Creek & Hastings

Kings Ck & Hastings			Residential Land Use Runoff	Commercial Land Use Runoff	Industrial Land Use Runoff	Major Road Runoff	Unsealed Road Runoff	Residential Development	Building Site Runoff (Lot Scale)	Unstable and Degraded Waterways	Flow Modification	Landfill and Contaminated Sites	Septic and Sewer Leakage
			2.0	2.0	2.0	1.0	3.0	3.0	2.0	2.0	2.0	2.0	1.0
Environmental	In-Stream Habitat	1.0	3.0	3.0	4.0	3.0	3.0	4.0	2.0	3.0	3.0	2.0	2.0
	Riparian Habitat	2.0	2.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	4.0	1.0	1.0
	Geomorphology	1.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	4.0	4.0	1.0	1.0
	Groundwater	2.0	2.0	2.0	3.0	2.0	1.0	1.0	1.0	1.0	1.0	4.0	4.0
Cultural	European Heritage		3.0	3.0	3.0	2.0	2.0	2.0	2.0	1.0	3.0	1.0	1.0
	Indigenous Heritage		3.0	4.0	3.0	1.0	2.0	2.0	2.0	4.0	4.0	2.0	2.0
Amenity	Recreational	2.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0	2.0	3.0
	Visual/Landscape	2.0	3.0	3.0	2.0	2.0	3.0	3.0	4.0	2.0	2.0	2.0	2.0
Stormwater	Flood Conveyance	2.0	2.0	2.0	2.0	1.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
	Water Quality Treatment		3.0	3.0	3.0	2.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
Economic	Property Value	2.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	3.0	2.0	3.0
	Irrigation Supply	3.0	1.0	1.0	1.0	1.0	3.0	1.0	1.0	3.0	4.0	3.0	2.0
Receiving Environmental	Local (estuarine)	3.0	3.0	3.0	3.0	2.0	3.0	4.0	1.0	2.0	2.0	2.0	2.0
	Regional	4.0	2.0	2.0	3.0	2.0	2.0	3.0	1.0	2.0	2.0	2.0	2.0

Legend
 Risk = Value x Threat x Sensitivity
 Sensitivity is indicated in the upper right hand corner of each box.

Key					
Threat	Score	Value	Score	Sensitivity	Score
Very High	4	Very High	4	Very High	4
High	3	High	3	High	3
Medium	2	Medium	2	Medium	2
Low	1	Low	1	Low	1

Table D.4 Risk Analysis for Warringine Creek

Warringine Creek			Residential Land Use Runoff	Commercial Land Use Runoff	Industrial Land Use Runoff	Major Road Runoff	Unsealed Road Runoff	Residential Development	Building Site Runoff (Lot Scale)	Unstable and Degraded Waterways	Flow Modification	Landfill and Contaminated Sites	Septic and Sewer Leakage
			1.0	1.0	2.0	1.0	2.0	1.0	1.0	2.0	1.0	2.0	1.0
Environmental	In-Stream Habitat	2.0	3	3	4.0	3.0	3.0	4.0	2.0	3.0	3.0	2.0	2.0
	Riparian Habitat	2.0	2.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	4.0	1.0	1.0
	Geomorphology	1.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	4.0	4.0	1.0	1.0
	Groundwater	2.0	2.0	2.0	3.0	2.0	1.0	1.0	1.0	1.0	1.0	4.0	4.0
Cultural	European Heritage		3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	1.0	3.0	1.0
	Indigenous Heritage	2.0	3.0	4.0	3.0	1.0	2.0	2.0	2.0	4.0	4.0	2.0	2.0
Amenity	Recreational	3.0	3.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	2.0	2.0	3.0
	Visual/Landscape	3.0	3.0	3.0	2.0	2.0	3.0	3.0	4.0	2.0	2.0	2.0	2.0
Stormwater	Flood Conveyance	2.0	2.0	2.0	2.0	1.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
	Water Quality Treatment		3.0	3.0	3.0	2.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
Economic	Property Value	2.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	3.0	2.0	3.0
	Irrigation Supply	2.0	1.0	1.0	1.0	1.0	3.0	1.0	1.0	3.0	4.0	3.0	2.0
Receiving Environmental	Local (estuarine)	4.0	3.0	3.0	3.0	2.0	3.0	4.0	1.0	2.0	2.0	2.0	2.0
	Regional	4.0	2.0	2.0	3.0	2.0	2.0	3.0	1.0	2.0	2.0	2.0	2.0

Legend
 Risk = Value x Threat x Sensitivity
 Sensitivity is indicated in the upper right hand corner of each box.

Threat	Score	Value	Score	Sensitivity	Score
Very High	4	Very High	4	Very High	4
High	3	High	3	High	3
Medium	2	Medium	2	Medium	2
Low	1	Low	1	Low	1

Table D.5 Risk Analysis for Crib Point

Crib Point		Residential Land Use Runoff	Commercial Land Use Runoff	Industrial Land Use Runoff	Major Road Runoff	Unsealed Road Runoff	Residential Development	Building Site Runoff (Lot Scale)	Unstable and Degraded Waterways	Flow Modification	Landfill and Contaminated Sites	Septic and Sewer Leakage	
		2.0	1.0	2.0		2.0			1.0			2.0	
Environmental	In-Stream Habitat	3.0	3	3	4.0	3.0	3.0	4.0	2.0	3.0	3.0	2.0	2.0
	Riparian Habitat	3.0	2.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	4.0	1.0	1.0
	Geomorphology	3.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	4.0	4.0	1.0	1.0
	Groundwater	3.0	2.0	2.0	3.0	2.0	1.0	1.0	1.0	1.0	1.0	4.0	4.0
Cultural	European Heritage		3.0	3.0	3.0	2.0	2.0	2.0	2.0	1.0	3.0	1.0	1.0
	Indigenous Heritage		3.0	4.0	3.0	1.0	2.0	2.0	2.0	4.0	4.0	2.0	2.0
Amenity	Recreational	1.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0	2.0	3.0
	Visual/Landscape	3.0	6.0	3.0	6.0	2.0	6.0	3.0	4.0	2.0	2.0	2.0	2.0
Stormwater	Flood Conveyance		2.0	2.0	2.0	1.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
	Water Quality Treatment		3.0	3.0	3.0	2.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
Economic	Property Value	1.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	3.0	2.0	3.0
	Irrigation Supply		4.0	2.0	4.0	1.0	2.0	2.0	1.0	1.0	3.0	4.0	3.0
Receiving Environmental	Local (estuarine)	4.0	3.0	3.0	3.0	2.0	3.0	4.0	1.0	2.0	2.0	2.0	2.0
	Regional	4.0	2.0	2.0	3.0	2.0	2.0	3.0	1.0	2.0	2.0	2.0	2.0

Legend
 Risk = Value x Threat x Sensitivity
 Sensitivity is indicated in the upper right hand corner of each box.

Threat	Score	Value	Score	Sensitivity	Score
Very High	4	Very High	4	Very High	4
High	3	High	3	High	3
Medium	2	Medium	2	Medium	2
Low	1	Low	1	Low	1

Table D.6 Risk Analysis for Merricks Creek

Merricks Creek			Residential Land Use Runoff	Commercial Land Use Runoff	Industrial Land Use Runoff	Major Road Runoff	Unsealed Road Runoff	Residential Development	Building Site Runoff (Lot Scale)	Unstable and Degraded Waterways	Flow Modification	Landfill and Contaminated Sites	Septic and Sewer Leakage
			1.0					3.0			3.0	2.0	
Environmental	In-Stream Habitat	3.0	3	3	4.0	3.0	3.0	4.0	2.0	3.0	3.0	2.0	2.0
	Riparian Habitat	2.0	2.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	4.0	1.0	1.0
	Geomorphology	2.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	4.0	4.0	1.0	1.0
	Groundwater	2.0	2.0	2.0	3.0	2.0	1.0	1.0	1.0	1.0	1.0	4.0	4.0
Cultural	European Heritage		3.0	3.0	3.0	2.0	2.0	2.0	2.0	1.0	3.0	1.0	1.0
	Indigenous Heritage	3.0	3.0	4.0	3.0	1.0	2.0	2.0	2.0	3.0	4.0	2.0	2.0
Amenity	Recreational	3.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0	2.0	3.0
	Visual/Landscape	3.0	3.0	3.0	2.0	2.0	3.0	3.0	4.0	2.0	2.0	2.0	2.0
Stormwater	Flood Conveyance	1.0	2.0	2.0	2.0	1.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
	Water Quality Treatment	1.0	3.0	3.0	3.0	2.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
Economic	Property Value	2.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	3.0	2.0	3.0
	Irrigation Supply	2.0	1.0	1.0	1.0	1.0	3.0	1.0	1.0	3.0	4.0	3.0	2.0
Receiving Environmental	Local (estuarine)	4.0	3.0	3.0	3.0	2.0	3.0	4.0	1.0	2.0	2.0	2.0	2.0
	Regional	4.0	2.0	2.0	3.0	2.0	2.0	3.0	1.0	2.0	2.0	2.0	2.0

Legend
 Risk = Value x Threat x Sensitivity
 Sensitivity is indicated in the upper right hand corner of each box.

Key					
Threat	Score	Value	Score	Sensitivity	Score
Very High	4	Very High	4	Very High	4
High	3	High	3	High	3
Medium	2	Medium	2	Medium	2
Low	1	Low	1	Low	1

Table D.7 Risk Analysis for Shoreham

Shoreham		Residential Land Use Runoff	Commercial Land Use Runoff	Industrial Land Use Runoff	Major Road Runoff	Unsealed Road Runoff	Residential Development	Building Site Runoff (Lot Scale)	Unstable and Degraded Waterways	Flow Modification	Landfill and Contaminated Sites	Septic and Sewer Leakage	
		1.0				3.0			3.0	2.0		3.0	
Environmental	In-Stream Habitat	3.0	3	3	4.0	3.0	3.0	4.0	2.0	3.0	3.0	2.0	2.0
	Riparian Habitat	2.0	2.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	4.0	1.0	1.0
	Geomorphology	2.0	4.0	2.0	3.0	2.0	2.0	2.0	2.0	4.0	4.0	1.0	1.0
	Groundwater	1.0	4.0	2.0	3.0	2.0	2.0	1.0	1.0	1.0	1.0	4.0	4.0
Cultural	European Heritage		2.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	1.0	3.0	1.0
	Indigenous Heritage		3.0	4.0	3.0	1.0	2.0	2.0	2.0	4.0	4.0	2.0	2.0
Amenity	Recreational	3.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0	2.0	3.0
	Visual/Landscape	3.0	9.0	3.0	3.0	2.0	2.0	3.0	4.0	2.0	2.0	2.0	2.0
Stormwater	Flood Conveyance	1.0	2.0	2.0	2.0	1.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
	Water Quality Treatment		2.0	3.0	3.0	2.0	3.0	3.0	1.0	6.0	6.0	3.0	3.0
Economic	Property Value	1.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	3.0	2.0	3.0
	Irrigation Supply	2.0	2.0	1.0	1.0	1.0	3.0	1.0	1.0	3.0	4.0	3.0	2.0
Receiving Environmental	Local (estuarine)	3.0	2.0	3.0	3.0	2.0	3.0	4.0	1.0	2.0	2.0	2.0	2.0
	Regional	3.0	12.0	4.0	4.0	2.0	3.0	3.0	1.0	2.0	2.0	2.0	2.0

Legend
 Risk = Value x Threat x Sensitivity
 Sensitivity is indicated in the upper right hand corner of each box.

Threat		Value		Sensitivity	
Threat	Score	Value	Score	Sensitivity	Score
Very High	4	Very High	4	Very High	4
High	3	High	3	High	3
Medium	2	Medium	2	Medium	2
Low	1	Low	1	Low	1

Table D.8 Risk Analysis for Flinders

Flinders			Residential Land Use Runoff	Commercial Land Use Runoff	Industrial Land Use Runoff	Major Road Runoff	Unsealed Road Runoff	Residential Development	Building Site Runoff (Lot Scale)	Unstable and Degraded Waterways	Flow Modification	Landfill and Contaminated Sites	Septic and Sewer Leakage
			1.0	1.0			2.0			2.0	1.0		3.5
Environmental	In-Stream Habitat	2.0	3	3	4.0	3.0	3.0	4.0	2.0	3.0	3.0	2.0	4.0
			6.0	6.0		12.0			12.0		6.0		28.0
	Riparian Habitat	1.0	2.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	4.0	1.0	1.0
			2.0	3.0		4.0			6.0		4.0		3.5
Geomorphology		2.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	4.0	4.0	1.0	1.0
			4.0	6.0		8.0			16.0		8.0		7.0
Groundwater		2.0	2.0	2.0	3.0	2.0	1.0	1.0	1.0	1.0	1.0	4.0	2.0
			4.0	4.0		4.0			4.0		2.0		14.0
Cultural	European Heritage		3.0	3.0	3.0	2.0	2.0	2.0	2.0	1.0	3.0	1.0	1.0
	Indigenous Heritage		3.0	4.0	3.0	1.0	2.0	2.0	2.0	4.0	4.0	2.0	2.0
Amenity	Recreational	1.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0	2.0	3.0
			3.0	3.0		6.0			4.0		2.0		10.5
Visual/Landscape		2.0	3.0	3.0	2.0	2.0	3.0	3.0	4.0	2.0	2.0	2.0	2.0
			6.0	6.0		12.0			8.0		4.0		14.0
Stormwater	Flood Conveyance	1.0	2.0	2.0	2.0	1.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
			2.0	2.0		6.0			4.0		3.0		3.5
Water Quality Treatment			3.0	3.0	3.0	2.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
Economic	Property Value	1.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	3.0	2.0	3.0
			2.0	2.0		2.0			2.0		3.0		10.5
Irrigation Supply		1.0	1.0	1.0	1.0	1.0	3.0	1.0	1.0	3.0	4.0	3.0	2.0
			1.0	1.0		6.0			6.0		4.0		7.0
Receiving Environmental	Local (estuarine)	3.0	3.0	3.0	3.0	2.0	3.0	4.0	1.0	2.0	2.0	2.0	3.0
			9.0	9.0		18.0			12.0		6.0		31.5
Regional		3.0	4.0	4.0	4.0	2.0	3.0	3.0	1.0	2.0	2.0	2.0	2.0
			12.0	12.0		18.0			12.0		6.0		21.0

Legend
 Risk = Value x Threat x Sensitivity
 Sensitivity is indicated in the upper right hand corner of each box.

Key					
Threat	Score	Value	Score	Sensitivity	Score
Very High	4	Very High	4	Very High	4
High	3	High	3	High	3
Medium	2	Medium	2	Medium	2
Low	1	Low	1	Low	1

Table D.9 Risk Analysis for Cape Schanck

Cape Schanck			Residential Land Use Runoff	Commercial Land Use Runoff	Industrial Land Use Runoff	Major Road Runoff	Unsealed Road Runoff	Residential Development	Building Site Runoff (Lot Scale)	Unstable and Degraded Waterways	Flow Modification	Landfill and Contaminated Sites	Septic and Sewer Leakage
							2.0			2.0	1.0		1.0
Environmental	In-Stream Habitat	2.0	3	3	4.0	3.0	3.0	4.0	2.0	3.0	3.0	2.0	2.0
	Riparian Habitat	1.0	2.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	4.0	1.0	1.0
	Geomorphology	2.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	6.0	4.0	1.0	1.0
	Groundwater	2.0	2.0	2.0	3.0	2.0	1.0	1.0	1.0	1.0	1.0	4.0	4.0
Cultural	European Heritage		3.0	3.0	3.0	2.0	2.0	2.0	2.0	1.0	3.0	1.0	1.0
	Indigenous Heritage	3.0	3.0	4.0	3.0	1.0	2.0	2.0	2.0	4.0	4.0	2.0	2.0
Amenity	Recreational	4.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0	2.0	3.0
	Visual/Landscape	3.0	3.0	3.0	2.0	2.0	3.0	3.0	4.0	2.0	2.0	2.0	2.0
Stormwater	Flood Conveyance		2.0	2.0	2.0	1.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
	Water Quality Treatment		3.0	3.0	3.0	2.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
Economic	Property Value		2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	3.0	2.0	3.0
	Irrigation Supply	1.0	1.0	1.0	1.0	1.0	3.0	1.0	1.0	3.0	4.0	3.0	2.0
Receiving Environmental	Local (estuarine)	3.0	3.0	3.0	3.0	2.0	3.0	4.0	1.0	2.0	2.0	2.0	2.0
	Regional	3.0	4.0	4.0	4.0	2.0	3.0	3.0	1.0	2.0	2.0	2.0	2.0

Legend
 Risk = Value x Threat x Sensitivity
 Sensitivity is indicated in the upper right hand corner of each box.

Threat		Value		Sensitivity	
Threat	Score	Value	Score	Sensitivity	Score
Very High	4	Very High	4	Very High	4
High	3	High	3	High	3
Medium	2	Medium	2	Medium	2
Low	1	Low	1	Low	1

Table D.10 Risk Analysis for Nepean

Nepean		Residential Land Use Runoff	Commercial Land Use Runoff	Industrial Land Use Runoff	Major Road Runoff	Unsealed Road Runoff	Residential Development	Building Site Runoff (Lot Scale)	Unstable and Degraded Waterways	Flow Modification	Landfill and Contaminated Sites	Septic and Sewer Leakage
		3.0	3.0		1.0	2.0					2.0	4.0
Environmental	In-Stream Habitat	3.0	3.0	4.0	3.0	3.0	4.0	2.0	3.0	3.0	2.0	2.0
	Riparian Habitat	3.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	4.0	1.0	1.0
	Geomorphology	3.0	3.0	2.0	2.0	2.0	2.0	2.0	4.0	4.0	1.0	1.0
	Groundwater	3.5	2.0	3.0	2.0	1.0	1.0	1.0	1.0	1.0	3.0	4.0
Cultural	European Heritage		3.0	3.0	2.0	2.0	2.0	2.0	1.0	3.0	1.0	1.0
	Indigenous Heritage		3.0	4.0	3.0	1.0	2.0	2.0	4.0	4.0	2.0	2.0
Amenity	Recreational	3.0	3.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0	2.0	3.0
	Visual/Landscape	3.0	3.0	3.0	2.0	3.0	3.0	4.0	2.0	2.0	2.0	2.0
Stormwater	Flood Conveyance	1.0	2.0	2.0	2.0	1.0	3.0	3.0	1.0	2.0	3.0	1.0
	Water Quality Treatment	1.0	3.0	3.0	3.0	2.0	3.0	3.0	1.0	2.0	3.0	1.0
Economic	Property Value	2.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	3.0	3.0
	Irrigation Supply		1.0	1.0	1.0	1.0	3.0	1.0	3.0	4.0	3.0	2.0
Receiving Environmental	Local (estuarine)	3.0	3.0	3.0	3.0	2.0	3.0	4.0	1.0	2.0	2.0	2.0
	Regional	3.0	2.0	2.0	3.0	2.0	2.0	3.0	1.0	2.0	2.0	2.0

Legend
 Risk = Value x Threat x Sensitivity
 Sensitivity is indicated in the upper right hand corner of each box.

Key					
Threat	Score	Value	Score	Sensitivity	Score
Very High	4	Very High	4	Very High	4
High	3	High	3	High	3
Medium	2	Medium	2	Medium	2
Low	1	Low	1	Low	1

Table D.11 Risk Analysis for Chinamans Creek

Chinamans Creek		Residential Land Use Runoff	Commercial Land Use Runoff	Industrial Land Use Runoff	Major Road Runoff	Unsealed Road Runoff	Residential Development	Building Site Runoff (Lot Scale)	Unstable and Degraded Waterways	Flow Modification	Landfill and Contaminated Sites	Septic and Sewer Leakage	
		2.0	2.0		2.0	1.0	2.0	2.0	3.0		2.0	3.5	
Environmental	In-Stream Habitat	2.0	3	3	4.0	3.0	3.0	4.0	2.0	3.0	3.0	2.0	2.0
	Riparian Habitat	2.0	2.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	4.0	1.0	1.0
	Geomorphology	1.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	4.0	4.0	1.0	1.0
	Groundwater	3.0	4.0	6.0	4.0	2.0	4.0	4.0	1.0	1.0	1.0	4.0	3.5
Cultural	European Heritage		3.0	3.0	3.0	2.0	2.0	2.0	2.0	1.0	3.0	1.0	1.0
	Indigenous Heritage		3.0	4.0	3.0	1.0	2.0	2.0	2.0	4.0	4.0	2.0	2.0
Amenity	Recreational	3.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0	2.0	3.0
	Visual/Landscape	1.0	3.0	3.0	2.0	2.0	3.0	3.0	4.0	2.0	2.0	2.0	2.0
Stormwater	Flood Conveyance	3.0	6.0	6.0	4.0	3.0	6.0	8.0	6.0	6.0	4.0	7.0	1.0
	Water Quality Treatment	3.0	2.0	2.0	2.0	1.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
Economic	Property Value	2.0	3.0	3.0	3.0	6.0	9.0	18.0	6.0	18.0	6.0	10.5	1.0
	Irrigation Supply	2.0	18.0	18.0	12.0	9.0	18.0	6.0	18.0	6.0	6.0	10.5	3.0
Receiving Environmental	Local (estuarine)	3.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	3.0	2.0	2.0
	Regional	3.0	8.0	8.0	4.0	2.0	3.0	8.0	8.0	6.0	8.0	21.0	2.0

Legend
 Risk = Value x Threat x Sensitivity
 Sensitivity is indicated in the upper right hand corner of each box.

Threat	Score	Value	Score	Sensitivity	Score
Very High	4	Very High	4	Very High	4
High	3	High	3	High	3
Medium	2	Medium	2	Medium	2
Low	1	Low	1	Low	1

Table D.12 Risk Analysis for Rosebud

Rosebud		Residential Land Use Runoff	Commercial Land Use Runoff	Industrial Land Use Runoff	Major Road Runoff	Unsealed Road Runoff	Residential Development	Building Site Runoff (Lot Scale)	Unstable and Degraded Waterways	Flow Modification	Landfill and Contaminated Sites	Septic and Sewer Leakage	
		2.0	2.0		2.0		1.0		3.0			2.0	
Environmental	In-Stream Habitat	2.0	3	3	4.0	3.0	3.0	4.0	2.0	3.0	3.0	2.0	2.0
	Riparian Habitat	2.0	2.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	4.0	1.0	1.0
	Geomorphology	2.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	4.0	4.0	1.0	1.0
	Groundwater	2.0	2.0	2.0	3.0	2.0	1.0	1.0	1.0	1.0	1.0	4.0	4.0
Cultural	European Heritage		3.0	3.0	3.0	2.0	2.0	2.0	2.0	1.0	3.0	1.0	1.0
	Indigenous Heritage		3.0	4.0	3.0	1.0	2.0	2.0	2.0	4.0	4.0	2.0	2.0
Amenity	Recreational	3.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0	2.0	3.0
	Visual/Landscape	4.0	3.0	3.0	2.0	2.0	3.0	3.0	4.0	2.0	2.0	2.0	2.0
Stormwater	Flood Conveyance	1.0	2.0	2.0	2.0	1.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
	Water Quality Treatment	1.0	3.0	3.0	3.0	2.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
Economic	Property Value	1.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	3.0	2.0	3.0
	Irrigation Supply		1.0	1.0	1.0	1.0	3.0	1.0	1.0	3.0	4.0	3.0	2.0
Receiving Environmental	Local (estuarine)	3.0	3.0	3.0	3.0	2.0	3.0	4.0	1.0	2.0	2.0	2.0	2.0
	Regional	3.0	4.0	4.0	4.0	2.0	3.0	3.0	1.0	2.0	2.0	2.0	2.0

Legend
 Risk = Value x Threat x Sensitivity
 Sensitivity is indicated in the upper right hand corner of each box.

Key					
Threat	Score	Value	Score	Sensitivity	Score
Very High	4	Very High	4	Very High	4
High	3	High	3	High	3
Medium	2	Medium	2	Medium	2
Low	1	Low	1	Low	1

Table D.13 Risk Analysis for Dromana

Dromana			Residential Land Use Runoff	Commercial Land Use Runoff	Industrial Land Use Runoff	Major Road Runoff	Unsealed Road Runoff	Residential Development	Building Site Runoff (Lot Scale)	Unstable and Degraded Waterways	Flow Modification	Landfill and Contaminated Sites	Septic and Sewer Leakage
			2.0	2.0	1.0	2.0				1.0			2.0
Environmental	In-Stream Habitat	2.0	3	3	4.0	3.0	3.0	4.0	2.0	3.0	3.0	2.0	2.0
	Riparian Habitat	2.0	2.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	4.0	1.0	1.0
	Geomorphology	2.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	4.0	4.0	1.0	1.0
	Groundwater	2.0	2.0	2.0	3.0	2.0	1.0	1.0	1.0	1.0	1.0	4.0	4.0
Cultural	European Heritage		3.0	3.0	3.0	2.0	2.0	2.0	2.0	1.0	3.0	1.0	1.0
	Indigenous Heritage		3.0	4.0	3.0	1.0	2.0	2.0	2.0	4.0	4.0	2.0	2.0
Amenity	Recreational	3.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0	2.0	3.0
	Visual/Landscape	4.0	3.0	3.0	2.0	2.0	3.0	3.0	4.0	2.0	2.0	2.0	2.0
Stormwater	Flood Conveyance	2.0	2.0	2.0	2.0	1.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
	Water Quality Treatment		3.0	3.0	3.0	2.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
Economic	Property Value	1.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	3.0	2.0	3.0
	Irrigation Supply		1.0	1.0	1.0	1.0	1.0	3.0	1.0	1.0	3.0	4.0	3.0
Receiving Environmental	Local (estuarine)	3.0	3.0	3.0	3.0	2.0	3.0	4.0	1.0	2.0	2.0	2.0	2.0
	Regional	3.0	4.0	4.0	4.0	2.0	3.0	3.0	1.0	2.0	2.0	2.0	2.0

Legend
 Risk = Value x Threat x Sensitivity
 Sensitivity is indicated in the upper right hand corner of each box.

Threat	Score	Value	Score	Sensitivity	Score
Very High	4	Very High	4	Very High	4
High	3	High	3	High	3
Medium	2	Medium	2	Medium	2
Low	1	Low	1	Low	1

Table D.14 Risk Analysis for Safety Beach

Safety Beach			Residential Land Use Runoff	Commercial Land Use Runoff	Industrial Land Use Runoff	Major Road Runoff	Unsealed Road Runoff	Residential Development	Building Site Runoff (Lot Scale)	Unstable and Degraded Waterways	Flow Modification	Landfill and Contaminated Sites	Septic and Sewer Leakage
			1.0			1.0	1.0			1.0			1.0
Environmental	In-Stream Habitat	1.0	3	3	4.0	3.0	3.0	4.0	2.0	3.0	3.0	2.0	2.0
	Riparian Habitat	1.0	2.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	4.0	1.0	1.0
	Geomorphology	2.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	4.0	1.0	1.0
	Groundwater	2.0	2.0	2.0	3.0	2.0	1.0	1.0	1.0	1.0	1.0	4.0	4.0
Cultural	European Heritage		3.0	3.0	3.0	2.0	2.0	2.0	2.0	1.0	3.0	1.0	1.0
	Indigenous Heritage		3.0	4.0	3.0	1.0	2.0	2.0	2.0	4.0	4.0	2.0	2.0
Amenity	Recreational	1.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0	2.0	3.0
	Visual/Landscape	2.0	3.0	3.0	2.0	2.0	3.0	3.0	4.0	2.0	2.0	2.0	2.0
Stormwater	Flood Conveyance	2.0	2.0	2.0	2.0	1.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
	Water Quality Treatment		3.0	3.0	3.0	2.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
Economic	Property Value	1.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	3.0	2.0	3.0
	Irrigation Supply		1.0	1.0	1.0	1.0	3.0	1.0	1.0	3.0	4.0	3.0	2.0
Receiving Environmental	Local (estuarine)	3.0	3.0	3.0	3.0	2.0	3.0	4.0	1.0	2.0	2.0	2.0	2.0
	Regional	3.0	4.0	4.0	4.0	2.0	3.0	3.0	1.0	2.0	2.0	2.0	2.0

Legend
 Risk = Value x Threat x Sensitivity
 Sensitivity is indicated in the upper right hand corner of each box.

Threat	Score	Value	Score	Sensitivity	Score
Very High	4	Very High	4	Very High	4
High	3	High	3	High	3
Medium	2	Medium	2	Medium	2
Low	1	Low	1	Low	1

Table D.15 Risk Analysis for Mt Martha

Mt Martha		Residential Land Use Runoff	Commercial Land Use Runoff	Industrial Land Use Runoff	Major Road Runoff	Unsealed Road Runoff	Residential Development	Building Site Runoff (Lot Scale)	Unstable and Degraded Waterways	Flow Modification	Landfill and Contaminated Sites	Septic and Sewer Leakage
		2.0				3.0	2.5	2.5	4.0			
Environmental	In-Stream Habitat	3.0	3	3	4.0	3.0	3.0	4.0	2.0	3.0	2.0	2.0
	Riparian Habitat	2.0	2.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	4.0	1.0
	Geomorphology	2.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	4.0	4.0	1.0
	Groundwater	2.0	2.0	2.0	3.0	2.0	1.0	1.0	1.0	1.0	4.0	4.0
Cultural	European Heritage		3.0	3.0	3.0	2.0	2.0	2.0	2.0	1.0	3.0	1.0
	Indigenous Heritage	3.0	3.0	4.0	3.0	1.0	2.0	2.0	2.0	3.0	4.0	2.0
Amenity	Recreational	2.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0	3.0
	Visual/Landscape	3.0	3.0	3.0	2.0	2.0	3.0	3.0	4.0	2.0	2.0	2.0
Stormwater	Flood Conveyance		2.0	2.0	2.0	1.0	3.0	3.0	1.0	2.0	3.0	1.0
	Water Quality Treatment		3.0	3.0	3.0	2.0	3.0	3.0	1.0	2.0	3.0	1.0
Economic	Property Value	3.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	3.0	2.0
	Irrigation Supply		1.0	1.0	1.0	1.0	3.0	1.0	1.0	3.0	4.0	3.0
Receiving Environmental	Local (estuarine)	3.0	3.0	3.0	3.0	2.0	3.0	4.0	1.0	2.0	2.0	2.0
	Regional	3.0	4.0	4.0	4.0	2.0	3.0	3.0	1.0	2.0	2.0	2.0

Legend
 Risk = Value x Threat x Sensitivity
 Sensitivity is indicated in the upper right hand corner of each box.

Threat		Value		Sensitivity	
Threat	Score	Value	Score	Sensitivity	Score
Very High	4	Very High	4	Very High	4
High	3	High	3	High	3
Medium	2	Medium	2	Medium	2
Low	1	Low	1	Low	1

Table D.16 Risk Analysis for Balcombe Creek

Balcombe Creek		Residential Land Use Runoff	Commercial Land Use Runoff	Industrial Land Use Runoff	Major Road Runoff	Unsealed Road Runoff	Residential Development	Building Site Runoff (Lot Scale)	Unstable and Degraded Waterways	Flow Modification	Landfill and Contaminated Sites	Septic and Sewer Leakage	Agriculture	Docks and Wharves	Other (Golf Course)	
		2.5	1.0	1.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	1.0	2.0		1.0
Environmental	In-Stream Habitat	2.0	3	3	4.0	3.0	3.0	4.0	2.0	3.0	3.0	2.0	2.0	3.0	2.0	4.0
	Riparian Habitat	2.0	2.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	4.0	1.0	1.0	3.0	1.0	4.0
	Geomorphology	2.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	4.0	4.0	1.0	1.0	3.0	1.0	4.0
	Groundwater	2.0	2.0	2.0	3.0	2.0	1.0	1.0	1.0	1.0	1.0	4.0	4.0	3.0	1.0	4.0
Cultural	European Heritage		3.0	3.0	3.0	2.0	2.0	2.0	2.0	1.0	3.0	1.0	1.0	2.0	1.0	6.0
	Indigenous Heritage		3.0	4.0	3.0	1.0	2.0	2.0	2.0	4.0	4.0	2.0	2.0	4.0	1.0	6.0
Amenity	Recreational	3.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0	2.0	3.0	2.0	2.0	9.0
	Visual/Landscape	3.0	3.0	3.0	2.0	2.0	3.0	3.0	4.0	2.0	2.0	2.0	2.0	3.0	1.0	3.0
Stormwater	Flood Conveyance	3.0	2.0	2.0	2.0	1.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0	3.0	1.0	3.0
	Water Quality Treatment	2.0	3.0	3.0	3.0	2.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0	3.0	1.0	3.0
Economic	Property Value	1.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	3.0	2.0	3.0	2.0	1.0	6.0
	Irrigation Supply	1.0	1.0	1.0	1.0	1.0	3.0	1.0	1.0	3.0	4.0	3.0	2.0	4.0	1.0	1.0
Receiving Environmental	Local (estuarine)	4.0	3.0	3.0	3.0	2.0	3.0	4.0	1.0	2.0	2.0	2.0	2.0	3.0	2.0	4.0
	Regional	3.0	4.0	4.0	4.0	2.0	3.0	3.0	1.0	2.0	2.0	2.0	2.0	3.0	2.0	3.0

Legend
 Risk = Value x Threat x Sensitivity
 Sensitivity is indicated in the upper right hand corner of each box.

Threat	Score	Value	Score	Sensitivity	Score
Very High	4	Very High	4	Very High	4
High	3	High	3	High	3
Medium	2	Medium	2	Medium	2
Low	1	Low	1	Low	1

Risk Range	Shading
40 - 64	Red
20 - 40	Orange
8 - 20	Yellow
8 - 10	Light Yellow

Table D.17 Risk Analysis for Mornington

Mornington			Residential Land Use Runoff	Commercial Land Use Runoff	Industrial Land Use Runoff	Major Road Runoff	Unsealed Road Runoff	Residential Development	Building Site Runoff (Lot Scale)	Unstable and Degraded Waterways	Flow Modification	Landfill and Contaminated Sites	Septic and Sewer Leakage
			2.5	2.5	2.5	1.0	1.0		2.0	3.0			
Environmental	In-Stream Habitat	2.0	3	3	4.0	3.0	3.0	4.0	2.0	3.0	3.0	2.0	2.0
			15.0	15.0	20.0	6.0	6.0		8.0	18.0			
	Riparian Habitat	2.0	2.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	4.0	1.0	1.0
			10.0	15.0	15.0	4.0	4.0		8.0	18.0			
	Geomorphology	2.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	4.0	4.0	1.0	1.0
			10.0	15.0	10.0	4.0	4.0		8.0	24.0			
	Groundwater	2.0	2.0	2.0	3.0	2.0	1.0	1.0	1.0	1.0	1.0	4.0	4.0
			10.0	10.0	15.0	4.0	2.0		4.0	6.0			
Cultural	European Heritage	1.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	1.0	3.0	1.0	1.0
			7.5	7.5	7.5	2.0	2.0		4.0	3.0			
	Indigenous Heritage	2.0	3.0	4.0	3.0	1.0	2.0	2.0	2.0	4.0	4.0	2.0	2.0
			15.0	20.0	15.0	2.0	4.0		8.0	24.0			
Amenity	Recreational	1.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0	2.0	3.0
			7.5	7.5	7.5	2.0	3.0		6.0	6.0			
	Visual/Landscape	3.0	3.0	3.0	2.0	2.0	3.0	3.0	4.0	2.0	2.0	2.0	2.0
			22.5	22.5	15.0	6.0	9.0		24.0	18.0			
Stormwater	Flood Conveyance	3.0	2.0	2.0	2.0	1.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
			15.0	15.0	15.0	3.0	9.0		6.0	18.0			
	Water Quality Treatment		3.0	3.0	3.0	2.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
Economic	Property Value	2.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	3.0	2.0	3.0
			10.0	10.0	10.0	2.0	2.0		8.0	6.0			
	Irrigation Supply		1.0	1.0	1.0	1.0	3.0	1.0	1.0	3.0	4.0	3.0	2.0
Receiving Environmental	Local (estuarine)	3.0	3.0	3.0	3.0	2.0	3.0	4.0	1.0	2.0	2.0	2.0	2.0
			22.5	22.5	22.5	6.0	9.0		6.0	18.0			
	Regional	3.0	2.0	2.0	3.0	2.0	2.0	3.0	1.0	2.0	2.0	2.0	2.0
			15.0	15.0	22.5	6.0	6.0		6.0	18.0			

Legend
 Risk = Value x Threat x Sensitivity
 Sensitivity is indicated in the upper right hand corner of each box.

Threat	Score	Value	Score	Sensitivity	Score
Very High	4	Very High	4	Very High	4
High	3	High	3	High	3
Medium	2	Medium	2	Medium	2
Low	1	Low	1	Low	1

Table D.18 Risk Analysis for Mt Eliza

Mt Eliza		Residential Land Use Runoff	Commercial Land Use Runoff	Industrial Land Use Runoff	Major Road Runoff	Unsealed Road Runoff	Residential Development	Building Site Runoff (Lot Scale)	Unstable and Degraded Waterways	Flow Modification	Landfill and Contaminated Sites	Septic and Sewer Leakage	
		3.0	1.0		1.0				3.0				
Environmental	In-Stream Habitat	2.0	3	3	4.0	3.0	3.0	4.0	2.0	3.0	3.0	2.0	2.0
	Riparian Habitat	2.0	2.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	4.0	1.0	1.0
	Geomorphology	2.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	4.0	4.0	1.0	1.0
	Groundwater	2.0	2.0	2.0	3.0	2.0	1.0	1.0	1.0	1.0	1.0	4.0	4.0
Cultural	European Heritage	2.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	1.0	3.0	1.0	1.0
	Indigenous Heritage	2.0	3.0	4.0	3.0	1.0	2.0	2.0	2.0	4.0	4.0	2.0	2.0
Amenity	Recreational	1.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0	2.0	3.0
	Visual/Landscape	3.0	3.0	3.0	2.0	2.0	3.0	3.0	4.0	2.0	2.0	2.0	2.0
Stormwater	Flood Conveyance	1.0	2.0	2.0	2.0	1.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
	Water Quality Treatment		3.0	3.0	3.0	2.0	3.0	3.0	1.0	2.0	3.0	1.0	1.0
Economic	Property Value	2.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	3.0	2.0	3.0
	Irrigation Supply		1.0	1.0	1.0	1.0	3.0	1.0	1.0	3.0	4.0	3.0	2.0
Receiving Environmental	Local (estuarine)	3.0	3.0	3.0	3.0	2.0	3.0	4.0	1.0	2.0	2.0	2.0	2.0
	Regional	3.0	4.0	4.0	4.0	2.0	3.0	3.0	1.0	2.0	2.0	2.0	2.0

Legend
 Risk = Value x Threat x Sensitivity
 Sensitivity is indicated in the upper right hand corner of each box.

Key					
Threat	Score	Value	Score	Sensitivity	Score
Very High	4	Very High	4	Very High	4
High	3	High	3	High	3
Medium	2	Medium	2	Medium	2
Low	1	Low	1	Low	1

APPENDIX E: MANAGEMENT ELEMENT SCREENING

Strategy 1 - Watsons Creek

Threat
Market Garden Areas
Pollutants
Fine Sediment, Coarse Sediment, Pathogens and Nutrients

Primary Value
Local Receiving Environments
Secondary Values
Groundwater, Regional Receiving Environments & Irrigation Supply

Element Type	Strategy Elements				Comment	Recommended
		Coarse Sediment	Fine Sediment	Nutrients		
Education and Awareness	Literature/Guideline Development and Distribution	■	■	■	Occurring under existing strategies	
	Stormwater Management Education Workshops	■	■	■	Occurring under existing strategies	
	Demonstration Projects	■	■	■	Occurring under existing strategies	
	Long Term Individual/Organisation Consultation	■	■	■	MPSC can take a role in the co-ordination of actions of a number of parties	■
	Media Release	■	■	■	Occurring under existing strategies	
	Signage	■	■	■	NA	
	Landcare, Community & Special Interest Group	■	■	■	Support established groups within the catchment	■
	Business Stakeholder Groups & Committees	■	■	■	Occurring under existing strategies	
Source Controls	Street Sweeping	■	■	■	Unlikely to be cost effective or have significant impact	
	Waste & Refuse Collection	■	■	■	NA	
	Waterway Rehabilitation & Revegetation	■	■	■	Strongly recommended that stream frontages be protected and revegetated	■
	Roof Water Diversion	■	■	■	NA	
Site Specific Strategies and Plans	Develop & Implement Site Specific EMP's	■	■	■	Occurring under existing strategies	
	Develop & Implement Site Specific Sed & Erosion Control Plans	■	■	■	These issues should be covered by EMP	
	Waste Management Program Development	■	■	■	These issues should be covered by EMP	
	Water Quality Management Strategy	■	■	■	MPSC, MW, EPA and others should develop strategy for catchment	■
	Waterway Management Strategy Development	■	■	■	Under developmnt by MW	■
	Spill Prevention and Containment Plans	■	■	■	Spills have very low risk	
Non-Structural Treatments	Swales	■	■	■	Limited opportunities within existing farming network	
	Porous Pavements	■	■	■	Will not address pollution	
	Rainwater Storage and Reuse (Tanks)	■	■	■	NA	
	Stormwater Infiltration Measures	■	■	■	Catchment already has high rate of infiltration which is contributing to poor GW qual	
	Filter Strips	■	■	■	Implement as part of stream revege program	
Structural Treatments	Screening Devices	■	■	■	NA	
	Artificial Wetlands	■	■	■	Innapropriate as sites either US of threat or too expensive to construct as it would require buying large areas of market gardens	
	Gross Pollutant Traps	■	■	■	Innapropriate given catchment development	
	Drainage Inlet Traps	■	■	■	Innapropriate given catchment development	
	Sedimentation Basins	■	■	■	Limited opportunities within existing farming network	
	Instream Floating Debris & Litter Booms	■	■	■	NA	
	Oil and Grease Interceptors	■	■	■	NA	
	Flow Detention Structures (Basins)	■	■	■	NA	
Information & Data Collection	Litter Audits	■	■	■	NA	
	Monitoring (Stormwater, Instream Ecology, Flow)	■	■	■	MW should continue monitoring of WQ and GW monitoring should be undertaken	■
Regulation and Enforcement	Financial Incentives (eg. Rate Rebates)	■	■	■	Unlikely to offer ant real incentive	
	Audit and Inspection	■	■	■	Auditing is likely to alienate community	
	Infringement Notification and Fines	■	■	■	Will hinder efforts being made to engage community	

Strategy 2 - Nepean Peninsula

Threat
 Septic Systems
Pollutants
 Nutrients, deoxygenating materials and pathogens

Primary Value
 Ground water
Secondary Values
 Recreational Amenity

Element Type	Strategy Elements	Deoxygenating Materials	Nutrients	Pathogens	Comment	Recommended
Education and Awareness	Literature/Guideline Development and Distribution				Educate home owners regarding a number of issues related to septic systems	☑
	Stormwater Management Education Workshops				NA	
	Demonstration Projects	☑	☑	☑	Demonstration project is unlikely to have a significant impact	
	Long Term Individual/Organisation Consultation	☑	☑	☑	MPSC should continue to lobby agencies to be part of trial WW management strategy	☑
	Media Release	☑	☑	☑	Use local media to highlight issues to residents	☑
	Signage	☑	☑	☑	Several open water bodies within the catchment are signed by South East Water	☑
	Landcare, Community & Special Interest Group	☑	☑	☑	Community will be targeted through a general communication program	
	Business Stakeholder Groups & Committees	☑	☑	☑	Innapropriate as issue is mostly realted to residential areas	
Source Controls	Street Sweeping				NA	
	Waste & Refuse Collection				NA	
	Waterway Rehabilitation & Revegetation				NA	
	Roof Water Diversion				NA	
Site Specific Strategies and Plans	Develop & Implement Site Specific EMP's	☑	☑	☑	Very few large sites within the catchment	
	Develop & Implement Site Specific Sed & Erosion Control Plans				NA	
	Waste Management Program Development	☑	☑	☑	NA	
	Water Quality Management Strategy	☑	☑	☑	Should be developed for groundwater resource by Southern Rural Water	☑
	Waterway Management Strategy Development	☑	☑	☑	Catchment does not contain overland flow paths	
	Spill Prevention and Containment Plans	☑	☑	☑	Spills are not a major threat within the catchment	
Non-Structural Treatments	Swales				NA	
	Porous Pavements				NA	
	Rainwater Storage and Reuse (Tanks)				NA	
	Stormwater Infiltration Measures			☑	Infiltration already occurs, further infiltration would potentially impact aquifer further	
Structural Treatments	Filter Strips				NA	
	Screening Devices				NA	
	Artificial Wetlands				NA	
	Gross Pollutant Traps				NA	
	Drainage Inlet Traps				NA	
	Sedimentation Basins				NA	
	Instream Floating Debris & Litter Booms				NA	
	Oil and Grease Interceptors				NA	
Flow Detention Structures (Basins)				NA		
Information & Data Collection	Litter Audits				NA	
	Monitoring (Stormwater, Instream Ecology, Flow)	☑	☑	☑	Monitor the condition of the GW aquifer (Southern Rural Water)	☑
Regulation and Enforcement	Financial Incentives (eg. Rate Rebates)	☑	☑	☑	Financial incentives should be offered to home owners to hook up septic systems to sewer	☑
	Audit and Inspection	☑	☑	☑	As part of hook up process houses which aren't connected should be identified	☑
	Infringement Notification and Fines	☑	☑	☑	Unlikely to gain community support, continue with more positive programs	

Strategy 3 - Various

Threat
Residential Development
Pollutants
Sediment, Litter and Nutrients

Primary Value
Local and Regional Receiving Environments
Secondary Values
Various

Element Type	Strategy Elements	Litter	Coarse Sediment	Fine Sediment	Nutrients	Comment	Recommended
Education and Awareness	Literature/Guideline Development and Distribution	☑	☑	☑	☑	Regional authority such as DOI or MAV should produce documents for council to distribute	☑
	Stormwater Management Education Workshops	☑	☑	☑	☑	Conduct a series of workshops for major developers (multi lot greenfield sites)	☑
	Demonstration Projects	☑	☑	☑	☑	Encourage and support the adopting of a WSUD approach at a new site	☑
	Long Term Individual/Organisation Consultation	☑	☑	☑	☑	Liase with DOI and EPA to change laws regarding site management	☑
	Media Release	☑	☑	☑	☑	Through local media to general community and via trade and industry journals	☑
	Signage	☑	☑	☑	☑	Identify Assets that are being impacted on by pollutant export	☑
	Landcare, Community & Special Interest Group	☑	☑	☑	☑	Unlikely to result in litigation of threat	☑
	Business Stakeholder Groups & Committees	☑	☑	☑	☑	Liase with developers to build their understanding of SW issues	☑
Source Controls	Street Sweeping	☑	☑	☑	☑	limited scope to treat pollution	
	Waste & Refuse Collection	☑	☑	☑	☑	Not a significant pollutant source	
	Waterway Rehabilitation & Revegetation	☑	☑	☑	☑	Will not target construction pollution	
	Roof Water Diversion					NA	
Site Specific Strategies and Plans	Develop & Implement Site Specific EMP's	☑	☑	☑	☑	Development sites should be required to develop EMP as part of planning application	☑
	Develop & Implement Site Specific Sed & Erosion Control Plans	☑	☑	☑	☑	These type of plans are suitable for small scale and in-fill developments	☑
	Waste Management Program Development	☑	☑	☑	☑	Not appropriate for threat type	
	Water Quality Management Strategy	☑	☑	☑	☑	These issues will be covered by EMP	
	Waterway Management Strategy Development	☑	☑	☑	☑	Should be considered where appropriate as part of EMP and Sediment & Erosion Plan	
Non-Structural Treatments	Spill Prevention and Containment Plans	☑	☑	☑	☑	Not appropriate for threat type	
	Swales		☑	☑	☑	Difficult to implement on construction sites	
	Porous Pavements		☑	☑	☑	NA	
	Rainwater Storage and Reuse (Tanks)					NA	
	Stormwater Infiltration Measures		☑	☑	☑	NA	
	Filter Strips		☑	☑	☑	Should be considered where appropriate as part of EMP and Sediment & Erosion Plan	
Structural Treatments	Screening Devices	☑	☑	☑	☑	Will not remove key pollutants and many sites drainage system is not established	
	Artificial Wetlands	☑	☑	☑	☑	Not appropriate to treat high sediment load	
	Gross Pollutant Traps	☑	☑	☑	☑	Rely on drainage infrastructure being complete to be of use	
	Drainage Inlet Traps	☑	☑	☑	☑	Not appropriate as they require infrastructure to be complete	
	Sedimentation Basins	☑	☑	☑	☑	Should be considered where appropriate as part of EMP and Sediment & Erosion Plan	
	Instream Floating Debris & Litter Booms	☑				Not appropriate for waterways within catchment	
	Oil and Grease Interceptors					NA	
	Flow Detention Structures (Basins)					NA	
Information & Data Collection	Litter Audits	☑				This will be covered under audit and inspection	
	Monitoring (Stormwater, Instream Ecology, Flow)	☑	☑	☑	☑	Developers should be required to monitor sites to confirm that it meets EMP requirements	☑
Regulation and Enforcement	Financial Incentives (eg. Rate Rebates)	☑	☑	☑	☑	Allow a reduction in lot size if developer adopts good practices	☑
	Audit and Inspection	☑	☑	☑	☑	EMP's for sites should be regularly audited to check they comply	☑
	Infringement Notification and Fines	☑	☑	☑	☑	Fines should be a toll for use with serial polluters	☑

Strategy 4 - Chinamans Creek

Threat

Market Garden Areas

Pollutants

Fine Sediment, Coarse Sediment, Nutrients and Pathogens

Primary Value

Local and Regional Receiving Environments

Secondary Values

Various

Element Type	Strategy Elements	Coarse Sediment	Fine Sediment	Nutrients	Pathogens	Comment	Recommended
Education and Awareness	Literature/Guideline Development and Distribution	☑	☑	☑	☑	Use material developed for Watsons Creek and direct extension activities to distribute	☑
	Stormwater Management Education Workshops	☑	☑	☑	☑	Direct contact will be more appropriate and effective	
	Demonstration Projects	☑	☑	☑	☑	Should be supported, but will depend on individual growers	☑
	Long Term Individual/Organisation Consultation	☑	☑	☑	☑	Establishment of constructive dialog with farmers is essential to improving SW quality	☑
	Media Release	☑	☑	☑	☑	Would be likely to undermine extension activities	
	Signage	☑	☑	☑	☑	Could be used to identify high value assets such as Tootgarook Swamp	☑
	Landcare, Community & Special Interest Group	☑	☑	☑	☑	This activity occurs as part of individual consultation	
Source Controls	Business Stakeholder Groups & Committees	☑	☑	☑	☑	Market gardens is dominated by a few large operators who can be contacted directly	
	Street Sweeping	☑	☑	☑	☑	Will not target threat	
	Waste & Refuse Collection	☑	☑	☑	☑	Will not target threat	
	Waterway Rehabilitation & Revegetation	☑	☑	☑	☑	Dependent on Outcomes of Water Management Strategy	☑
Site Specific Strategies and Plans	Roof Water Diversion					NA	
	Develop & Implement Site Specific EMP's	☑	☑	☑	☑	Market Gardens should have Whole Farm Plans which encompass EMP issues	☑
	Develop & Implement Site Specific Sed & Erosion Control Plans	☑	☑	☑	☑	Would be considered as part of Whole Farm Plans	
	Waste Management Program Development	☑	☑	☑	☑	Will not impact on threats	
	Water Quality Management Strategy	☑	☑	☑	☑	Update and implement Chinamans Creek Catchment Strategy	☑
	Waterway Management Strategy Development	☑	☑	☑	☑	Will be covered as part of Chinamans Creek Strategy	
Non-Structural Treatments	Spill Prevention and Containment Plans	☑	☑	☑	☑	Not appropriate for threat type	
	Swales	☑	☑	☑	☑	Innapropriate for threat type	
	Porous Pavements	☑	☑	☑	☑	Innapropriate for threat type	
	Rainwater Storage and Reuse (Tanks)					NA	
	Stormwater Infiltration Measures	☑	☑	☑	☑	Infiltration already occurs	
	Filter Strips	☑	☑	☑	☑	Dependent on outcomes of Catchemnt Management Study	
Structural Treatments	Screening Devices					NA	
	Artificial Wetlands	☑	☑	☑	☑	Consider constructing a WQ wetland US of Tootgarook Swamp	☑
	Gross Pollutant Traps	☑	☑	☑	☑	Gross pollutants are not a major threat	
	Drainage Inlet Traps	☑	☑	☑	☑	Little formal drainage to treat	
	Sedimentation Basins	☑	☑	☑	☑	Consider placing downstream of market gardens	
	Instream Floating Debris & Litter Booms					NA	
	Oil and Grease Interceptors					NA	
	Flow Detention Structures (Basins)					NA	
Information & Data Collection	Litter Audits					NA	
	Monitoring (Stormwater, Instream Ecology, Flow)	☑	☑	☑	☑	Monitor WQ and GW	☑
Regulation and Enforcement	Financial Incentives (eg. Rate Rebates)	☑	☑	☑	☑	Likely to have minimal impact on growers	
	Audit and Inspection	☑	☑	☑	☑	Encouraging good behaviour will probably have better results than audits\	
	Infringement Notification and Fines	☑	☑	☑	☑	Likely to harm extension programs	

Strategy 5 - Mt Martha

Threat
Waterway Degradation
Pollutants
Sediment and Nutrients

Primary Value
In-Stream Habitat
Secondary Values

Element Type	Strategy Elements	Coarse Sediment	Fine Sediment	Nutrients	Comment	Recommended
Education and Awareness	Literature/Guideline Development and Distribution	☐	☐	☐	Limited Target audience	
	Stormwater Management Education Workshops	☐	☐	☐	Limited target audience	
	Demonstration Projects	☐	☐	☐	Use Revegetation via friends groups to raise awareness of waterway management	
	Long Term Individual/Organisation Consultation	☐	☐	☐	MPSC is only management authority	
	Media Release	☐	☐	☐	Unlikely to have any impact	
	Signage	☐	☐	☐	Limited opportunities to sign creeks	
	Landcare, Community & Special Interest Group	☐	☐	☐	Friends groups could be used to raise awareness of waterways and conduct revegetation works	
	Business Stakeholder Groups & Committees	☐	☐	☐	NA	
Source Controls	Street Sweeping	☐	☐	☐	Will not treat source of pollution	
	Waste & Refuse Collection	☐	☐	☐	Will not treat source of pollution	
	Waterway Rehabilitation & Revegetation	☐	☐	☐	It is suggested that works suggested in the Due Diligence study be undertaken	☑
	Roof Water Diversion	☐	☐	☐	NA	
Site Specific Strategies and Plans	Develop & Implement Site Specific EMP's	☐	☐	☐	NA	
	Develop & Implement Site Specific Sed & Erosion Control Plans	☐	☐	☐	NA	
	Waste Management Program Development	☐	☐	☐	NA	
	Water Quality Management Strategy	☐	☐	☐	NA	
	Waterway Management Strategy Development	☐	☐	☐	Waterway management is addressed through the planning scheme	
Non-Structural Treatments	Spill Prevention and Containment Plans	☐	☐	☐	Will not treat source of pollution	
	Swales	☐	☐	☐	Inappropriate for scale of problem	
	Porous Pavements	☐	☐	☐	Will have limited impact on threat	
	Rainwater Storage and Reuse (Tanks)	☐	☐	☐	NA	
	Stormwater Infiltration Measures	☐	☐	☐	Will have limited impact on threat	
	Filter Strips	☐	☐	☐	No space and will have limited impact on threat	
Structural Treatments	Screening Devices	☐	☐	☐	NA	
	Artificial Wetlands	☐	☐	☐	Will not treat source of pollution	
	Gross Pollutant Traps	☐	☐	☐	Will not treat source of pollution	
	Drainage Inlet Traps	☐	☐	☐	Will not treat source of pollution	
	Sedimentation Basins	☐	☐	☐	Limited space within drainage network and likely to have significant impact on waterways	
	Instream Floating Debris & Litter Booms	☐	☐	☐	NA	
	Oil and Grease Interceptors	☐	☐	☐	NA	
Information & Data Collection	Flow Detention Structures (Basins)	☐	☐	☐	NA	
	Litter Audits	☐	☐	☐	NA	
Regulation and Enforcement	Monitoring (Stormwater, Instream Ecology, Flow)	☐	☐	☐	A program of regular stream condition inspections should be implemented	☑
	Financial Incentives (eg. Rate Rebates)	☐	☐	☐	Works funded by council	
	Audit and Inspection	☐	☐	☐	This item covered by monitoring	
	Infringement Notification and Fines	☐	☐	☐	NA	

Strategy 6 - Balcombe Creek and Mt Martha

Threat

Building Site Runoff

Pollutants

Sediment, Litter and Nutrients

Primary Value

Visual Amenity and Local Receiving Environments

Secondary Values

Various

Element Type	Strategy Elements	Litter	Coarse Sediment	Fine Sediment	Nutrients	Comment	Recommended
Education and Awareness	Literature/Guideline Development and Distribution	☑	☑	☑	☑	Builders and home owners should be educated regarding building site waste management	☑
	Stormwater Management Education Workshops	☑	☑	☑	☑	Use the Business and Stakeholder Groups to distribute information	
	Demonstration Projects	☑	☑	☑	☑	Limited scope given short time frame of building projects	
	Long Term Individual/Organisation Consultation	☑	☑	☑	☑	MPSC should lobby DOI, EPA and MAV to improve building practices	☑
	Media Release	☑	☑	☑	☑	Use local media to educate new home buyers and residents about issue	☑
	Signage	☑	☑	☑	☑	Sign Building Sites to provide contact details if site is exporting pollution	
	Landcare, Community & Special Interest Group	☑	☑	☑	☑	Work with local groups to raise awareness of the issue	☑
Source Controls	Business Stakeholder Groups & Committees	☑	☑	☑	☑	Approach large developers and builders	☑
	Street Sweeping	☑	☑	☑	☑	Unlikely to be effective given large area of development	
	Waste & Refuse Collection	☑	☑	☑	☑	Site are already required to have bins	
	Waterway Rehabilitation & Revegetation	☑	☑	☑	☑	Will not target pollutant source	
Site Specific Strategies and Plans	Roof Water Diversion					NA	
	Develop & Implement Site Specific EMP's	☑	☑	☑	☑	Require all building sites regardless of size to develop site EMP	☑
	Develop & Implement Site Specific Sed & Erosion Control Plans	☑	☑	☑	☑	Include as part of EMP	
	Waste Management Program Development	☑	☑	☑	☑	Include as part of EMP	
	Water Quality Management Strategy	☑	☑	☑	☑	Inappropriate for the scale of the threat	
	Waterway Management Strategy Development	☑	☑	☑	☑	Will not target pollutant source	
Non-Structural Treatments	Spill Prevention and Containment Plans	☑	☑	☑	☑	Spills are not a significant threat from building sites	
	Swales	☑	☑	☑	☑	Not appropriate for the types of pollutants and their high loads	
	Porous Pavements	☑	☑	☑	☑	Will have limited impact and require high degree of maintenance	
	Rainwater Storage and Reuse (Tanks)	☑	☑	☑	☑	NA	
	Stormwater Infiltration Measures	☑	☑	☑	☑	Will be difficult to maintain under high sediment load and will not target litter	
Structural Treatments	Filter Strips	☑	☑	☑	☑	Unlikely to be sufficient sapce on most building sites	
	Screening Devices	☑	☑	☑	☑	Consider for use during construction phase	☑
	Artificial Wetlands	☑	☑	☑	☑	High sediment load from building sites likely to damage wetlands	
	Gross Pollutant Traps	☑	☑	☑	☑	Suitable for catchments with number of building sites	☑
	Drainage Inlet Traps	☑	☑	☑	☑	Limited pollutant removal opportunities and high maintenance requirements	
	Sedimentation Basins	☑	☑	☑	☑	Material should be trapped at or near source	
	Instream Floating Debris & Litter Booms	☑	☑	☑	☑	Could be an opportunity in Balcombe Creek	☑
	Oil and Grease Interceptors	☑	☑	☑	☑	NA	
Information & Data Collection	Flow Detention Structures (Basins)	☑	☑	☑	☑	NA	
	Litter Audits	☑	☑	☑	☑	Regularly monitor areas of development to identify litter hot spots	
Regulation and Enforcement	Monitoring (Stormwater, Instream Ecology, Flow)	☑	☑	☑	☑	Building site inspections will be more efficient way of identifying sources	
	Financial Incentives (eg. Rate Rebates)	☑	☑	☑	☑	Limited opportunities to financially influence Builders	
	Audit and Inspection	☑	☑	☑	☑	Use EPA and Local Laws officers to audit building site waste management practices	☑
	Infringement Notification and Fines	☑	☑	☑	☑	Use as tool of last resort for poorly managed building sites	☑

Strategy 7 - Various Subcatchments

Threat

Residential Runoff

Pollutants

Sediment, Litter, Oils and Grease, Toxicants,
Deoxygenating Material and Nutrients

Element Type	Strategy Elements	Litter	Coarse Sediment	Fine Sediment	Toxicants	Oils and Grease	Deoxygenating Materials	Nutrients	Pathogens	Flow Management
Education and Awareness	Literature/Guideline Development and Distribution	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Stormwater Management Education Workshops	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Demonstration Projects	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Long Term Individual/Organisation Consultation	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Media Release	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Signage	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Landcare, Community & Special Interest Group Business Stakeholder Groups & Committees	EE	EE	EE	EE	EE	EE	EE	EE	EE
Source Controls	Street Sweeping	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Waste & Refuse Collection	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Waterway Rehabilitation & Revegetation	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Roof Water Diversion	EE	EE	EE	EE	EE	EE	EE	EE	EE
Site Specific Strategies and Plans	Develop & Implement Site Specific EMP's	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Develop & Implement Site Specific Sed & Erosion Control Plans	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Waste Management Program Development	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Water Quality Management Strategy	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Waterway Management Strategy Development	EE	EE	EE	EE	EE	EE	EE	EE	EE
Non-Structural Treatments	Spill Prevention and Containment Plans	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Swales	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Porous Pavements	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Rainwater Storage and Reuse (Tanks)	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Stormwater Infiltration Measures	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Filter Strips	EE	EE	EE	EE	EE	EE	EE	EE	EE
Structural Treatments	Screening Devices	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Artificial Wetlands	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Gross Pollutant Traps	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Drainage Inlet Traps	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Sedimentation Basins	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Instream Floating Debris & Litter Booms	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Oil and Grease Interceptors	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Flow Detention Structures (Basins)	EE	EE	EE	EE	EE	EE	EE	EE	EE
Information & Data Collection	Litter Audits	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Monitoring (Stormwater, Instream Ecology, Flow)	EE	EE	EE	EE	EE	EE	EE	EE	EE
Regulation and Enforcement	Financial Incentives (eg. Rate Rebates)	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Audit and Inspection	EE	EE	EE	EE	EE	EE	EE	EE	EE
	Infringement Notification and Fines	EE	EE	EE	EE	EE	EE	EE	EE	EE

Strategy 8 - Various Subcatchments

Threat
Unsealed Roads
Pollutants
Sediment

Primary Value
Various
Secondary Values
Various

Element Type	Strategy Elements	Coarse Sediment	Fine Sediment	Comment	Recommended
Education and Awareness	Literature/Guideline Development and Distribution	☑	☑	Literature is available and it should be distributed to MPSC officers	☑
	Stormwater Management Education Workshops	☑	☑	Unlikely to have significant impact	
	Demonstration Projects	☑	☑	Unlikely to have significant impact	
	Long Term Individual/Organisation Consultation	☑	☑	Liason with Councillors to highlight Issues	☑
	Media Release	☑	☑	Inform Community to raise awareness of issue and publicise proposed solutions	
	Signage	☑	☑	Limited opportunities	
	Landcare, Community & Special Interest Group	☑	☑	The community will need to be engaged when developing a strategy	
	Business Stakeholder Groups & Committees	☑	☑	Business groups, in particular the farming community, will need to be consulted	
Source Controls	Street Sweeping	☑	☑	Innapropriate for threat	
	Waste & Refuse Collection	☑	☑	NA	
	Waterway Rehabilitation & Revegetation	☑	☑	NA	
	Roof Water Diversion	☑	☑	NA	
Site Specific Strategies and Plans	Develop & Implement Site Specific EMP's	☑	☑	Key outcome of strategy. Will provide a prioritised list of actions based on review of existing roads network.	☑
	Develop & Implement Site Specific Sed & Erosion Control Plans	☑	☑	Will not target threat	
	Waste Management Program Development	☑	☑	NA	
	Water Quality Management Strategy	☑	☑	NA	
	Waterway Management Strategy Development	☑	☑	NA	
	Spill Prevention and Containment Plans	☑	☑	NA	
Non-Structural Treatments	Swales	☑	☑	Many roads already have swales, pollutant removal function of many could be upgraded	
	Porous Pavements	☑	☑	NA	
	Rainwater Storage and Reuse (Tanks)	☑	☑	NA	
	Stormwater Infiltration Measures	☑	☑	NA	
	Filter Strips	☑	☑	Filter strips could be used to protect waterways for road runoff	
	Screening Devices	☑	☑	NA	
Structural Treatments	Artificial Wetlands	☑	☑	Road catchments are likely to be too small to be treated	
	Gross Pollutant Traps	☑	☑	Capital and maintenance costs would be too high	
	Drainage Inlet Traps	☑	☑	no formal drainage network in most cases	
	Sedimentation Basins	☑	☑	May be appropriate in certain cases, but will depend on outcomes of study	
	Instream Floating Debris & Litter Booms	☑	☑	NA	
	Oil and Grease Interceptors	☑	☑	NA	
	Flow Detention Structures (Basins)	☑	☑	NA	
	Litter Audits	☑	☑	NA	
Information & Data Collection	Monitoring (Stormwater, Instream Ecology, Flow)	☑	☑	Too large a scale to be monitored	
	Financial Incentives (eg. Rate Rebates)	☑	☑	All roads are council assets	
Regulation and Enforcement	Audit and Inspection	☑	☑	Develop an inspection program as part of regular asset management audits	
	Infringement Notification and Fines	☑	☑	NA	

Strategy 9 - Flinders

Threat
Septic Systems
Pollutants
Nutrients, deoxygenating materials and pathogens

Primary Value
Local Receiving Environment
Secondary Values

Element Type	Strategy Elements	Deoxygenating Materials	Nutrients	Pathogens	Comment	Recommended
Education and Awareness	Literature/Guideline Development and Distribution	☐	☐	☐	Use material developed in Strategy 2	☐
	Stormwater Management Education Workshops	☐	☐	☐	Limited scope, given the audience	☐
	Demonstration Projects	☐	☐	☐	Demonstration project is unlikely to have a significant impact	☐
	Long Term Individual/Organisation Consultation	☐	☐	☐	Covered in Strategy 2	☐
	Media Release	☐	☐	☐	Covered in Strategy 2	☐
	Signage	☐	☐	☐	Install signs along Dodds Creek and foreshore to highlight septic issue	☐
	Landcare, Community & Special Interest Group	☐	☐	☐	Work with local groups to highlight issues	☐
	Business Stakeholder Groups & Committees	☐	☐	☐	Innapropriate as issue is mostly realted to residential areas	☐
Source Controls	Street Sweeping	☐	☐	☐	Will not target threat	☐
	Waste & Refuse Collection	☐	☐	☐	Will not target threat	☐
	Waterway Rehabilitation & Revegetation				NA	☐
	Roof Water Diversion				NA	☐
Site Specific Strategies and Plans	Develop & Implement Site Specific EMP's	☐	☐	☐	Limited scope to treat threat	☐
	Develop & Implement Site Specific Sed & Erosion Control Plans				NA	☐
	Waste Management Program Development	☐	☐	☐	NA	☐
	Water Quality Management Strategy	☐	☐	☐	NA	☐
	Waterway Management Strategy Development	☐	☐	☐	Threat is not related to waterway management	☐
Non-Structural Treatments	Spill Prevention and Containment Plans	☐	☐	☐	Spillage of septic material should be managed via septic systems or sewer	☐
	Swales			☐	Innapropriate for threat and limited spatial opportunities	☐
	Porous Pavements				NA	☐
	Rainwater Storage and Reuse (Tanks)				NA	☐
	Stormwater Infiltration Measures			☐	Will not target threat	☐
	Filter Strips			☐	Will not target threat	☐
Structural Treatments	Screening Devices	☐			Physical form of pollution cannot be treated by this device	☐
	Artificial Wetlands	☐	☐		Limited opportunities given spatial constraints	☐
	Gross Pollutant Traps	☐			GPT's have performance and practical limitaions in this catchment	☐
	Drainage Inlet Traps	☐			The catchment does not have a formal drainage system	☐
	Sedimentation Basins				NA	☐
	Instream Floating Debris & Litter Booms				NA	☐
	Oil and Grease Interceptors				NA	☐
	Flow Detention Structures (Basins)				NA	☐
Information & Data Collection	Litter Audits	☐			Litter is not a major pollutant threat	☐
	Monitoring (Stormwater, Instream Ecology, Flow)	☐	☐	☐	Monitor the WQ in Dodds Creek to try and identify where septic leakage is occurring	☐
Regulation and Enforcement	Financial Incentives (eg. Rate Rebates)	☐	☐	☐	MPSC could offer subsidies to encourage homeowners to upgrade & maintain septic systems	☐
	Audit and Inspection	☐	☐	☐	Inspect septic systems	☐
	Infringement Notification and Fines	☐	☐	☐	It is unclear if legislation exists to ensure this action would be successful	☐

Strategy 10 - Nepean

Threat

Commercial Areas

Pollutants

Litter, Toxicants, Sediment, Oils and Grease,

Deoxygenating Materials, Nutrients and Pathogens

Element Type	Strategy Elements	Litter	Fine Sediment	Toxicants	Oils and Grease	Deoxygenating Materials	Nutrients	Pathogens
Education and Awareness	Literature/Guideline Development and Distribution	☑	☑	☑	☑	☑	☑	☑
	Stormwater Management Education Workshops	☑	☑	☑	☑	☑	☑	☑
	Demonstration Projects	☑	☑	☑	☑	☑	☑	☑
	Long Term Individual/Organisation Consultation	☑	☑	☑	☑	☑	☑	☑
	Media Release	☑	☑	☑	☑	☑	☑	☑
	Signage	☑	☑	☑	☑	☑	☑	☑
	Landcare, Community & Special Interest Group	☑	☑	☑	☑	☑	☑	☑
Source Controls	Business Stakeholder Groups & Committees	☑	☑	☑	☑	☑	☑	☑
	Street Sweeping	☑	☑	☑	☑	☑	☑	☑
	Waste & Refuse Collection	☑	☑	☑	☑	☑	☑	☑
	Waterway Rehabilitation & Revegetation	☑	☑	☑	☑	☑	☑	☑
Site Specific Strategies and Plans	Roof Water Diversion	☑	☑	☑	☑	☑	☑	☑
	Develop & Implement Site Specific EMP's	☑	☑	☑	☑	☑	☑	☑
	Develop & Implement Site Specific Sed & Erosion Control Plans	☑	☑	☑	☑	☑	☑	☑
	Waste Management Program Development	☑	☑	☑	☑	☑	☑	☑
	Water Quality Management Strategy	☑	☑	☑	☑	☑	☑	☑
	Waterway Management Strategy Development	☑	☑	☑	☑	☑	☑	☑
Non-Structural Treatments	Spill Prevention and Containment Plans	☑	☑	☑	☑	☑	☑	☑
	Swales	☑	☑	☑	☑	☑	☑	☑
	Porous Pavements	☑	☑	☑	☑	☑	☑	☑
	Rainwater Storage and Reuse (Tanks)	☑	☑	☑	☑	☑	☑	☑
	Stormwater Infiltration Measures	☑	☑	☑	☑	☑	☑	☑
Structural Treatments	Filter Strips	☑	☑	☑	☑	☑	☑	☑
	Screening Devices	☑	☑	☑	☑	☑	☑	☑
	Artificial Wetlands	☑	☑	☑	☑	☑	☑	☑
	Gross Pollutant Traps	☑	☑	☑	☑	☑	☑	☑
	Drainage Inlet Traps	☑	☑	☑	☑	☑	☑	☑
	Sedimentation Basins	☑	☑	☑	☑	☑	☑	☑
	Instream Floating Debris & Litter Booms	☑	☑	☑	☑	☑	☑	☑
	Oil and Grease Interceptors	☑	☑	☑	☑	☑	☑	☑
Information & Data Collection	Flow Detention Structures (Basins)	☑	☑	☑	☑	☑	☑	☑
	Litter Audits	☑	☑	☑	☑	☑	☑	☑
Regulation and Enforcement	Monitoring (Stormwater, Instream Ecology, Flow)	☑	☑	☑	☑	☑	☑	☑
	Financial Incentives (eg. Rate Rebates)	☑	☑	☑	☑	☑	☑	☑
	Audit and Inspection	☑	☑	☑	☑	☑	☑	☑
	Infringement Notification and Fines	☑	☑	☑	☑	☑	☑	☑

Strategy 11 - Merricks Creek and Shoreham

Threat
Waterway Degradation
Pollutants
Sediment and Nutrients

Primary Value
In-Stream Habitat
Secondary Values

Element Type	Strategy Elements	Coarse Sediment	Fine Sediment	Nutrients	Comment	Recommended
Education and Awareness	Literature/Guideline Development and Distribution	☑	☑	☑	Use existing material developed by Landcare	
	Stormwater Management Education Workshops	☑	☑	☑	The target audience is better reached via direct contact	
	Demonstration Projects	☑	☑	☑	Negotiate with cooperative landowner to develop a demonstration project	☑
	Long Term Individual/Organisation Consultation	☑	☑	☑	The target group is mostly farmers and is best contacted by liaison with Landcare or community groups	
	Media Release	☑	☑	☑	Likely to alienate target audience	
	Signage	☑	☑	☑	Limited opportunities as streamlines are held in private property	
	Landcare, Community & Special Interest Group	☑	☑	☑	Develop links with community to facilitate change in practices	☑
	Business Stakeholder Groups & Committees	☑	☑	☑	These groups will be engaged through Landcare and community groups	
Source Controls	Street Sweeping	☑	☑		NA	
	Waste & Refuse Collection	☑	☑	☑	NA	
	Waterway Rehabilitation & Revegetation	☑	☑	☑	Undertake works identified in Due Diligence Study	☑
	Roof Water Diversion	☑	☑	☑	NA	
Site Specific Strategies and Plans	Develop & Implement Site Specific EMP's	☑	☑	☑	Will be covered by Waterway management strategy	
	Develop & Implement Site Specific Sed & Erosion Control Plans	☑	☑	☑	Will be covered by Waterway management strategy	
	Waste Management Program Development	☑	☑	☑	NA	
	Water Quality Management Strategy	☑	☑	☑	NA	
	Waterway Management Strategy Development	☑	☑	☑	Regional Drainage Authority should develop strategy for all streamlines on Peninsula	☑
Non-Structural Treatments	Spill Prevention and Containment Plans	☑	☑	☑	NA	
	Swales	☑	☑	☑	Will not reduce waterway degradation	
	Porous Pavements	☑	☑	☑	NA	
	Rainwater Storage and Reuse (Tanks)	☑	☑	☑	NA	
	Stormwater Infiltration Measures	☑	☑	☑	Include as part of Waterway Rehabilitation and Revegetation	
Structural Treatments	Filter Strips	☑	☑	☑	Include as part of Waterway Rehabilitation and Revegetation	
	Screening Devices	☑	☑	☑	NA	
	Artificial Wetlands	☑	☑	☑	Investigate opportunities to develop on private property as stream works	
	Gross Pollutant Traps	☑	☑	☑	Not appropriate to threat	
	Drainage Inlet Traps	☑	☑	☑	Upper parts of catchment do not contain formal drainage network	
	Sedimentation Basins	☑	☑	☑	Could be installed as parts of farm dams	
	Instream Floating Debris & Litter Booms	☑	☑	☑	NA	
	Oil and Grease Interceptors	☑	☑	☑	NA	
Information & Data Collection	Flow Detention Structures (Basins)	☑	☑	☑	NA	
	Litter Audits	☑	☑	☑	NA	
Regulation and Enforcement	Monitoring (Stormwater, Instream Ecology, Flow)	☑	☑	☑	Undertake regular waterway condition assessments to identify where rehab work is required	☑
	Financial Incentives (eg. Rate Rebates)	☑	☑	☑	Use financial incentives to encourage farmers to protect streams	☑
	Audit and Inspection	☑	☑	☑	Likely to hinder other extension activities	
	Infringement Notification and Fines	☑	☑	☑	Likely to hinder other extension activities	

Strategy 12 - Merricks and Shoreham

Threat
Septic Systems
Pollutants
Nutrients, deoxygenating materials and pathogens

Primary Value
Recreational Amenity
Secondary Values
Various

Element Type	Strategy Elements	Deoxygenating Materials	Nutrients	Pathogens	Comment	Recommended
Education and Awareness	Literature/Guideline Development and Distribution	☑	☑	☑	Use material developed in Strategy 2	☑
	Stormwater Management Education Workshops	☑	☑	☑	Limited scope, given the audience	
	Demonstration Projects	☑	☑	☑	Demonstration project is unlikely to have a significant impact	
	Long Term Individual/Organisation Consultation	☑	☑	☑	MPSC should continue to lobby agencies to be part of trial WW management strategy	☑
	Media Release	☑	☑	☑	Use local media to highlight issues to residents	☑
	Signage	☑	☑	☑	Investigations should be undertaken the source and flow path of any septic overflow prior to erecting signs	
	Landcare, Community & Special Interest Group	☑	☑	☑	Work with local groups to highlight issues and to encourage installation of sewer	☑
	Business Stakeholder Groups & Committees	☑	☑	☑	Innapropriate as issue is mostly related to residential areas	
Source Controls	Street Sweeping	☑			Will not target threat	
	Waste & Refuse Collection	☑	☑	☑	Will not target threat	
	Waterway Rehabilitation & Revegetation				NA	
	Roof Water Diversion				NA	
Site Specific Strategies and Plans	Develop & Implement Site Specific EMP's	☑	☑	☑	Limited scope to treat threat	
	Develop & Implement Site Specific Sed & Erosion Control Plans				NA	
	Waste Management Program Development	☑	☑	☑	NA	
	Water Quality Management Strategy	☑	☑	☑	NA	
	Waterway Management Strategy Development	☑	☑	☑	Threat is not related to waterway management	
Non-Structural Treatments	Spill Prevention and Containment Plans	☑	☑	☑	Spillage of septic material should be managed via septic systems or sewer	
	Swales			☑	Innapropriate for threat and limited spatial opportunities	
	Porous Pavements				NA	
	Rainwater Storage and Reuse (Tanks)				NA	
	Stormwater Infiltration Measures			☑	Will not target threat	
	Filter Strips			☑	Will not target threat	
Structural Treatments	Screening Devices	☑			Physical form of pollution cannot be treated by this device	
	Artificial Wetlands	☑	☑		Limited opportunities given spatial constraints	
	Gross Pollutant Traps	☑			GPT's have performance and practical limitaions in this catchment	
	Drainage Inlet Traps	☑			The catchment does not have a formal drainage system	
	Sedimentation Basins				NA	
	Instream Floating Debris & Litter Booms				NA	
	Oil and Grease Interceptors				NA	
Information & Data Collection	Flow Detention Structures (Basins)				NA	
	Litter Audits	☑			Litter is not a major pollutant threat	
Regulation and Enforcement	Monitoring (Stormwater, Instream Ecology, Flow)	☑	☑	☑	Monitor the WQ in Dodds Creek to try and identify where septic leakage is occurring	
	Financial Incentives (eg. Rate Rebates)	☑	☑	☑	MPSC could offer subsidies to encourage homeowners to hook up to sewer	☑
	Audit and Inspection	☑	☑	☑	Inspect septic systems	☑
	Infringement Notification and Fines	☑	☑	☑	Consider fines to ensure septic systems are compliant with EPA regulations	☑

APPENDIX F: STRATEGY ELEMENT SELECTION TABLES

Table F.1 Strategy Formulation for Stormwater Risk Issue 1, Management of Agricultural Runoff in Watsons Creek

Rank	ID	Element Types	Description/ Location (structural measures only)	Lifecycle	Capital Cost	Ongoing Cost	Total Cost	% Catchment	Effectiveness	Life time	Feasibility	Multiple Benefit	Desirability	Score
1	MS1-SS-01	Water Quality Management Strategy		10	\$40,000	\$5,000	\$90,000	100	L	15	H	M	H	816
2	MS1-SS-02	Waterway Management Strategy Development		1	\$60,000		\$60,000	100	N	15	H	H	H	2332
3	MS1-EA-02	Landcare, Community & Special Interest Groups		10		\$5,000	\$50,000	100	N	10	H	H	H	2915
4	MS1-SC-01	Waterway Rehabilitation and Revegetation		10		\$10,000	\$100,000	10	L	50	M	M	H	3810
5	MS1-EA-01	Long Term Organisational Consultation		10		\$10,000	\$100,000	100	N	10	H	H	H	5831
6	Ms1-DC-01	Monitoring		10		\$40,000	\$400,000	100	N	10	H	L	M	76190

Strategy 1 Cost Effectiveness Plot

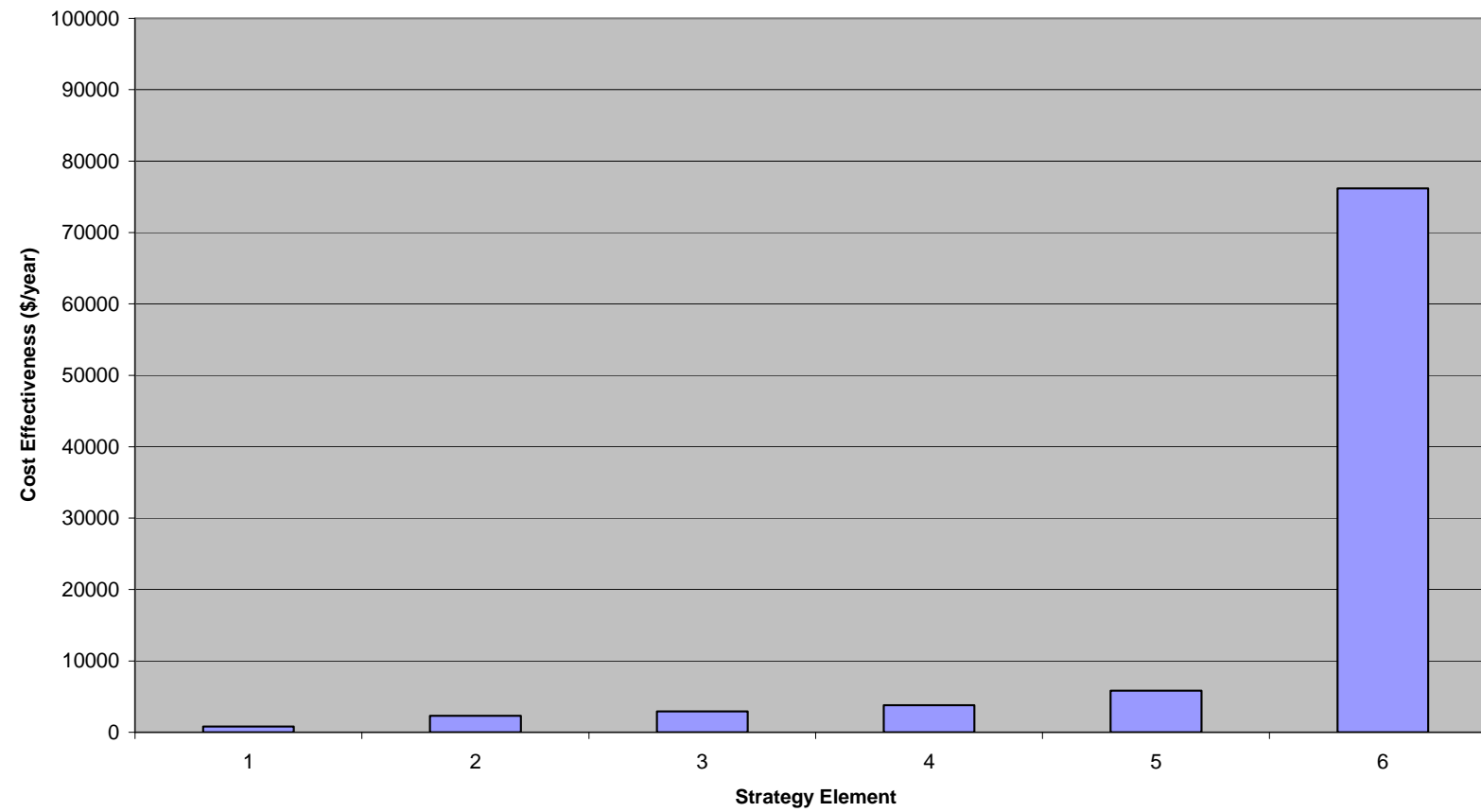


Table F.2 Strategy Formulation for Stormwater Risk Issue 2, Management of Septic Systems within the Nepean Peninsula

Rank	ID	Element Types	Description/ Location (structural measures only)	Lifecycle	Capital Cost	Ongoing Cost	Total Cost	% Catchment	Effectiveness	Life time	Feasibility	Multiple Benefit	Desirability	Score
1	MS2-EA-04	Media Release		1		\$7,500	\$7,500	100	N	1	H	M	H	6122
2	MS2-EA-02	Long Term Consultation		10		\$5,000	\$50,000	100	N	10	H	L	H	6803
3	MS2-EA-03	Long Term Consultation		10		\$5,000	\$50,000	100	N	10	H	L	H	6803
4	MS2-EA-01	Literature & Guideline Development		5	\$15,000	\$5,000	\$40,000	100	N	5	H	L	H	10884
5	MS2-RE-01	Financial Incentives		1	\$1,500,000		\$1,500,000	50	H	50	L	M	M	11429
6	MS2-EA-05	Signage		5	\$5,000	\$1,000	\$10,000	10	N	7	H	M	H	11662
7	MS2-RE-02	Financial Incentives		1	\$3,000,000		\$3,000,000	50	VH	50	L	M	H	12698
8	MS2-SS-04	Water Quality Management Strategy		10	\$20,000	\$10,000	\$120,000	100	N	10	H	L	M	22857
9	MS2-RE-03	Audit & Inspection	Sewer Connections	1	\$5,000		\$5,000	50	N	1	H	N	H	81633
10	MS2-DC-01	Monitoring		10		\$40,000	\$400,000	100	N	10	M	L	M	106667
11	MS2-RE-03	Audit & Inspection	Septic Tanks	1	\$200,000		\$200,000	50	N	1	L	N	H	7619048

Strategy 2 Cost-Effectiveness Plot

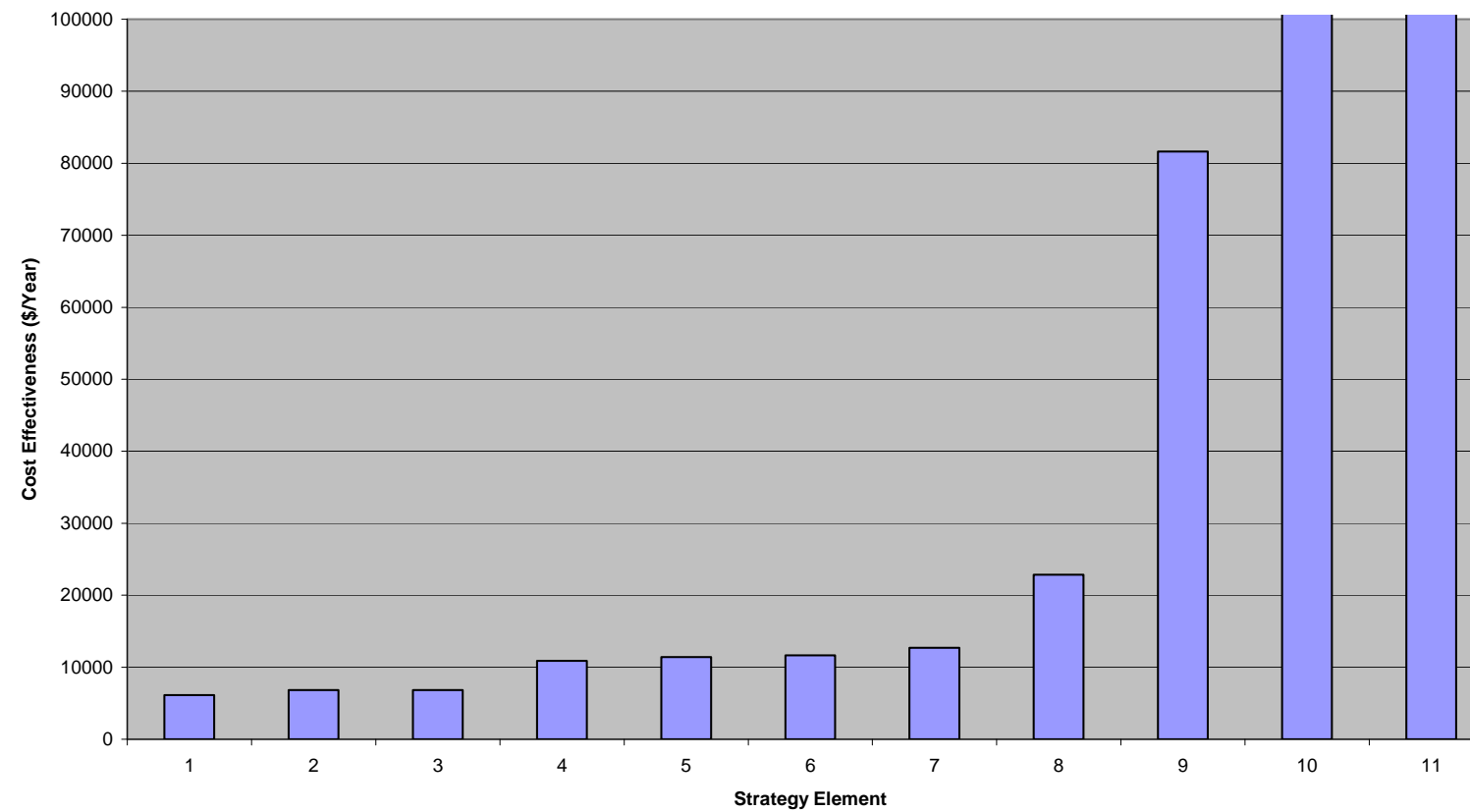


Table F.3 Strategy Formulation for Stormwater Risk Issue 3, Management of Residential Development throughout the Municipality

Rank	ID	Element Types	Description/ Location (structural measures only)	Lifecycle	Capital Cost	Ongoing Cost	Total Cost	% Catchment	Effectiveness	Life time	Feasibility	Multiple Benefit	Desirability	Score
1	MS3-EA-06	Signage		5	\$5,000	\$500	\$7,500	100	N	8	H	L	H	1276
2	MS3-EA-01	Literature and Guideline Development and Distribution		1	\$5,000		\$5,000	100	N	2	H	M	H	2041
3	MS3-SS-02	Site Specific Sediment and Erosion Control Plans		1	\$10,000		\$10,000	100	M	1	L	L	H	3175
4	MS3-EA-04	Long Term Individual and Organisational Consultation		5		\$5,000	\$25,000	100	N	5	H	M	H	4082
5	MS3-EA-07	Business Stakeholder Groups and Committees		10		\$3,000	\$30,000	100	N	10	L	L	H	9524
6	MS3-EA-05	Media Release		1		\$7,500	\$7,500	100	N	1	H	L	H	10204
7	MS3-EA-02	Stormwater Education Workshops		1	\$10,000		\$10,000	100	N	1	M	M	M	16000
8	MS3-SS-01	Develop and Implement Site Specific EMP's		1	\$40,000		\$40,000	5	M	10	L	L	H	25397
9	MS3-EA-03	Demonstration Projects		1	\$20,000		\$20,000	5	M	1	M	H	M	45714
10	MS3-RE-02	Audit and Inspection		10		\$100,000	\$1,000,000	100	L	10	M	L	L	74074
11	MS3-RE-03	Infringement Notification and Fines		10	\$200,000	\$50,000	\$700,000	100	L	10	L	N	L	518519
12	MS3-RE-01	Financial Incentives		10	\$200,000	\$100,000	\$1,200,000	100	L	10	L	N	M	533333

Strategy 3 Cost-Effectiveness Plot

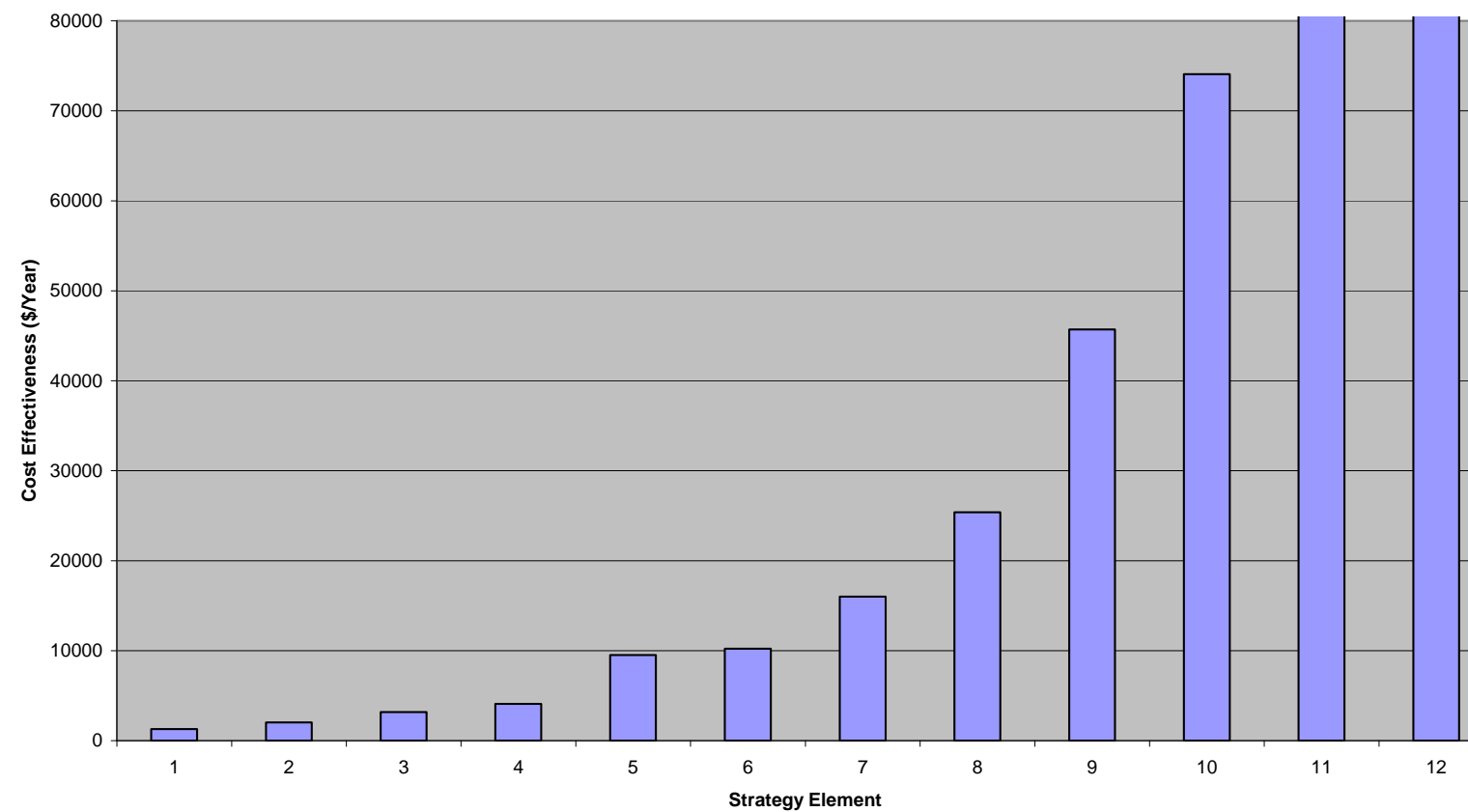


Table F.4 Strategy Formulation for Stormwater Risk Issue 4, Management of Market Gardens in Chinamans Creek

Rank	ID	Element Types	Description/ Location (structural measures only)	Lifecycle	Capital Cost	Ongoing Cost	Total Cost	% Catchment	Effectiveness	Life time	Feasibility	Multiple Benefit	Desirability	Score
1	MS4-EA-01	Literature/Guideline Development and Distribution		10	\$2,000		\$2,000	100	N	10	H	L	M	381
2	MS4-SS-02	Water Quality Management Strategy		1	\$5,000		\$5,000	100	N	20	H	N	H	2041
3	MS4-EA-02	Demonstration Programs		10		\$5,000	\$50,000	10	M	10	M	H	H	4082
4	MS4-EA-03	Long Term Individual Consultation		10	\$10,000	\$10,000	\$110,000	100	N	10	H	M	H	8980
5	MS4-SS-01	Develop Site Specific EMP's		10	\$10,000	\$2,000	\$30,000	20	M	10	L	N	H	28571
6	MS4-SC-01	Waterway Rehabilitation		10		\$10,000	\$100,000	10	N	50	L	M	M	53333
7	MS4-DC-01	Monitoring	Groundwater	10		\$20,000	\$200,000	100	N	10	M	L	M	53333
8	MS4-DC-02	Monitoring	Stormwater	10	\$10,000	\$40,000	\$410,000	100	N	10	M	L	H	78095
9	MS4-SS-01	Artificial Wetlands	Construct an artificial wetland upstre	50	\$7,000,000	\$700,000	\$42,000,000	80	H	50	L	H	H	102041

Strategy 4 Cost-Effectiveness Plot

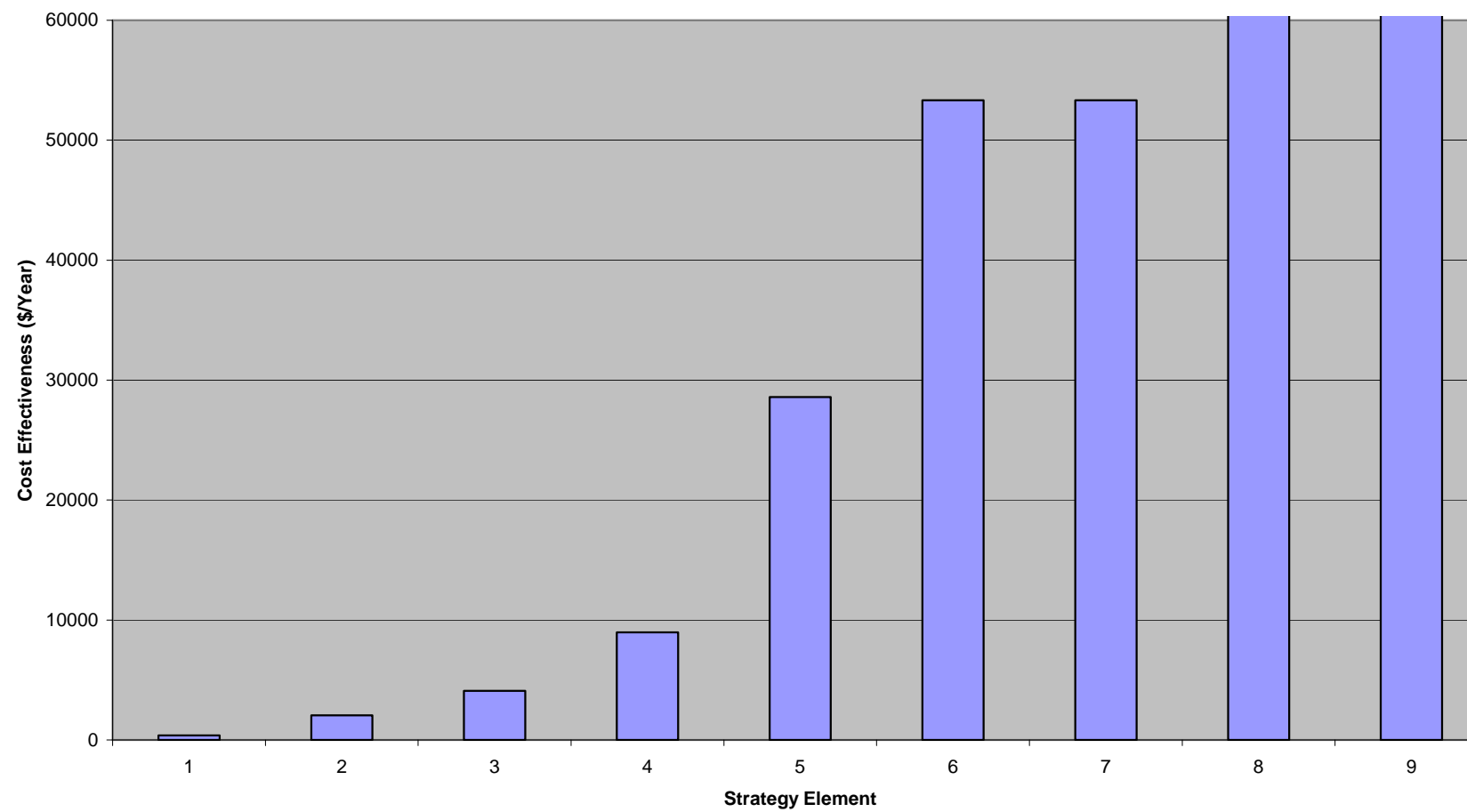


Table F.5 Strategy Formulation for Stormwater Risk Issue 6, Building Site Runoff in Balcombe Creek and Mt Martha

Rank	ID	Element Types	Description/ Location (structural measures only)	Lifecycle	Capital Cost	Ongoing Cost	Total Cost	% Catchment	Effectiveness	Life time	Feasibility	Multiple Benefit	Desirability	Score
1	MS6-SS-01	Develop and Implement Site Specific EMP's		1	\$6,000		\$6,000	100	L	1	M	M	H	1143
2	MS6-EA-04	Business Stakeholder Groups and Committees		10	\$5,000	\$1,000	\$15,000	100	N	10	L	M	H	2857
3	MS6-EA-03	Media Release		5		\$5,000	\$25,000	100	N	5	H	M	H	4082
4	MS6-EA-01	Literature/Guideline Development and Distribution		5	\$5,000	\$5,000	\$30,000	100	N	5	H	M	M	6857
5	MS6-EA-02	Long Term Individual/Organisational Consultation		10		\$10,000	\$100,000	100	N	10	M	L	M	26667
6	MS6-ST-02	Gross Pollutant Traps		10	\$35,000	\$9,000	\$125,000	5	VH	10	M	L	L	61728
7	MS6-RE-01	Infringement Notification and Fines		10	\$40,000		\$40,000	100	N	10	L	N	L	177778
8	MS6-RE-01	Audit and Inspection		10		\$50,000	\$500,000	100	N	10	L	L	L	370370
9	MS6-ST-01	Screening Devices		20	\$20,000	\$9,000	\$200,000	5	H	20	M	N	L	380952
10	MS6-ST-03	Instream Floating Debris and Litter Boom		20	\$40,000	\$10,000	\$240,000	100	N	20	L	N	L	533333

Strategy 6 Cost-Effectiveness Plot

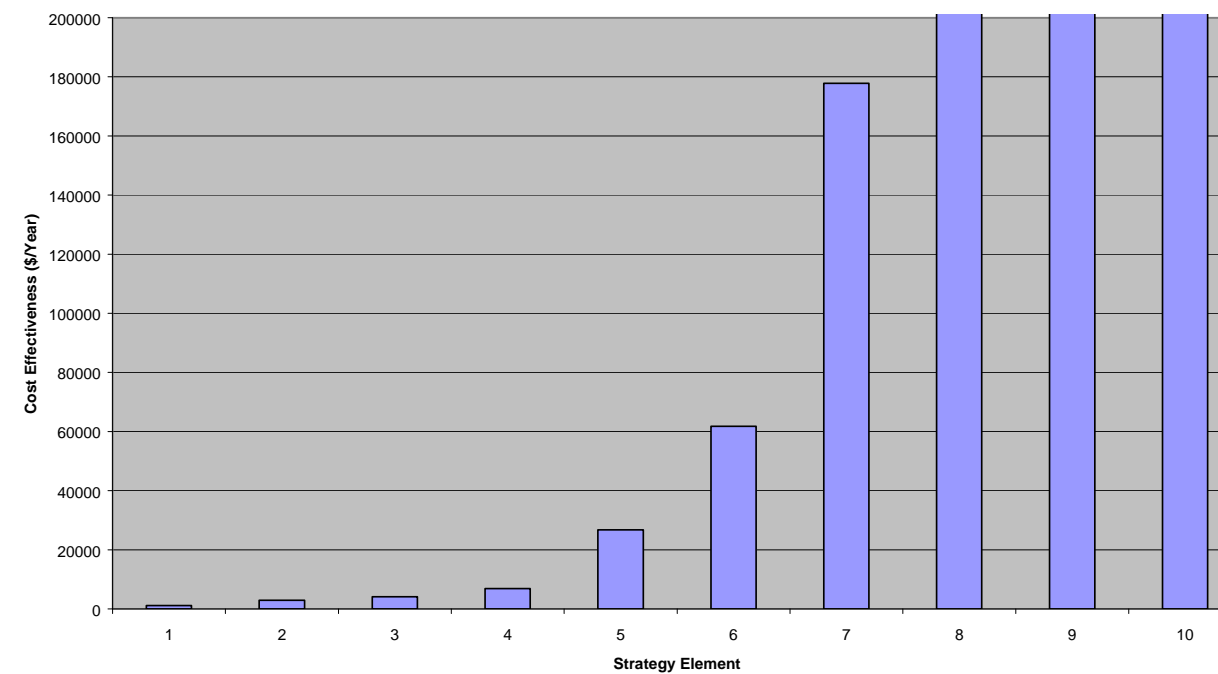


Table F.6 Strategy Formulation for Stormwater Risk Issue 9, Septic Tank Leakage in Flinders

Rank	ID	Element Types	Description/ Location (structural measures only)	Lifecycle	Capital Cost	Ongoing Cost	Total Cost	% Catchment	Effectiveness	Life time	Feasibility	Multiple Benefit	Desirability	Score
1	MS8-EA-05	Community Group Consultation		1	\$6,000		\$6,000	100	L	1	M	M	H	1143
2	MS2-EA-04	Media Release		10	\$5,000	\$1,000	\$15,000	100	N	10	L	M	H	2857
3	MS8-EA-03	Long Term Consultation		5		\$5,000	\$25,000	100	N	5	H	M	H	4082
4	MS2-EA-01	Literature & Guideline Development and Distribution		5	\$5,000	\$5,000	\$30,000	100	N	5	H	M	M	6857
5	MS2-EA-02	Long Term Consultation		10		\$10,000	\$100,000	100	N	10	M	L	M	26667
6	MS8-DC-01	Monitoring		50	\$35,000	\$9,000	\$485,000	50	VH	50	M	N	L	28741
7	MS8-EA-06	Signage		20	\$20,000	\$9,000	\$200,000	50	H	20	M	N	L	38095
8	MS8-RE-02	Audit & Inspection		10		\$50,000	\$500,000	100	N	10	L	L	L	370370
9	MS8-RE-01	Financial Incentives		20	\$40,000	\$10,000	\$240,000	100	N	20	L	N	L	533333

Strategy 9 Cost-Effectiveness Plot

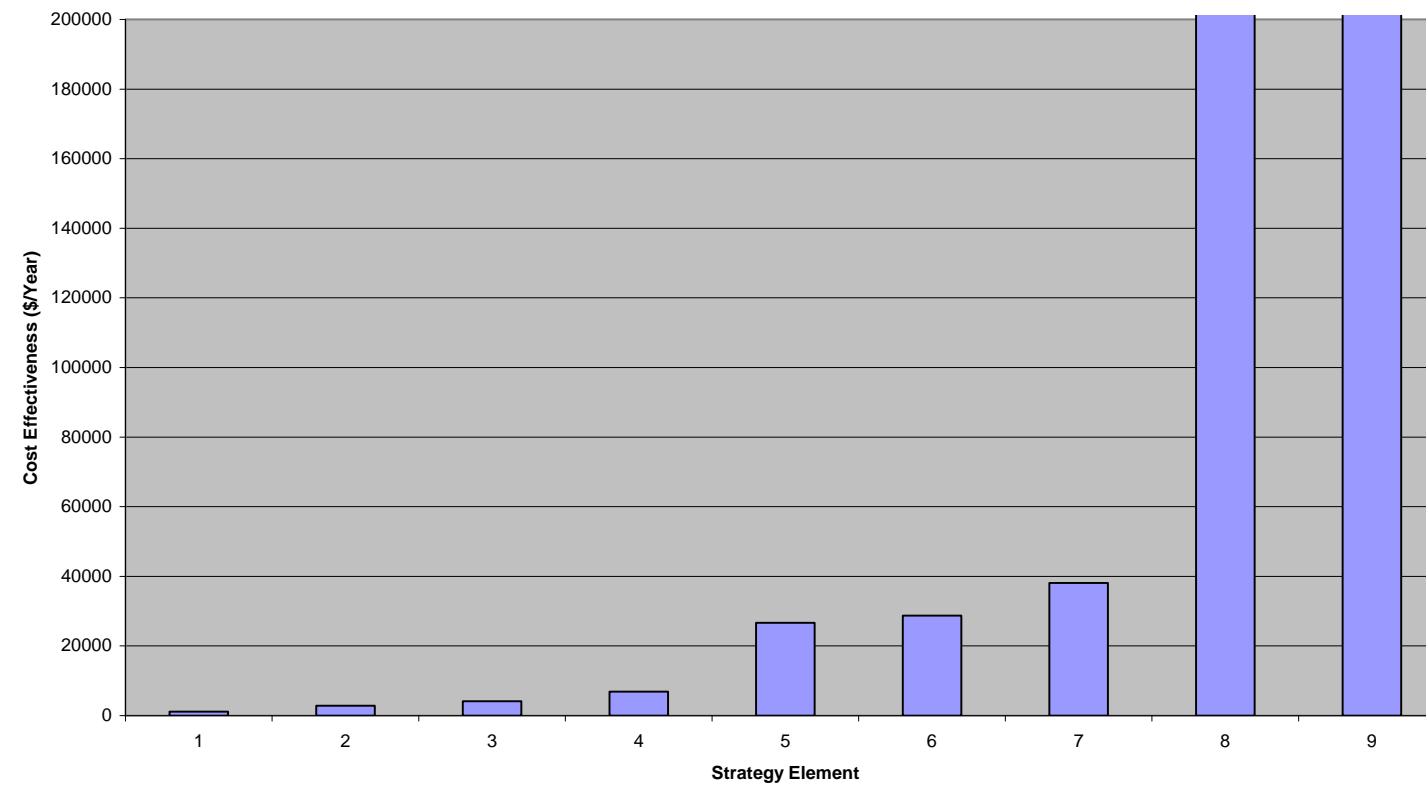


Table F7 Strategy Formulation for Stormwater Risk Issue 10, Runoff From Commercial Areas in the Nepean Catchment

Rank	ID	Element Types	Description/ Location (structural measures only)	Lifecycle	Capital Cost	Ongoing Cost	Total Cost	% Catchment	Effectiveness	Life time	Feasibility	Multiple Benefit	Desirability	Score
1	MS10-EA-01	Literature/Guideline Development and Distribution		5	\$5,000		\$5,000	100	N	5	H	L	M	1905
2	MS10-EA-02	Long Term Individual/Organisational Consultation		10		\$8,000	\$80,000	100	N	10	H	M	H	6531
3	MS10-EA-03	Media Release		5		\$7,500	\$40,000	100	N	5	H	M	H	6531
4	MS10-EA-04	Signage		10	\$15,000	\$1,000	\$75,000	50	N	10	H	M	L	28571
5	MS10-ST-02	Gross Pollutant Traps	φ mm Sorrento Pier	50	\$182,000	\$9,000	\$632,000	49	VH	50	M	N	L	38216
6	MS10-ST-03	Gross Pollutant Traps	φ 450 mm Hygeia Street	50	\$30,000	\$9,000	480000	20.1	VH	50	H	N	L	50541
7	MS10-ST-01	Screening Devices	φ 450 mm Hygeia Street	20	\$9,000	\$9,000	\$189,000	20.1	H	20	H	N	L	63966
8	MS10-ST-01	Screening Devices	φ mm Sorrento Pier	20	\$26,400	\$9,000	\$206,400	49	H	20	L	N	L	66861
9	MS10-ST-01	Screening Devices	φ mm Portsea Pier	20	\$26,400	\$9,000	\$35,000	6.5	H	20	L	N	L	85470
10	MS10-ST-02	Gross Pollutant Traps	φ 450 mm Hunt Avenue	50	\$30,000	\$9,000	\$480,000	11	VH	50	H	N	L	92352
11	MS10-ST-01	Screening Devices	φ 450 mm Hunt Avenue	20	\$9,000	\$9,000	\$189,000	11	H	20	H	N	L	116883
12	MS10-ST-02	Gross Pollutant Traps	φ 450 mm Rye Boat Ramp Jetty	50	\$30,000	\$9,000	\$480,000	4.5	VH	50	H	N	L	225750
13	MS10-ST-02	Gross Pollutant Traps	φ 450 mm Rye Pier West	50	\$30,000	\$9,000	\$480,000	4.5	VH	50	H	N	L	225750
14	MS10-ST-02	Gross Pollutant Traps	φ 450 mm Rye Pier East	50	\$30,000	\$9,000	\$480,000	4.5	VH	50	H	N	L	225750
15	MS10-ST-01	Screening Devices	φ 450 mm Rye Pier West	20	\$9,000	\$9,000	\$189,000	4.5	H	20	H	N	L	285714
16	MS10-ST-01	Screening Devices	φ 450 mm Rye Pier East	20	\$9,000	\$9,000	\$189,000	4.5	H	20	H	N	L	285714
17	MS10-ST-02	Gross Pollutant Traps	φ mm Portsea Pier	50	\$182,000	\$9,000	\$632,000	6.5	VH	50	M	N	L	288091
18	MS10-ST-01	Screening Devices	φ 450 mm Rye Boat Ramp Jetty	20	\$9,000	\$9,000	\$206,400	4.5	H	20	H	N	L	312018

Strategy 10 Cost-Effectiveness Plot

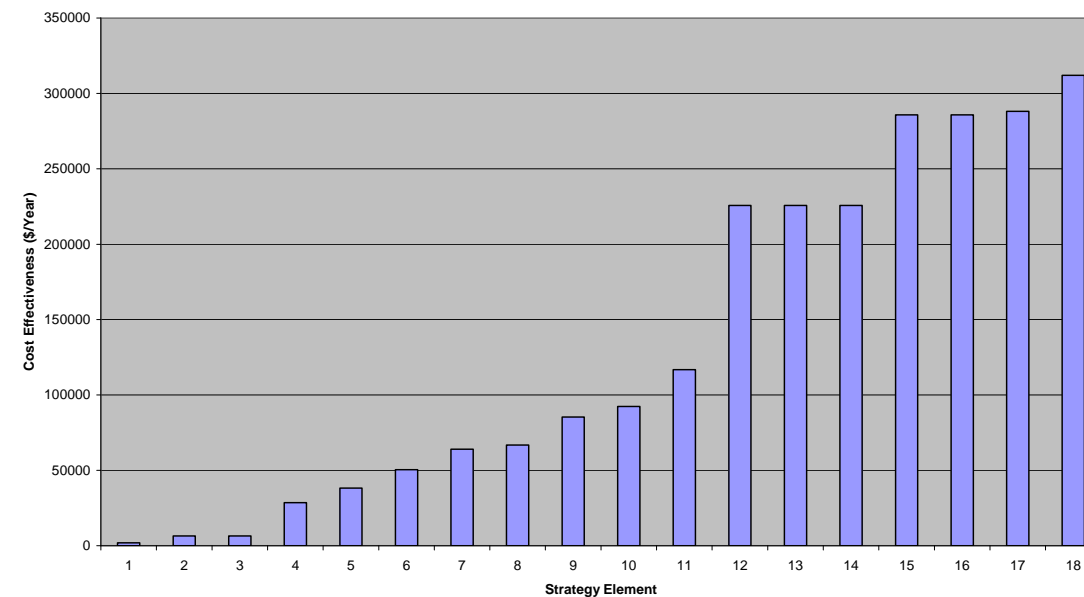


Table F.8 Strategy Formulation for Stormwater Risk Issue 11, Waterway Degradation in the Merricks and Shoreham Catchments

Rank	ID	Element Types	Description/ Location (structural measures only)	Lifecycle	Capital Cost	Ongoing Cost	Total Cost	% Catchment	Effectiveness	Life time	Feasibility	Multiple Benefit	Desirability	Score
1	MS11-EA-01	Demonstration Projects		10	\$7,500	\$7,500	\$82,500	10	L	50	M	H	H	2245
2	MS11-RE-01	Financial Incentives		10		\$10,000	\$100,000	100	L	10	M	M	M	2667
3	MS11-SS-01	Waterway Management Strategy Development		1	\$20,000		\$20,000	100	N	5	H	M	H	3265
4	MS11-EA-02	Landcare, Community and Special Interest Groups		10		\$5,000	\$50,000	100	N	10	H	M	H	4082
5	MS11-SC-01	Waterway Rehabilitation and Revegetation		5	\$140,000	\$10,000	\$190,000	5	H	50	M	H	H	4431
6	MS11-DC-01	Monitoring		10		\$5,000	\$50,000	100	N	10	H	L	L	15873

Strategy 11 Cost-Effectiveness Plot

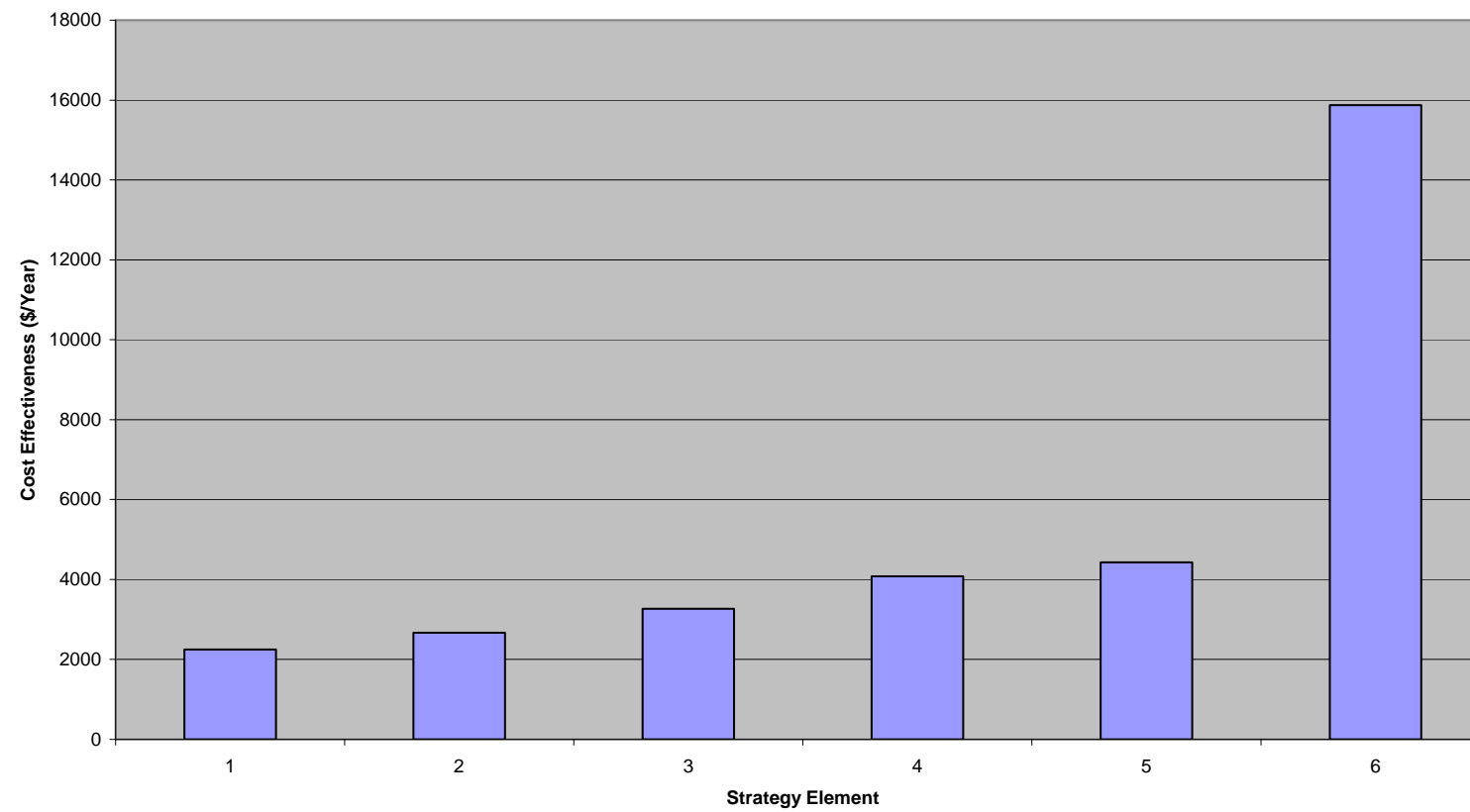
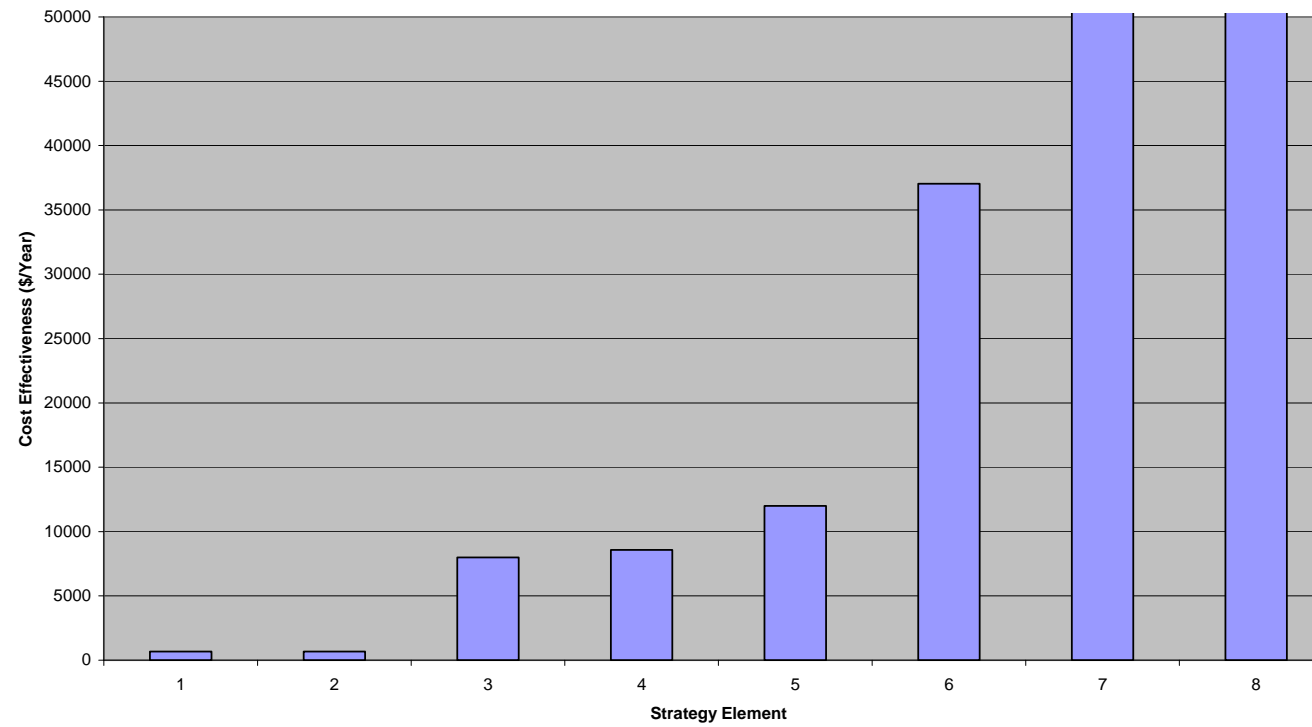


Table F.9 Strategy Formulation for Stormwater Risk Issue 12, Septic Tank Leakage in Merricks and Shoreham

Rank	ID	Element Types	Description/ Location (structural measures only)	Lifecycle	Capital Cost	Ongoing Cost	Total Cost	% Catchment	Effectiveness	Life time	Feasibility	Multiple Benefit	Desirability	Score
1	MS2-EA-01	Literature & Guideline Development and Distribution		5		\$5,000	\$25,000	100	L	5	H	M	H	680
2	MS2-EA-02	Long Term Consultation		5		\$5,000	\$25,000	100	L	5	H	M	H	680
3	MS12-EA-01	Long Term Consultation		10		\$5,000	\$50,000	100	N	10	M	M	M	8000
4	MS2-EA-04	Media Release		10		\$7,500	75000	100	N	10	H	M	M	8571
5	MS12-EA-02	Community Group Consultation		5		\$7,500	\$37,500	100	N	5	M	M	M	12000
6	MS8-RE-01	Financial Incentives		1	\$300,000		\$300,000	100	VH	20	L	N	L	37037
7	MS12-RE-02	Audit & Inspection		10	\$100,000		\$100,000	100	N	10	L	L	L	74074
8	MS12-DC-01	Monitoring		10		\$40,000	\$400,000	100	N	10	H	M	L	76190

Strategy 12 Cost-Effectiveness Plot



APPENDIX G: MANAGEMENT FRAMEWORK INTERVIEWEES

The following people were in attendance at various workshops and/or were consulted directly as part of the management framework review.

NAME	ORGANISATION
Annear, John	MPSC
Batty, Mark	Melbourne Water
Burte, Stuart	EPA
Bonici, Paul	MPSC
Burke, Tom	MPSC
Cooksley, Arthur	MPSC
Cowley, Allan	MPSC
Douglas, Bruce	MPSC
Healy, Paul	MPSC
Katakouzinis, Sotirios	MPSC
Kinns, Emily	MPSC
Millineux, Dan	MPSC
Pankhurst, Barry	MPSC
Pergle, Garrigue	MPSC
Schyschow, Sophie	MPSC
Somerville, Michael	MPSC
Turner, John	MPSC
Upton, Mark	MPSC
Webb, Ray	MPSC
Woods, Daryl	MPSC

APPENDIX H: MANAGEMENT FRAMEWORK STRATEGIES – RECOMMENDED AMENDMENTS TO COUNCIL DOCUMENTATION

The following are examples where Council might consider reviewing or amending its Community Plan or Planning Scheme to better reflect the importance of stormwater management. It also recommends ways in which Council can introduce statutory tools to assist in the management of stormwater.

The suggestions are not exhaustive, nor are they meant to be, they are intended to provide a range of suggestions of how the documents may be altered. The ultimate responsibility of reviewing the documents lies with Council and they are best able to judge the number and manner of changes required.

Table H.1 Suggested Changes Community Plan

Current Documentation	Suggested alteration or addition
Goal 1.1.2 To protect and enhance waterways systems within the municipality	‘to conduct workshops within Council to ensure effective implementation of the stormwater management plan.’
4.3 Providing and Maintaining Drainage Systems	‘review mapping and flooding data for the Shire and develop a single mapping system.’ ‘develop a regional stormwater drainage strategy for inclusion in the Planning Scheme.’

Table H.2 Suggested Changes to Municipal Strategic Statement

Current Documentation	Suggested alteration or addition
21.02 Profile of the Mornington Peninsula - Settlement Pattern & Housing	Where discussing opportunities for future residential development, add reference to the environmental and stormwater impacts that may result.
21.02 Profile of the Mornington Peninsula - Agriculture	Where discussing agricultural land uses of the Shire, add reference to the environmental and stormwater impacts that may result.
21.02 Profile of the Mornington Peninsula – Environmental and Cultural Significance	Reference to stormwater where discussing the vulnerability of stream catchments and the need for whole of catchment management.
21.02 Profile of the Mornington Peninsula – Recreation and Tourism	Where discussing the Shire’s attractions, emphasise that its beaches and waterways are not prized just because they are there but because they are in good condition.
21.02 Profile of the Mornington Peninsula - Infrastructure	Where discussing the concerns of unsewered development, link back to environmental and stormwater implications.
21.03 – 1 The Regional Role of Mornington Peninsula - Environmental Values	Expand to reflect the importance this issue is afforded in the Community Plan and give weight to stormwater issues.
21.03-2 A Shared Vision – Council’s Corporate Plan.	Update to reflect changes incorporated in the Community Plan.
21.03-3 Summary of Strategic Challenges – Conservation Values	Discussion reflecting the impact of stormwater management practices on environmental values and the opportunity to relieve some of the recognised pressures on the system.
21.06 Strategic Framework and the Peninsula’s Settlement Pattern 21.07 Guiding Future Township Development 21.08 Foreshore and Coastal Areas 21.09 Planning for Rural Areas 21.10 Managing Port Area Development	Reference to appropriate stormwater management outcomes.
21.11 Monitoring & Review	Add stormwater
21.12 Reference Documents	MPSC Stormwater Management Plan

Table H.3 Suggested Changes to Local Policies

Current Documentation	Suggested alteration or addition
22.01 Industrial Subdivision and Design	Environmental objectives Reference to stormwater issues, particularly where near waterways.
22 Local Policies	MPSC Stormwater Management Plan as a Policy Reference to Local Policies where appropriate. Develop a Regional Stormwater Drainage Policy.
22.13 Township Environment	Discussion relating to stormwater management and any standards, documents or guidelines developed as a result of the implementation of the stormwater management plan.
22.13-3 Policy	'existing premises within unsewered areas will be required to improve inadequate treatment and disposal systems where wastewater discharges do not meet the required standards and are contributing to the pollution of groundwater or surface waters.