

WESTERN BAY OF PLENTY DISTRICT COUNCIL

**Te Puna West Stormwater
Catchment Management Plan**

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EXECUTIVE SUMMARY

The Western Bay of Plenty District Council (WBOPDC) has identified the need for stormwater catchment management in some of the smaller settlements of the Western Bay of Plenty. This document provides an overview of the Te Puna West stormwater catchment, describing the catchment's characteristics and stormwater network.

Te Puna West is a small settlement south east of the Katikati township with a stormwater catchment area of approximately 22 Ha. The catchment is bordered by the coast on one side and farmland on the remainder. The catchment area is zoned residential.

The existing stormwater network was modelled using the MOUSE drainage software and an ecological assessment of the catchment was prepared by Wildland Consultants.

Network upgrades were recommended as a result of the network modelling. The recommendations are based on maximum probable development using the current Western Bay of Plenty District Council Code of Practice and District Plan constraints. Should any of the current rules or controls change, stormwater discharge constraints may be required for further development.

The estimated cost of the recommended upgrade works totaled \$393,328 excl GST. This work is proposed to start in the 2007/2008 financial year and would take till the 2011/2012 financial year based on the assumed funding allocation. The maintenance cost for these additional assets will gradually increase to approximately \$1400 per annum upon completion of the capital works.

It is recommended that the works be added to the Long Term Council Community Plan (LTCCP) for the residents of Te Puna to discuss and review.

It is also suggested that land coverage restrictions be placed on the catchment so the impervious area of the catchment does not go above 35% (or the C factor above 0.5).

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CONTENTS

1	INTRODUCTION	4
2	DESCRIPTION OF THE CATCHMENT	4
	Description of the Te Puna West Catchment	4
	Land Use	4
3	REGULATORY INFORMATION	5
	Western Bay of Plenty Subdivision and Development Code of Practice	5
	Western Bay of Plenty District Plan	5
	Environment Bay of Plenty	6
4	EXISTING INFORMATION	7
	Stormwater Network	7
	Marine Receiving Water Quality	7
	Ecological Characteristics	8
	Vegetation and Habitats	8
5	CONSTRAINTS AND MODELLING ANALYSIS	8
6	IDENTIFIED STORMWATER PROBLEMS	9
	Network	9
	Ecological	10
	Pollution	10
7	REMEDIAL METHODS	10
	Network	10
	Ecological	11
8	RECOMMENDATION	11

APPENDIX A	12
Location of the Te Puna West Catchment and EBOP Sampling Sites	12
APPENDIX B	14
Te Puna West District Plan Zoning Area and Existing Stormwater Pipe Network	14
APPENDIX C	17
Wildland Report “Ecological Assessment of Stormwater Catchments of Te Puna, Western Bay of Plenty District”	17
APPENDIX D	39
Map of Floodable Areas	39
APPENDIX E	41
Recommended Stormwater Upgrades and Costs	41
APPENDIX F	43
Map of Recommended Stormwater Upgrades	43
APPENDIX G	45
Proposed Works Programme	45

1 INTRODUCTION

The Western Bay of Plenty District Council (WBOPDC) has identified the need for stormwater catchment management in some of the smaller settlements of the Western Bay of Plenty. This document provides an overview of the Te Puna West stormwater catchment, briefly describing the catchment characteristics and stormwater network. In this document Te Puna West will be referred to as Te Puna.

The existing stormwater network was modelled using the MOUSE drainage software, which allowed the network and recommended upgrades to be assessed for effectiveness.

This catchment management plan also incorporates the results of an ecological assessment of the catchment prepared by Wildland Consultants in April 2005.

2 DESCRIPTION OF THE CATCHMENT

Description of the Te Puna West Catchment

Te Puna West is a small settlement south east of the Katikati township with a catchment area of approximately 20 Ha. The catchment is bordered by rural land comprising of farming and horticultural land and the Tauranga Harbour. A map showing the location of Te Puna is in Appendix A.

Land Use

The Te Puna area is zoned residential. The catchment has very little potential for subdivision and expansion, based on the current district plan. Appendix B is a map from the WBOPDC district plan and shows the actual zoning boundary's for Te Puna.

3 REGULATORY INFORMATION

Western Bay of Plenty Subdivision and Development Code of Practice

The Subdivision and Development Code of Practice (COP) is in place to

“maximise efficient use of resources to ensure that any development in the district is to an appropriate long term, cost effective and minimum uniform standard which benefits the community”.

The COP outlines detailed requirements for the stormwater network. A summary of the main requirements that relate to the Te Puna catchment are as follows:

- The minimum design standard for a primary (piped) stormwater system in the District is a 5 year return period (20% AEP).
- The minimum design standard for stormwater systems to protect important recreation fields, and streets without alternative access is a 10 year return period (10% AEP).
- The minimum design standard for stormwater systems to protect residential property, commercial and industrial buildings is a 50 year return period (2% AEP).
- The minimum design of stormwater systems to protect major communal facilities related to supply of electricity, telecommunications and water and sewage disposal systems and bridges is a 100 year return period (1% AEP).

Western Bay of Plenty District Plan

The residential zone rules specify the following as a controlled activity;

“More than one dwelling per lot, subject to a minimum net land area of 350m² per dwelling on sewered lots and 800m² on unsewered lots”

The Te Puna catchment is unsewered.

Environment Bay of Plenty

Environment Bay of Plenty (EBOP) has approved General Authorisation No 8 to provide for relatively small stormwater discharges. This authorisation dates back to the Water and Soil Conservation Act which permitted a Regional Council to authorise a number of minor or inconsequential uses of natural water by issuing a General Authorisation. When the Resource Management Act came into effect each General Authorisation became incorporated into the regional rules.

The provisions of General Authorisation No 8 are as follows:

“Clean stormwater may be discharged (excluding waste) into natural water provided that:

- a) The maximum discharge shall not exceed the flow from a 300 mm pipe on a flat grade or equivalent of 80 litres per second.*
- b) The suspended solids concentration of the water discharged does not exceed 150 g/m³.*
- c) The water discharged is substantially free of grease and oil.*
- d) The works shall be designed, constructed and maintained in such a manner so as not to cause erosion or flooding or to adversely affect any land or property owned or occupied by another person”*

All other charges require consents from EBOP..

4 EXISTING INFORMATION

Stormwater Network

The catchment currently consists of 1859 metres of stormwater pipe, 12 manholes and 38 catch pits. The pipes in the catchment are between 100mm and 600mm in diameter, with the majority being 300mm. The oldest pipes in the catchment were laid in 1959 and the newest in 2004. The majority of the pipes are made of concrete. Appendix B shows a map of the existing stormwater reticulation.

There are four discharge points into Tauranga Harbour from the Te Puna catchment.

There are three different stormwater discharge situations for the Te Puna catchment.

- Overland flow into the harbour
- Direct soakage
- Pipes discharging to the harbour

Marine Receiving Water Quality

EBOP regularly sample two sites throughout the bathing season (the start of November till the end of March) near the Te Puna catchment. The location of the sites is shown in Appendix A. Following is a table showing the sampling sites, sample site number and the median enterococci value (cfu/100ml) for the 2003/2004 and 2004/2005 bathing seasons.

Sampling Site	Sampling Site Number	Median Enterococci Result (cfu/100mL)
Waitui Reserve Te Puna	BOP800087	4
Omokoroa Beach	BOP900022	2

All the sampling results are assessed against the Marine Water Quality Guidelines which are as follows:

Safe Mode	single sample < 140 cfu/100ml
Amber / Alert Mode	single sample > 140 cfu/100ml
Red / Action Mode	2 consecutive samples over 280 cfu/100ml

In the 2003/2004 and 2004/2005 bathing seasons none of the above sampling points recorded any exceedences.

Ecological Characteristics

Following is a summary of information from the Western Bay of Plenty District Plan, Bay of Plenty Regional Coastal Environment Plan (RCEP). This shown in Appendix B.

Western Bay of Plenty District Plan

- Site S8 Tauranga Harbour Landward Edge

This area is identified as visually significant and includes all the land 40 metres inland from mean high water springs (MHWS).

Bay of Plenty Regional Coastal Environment Plan

- Site ASCV-4 Tauranga Harbour

The Tauranga Harbour is recognised in the RCEP as an “Area of Significant Conservation or Cultural Value” and also as an “Outstanding Natural Feature or landscape”.

Vegetation and Habitats

There are no indigenous vegetation or habitat types documented in the Te Puna catchment.

5 CONSTRAINTS AND MODELLING ANALYSIS

The WBOPDC data for the Te Puna catchment was adapted and used for the construction of a MOUSE drainage model of the area. This method of analysis allows accurate representation of existing and future systems and is only limited by the accuracy of the data used.

The maximum probable development potential in the catchment was approximated by assuming a maximum impervious ratio of 35% (this equates to a C factor of 0.5) which is based on a statistical development figure for Katikati prior to reticulated sewerage. The maximum development potential therefore is based on current Code of Practice and District Plan requirements, should permitted activities change the recommendations may no longer be representative. The Te Puna area population is expected to grow by approximately 33% (based on 2001 census figures) by the year 2021 absorbed by infill subdivision and rezoning. Infill subdivision is covered by the assumed maximum impervious ratio and current development constraints.

The annual exceedance probability (AEP) used was 2% (i.e. equivalent to a 50 year return period) to determine potential areas of flooding. In all

cases piped reticulation was sized using a 20% AEP event, unless no safe secondary flowpath was available, in which case the 2% AEP was used.

Two models were run; the first modelled the area as it is currently and the second modelled maximum probably development. There was minimal difference so the second model was used for cost analysis and to produce a work programme.

It is likely in future that Te Puna will link into the Omokoroa transfer pipeline currently in design stage. The report will need to be revised when this occurs. This will mean the recommended upgrades in this report may not meet Councils current LOS (level of service) requirements without additional constraints on private stormwater discharges.

6 IDENTIFIED STORMWATER PROBLEMS

Network

The MOUSE model was used to check the capacity of the existing stormwater system, determine flooding levels and identify required upgrades to the system.

The removal of deficient systems has been prioritised using three categories; high, medium and low. The following criteria were used to categorise these systems.

1. High – Upgrades of deficient systems that could cause major flooding of private property if not upgraded.
2. Medium – Upgrades of deficient systems to alleviate flooding of private property.
3. Low – Upgrades of deficient systems in flooding areas that do not cause major problems and do not flood private property.

Deficient systems are those which do not meet Councils current code of practice requirements either under existing development or maximum probable development. Details of the deficient systems are listed in Appendix E and illustrated in Appendix F.

Ecological

The existing ecological values should be protected and enhanced if possible. This will improve the quality of stormwater that is discharged into the harbour.

Pollution

No industrial or commercial areas exist at Te Puna. Catchments are residential with relatively low traffic volumes, producing limited pollution potential. No specific treatment systems are recommended other than the control of erosion caused by high velocity stormwater flows.

7 REMEDIAL METHODS

All recommended remedial methods are determined using maximum probable development information based on the current Code of Practice and District Plan constraints (see section 5). This report written on the basis that no reticulated sewerage is available for Te Puna although this is proposed in future therefore minimum section sizes are 800m².

Network

Details of the recommended upgrades, predicted costs and proposed programme are shown in appendices E and G. The Development Impact Fee (DIF) contribution is the estimated proportion of the cost of increasing the pipe sizes if subdivision was to occur. This was calculated by assessing the requirements and cost of upgrading the system to cater for existing development and comparing the results with the requirements and cost involved in upgrading the system to cater for potential maximum development. The difference between these two costs gives the total DIF amount.

The order of work listed in the proposed works programme (appendix G) was established by ranking the work based on priority. The work was then grouped so work in similar areas is carried out in consecutive years. It is possible to change the order of the work within each priority category.

Methods other than a piped system were considered but topographical and space constraints prevent other options such as ponds or swales being used.

Appendix F contains a map showing green coloured areas which can be developed without any upgrade of the stormwater systems. Red areas require stormwater upgrades before development can occur, or restrictions placed on new stormwater discharges to the Councils system.

The approximate cost of the proposed capital works is \$393,328. This work is proposed to be started in the 2007/2008 financial year and would take 5 years based on the assumed funding allocation. The maintenance cost for these additional assets will gradually increase to approximately \$1400 per annum upon completion of the capital works.

Ecological

The report produced by Wildland Consultants produced recommendations but these are only to improve aesthetics and are not related to stormwater quality or management.

8 RECOMMENDATION

It is recommended that the suggested capital works be added to the Long Term Council Community Plan (LTCCP) for the residents of Te Puna to discuss and review the proposed works programme.

It is also suggested that land coverage restrictions be placed on the catchment so the impervious area of the catchment does not go above 35% (or the C factor above 0.5).

APPENDIX A

Location of the Te Puna West Catchment and EBOP Sampling Sites

APPENDIX B

Te Puna West District Plan Zoning Area and Existing Stormwater Pipe Network

APPENDIX C

Wildland Report “Ecological Assessment of Stormwater Catchments of Te Puna, Western Bay of Plenty District”

APPENDIX D

Map of Floodable Areas

APPENDIX E

Recommended Stormwater Upgrades and Costs

Street Name	From Node	To Node	Priority	Existing Diameter [m]	Upgrade Diameter [m]	Length [m]	Cost [\$/m]	No. of man holes / outlets	Cost per man hole	No. of catch pits	Cost per catch pit	Amount [\$]	Cost per Job [\$]
Matahiwi Road	CP2075	JN0801	High	0.300	0.450	36	\$320	1	\$2,900	1	\$1,519.90	\$15,940	\$77,400
	JN0801	MH1531	High	0.300	0.450	10	\$320	1	\$2,900	0	\$1,519.90	\$6,100	
	MH1531	CO1131	High	0.375	0.450	77	\$320	1	\$2,900	0	\$1,519.90	\$27,540	
	MH1	CP2075	High	New Pipe	0.375	67	\$240	1	\$2,900	0	\$1,519.90	\$18,980	
	CP04	MH1	High	New Pipe	0.300	10	\$200	0	\$2,900	1	\$1,519.90	\$3,520	
	CP03	MH1	High	New Pipe	0.300	19	\$200	0	\$2,900	1	\$1,519.90	\$5,320	
Wallace Road	CP2309	CP2308	High	0.100	0.300	10	\$200	0	\$2,900	2	\$1,519.90	\$5,040	\$28,840
	CP2308	CP2306	High	0.100	0.375	11	\$240	0	\$2,900	1	\$1,519.90	\$4,160	
	CP2307	CP2306	High	0.100	0.300	12	\$200	0	\$2,900	1	\$1,519.90	\$3,920	
	CP2079	BX0812	High	0.300	0.375	17	\$240	1	\$2,900	1	\$1,519.90	\$8,500	
	CP2306	MH1804	High	0.150	0.375	18	\$240	1	\$2,900	0	\$1,519.90	\$7,220	
Matahiwi Road	CP01	MH12	Med	New Pipe	0.300	16	\$200	1	\$2,900	1	\$1,519.90	\$7,620	\$35,420
	MH12	MH1	Med	New Pipe	0.375	70	\$240	1	\$2,900	0	\$1,519.90	\$19,700	
	CP01	MH12	Med	New Pipe	0.300	16	\$200	0	\$2,900	0	\$1,519.90	\$3,200	
	CP02	MH12	Med	New Pipe	0.300	10	\$200	1	\$2,900	0	\$1,519.90	\$4,900	
Lindoch Avenue	CP2081	MH1532	Med	0.225	0.375	11	\$240	1	\$2,900	1	\$1,519.90	\$7,060	\$72,050
	MH1532	MH1533	Med	0.300	0.375	61	\$240	1	\$2,900	0	\$1,519.90	\$17,540	
	MH1533	MH1534	Med	0.375	0.525	39	\$350	1	\$2,900	0	\$1,519.90	\$16,550	
	MH1534	CO1137	Med	0.450	0.525	80	\$350	1	\$2,900	0	\$1,519.90	\$30,900	

Street Name	From Node	To Node	Priority	Existing Diameter [m]	Upgrade Diameter [m]	Length [m]	Cost [\$/m]	No. of man holes / outlets	Cost per man hole	No. of catch pits	Cost per catch pit	Amount [\$]	Cost per Job [\$]
Snodgrass Road	CI0065	CP2403	Med	0.300	0.525	11	\$350	1	\$2,900	2	\$1,519.90	\$9,790	\$72,900
	CP2403	CO1351	Med	0.300	0.525	97	\$350	1	\$2,900	0	\$1,519.90	\$36,850	
	MH9	CP2080	Med	New Pipe	0.375	91	\$240	1	\$2,900	1	\$1,519.90	\$26,260	
Wallace Road	CP2304	MH1804	Med	0.150	0.300	32	\$200	1	\$2,900	1	\$1,519.90	\$10,820	\$101,680
	CP2305	MH1804	Med	0.150	0.300	39	\$200	0	\$2,900	1	\$1,519.90	\$9,320	
	MH7	MH8	Med	New Pipe	0.375	107	\$240	2	\$2,900	0	\$1,519.90	\$31,480	
	MH8	CP2079	Med	New Pipe	0.375	73	\$240	0	\$2,900	1	\$1,519.90	\$19,040	
	MH2	MH3	Low	New Pipe	0.375	22	\$240	2	\$2,900	0	\$1,519.90	\$11,080	
	MH3	MH4	Low	New Pipe	0.375	71	\$240	1	\$2,900	0	\$1,519.90	\$19,940	
Fairlie Grove	CP2076	CP2077	Low	0.225	0.300	10	\$200	0	\$2,900	2	\$1,519.90	\$5,040	\$5,040
Total													\$393,328

Costs covered by DIF's \$0
 Costs covered by current ratepayers \$393,328

Maintenance Costs for the Additional Service

Year	Additional Cost per annum	Additional Costs - Cumulative
2007/2008	\$241	\$241
2008/2009	\$280	\$521
2009/2010	\$0	\$521
2010/2011	\$202	\$723
2011/2012	\$682	\$1,405

APPENDIX F

Map of Recommended Stormwater Upgrades

APPENDIX G

Proposed Works Programme