

(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)
4,448	7,441	5,433	9,002	15,718	11,377

**Table 5.2: Stormwater Vested Assets**

The **key issues** relating to the management of the stormwater scheme are: -

- inadequate or poorly constructed infrastructure in places
- no or very little water treatment systems
- no pollution control measures
- no comprehensive stormwater management plans at places
- high risk of flooding with respect to a 1% AEP event at places
- some flooding of properties along the Parade, Bucklands Beach due to tidal effects.
- Sewer overflows into the stormwater systems do still occur in wet weather mainly due to stormwater infiltration into the sewer lines. It is important that a comprehensive infiltration study be carried out to reduce this problem.

### 5.2.2 Network and Asset Inventory

The stormwater catchment boundaries vary from the ward boundaries and it is therefore not practical to deal with the stormwater system on a ward basis. In this document, the stormwater system will be considered as one overall system with a number of catchments and sub-catchments. There are 170 stormwater catchments within Manukau City, of which 113 are urban catchments where the public stormwater infrastructure assets are concentrated. The rural catchments have very little public stormwater infrastructure provided.

The reticulation system consists of a approximately 1,657 kilometres of stormwater pipes [as at 30 June 2002] varying in size from 100 mm to about 2000 mm diameter. The main materials are Asbestos Cement (AC), PVC and concrete, with AC and PVC pipe generally used up to 225 mm diameter and concrete pipes for almost all larger sizes. Corrugated steel pipe has been used only for larger diameters and only to a very limited extent.

The total gross optimised replacement cost (ORC) of these assets is \$738 million [as at June 2002].

The condition of the reticulation system is not very accurate as it is based on operators' estimates as limited condition assessment and analytical study has been undertaken.

Figures 5.1 shows the network summary (replacement values). This clearly indicates that over 95% of the asset base consists of either pipes or manholes. Other significant assets include water quality ponds, watercourses and inlets/outlets.

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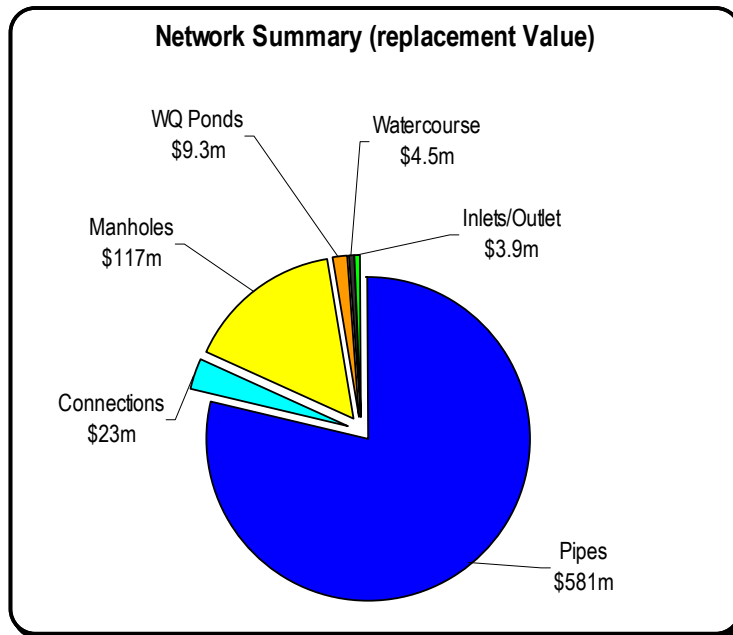


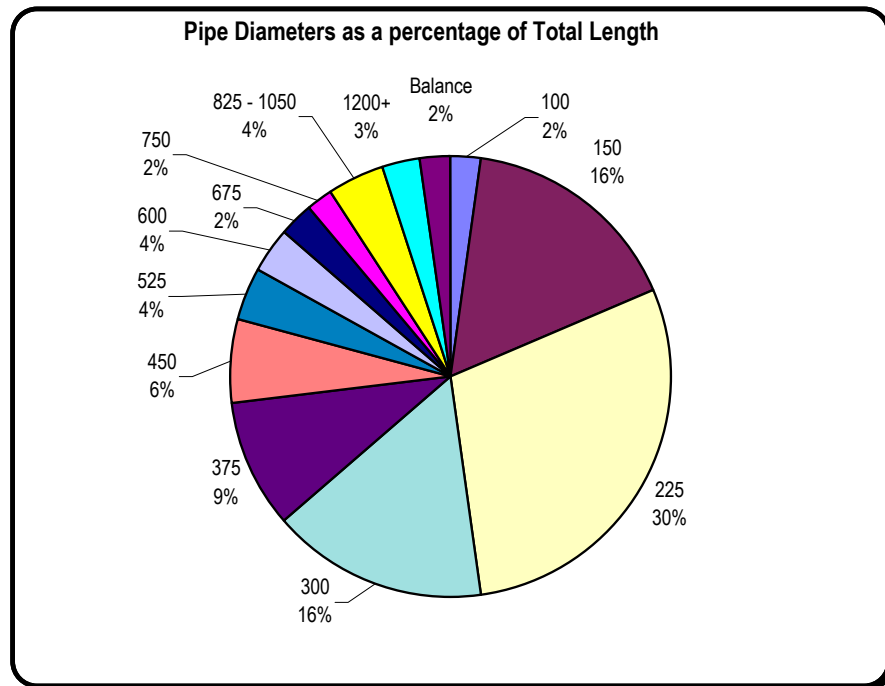
Figure 5.1: Network Summary (gross replacement value \$738 million)

### 5.2.3 Stormwater Pipes

Stormwater pipes are the most significant asset in the network and consist of 79% of the total replacement cost (1,657km).

Figures 5.2 and 5.3 show the distribution of the most commonly used pipes sizes as a percentage of the total length of pipeline.

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(Source: 2002 PAMS data)

Figure 5.2: Commonly used pipe sizes as a percentage of the total length of pipeline

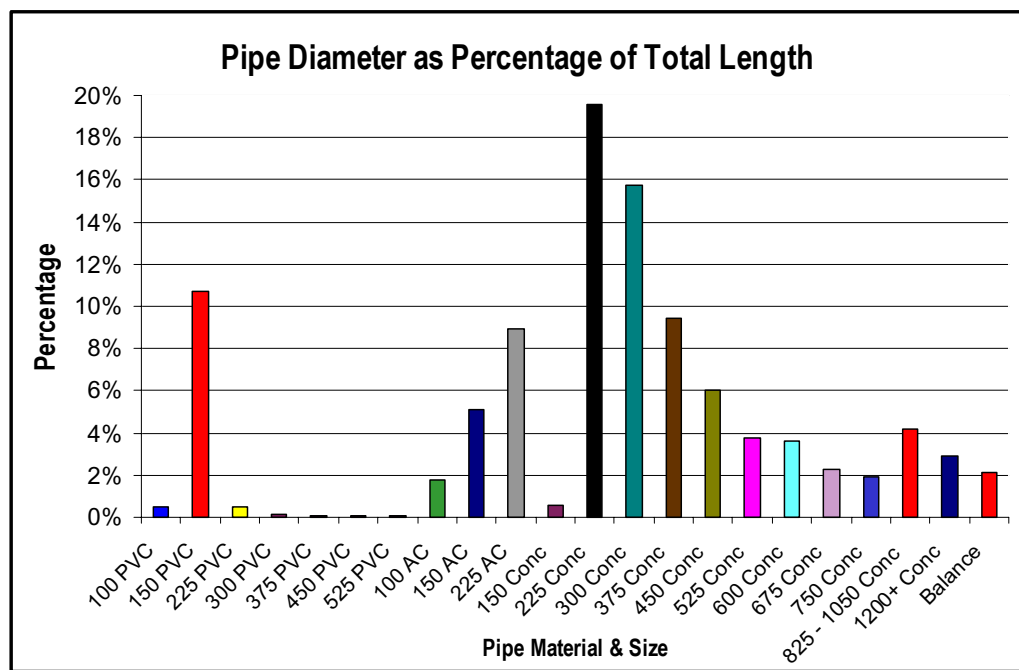
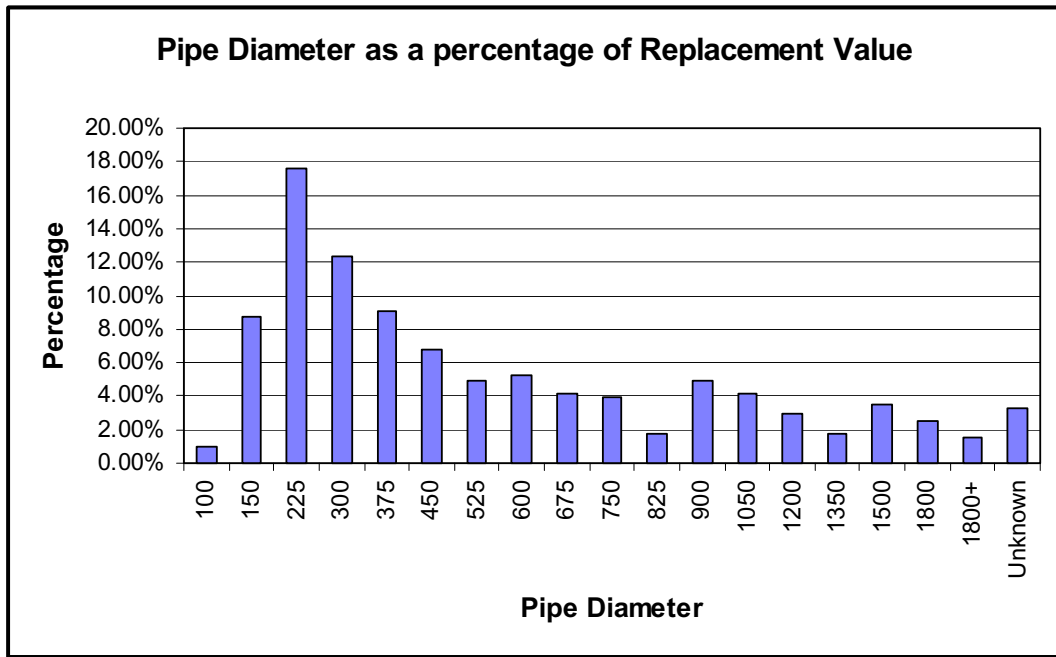


Figure 5.3: Pipe material and sizes as a percentage of the total length of pipeline.

Figure 5.4 shows the proportions of most commonly used pipes as a percentage based on the replacement value.

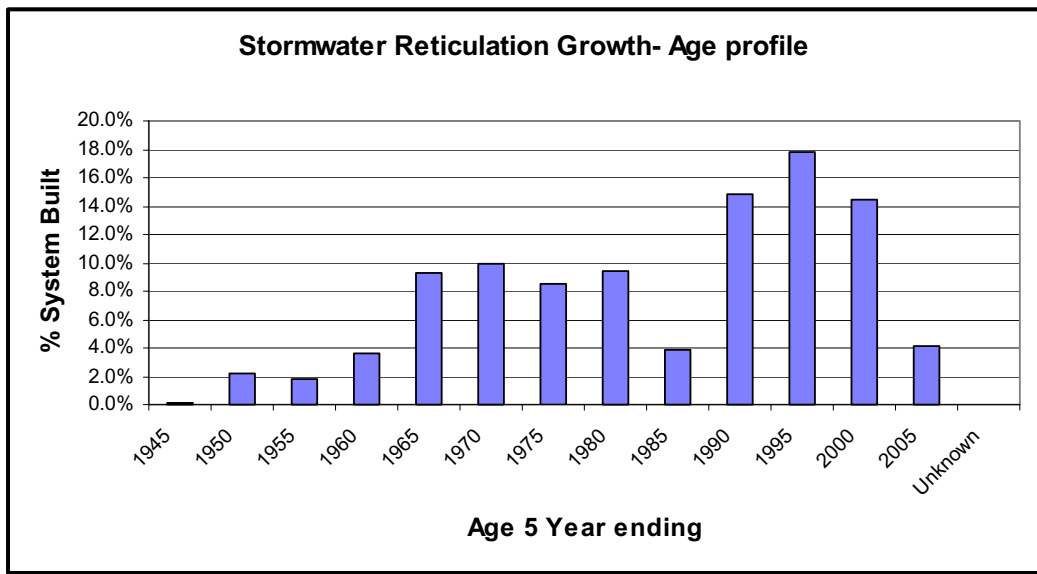
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(Source 2002 PAMS data)

Figure 5.4: Pipes As A Percentage Of The Replacement Value

The age profile of the pipes is shown in figure 5.5.



(Source: 2002 PAMS data)

Figure 5.5: Age Profile of pipelines

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Figures 5.4 and 5.5 clearly indicate the following key facts and issues:

- The pipes equal to or smaller than 225 mm diameter constitute about 47% of the total length of pipe in the ground, but are only about 27% of the total replacement value.
- The majority of the pipes (83%) were installed after 1970 and are thus not more than half way through their assumed economic life of sixty or more years.
- The date information in the PAMS database is suspect, particularly the high proportion of assets shown as built between 1985 and 2000. An improvement task is required to check the dates on this group of assets.

#### 5.2.4 Stormwater Manholes

The networks consist of 32,910 manholes and are likely to be concrete and assumed to be similar age and condition as their adjoining pipes.

#### 5.2.5 Water Quality and Watercourses

Council manages 7 flow attenuation ponds and tanks, and 12 treatment ponds (water quality), totalling \$9.3 million as listed in Table 5.3 and 5.4. These assets are considered as critical assets as they alleviate flooding during peak rainfall run off.

Location/Name	Catchment Management Area (ha)	Pond Design Volume (m <sup>3</sup> )	Construction date	Replacement Value (\$000)
Burswood Road	20	1,750	1986	\$100
To Raku Dr	79	12,000	1997	\$115
Guys Rd Pond 1	50	12,000	2003	\$350
Guys Rd Pond 2	132	8,000	2000	\$500
Manston Rd	37	600	1998	\$65
Pukaki Rd	20	10,500	1998	\$160
Gadsby Rd	16	900	1986	\$75
Wiri Pond	1050	10,000	2000	\$1,500
Hayman park	20.8	8,000	1985	\$500
Beaumont Way Pond 2 - Trap	76	100	1986	\$30
Puhinui Pond 2000	31	4,500	2001	\$350
Wattle Farm Rd (North)	400	85,000	1986	\$1,200
Wattle Farm Rd (South)	36	35,000	1986	\$670
<b>TOTAL TREATMENT PONDS</b>	<b>1967.8</b>	<b>188,350</b>		<b>\$5,615.00</b>

**Table 5.3: Water Quality Ponds [Source: GHD Valuation 2001 & Benchmarking 2002]**

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Location/Name	Catchment Management Area	Pond Design Volume (m <sup>3</sup> )	Construction date	Replacement Value (\$000)
Rongamai Rd	187	544,000	2000	\$600
Logan Car (Warehouse)	51	30,000	1998	\$650
Brett Avenue	68	3,000	2000	\$240
Beaumont Way Pond1 - Retention	76	40,000	1986	\$240
Puhinui Hospice pond	36	7,000	2000	\$615
Everglade Pond 18 (Kerri Ann Rd)	85	42,000	1986	\$570
Flat Bush	200	700,000	1998	\$770
<b>TOTAL FLOW ATTENUATION PONDS &amp; TANKS</b>	<b>703</b>	<b>1,366,000</b>		<b>\$3685.00</b>
<b>GRANT TOTAL (ALL PONDS)</b>	<b>2,670.8</b>	<b>1,554,350</b>		<b>\$9,300.00</b>

**Table 5.3: Flow Attenuation Ponds & Tanks [Source: GHD Valuation 2001 & Benchmarking 2002]**

Manukau City Council controls vegetation and maintains 146 kilometres of open watercourses (112km lined and 34km unlined) in the urban and rural areas. (Source: benchmarking 2002)

The lengths of the main open watercourses or streams in the Manukau urban area are as shown below: -

Streams/Creeks	Location	Length (km)
Harania Creek	Mangere Area	0
Tararata Stream	Mangere Area	0
Puhinui Stream	Manukau Area	24
Papakura	Papakura Area	16
Tamaki River	Otara Area	0
Otara Creek	Otara Area	14
South Otara	Otara Area	7
<b>Total</b>		<b>61km</b>

**Table 5.4: Length of major urban open watercourses**

The watercourses are unlined or lined with concrete, with walls ranging from natural ground to stones, concrete and timber. The valuation distinguishes between the natural watercourse (open unlined \$2.3 million) and those watercourses which are fully lined or have structural walls (\$2.2 million).

### 5.2.6 Inlets and Outlets

There are 4,636 inlets (991) and outlets (3,645) throughout the City totalling about \$3.3 million replacement cost. Inlets are located at the end of watercourses entering a piped network. Whereas, outlets are more substantial structures being located at the end of larger diameter pipes entering coastal environment or watercourses. Both inlets and outlets are also located in water quality ponds.

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**5.2.7 Non-asset Stormwater Network**

Part of the stormwater network is managed by non-asset solutions such as overland flow paths and flood plains. These are used to prevent flooding from extreme storm events and therefore, excess runoff produced from these events is directed through overland flow paths and flood plains.

Overland flow paths are secondary flow paths taken by stormwater overland on its way to a flood plain, in a storm that is more severe than a 1 in 10 year AEP storm. Overland flow paths are illustrated on catchment management plans.

Flood plains are natural land formations that do not have an asset value. However, flood plains are essential for managing flows in excess of the primary network (reticulation system).

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### 5.3 Asset Condition and Capacity

#### 5.3.1 Asset Condition

##### Stormwater Pipes:

Condition of piped network is assessed as per the New Zealand Pipe Inspection Manual. Key features are summarised as below:

- i) The condition of the older systems is generally unknown but as only about 2% of the network was laid prior to 1950, very little of the asset has reached its design life. There are locations in the city where larger pipes lead into smaller pipes, where pipes are structurally defective, where root ingress is a problem, and where grades and alignments are also poor. The full extent of the defective elements in the system is not known.
- ii) At present there is no ongoing programme in place to inspect the stormwater lines with closed circuit television (CCTV) to grade the condition of the pipelines. It is recommended that a programme be initiated to firstly carry out a sample assessment and then if necessary extend the programme to obtain a sound assessment of the condition of the pipes.
- iii) At present CCTV (72.9km) is only used in pipelines when blockages occur. Although the information gained from those inspections is valuable they do not give a balanced picture of the asset condition. However it is important to continue with this programme to determine the full extent of the faults.
- iv) Results from CCTV inspections indicate that 74%, 10%, 7.5%, 6% and 3% of pipes are in very good (C1), good (C2), moderate (C3), poor (C4) and very poor (C5) condition respectively (Figure 5.6). Condition inspection data indicates that most of the pipes (4%) installed prior to 1970 are in poor to very poor condition.

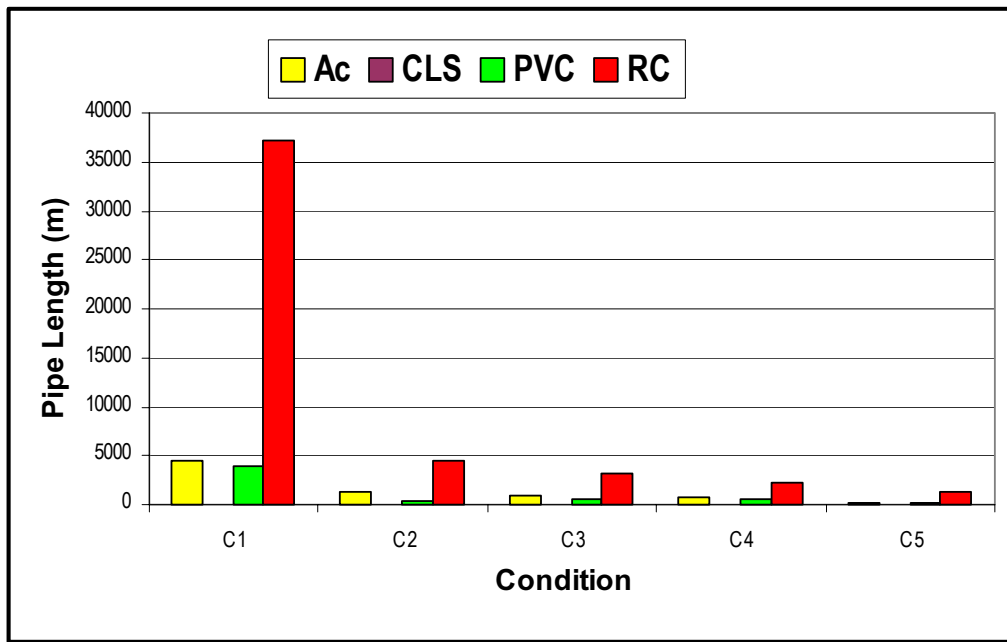


Figure 5.6: Condition of Stormwater Pipes [Source CCTV data]

##### Stormwater Manholes:

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The condition of stormwater manholes has not been separately assessed from pipes. Therefore, it is assumed that the condition of manholes will have the same condition as the pipe adjoining the manhole. Generally, manholes are replaced along with any pipe replacements.

#### Watercourses:

A comprehensive survey of open watercourses was undertaken in 2000 to collect baseline information on watercourses in terms of environmental condition, ecology, soil erosion, land use, water quality and to assess general condition of the watercourses. Assessment has been undertaken taking into consideration of the following parameters:

- Bed materials
- Bed depositions
- Bank erosion
- Bank modifications
- Flood problems
- Channel naturalness
- Riparian vegetation
- Catchment land use
- Water flow
- Colour and odour
- Aquatic vegetation
- Pollution and discharge pipes
- 

Numbers 1,2 and 3 were allocated to each parameter in a scale from low, medium to high in terms of severity of problem [Source: *Open Watercourses Inventory of Manukau City February 2000*]. It has been identified during the survey that most of the problems are associated to water quality, erosion, poor maintenance, land ownership and negligence of the residents.

For the condition assessment, maximum and minimum numbers allocated to each parameter has been divided into four categories:

Condition	Condition Rating	Range of Assessment Points
Good	1	16-21
Fair	2	22-27
Poor	3	28-33
Very Poor	4	>34

**Table 5.5: Open watercourses Condition Assessment Categories**

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Based on the above criteria, table 5.6 below summarises the current status of open watercourses of Manukau Urban Area.

Open Watercourse	Total Points	Average Points	Status/Condition
Harania Creek	173	34.6	Very poor
Howick Area	641	30.5	Poor
Manurewa Area	631	30	Poor
Otara Creek	647	30.8	Poor
South Otara	314	34.8	Very Poor
Papakura stream	318	28.9	Poor
Papatoetoe Stream	698	33.2	Poor
Pakuranga Area	344	31.3	Poor
Puhinui Stream	696	30.3	Poor
Tamaki River	173	34.6	Very Poor
Tararata Stream	213	30.4	Poor

**Table 5.6: Condition of Open watercourses**

In order to prepare a comprehensive and reliable valuation, depreciation and renewals programme, it is paramount to accurately determine the condition of the asset.

### 5.3.2 Asset Capacity and Performance

#### 5.3.2.1 Capacity Assessment Approach

The capacity of the system is assessed when preparing the catchment management plans (CMP). The primary networks (pipe systems) are designed to cater for the 20% AEP rainfall event while secondary systems (overland flow paths and ponding areas) are required to cater for the 1% AEP rainfall event. Council has completed 48 catchment management plans by 2002 and 20 CMPs have been already approved by Auckland Regional Council (ARC). Further as part of financial contribution (FC) network capacity assessment is undertaken and following principles are adopted:

- Ultimate catchment flows and existing pipe capacities are calculated
- Rational Method is applied
- Previously modelled catchment data is used where available
- Pipe capacity assessments divided into bulk and local systems
- Pipe sizes are used from as-built data available (GIS)
- Pipe capacity is compared to the capacity required to serve fully developed catchment - if upgrade required then new pipe size is calculated

Recent greenfields development has been designed to the above standards but in many other areas, especially the old Borough areas, the pipe capacity is insufficient for the 20% AEP storms. Specific performance gradings have not been recorded for each asset.

These older systems are being upgraded to the current standard as development occurs. In other areas the most pressing problems are solved as systems are replaced as part of councils asset renewal program.

The existing sections that do not meet the modern design criteria, do not cause major problems, as the housing density is generally lower than modern subdivisions. In addition, houses were generally built in more elevated parts of the city, with raised floor levels, and acceptable overland flow paths cater for most of the excess surface water

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Where flooding is reported, the complaints are investigated and dealt with in the following ways,

- if the problem can be resolved by minor work then MW may implement this.
- if the problem can be resolved by major works, it is put on the priority list for consideration.
- if the problem has no solution the owner is advised, this is usually related to badly sited houses with no overland flow provisions.

CCTV inspections as a result of customer service request are on going. The normal procedure is that a service request is received and if the engineer considers that a problem is possibly a result of a fault in the public drainage a video inspection is carried out. Root cutting or repairs may result from the CCTV work.

Open channel maintenance has carried out regularly and includes channel clearing and reshaping and subsoil drainage in the Israel/Palermo area.

### 5.3.2.2 Reliability (Performance)

In general the drainage network is reliable for low intensity rainfall and normal tides. During the 1998 winter period there were 133 stormwater related complaints over the four-month period between 14/7/98 to 8/11/98. In addition to the problems during this period there have been many instances of flooding at other times. The distribution of flooding per ward is shown in table 5.7.

Ward	Number of complaints 1998	Number of complaints from 1998 to 30 June 2002	% Of total complaints
Clevedon	9	21	7
Howick	23	80	26
Mangere	23	42	14
Manurewa	44	66	22
Otara	6	11	4
Pakuranga	9	43	14
Papatoetoe	19	43	14
<b>TOTAL</b>	<b>133</b>	<b>306</b>	<b>100</b>

Ward	Total	Problem Type						
		Habitable Floor	Basement	Basement/ Garage	Garage	Under House	Overland flow	Other
Clevedon	21	0	1	3	5	0	7	5
Howick	80	6	9	9	10	2	24	20
Mangere	42	0	1	6	6	6	6	17
Manurewa	66	7	8	8	10	2	9	22
Otara	11	0	0	3	0	2	2	4
Pakuranga	43	5	4	4	8	1	10	11
Papatoetoe	42	1	5	6	15	2	2	11

Table 5.7: Distribution of problems.

In 2001, performance of the network was mainly affected by blockages due to tree roots. Table below summarises the cause of blockages.

Cause of Blockage	Number
Tree roots	114

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Debris	5
Collapsed pipe	0
Third party damage	5
Other	0
<b>TOTAL</b>	<b>124</b>

**Table 5.8: Distribution of blockage problems.**

### 5.3.2.3 Safety of Network

The Manukau City Council has an Occupational Health and Safety Policy and requires all staff and contractors to comply with the requirements of the policy. In addition each contractor or subcontractor is required to have their own policies with site specific health and safety plans before commencing any work on the system. A programme of placing grills over inlet pipes is in progress.

### 5.3.2.4 Stormwater Quality

There are a total of 19 ponds in the city. Some of the ponds are purely retention ponds (7) while the others are operated more as recreational/ornamental ponds, which do provide water quality treatment (12). A number of these ponds are badly affected by silt and need to be cleaned.

There is no stormwater quality monitoring programme in place but the results of Auckland Regional Council's monthly monitoring programme is regularly assessed. The Puhinui and Otara streams are the most polluted streams in the region, and over the past four years there has been a gradual improvement in the water quality. The present quality is still far from acceptable in terms of the bathing water standards.

Sewer overflows, some agricultural land use, development and higher traffic volumes are all contributing to the poor water quality.

Council has recognised that water treatment systems need to be installed, and is working closely with the Regional Council to determine the best way to improve and maintain the water quality. There are 28 catchment management plans cover stormwater quality and quantity issues. Funds have been provided for water treatment systems.

Specific performance measures have not been recorded for pipes, manholes, inlets/outlets, water quality ponds and watercourses. Further work needs to be done to define the performance measures for each asset type.

Maintenance of pipes and manholes needs to record the performance issues. However, performance of stormwater reticulation system will be a secondary driver for renewal. Condition based asset renewal will be the primary driver for renewing pipes and manholes. Hence, recording performance grading is not a high priority.

The performance of flood plains and overland flow paths are measured by the number of flood risk areas identified adjoining the flood plains and the number of habitable floors that are flooded in these areas. Flood hazard mapping is essential to identifying the 'at risk areas'.

## 5.4 Maintenance Planning

### 5.4.1 General

Stormwater assets can be conveniently sorted into three groups as follows:

- Reticulation, covering pipelines, manholes, and connections.
- Stormwater ponds, including weirs, floodgates, and dams, and other Water Quality devices.
- Watercourses, including lined and unlined courses, inlets and outlets.

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As this section is improved, plans will be developed for each group separately. At present the plans, tactics etc. are all grouped together.

The short-term maintenance strategy is intended to maintain the current service standards while minimising costs. The long-term maintenance strategy will be modified to reflect:

- The risk associated with failure of critical assets
- Changes in the desired level of service
- Asset improvements and development programme
- Requirements of resource consents

#### 5.4.2 Operational & Maintenance Planning - Tactics

Council will monitor the condition and performance of assets, and investigate any system deficiencies, which are outside the parameters of the target level of service. It will then identify the work required to correct defects and the most cost effective renewal option. Monitoring activity will include: -

- build up of debris in the system
- serviceability of retention ponds
- monitoring contractor performance
- analysis of customer complaint and service problem records
- proactive inspection of critical assets and report on condition
- analysing condition reports provided by the Contractor during the day-to-day operation of stormwater assets and, as necessary, carrying out material testing to determine asset condition and decay rates.

Operate stormwater assets in accordance with current operating procedures:-

- clean system on a reactive basis
- inspect specific inlet chambers on at least a monthly basis
- provide appropriate supervision for installation of connections and other similar work.
- inspect and report on condition when working on the systems.
- monitor type and quantity of pollution discharged.

Minimise asset ownership costs:-

- identify, evaluate and introduce new technologies and monitoring/control equipment that may improve operational and management efficiency and modify standards as appropriate.
- monitor pollution discharged

Manage risk exposure:-

- provide a prompt and effective response to system failures and pollution incidents.
- clear systems regularly of debris and especially before inclement weather.
- maintaining appropriate insurance cover for key assets.
- undertaking structural checks of key assets.

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### Maintenance Tactics

The short-term maintenance strategy is intended to retain the current levels of service with respect to stormwater asset condition and functionality whilst minimising costs. In the longer-term maintenance activity will be modified as necessary to reflect: -

- the age of assets relative to expected economic life cycle
- the risk of failure of critical assets
- changes in the desired level of service
- the nature and timing of asset upgrading/development works.

To achieve this, the following maintenance activities will be undertaken:-

### Unplanned maintenance

- Maintain a suitable level of preparedness for prompt and effective response to emergencies and asset failures by ensuring the availability of suitably trained and equipped staff and service delivery contractors.
- Ensure ready availability of serviceable spare parts and equipment necessary for the prompt restoration of service.
- Respond to asset failures due to structural integrity with the initial objective of restoring service as quickly as possible by the most economic method available, making temporary repairs if major repairs or renewals are required.
- Clearing blockages caused by root penetration and foreign objects.
- Emergency and incident investigation, and works as appropriate.

### Planned (preventative) maintenance works

Undertake a programme of planned asset maintenance as necessary to: -

- deliver the required levels of service (e.g. clean manholes, regular inspections of the detention dams/watercourses, flush/scour pipelines, maintain retention ponds, clear inlets and outlets and flood gates).
- minimise the risk of equipment failure e.g. regular root removal.
- ensure safety (e.g. maintain inlet grates, non-slip surfaces, repair manholes)
- avoid economic inefficiencies due to deferring maintenance (e.g., repair erosion problems and stabilise the surrounding area).

Once a defect has been identified remedial work is programmed before the risk and consequence of failure become unacceptable, with priority given to defects which:-

- are life threatening
- are likely to cause premature failure prior to the next inspection
- safety is compromised, or
- if severe economic deterioration of an asset will occur.

When scheduling maintenance work it is planned to make the best use of resources wherever possible, including co-ordination of multiple repair works in the same area. The upgrade and replacement of pipes should be done with sizes identified in catchment management plans and checked by design and modelling.

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The effectiveness of the preventative maintenance programmes are continuously monitored and rescheduled as necessary to achieve efficiencies.

The frequency and cost of all maintenance activities are monitored wherever possible to enhance decision-making.

These maintenance works comprise four main categories:

- Maintenance of streams and watercourses.
- Maintenance of outfalls.
- Maintenance of detention ponds.
- Spraying.

Maintenance work is aimed at ensuring the stormwater system functions to prevent or minimise ponding associated with streams and watercourses. Many of the maintenance activities are similar and follow comparable methodologies despite occurring in different locations. Other beneficial effects also occur as a result of the maintenance e.g. clearing of refuse and debris from the watercourses and outfalls has aesthetic benefits and prevents ongoing gross contamination of the waterway.

**Stream and Watercourse Maintenance**

Maintenance works in streams and watercourses include the following activities:

- Obstruction removal e.g. refuse, logs and other gross debris including flood debris.
- Vegetation control.
- Removal of silt and sediment.
- Clearing culvert blockages.
- Limited culvert renewal
- Isolated removal of tree(s) where the functioning of the watercourse is affected.
- Stream channel erosion protection. This includes renewal of existing armouring (eg. timber lined channels), rock walls and other existing structures (eg. 'reno' mattresses) where total cost of work is less than \$25,000 and minor new stream channel erosion protection works.
- Disposal of silt and sediment.
- Spraying to control pest plants.

Maintenance does **not** include the following activities:

- New armouring of stream banks to prevent further erosion where total cost exceeds \$25,000.
- Silt and sediment removal in natural stream or wetland management areas.
- Other capital works.

**Maintenance of Outfalls**

Maintenance works at outfalls include the following activities:

- Obstruction removal e.g. refuse, logs and other gross debris including flood debris.
- Shifting accumulated sand and shells away from the outfall.
- Removal of silt and sediment adjacent to the outfall.

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- Renewal of existing armouring, wing walls, grouting and spalling.
- Culvert renewal.
- Minor bank and outfall protection.
- Disposal of silt and sediment.
- Vegetation control.

Maintenance of outfalls does **not** include:

- Construction of new wing walls where the total cost exceeds \$25,000.
- Silt and sediment removal around mangroves in the coastal protection areas.
- Other capital works.

**Maintenance of Detention Ponds**

Maintenance works in detention ponds include the following activities:

- Obstruction removal e.g. refuse, logs and other gross debris including flood debris.
- Vegetation removal and pest plant control.
- Desilting of forebays only.
- Outlet clearing.

Maintenance works in detention ponds does not include periodic silt removal from detention ponds. This is a renewal activity and separate resource consents will be applied for at the appropriate time.

**Spraying**

Spraying activities control vegetation in watercourses and around outfalls and include the following activities:

- Spraying of Round-Up (glyphosphate) on watercourse banks and over water.
- Spraying of Escort (metsulphuron) on land only to control alligator weed. Escort is not used in a way that could cause spray drift to affect a watercourse.

**5.4.3 Operational/Maintenance Works Needs, Costs and Timing**

In the past Council has managed, operated and maintained the system with in-house staff. In 1995 a business unit (Excell Corporation, formerly Manukau Works) was formed to maintain and operate the system. In 1998 the unit was sold although it was still contracted to Council to operate the system under the control of Manukau Water who were contracted by Council to manage the above contract. Manukau Water reports to the Infrastructural Policy Manager who is responsible for the overall management of the stormwater system.

Anticipated work needs and costs over the next 20 years to ensure delivery of the defined levels of service, include:-

- expected operational work
- the nature, incidence and cost of unplanned maintenance currently undertaken
- planned inspections and preventative maintenance
- expected planned maintenance work requirements.

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- preparing policies and undertaking system studies.
- managing assets to desired levels.

The nature and frequency of the work is consistent with the operational/maintenance tactics in Section 5.2 and the age, condition, performance and criticality profiles of the assets.

Operational/maintenance procedures and work activities are documented in the “Contract for provision of stormwater drainage services” and the “Contract for the provision of vegetation control services”. The above contracts form the basis of service agreement with Excell Corporation.

A Service Level Agreement is renewed annually with Manukau Water to manage the above contracts and sets out the processes and performance requirements for the Manukau Water/Council relationship. Table 5.9 outlines the list of maintenance contracts.

Description	Contract Number	Period
Stormwater Maintenance Contract	Manukau Water MW 99/02/V	1/07/2002 to 30/06/2003
Vegetation Control Services*	Manukau Water MW 99/02/V	1/10/1999 to 30/06/2002

**Table 5.9: Maintenance Contracts**

\*Council is currently looking to include vegetation control services under stormwater maintenance contract or this work will be given to Parks Services.

Specialised works such as ponds, wetlands, water quality devices etc. either will be included in stormwater maintenance contract or a new contract will be developed for water quality management.

The introduction of new processes (see Section 8 - AM Improvement Programme) to record work tasks, costs, asset condition and performance will improve knowledge of operations and maintenance needs, and enhance the quality of decision-making.

**5.4.4 Operations and Maintenance Cost Summary**

The total operations and maintenance expenditures (opex) in 2001/02 and budget identified in the 2002/03 and 2003/04 Annual Plans are summarised as below:

Asset	2001/02 (Actual) (\$000)	2002/03 Plan (\$000)	2003/04 (\$000)
Maintenance Costs-Collection/Discharge: Pipelines, Manholes, Inlets & Outlets Catchpits	1,209.1 316.1	2,014	2,113

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Outfalls	201.3		
Flood Attenuation Dry Ponds/Tanks	7.8		
Watercourses	278.6		
<b>Total Collection &amp; Discharge Costs</b>	<b>2,012.9</b>	<b>2,014</b>	<b>2,113</b>
Treatment Ponds	79.4		
<b>Total Treatment Costs</b>	<b>79.4</b>		
Total Operating Costs	<b>2,128.4</b>	2,900	3,042
<b>TOTAL OPEX (Excludes depreciation)</b>	<b>4,141</b>	<b>4,914</b>	<b>5,155</b>

Table 5.10: Operations and Maintenance Cost Summary

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## 5.5 **Renewal Planning**

### 5.5.1 **Renewal Strategy**

The general renewal strategy is to rehabilitate or replace assets when justified by:-

**Asset performance:** Renewal of an asset where it fails to meet the required level of service. Non-performing assets are identified by the monitoring of asset reliability, capacity and efficiency during planned maintenance inspections and operational activity. Indicators of non-performing assets include:-

- structural failure
- repeated asset failure
- excessive flooding or erosion
- repeated joint failure
- ineffective and/or uneconomic operation
- unsafe conditions for public

**Economics:** Asset renewal when it is no longer economic to continue repairing the asset (i.e. the annual cost of repairs exceeds the annualised cost of it's renewal). An economic consideration is the co-ordination of renewal works with other planned works such as road reconstruction. Council will actively research the effectiveness of new technology which may reduce the direct and social costs of repair works.

**Risk:** The risk of failure and associated environmental, public health, financial or social impact justifies proactive action (e.g. flooding risks). Where such assets are identified (critical assets), proactive inspection is undertaken to determine asset condition at a frequency appropriate to the risk and rate of asset decay.

Planned and reactive replacement works are prioritised in accordance with the following priority ranking Table 5.11 and then programmed or, in urgent cases, undertaken immediately.

Priority	Renewal Criteria
1 (High)	<ul style="list-style-type: none"> <li>• Asset failure has occurred and renewal is the most cost effective option.</li> <li>• Asset failure of critical system component is imminent</li> <li>• Regular maintenance required: more than 3 repairs/year or 2 visits per month {some criteria such as this require further discussion to ensure they are correct}</li> <li>• Fault has, or is liable to cause flooding to houses or shops</li> <li>• Complaints, re flooding resulting in a significant health risk or life threatening.</li> </ul>
2	<ul style="list-style-type: none"> <li>• Failure of non-critical asset is imminent and renewal is the most efficient life cycle cost alternative.</li> <li>• Maintenance requiring more than six visits per year.</li> <li>• Fault causes repeated complaints in excess of one per month.</li> <li>• Road upgrading unscheduled for the current financial year.</li> </ul>
3	<ul style="list-style-type: none"> <li>• Reticulation maintenance involving two to three visits annually</li> <li>• Difficult to repair, due to fragile nature of material, or obsolescence</li> </ul>
4	<ul style="list-style-type: none"> <li>• Existing assets have a low level of flexibility and efficiency compared with replacement</li> </ul>

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Priority	Renewal Criteria
	alternative.
<b>5 (Low)</b>	<ul style="list-style-type: none"> <li>Existing asset materials or types are such that known problems will develop in time.</li> </ul>

**Table 5.11: Selection Criteria for Asset Renewal**

The renewal strategy will be reviewed at least annually, with any deferred work re-prioritised alongside new renewal projects and a revised programme established.

Indirect costs (business/traffic disruption, temporary denial of access, nuisance, etc) are currently not taken into account when prioritising renewal works and evaluating renewal options.

Integral with the replacement strategy will be a funding strategy. Cashflow levelling will be applied to balance income with expenditure through either raising loans, saving, or deferring work.

Priority of renewal work is also dependent on the following factors:

- Strategic decisions.
- Financial and customer risks.
- Renewal Strategy reviews.

#### 5.5.2 *Deferred Works*

Renewal works identified in terms of the renewal strategies may be deferred if the cost is beyond the community's ability to fund it. This can occur when higher priority works are required on other infrastructure assets, or there are short-term peaks in expenditure or if an inadequate rating base exists.

#### 5.5.3 *Renewal Needs, Costs and Timing*

Historically, many renewal works have been carried out as part of general maintenance on an "as required" basis. Most pipe renewal occurred when the pipeline was upgraded to cater for larger flows while renewal of manhole covers, grates and inlets occurred when problems were reported by the public or noted by operational staff.

While many of the smaller renewal items are still done under maintenance, all major works are programmed as renewal items and are managed similar to new development capital works.

Where serious defects were noted from the CCTV inspections, programmes are initiated to repair or replace the defects.

The renewal programme and expenditure forecast for the next 20 years still needs to be improved as asset condition and data confidence improves.

#### 5.5.4 *Renewal Costs Summary*

The budgets (2002/03 and 2003/04) are summarised in Table 5.12 may be adequate to maintain current service standards. However, the potential number and size of problems that may arise in the future may make these budgets inadequate. Manukau City Council must consider the financial and customer risks of having sufficient funds to deal with renewal demands, consideration of detailed assessments, implementing proactive renewals and recognising the increasing maintenance and operational requirements.

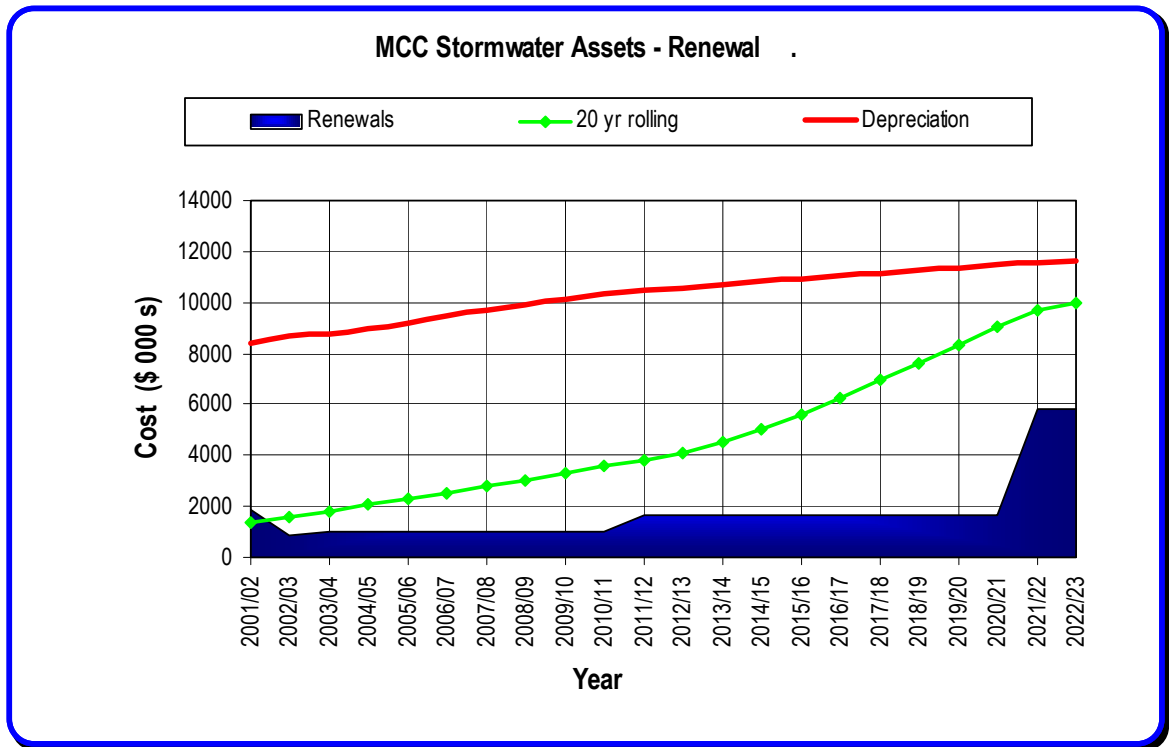
Category	Budget 2002/03 (\$000s)	2003/04 (\$000s)	2004/05 (\$000s)
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Investigation, consents & scoping	90	150	150
Manurewa stormwater	570	200	200
Howick stormwater	220	0	550
Mangere	0	135	100
Papatoetoe stormwater	0	595	0
<b>TOTAL RENEWAL BUDGET</b>	<b>880</b>	<b>1,080</b>	<b>1,000</b>

**Table 5.12: Renewal Cost Summary**

Figure 5.7 below outlines the projected renewal profile. An average annual renewal expenditure over 20 year period is about \$1.8 million, has been predicted based on the preliminary deterioration curves. This prediction includes stormwater pipes, manholes and inlets/outlets.



**Figure 5.7: Renewal Analysis (Predicted Expenditure)**

**5.6 New Capital Works Planning**

**5.6.1 New Works Tactics**

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The stormwater system will be developed to meet community expectations, technical and environmental standards and growth projections over the next 20 years.

New works are identified on the following basis:-

- Growth - ability to meet the most likely demand projections.
- Regulatory - anticipated expenditure needed to meet resource consents required under the Resource Management Act (e.g. higher environmental standards)
- Operational efficiency – to reduce costs and improve efficiency (e.g. ease of cleaning).

The selection criteria for the prioritising and programming of asset development projects is a function of Council preference, consideration of risk, costs and benefits, affordability and ranking with other projects.

Works are costed and benefits assessed in terms of the following: -

- Flood mitigation
- Water quality enhancement
- Aesthetic or Amenity, Safety, Cultural etc
- Strategic issues

All options are examined when evaluating upgrading options, including:-

- repair
- 'no-dig' renovation techniques
- replacement
- augmentation.

Council has carried out a prioritisation study of necessary development works. The priority list is used to assign funds when preparing the financial plans. It is important that the process be regularly reviewed and updated and it should be borne in mind that the cost estimates would have to be reviewed at detailed design stage.

The risk, cost and benefits of accepting new privately funded assets constructed in association with property development will be reviewed and a decision to approve made on a case-by-case basis by Council staff. Such assets will be accepted into public ownership by Council when satisfactorily completed in accordance with approvals given. Council will not contribute to the cost of such works unless there are exceptional levels of service or equity issues.

### Disposal Tactics

Assets are disposed of as a result of other capital works, (growth and LOS) and renewal works. However specific tactics may be applied to the disposal phase.

Costs of disposal are generally included in the overall project costs. One exception is the cost of writing off the book value of assets disposed of before their design life is complete.

Tactics are:-

- Develop AM systems and asset condition/performance data to allow better planning for the disposal of assets through rationalisation of the asset stock or when assets become uneconomic to own and operate.
- When considering disposal options all relevant costs of disposal will be considered, including: -
  - evaluation of options

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- consultation/advertising
  - obtaining Resource Consents
  - professional services, including engineering, planning, legal, survey
  - demolition/make safe
  - site clearing, decontamination, beautification.
- The use of revenue arising from the sale of any assets shall be decided by Council at the time of it's consideration of the asset's disposal.

**5.6.2 New capital Works - Works Needs, Costs and Timing**

Considerable development is taking place in the city at present both in the greenfields and the infill areas. The cost and timing of development is essentially out of Council control but allowance has been made for Council's involvement in development.

- Council has prepared a development plan for the East Tamaki area where the development has been designed around the local watercourses.
- Future growth areas where higher density housing is planned have been selected.
- During this study period it is anticipated that apart from the East Tamaki development area the rural areas will not change significantly.
- Council has prepared a priority list of upgrade work that has been identified when preparing the catchment management plans.

**New Work (Growth)**

Nodal development in accordance with the regional growth plan will require additional funds. The Growth Node expenditures were originally estimated in Nov 2000 and reviewed in 2002. Some rationalisations of the projections have since been undertaken during the preparation of the 2003 – 2013 LTFS or LTCCP (Long Term Council Community Plan).

Development costs for Growth Nodes are included as follows:	
Manurewa	\$5.8 million over 15 years
Howick	\$7.5 million over 15 years
Flat Bush	\$ 40.5 million over 15 years
Papatoetoe/Hunters Corner	\$ 9.8 million over 15 years
Contributions from developers are expected to increase in line with the following: Development within and around the node will occur over 50 years. Developers contributions will build up over the first 5 to 10 years until council costs for new work in the area are fully recovered.	

**Land purchases**

Land purchase mainly for Water Quality (WQ) ponds is projected at \$2.0 million pa for the first two years (due to network development at Flat Bush catchment) and then \$1.0 million pa indefinitely. These are mostly for WQ pond land in Greenfield catchments, and as such are a growth item rather than LOS.

**New Works (LOS)**

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These projects are mainly for WQ development (including ponds) in developed areas of the city.

The exact expenditure required is unknown, however additional catchment planning is to be undertaken which will identify new asset requirements to meet WQ levels of Service. It is known that intervention is required to reduce pollution in receiving waters. ARC requirements are being developed and a large number of new discharge consents are to be renewed in the next few years. With these consents, there may be an increase in the funding required to meet the water quality objectives.

Indications from ARC and Environmental groups are that a higher level of protection of the environment is required. This will require additional works and expenditure to improve WQ Ponds and watercourses throughout the city.

New works are mainly associated with future growth, water quality and levels of service. The significant projects identified are:

Category	Budget 2002/03 (\$000s)	Plan 2003/04 (\$000s)	Plan 2004/05 (\$000s)
New Works - Growth	2,100	4,291	7,576
New Works – Land Purchase	2,000	1,000	2,000
New Works - LoS	1,150	2,222	1,500
New Works –Water Quality	1,321	702	888
New Works –Developer’s Contribution	1,500	1,000	1,073
<b>TOTAL CAPEX BUDGET</b>	<b>8,071</b>	<b>9,215</b>	<b>13,037</b>

**Table 5.13: Capital Cost Summary**

### 5.6.3 Annual Planning Projects

Table 5.14 summarises annual planning projects categorised as new works (land development-growth, land purchase; LoS, developer’s contribution) capital and renewals capital.

Category	2002/03 (\$000s)	2003/04 (\$000s)	2004/05 (\$000s)
Renewals	880	1,000	1,000
New Works - Growth	2,100	4,291	7,576
New Works – Land Purchase	2,000	1,000	2,000

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New Works - LoS	1,150	2,222	1,500
New Works –Water Quality	1,321	702	888
New Works –Developer’s Contribution	1,500	1,000	1,073
<b>TOTAL CAPEX BUDGET</b>	<b>8,951</b>	<b>10,215</b>	<b>14,037</b>

**Table 5.14: Capital Cost Summary**

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## SECTION 6

# ASSET MANAGEMENT PRACTICES, STRATEGIES AND SYSTEMS

- 6.1 Overview**
- 6.2 Asset Management Processes and Strategies**
- 6.3 Asset Management Systems**
- 6.4 Asset Management Data**
- 6.5 Risk Analysis and Management**
  - 6.5.1 Risk Assessment**
- 6.6 Project Management Practices and Processes**
- 6.7 Gap Analysis**

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## 6. ASSET MANAGEMENT PRACTICES, STRATEGIES AND SYSTEMS

### 6.1 Overview

This section outlines the decision-making tools MCC uses to determine the long-term maintenance, renewal and development needs for stormwater assets.

To help identify the information needs of the stormwater activities it is helpful to breakdown business practice according to the Processes, Information Systems, and Data.

- **Processes:** The necessary processes, analysis and evaluation techniques needed for life cycle asset management.
- **Information systems:** The information support systems used to store and manipulate the data.
- **Data:** Data available for manipulation by information system to produce the required outputs. A general discussion only is appropriate in this document.

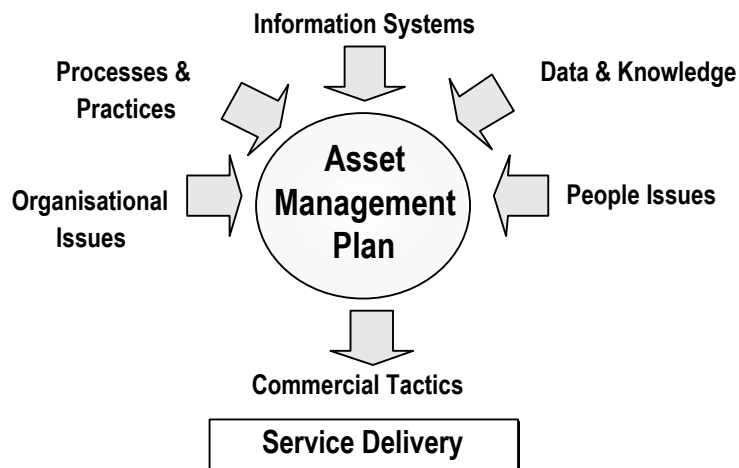


Figure 6.1: Asset Management Processes

The Infrastructure Policy Team, which is part of the Environmental Management Group, is responsible for the overall management of the stormwater infrastructure. The team sets the policies, procedures and prepares and controls the stormwater budget. The team is also responsible for project managing the capital development works.

Manukau Water has been contracted by the Infrastructure Policy Team to manage the stormwater operations function.

The operations function consists of managing and monitoring the performance of the operations contract which is currently let to Excell Corporation, attending to customer queries relating to stormwater issues and monitoring and reporting on the efficiency of the system. Manukau Water also undertakes the recording and maintenance of asset data

Another MCC group Environmental Services assesses and vets all new development works in terms of guidelines and policies set out by the Infrastructure Policy Team. Manukau Water carries out the field inspection of the works, ensures quality standards are met, and ensures that all as built records are provided and entered onto the GIS and PAMS data management systems.

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Further operational management activities include:

- Assessment and monitoring of water quality needs.
- Identify issues and assessment of catchment needs and development of solutions.
- Review of operational manuals and procedures.
- Review and update of key performance indicators (KPIs).
- Management of capital expenditure projects.
- Rationalise asset handover procedures.

## 6.2 Asset Management Processes and Strategies

Current stormwater asset management (AM) practices are described as processes, strategies, systems and data. The following tables set out the current state of business practices and the desired business practices it is intended to develop in the next 2 years. The AM Improvement plan (Section 8) details development priorities, timetables, resources and costs.

**Table 6.1: Asset Management Processes**

Processes	Current Business practices	Confidence Level	Desired Business Practices
<b>Strategic AM Team established (SAMT)</b>	A high level 5 person SAMT has strategic responsibility for overall guidance and standardisation of asset management. In addition there is a Citywide group with representation from asset manager groups.	1	Ongoing role with documented guidelines.
<b>Finance &amp; Accounting</b>	Processes and systems in place capturing and monitoring expenditure as required. New categories such as "Renewals" are catered for. Annual Plan, Budgeting, LTFS and review processes in place. Improvements to linking of AMP & LTFS and ongoing upgrading underway.	2	Long Term Financial Strategy (LTFS) undergoes major rewrite 3 yearly with annual review. AMP reconciled annually.
<b>Level of Service measures &amp; monitoring</b>	Level of Service (LOS) consultation held with elected members. This is part of annual planning process.  Some performance measures in use & reported in AMP  Consultation is undertaken with community in association with District Plan and Annual Plan processes. Council is currently working to develop "Consultation Strategy" to align with Local Government Act 2002 requirements.	3	Wider range of performance measures. Greater understanding of customer preferences. That a service level review and implemented.  More focussed customer feedback surveys.
<b>Capturing Knowledge of Assets</b>	Information being collected and summarised in this AMP.  For more detail refer to section 6.3 Systems  Contracts between Asset Manager / Specifier (MCC Infrastructure Policy) and service providers - called SLA (Service Level Agreement) are in place and reviewed	2	Processes and procedures are defined to capture all stormwater assets to keep asset registers updated.

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Processes	Current Business practices	Confidence Level	Desired Practices	Business
	annually. Requirements for customer service, reporting and data systems are included.			
<b>Optimised Life Cycle Strategy</b>	<p>Prioritised programme for stormwater reticulation replacement / upgrades in place.</p> <p>Some areas do not have stormwater catchment management plans.</p> <p>Maintenance costs, asset condition and history not available to enable good optimisation.</p>	3	<p>Develop 3-year renewal programme with budgets based on condition and predicted failure for critical assets.</p> <p>Replacement on failure of non-critical assets.</p> <p>Life cycle and risk costs considered in optimisation process.</p>	
<b>Quality Assurance &amp; Continuous Improvement</b>	<p>Internal review of AMP by Asset Mgt team</p> <p>Audit NZ annually audits selected AMP and performance reported in annual plan.</p> <p>GHD Ltd review all AMP as part of strategic advisor role.</p> <p>Continuous improvement underway</p>	1	<p>System of quality checks extended to more specific processes and systems.</p>	

Table 6.1: Asset Management Processes

Key strategies and processes are listed as below:

- Catchment management plan studies
- Emergency response planning
- Linkage with regional planning
- Amp updated annually
- Capital projects competitively tendered
- AM planning linked to annual plan
- Service level agreements with Manukau Water developed, implemented and reviewed annually
- Maintenance activities linked with call centre
- Environmental strategies are developed (eg water quality monitoring strategy)
- Project management practices are in place –project database priority
- Performance of service standards is monitored.

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### 6.3 Asset Management Systems

Manukau City Council has implemented Hansen IMS (PAMS) software to provide an asset register for the stormwater asset. In addition the GIS system is operational and is regularly updated and maintained. Assets such as, retention ponds, weirs, open channel details etc are captured but still need to be populated into Hansen. Council is in the process of linking the PAMS system to the GIS system and is working towards carrying out advanced decision making functions such as: -

- Predictive modelling (condition/performance)
- Work planning
- Risk assessment
- Treatment selection
- Life cycle costing
- Optimised maintenance/renewal programmes

MCC finance department also maintains a summary asset register. However it is important that asset histories including maintenance and fault records are held electronically. The preferred long-term official “asset register” is the PAMS system, which is being developed by Manukau Water.

This table sets out the current state of practice and the desired business practice for Asset Management systems.

System	Current Business Practice	Confidence Level	Desired Business Practice
<b>PAMS Asset Register</b>	GIS data verified and PAMS base data loaded Regular – semi automatic linking from Hansen IMS & GIS is in place.	3	Seamless integration of IMS & GIS databases is achieved
<b>Maintenance management</b>	Planning for capture of <b>maintenance</b> etc history underway Including capture of information held on contractor's database, work sheets and spreadsheets.	4	<b>Maintenance</b> & condition data incl. costs allocated against individual assets in IMS. <i>(Components in this case being manholes &amp; pipe lengths between)</i> Critical and non-critical assets identified. And tailored maintenance strategies used for each.
<b>Condition monitoring</b>	Condition of assets recorded on pipe repair sheets. Recently this information has been populated into Hansen.	3	Condition data analysis is undertaken to develop decay curves.
<b>Customer relationship management</b>	Some paper records of <b>customer enquiries</b> .	3	Electronic recording of <b>customer enquiries</b> . Property and asset links to customer enquiries.
<b>Risk Management</b>	<b>Risk assessment</b> carried out based on Asset Managers experience.	3	Failure modes, probabilities available from IMS.

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System	Current Business Practice	Confidence Level	Desired Business Practice
Financial Dept. Asset Register	Depreciation based on age of asset.	2	Better data to enable Advanced system of depreciation & DISP to be done directly from PAMS.
Forward Works Programme	Prioritised programme for stormwater reticulation replacement / upgrades in place.  Maintenance forward program based on historical trends. 3year renewal and new works programme developed.	2	Long term maintenance and renewal programme for all asset groups.
Plans and records	Plans and records linked to GIS database. Updating done routinely.	2	Plans and records linked to GIS.
Operations and Maintenance manuals	Depends mostly on worker knowledge. Contract is performance based and procedures are determined by contractor.	2	That basic manuals are readily available.
GIS	ARCVIEW GIS used for spatial record of assets.	2	ARCVIEW fully integrated with Hansen IMS (PAMS).

Table 6.2: Asset Management Systems

## 6.4 Asset Management Data

This table sets out the current state of practice and the desired business practice for Asset Management data.

Data	Current Business Practice	Confidence Level	Desired Business Practice
Asset Classification	Stormwater asset divided into suitable categories	2	Asset categories for all assets.
Asset Attributes, Spatial Data	GIS - Stormwater network Populated and verified.	2	Stormwater network Populated and 100% verified.
Asset Attributes, Textual data	GIS - Stormwater network Good base of information.	3	Stormwater network 100% engineering plan reference 100% verified.
Maintenance Tasks	Planned maintenance tasks for reticulation cleaning.	3	Fully documented tasks for maintenance of network.

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Data	Current Business Practice	Confidence Level	Desired Business Practice
<b>Historical Condition and Maintenance Data</b>	2 Years data on historical maintenance on Contractor's reports and 1 years work loaded onto spreadsheet. Hansen maintenance module has been implemented to populate maintenance history.	3	Paper information converted to electronic form and input into asset maintenance system. Maintenance data history captured in IMS.
<b>Future Prediction Data</b>	City-wide Growth scenario review available March 2000 and 2001 population data.  20-year financial plan prepared.	3	Simulated future flows from computer model based on gauged data.
<b>Life Cycle Costs</b>	Some maintenance cost data and rehabilitation cost data collected.	3	Computerisation of data and analysis of available cost information.

Table 6.3: Asset Management Data

Improvements tasks have been developed (as described in Section 8). Particular references in Section 8 are improvement tasks numbered 1.1, 1.5 and 6.2.

## 6.5 Risk Analysis and Management

### 6.5.1 Risk Assessment

Stormwater assets can be at risk from the following:

- Natural disasters – earthquakes, cyclones, tsunami, floods and volcanos.
- Asset failures in terms of capacity and reliability through structural integrity (condition).
- People – excavations, poor workmanship, and vandalism.

Other issues that should be assessed and considered include:

- Habitable floors flooding resulting in property damage.
- Large volume of contaminants entering the stormwater network.
- Wastewater overflows entering into stormwater system.
- Higher costs involved with environmental standards.

No detailed assessment of risk has been undertaken to date. As owners of the stormwater infrastructure Manukau City Council is exposed to a number of risks as outlined below: -

- Changes to legislation - changes to the RMA, Health and Safety Act, the Local Government Act, Local Government Bill and other legislation such as the ARC's Proposed Auckland Regional plan for Air, Land and Water, (Oct 2001) could result in additional cost to Council.
- Non conformance with legislation - by not complying with resource consent requirements or other legislation Council could face penalties
- Changes in levels of service - changes in life styles could result in changes in customer's tolerance to flooding, pollution and quality of service. In addition more cultural awareness could change service levels.
- Asset condition - rapid deterioration in existing infrastructure due to severe storms, seismic activity, damage by others or inadequate maintenance could result in substantial cost to Council.

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- Changes in population growth patterns - long-term predictions are not accurate and unplanned periods of rapid growth could result in inadequate infrastructure. This risk is not so great as the provision of infrastructure is developer driven.
- Financial contributions – Continuous improvement of the management and collection of financial contributions is required to ensure growth pressures are controlled and long term quality results are achieved for the infrastructure.
- Asset information – Ongoing management and improvement of asset information is needed to support decision making for maintenance, and development works and to ensure adequate funding.
- In addition poor asset information could result in damages to the infrastructure by others if the location of services is not known.
- Insurance - if Council does not hold adequate insurance to cover liabilities unacceptable rate rises could become a political issue.
- Safety issues may arise if records are not sufficient to enable rapid repair of faulty components.
- Global changes such as temperature and tide levels may require changes to policy updating of technical requirements
- Public health may be affected by global climate change issues including an increased range of pests.

It is proposed that a risk assessment be carried out as part of the management plan upgrade. Refer to the Improvement Section 8.

## 6.6 Project Management Practices and Processes

### Project Database and Prioritisation Process

The project database stores information on stormwater problems collected from incident reports and Catchment Management Plans. It includes a system to assess proposed solutions on an improvement points/cost basis. This method is similar to the Benefit/Cost methodology. There is a distinction made within the database between an Incident and a Project. A particular incident (whether from Manukau Water reports, or Catchment Plans) is recorded and there maybe one or more solutions which are called 'projects'. These have associated works descriptions, costs and Improvement/Cost scores and rankings.

Projects are filtered for three criteria

- 1 All projects over \$9,999 selects \$10,000 and over
- 2 Status "blank" selects those not in the alternative categories i.e. Not 'completed', not 'roading responsibility' etc.
- 3 B/C 1.0 selects projects with a B/C strictly greater than one. This also removes some large Clevedon projects which have not been prioritised.

Stormwater problems are scored under two main headings - Flood avoidance and Water Quality.

Other issues of a more intangible nature are notified by the use of a flag. Projects with a flag (or flags) are sorted to the top of the standard reports to draw attention to them. Flags are included to highlight the following:

Life / Health threat	Community issues
Problem over 5 years old	Contribution funds available
On MW wish-list	Ease of Implementation
On MW Renewal list	Needs Investigation
Litigation Potential	Project synergies with others
Strategic issues	

### Asset Handover Process

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The provision of “As-Built Plan and Asset Data” is an important phase for effective asset management. Specifications for all land development and capital works need to include data collection and handover arrangements.

Current As Built Plans approval process (land development) is outlined in Figure 6.2. According to this process, there is no involvement of the Stormwater Asset Manager to approve the stormwater plans and asset data. Once the 224c certificate is issued by the Manager-Development Compliance then any asset information received is forwarded to Manukau Water to update the asset registers.

The provisions of “As-Built Plans and Asset Data” requirements for all capital projects undertaken on behalf of MCC need to be incorporated in contract clauses. Suggested clauses may include the following:

- i. At the completion of all MCC generated capital projects (new and renewal works) the contractor shall submit to the Stormwater Asset Manager (Senior Policy Engineer) all required As-Built Plans and Associated Asset Data at the component level in a format as specified..
- ii. All As-Built plans and associated information are to be submitted to the Stormwater Asset Manager and approved prior to the issue of the Practical Completion Certificate for all new works and renewal works.
- iii. The Stormwater Manager shall ensure that all information has been received prior to the issue of Practical Completion Certificate for new works. For renewals MCC or its authorised representative (consultant or contractor) shall ensure that all information has been received prior to issue of Practical Completion Certificate.
- iv. On completion of each project the Manukau Water shall submit a report on the status of project and updated asset inventory/tracking register to the Stormwater Asset Manager.

Capital projects such as Land development where the asset is to be vested to Council, As-Built and asset data requirements must be submitted by the Developers or Consultants prior to the request for the “Practical Completion Certificate”.

The following are the requirements:

- i. At the completion of each subdivision all vested assets (stormwater) As Built Plans and associated asset data at the component level must be submitted in a format as specified by the Stormwater Asset Manager.
- ii. All as built plans and associated information must be submitted and approved by the Stormwater Asset Manager prior to approval of the “224c Certificate”.
- iii. The Manukau Water shall ensure that all information has been received prior to issue of the “224c Certificate”.

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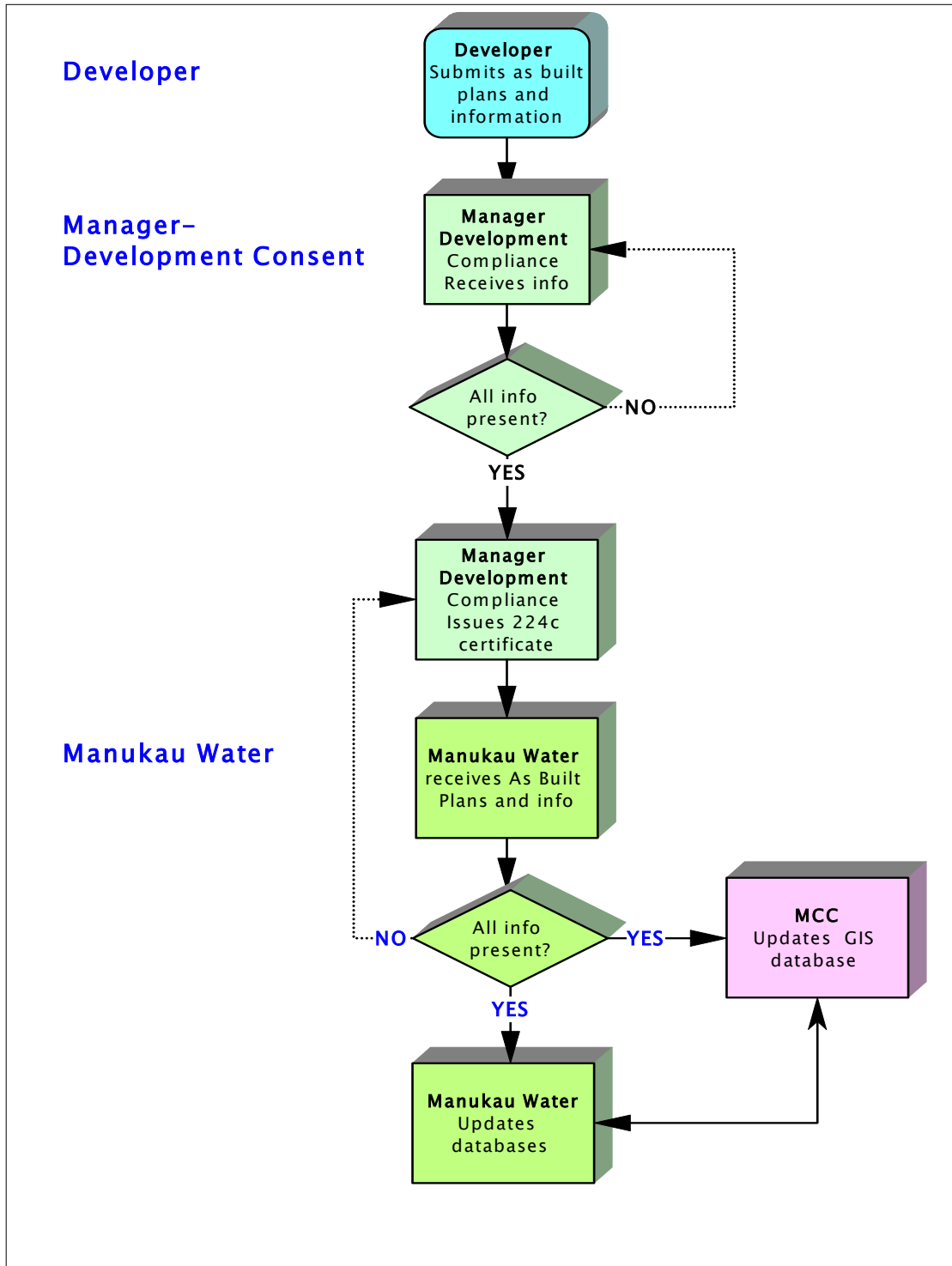


Figure 6.2: Current Asset handover process

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## 6.7 Gap Analysis

The review process has considered the following:

- Interviews with key asset management staff
- Assessment of existing asset management practices and strategies
- Review of selected processes, data and systems
- Assessment of current practices vs best appropriate practices for MCC's stormwater activity.

Review of current practices, processes, data and system by Asset Manager and by an independent consultant; have identified the following key areas that need improvement. Some of the improvements are already underway and will be progressed during 2002/03.

- Asset handover policy
- Data standards and management
- Risk analysis and management
- Customer consultant strategy
- Linking financials with LoS

Table below outlines the prime ranking automatically generated from the gap analysis chart. Figure 6.3 detailed the current status of practices and next 3 year targets.

**Table 6.4: Primary Ranking of Stormwater Priority improvements**

Ranking of Overall Quality Elements - Business Driver Assessment					
Functional Groups	Quality Elements	Gap	Business Driver	Total Score	Initial Rank
Processes and Practices	Overall Work/ Resource Mgmt	21	5	94	23
Data and Knowledge	Overall Tertiary Data	50	8	385	4
TAMP	Overall TAMP Rating	44	7	317	10
Processes and Practices	Overall Strategic Planning	45	9	391	3
Information Systems	Overall Secondary Systems	45	8	344	6
Data and Knowledge	Overall Secondary Data	54	9	457	1
Processes and Practices	Overall Rationalisn/Disposal	35	5	182	18
Information Systems	Overall Primary Systems	33	9	293	13
Data and Knowledge	Overall Primary Data	36	8	292	14
People Issues	Overall People Issues	22	7	158	20
Organisational Issues	Overall Organisational	14	8	120	22
Processes and Practices	Overall Operations	28	6	177	19
Processes and Practices	Overall Maintenance	40	8	329	7
Processes and Practices	Overall Knowledge	44	7	322	9
Processes and Practices	Overall Demand Analysis	40	8	329	7
Processes and Practices	Overall Creation/Acquisition	28	7	187	16
Processes and Practices	Overall Continuous Improvement	24	8	184	17
Commercial Tactics	Overall Commercial Tactics	26	6	149	21
Processes and Practices	Overall CAPEX Evaluation	28	7	202	15
Processes and Practices	Overall Business Risk	56	7	402	2
Processes and Practices	Overall Acctg & Costing	40	8	309	11
Information Systems	Overall - Tertiary Systems	59	6	369	5
Information Systems	Overall - Systems Issues	37	8	298	12

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## SECTION 7

### FINANCIAL SUMMARY

#### 7.1 Overview

- 7.1.1 Risk
- 7.1.2 Funding Strategy and Financial Policies
- 7.1.3 Asset Valuation

#### 7.2 Financial Forecasts

- 7.2.1 Renewal Expenditure
- 7.2.2 Relationship between Renewals and depreciation
- 7.2.3 Decline in Service Potential
- 7.2.4 New Capital Expenditure
- 7.2.5 Operations and Maintenance

#### 7.3 Long Term Financial Plan

- 7.3.1 Reconciliation with Long Term Financial Strategy

#### 7.4 Data Reliability

- 7.4.1 Assumptions
- 7.4.2 Data Accuracy and Reliability

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## 7. FINANCIAL SUMMARY

### 7.1. Overview

This section summarises the financial forecast for Manukau City Council's stormwater system, covering the year 2002/03, plus the 20 years to 2022/23.

Expenditure is identified under the headings of: -

- New Development - (creation of new assets), two groups under this heading are Growth and LOS
- Renewals - (upgrade, refurbishment and replacement works)
- Maintenance - (planned and reactive maintenance)
- Operational and Management - (rates, insurance, contract data management, systems costs, investigations and monitoring), and management (AM planning, contract management etc).

The operational, maintenance and capex expenditures have been calculated based on current expenditure. Renewal figures have been worked out from the asset data including CCTV records and the estimates of age and asset life given in the 2001 valuation.

As indicated in Figure 7.1, the total annual expenditure is about \$22.5 million in 2002/03 and \$24.1 million in 2003/04. In summary, the 20-year overall stormwater forecasts Council expenditure is identified by the following categories: -

#### Operations

Operations expenditure covers corporate management, asset management, depreciation etc.

Operations expenditure is estimated to be \$ 11.8 million in 2003/04 (including corporate overheads, and depreciation of \$ 8.7 million). These figures will increase over the 20 years in line with growth expectations.

#### Maintenance

Ongoing maintenance (planned and unplanned network maintenance) of around 2.11 million in 2003/04 is allowed for. This expenditure will increase in line with growth expectations of 1.9% pa. Additional expenditure to update consents in line with the integrated regional approach for Comprehensive Catchment Discharge Consents (CCDC) has been allowed over the next five years. More information is provided in section 7.2.

#### Development and New Capex

Over the next 20-year period, Council funded capex averaging of \$6.4 million p.a. has been proposed, with a further \$1.5 million p.a. from developers financial contributions. For 2002/03 to 2004/05

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STORMWATER ASSET MANAGEMENT PLAN



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STORMWATER ASSET MANAGEMENT PLAN



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STORMWATER ASSET MANAGEMENT PLAN



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STORMWATER ASSET MANAGEMENT PLAN



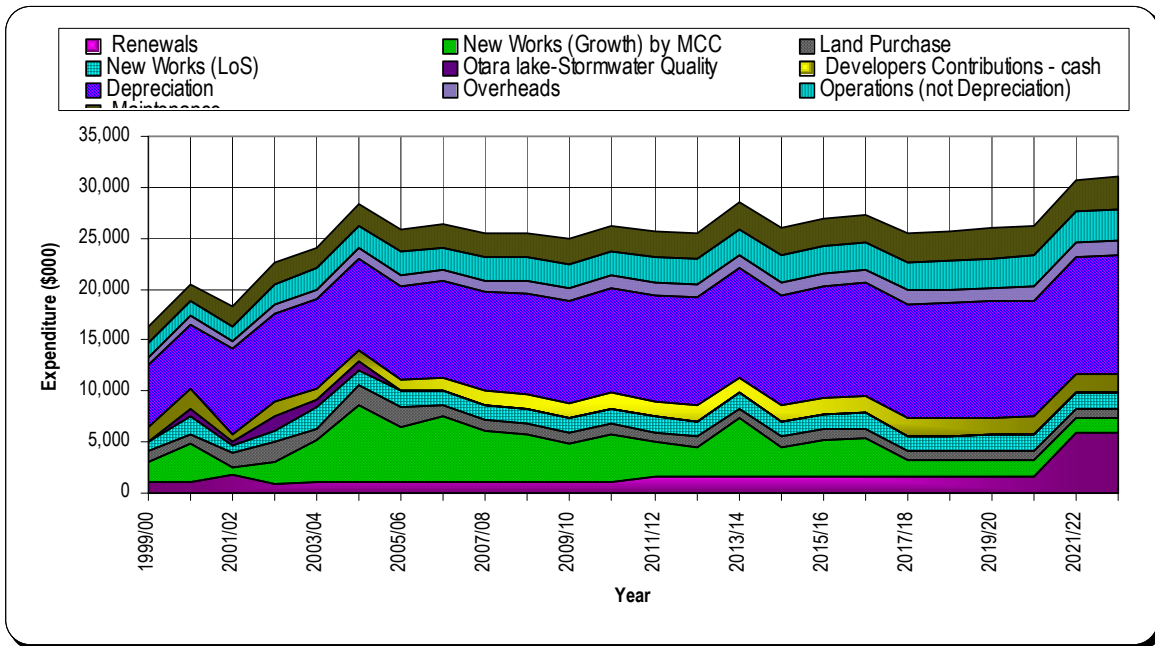
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Proposed to be spent on renewals over the 20-year period. Initially this expenditure is at \$ 1 million pa, but towards the end of the 20 years it increases as the proportion of asset reaching the end of its life, increases.

A programme of Renewal works for 2003/04 has been extracted from the stormwater priority database. The programme of works is attached as Appendix B.

**Key Assumptions**

Assumptions have been collected together in section 7.4, including a section on data accuracy and reliability.



**Figure 7.1: Financial Summary**

**7.1.1 Risk**

No detailed assessment of risk has been undertaken to date. As owners of the stormwater infrastructure Manukau City Council is exposed to a number of risks as outlined below: -

- Changes to legislation - changes to the RMA, Health and Safety Act, the Local Government Act 2002, and other legislation such as the ARC's Proposed Auckland Regional plan for Air, Land and Water, (Oct 2001) could result in additional cost to Council.
- Non-conformance with legislation - by not complying with resource consent requirements or other legislation Council could face penalties.
- Changes in levels of service - changes in life styles could result in changes in customers' tolerance to flooding, pollution and quality of service. In addition more cultural awareness could change service levels.
- Asset condition - rapid deterioration in existing infrastructure due to severe storms, seismic activity, damage by others or inadequate maintenance could result in substantial cost to Council.

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- Changes in population growth patterns - Long-term predictions are not accurate and unplanned periods of rapid growth could result in inadequate infrastructure. This risk is not so great as the provision of infrastructure is developer-driven.
- Financial contributions – Continuous improvement of the management and collection of financial contributions is required to ensure growth pressures are controlled and long-term quality results are achieved for the infrastructure.
- Asset information – Ongoing management and improvement of asset information is needed to support decision making for maintenance, and development works and to ensure adequate funding.
- Poor asset information could result in damages to the infrastructure by others if the location of services is not known.
- Insurance - if Council does not hold adequate insurance to cover liabilities, unacceptable rate rises could become a political issue.
- Safety issues may arise if records are not sufficient to enable rapid repair of faulty components.
- Global changes such as temperature and tide levels may require changes to policy updating of technical requirements
- Public health may be affected by global climate change issues, including an increased range of pests.

It is proposed that a risk assessment be carried out as part of the management plan upgrade. Refer to the Improvement Section 8.

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### 7.1.2 **Funding Strategy and Financial Policies**

#### **Funding Strategy**

The focus of AM planning is on identifying the optimum (lowest life cycle) cost for assets necessary to produce the desired level of service. How this cashflow is funded is a matter for separate consideration as part of Manukau City Council's financial strategy review.

Funding sources available for stormwater services include:-

- rates (consolidated, general, special, differential)
- uniform annual change
- subsidy from Infrastructure Auckland.
- development impact levies
- private (financial contribution-developer) funded works

Under current rating policy, stormwater systems are financed mainly by uniform rates levied on all properties within the serviced area.

#### **Financial Policies**

The financial projections presented in this plan are aligned to and will incorporate within Council's Annual Plan and Long Term Financial Strategy. Financial data from this AMP forms the basis for the asset capital and operating costs in the Council's financial system.

Expenditure projections within this plan have been classified as capital (new and renewal) or operating (opex) in accordance with generally acceptable accounting practice.

The overall financing policy, which is currently being reviewed, will aim to minimise the fluctuations in rates requirements from one year to the next.

### 7.1.3 **Asset Valuation**

#### **Current Valuation Summary**

Stormwater assets are infrastructure assets, defined as fixed utility systems that provide a continuing service to the community and are not regarded as tradable. Stormwater assets were valued at a depreciated replacement cost of \$724 million (30 June 2001) by GHD. The valuation was based on information available at the time.

The valuation has been based on asset data held by MCC. The main groups of asset (ie pipelines, manholes and connections) have component data held on the MCC Hansen IMS asset register. This has enabled the bulk of the asset (over 95% by value) to be valued on a component basis. Individual types of asset, asset life and age data have been used in determining replacement value, depreciated value and depreciation figures.

Good information is held on other asset groups such as stormwater ponds, watercourses and inlets/outlets, but detail component level data could not be used. In these cases, summary level information on asset type and age was used after consultation with MCC engineering staff to determine appropriate figures.

Unit replacement costs were determined from construction cost history of the Manukau region and are based on replacement works in built up urban environment (ie brown fields) with allowance for design, consents, and all project costs.

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The economic life of assets is supported by local, NZ and Australian asset histories and is in accordance with the International Infrastructure Management Manual and Infrastructure Asset Valuation Guidelines.

Depreciation is provided on all depreciable stormwater assets on a straight-line basis over the total assessed economic life of the asset. Land formation and earthworks have not been valued or depreciated. Residual values have been assumed as zero throughout.

The current valuation of stormwater reticulation assets as at 30 June 2002, excluding land, is shown in table 7.1 below.

Asset Type	Number / Length As at June 2001	Base Life (see table 7.2)	Replacement Value \$million (as at 30 June 2001)	Depreciated Replacement Cost \$million (as at 30 June 2001)	Number / Length As at June 2002	Estimated Replacement Value \$million (as at 30 June 2002)
Reticulation - Pipelines - Manholes - Connections	1,614 km 31,595 47,105	65 - 100 yr.	571 115 23	462 88 19	1,657 km 32,910 47,105	581 117 23
Stormwater ponds	19 in all	30 – 100 yr	6.7	6.1	19 in all	9.3
Water courses incl – Unlined channel – Lined channel	112 14	25 - indefinite	2.3 2.1	2.3 0.7	112 14	2.3 2.2
Inlets – Outlets Rod-eyes & Soakholes	4,636 763	60 - 70	3.0 0.6	2.3 0.5	4,590 769	3.3 0.6
<b>Total</b>			<b>\$724 million</b>	<b>\$581 million</b>		<b>738.7million</b>

**Table 7.1: Asset Valuation [Source Valuation by GHD Ltd 30 June 2001]**

Notes to Table 7.1. Drainage reserves (in which many watercourses are located) are not valued (or depreciated) under this stormwater activity. They are covered by the Parks activity Asset Management Plan.

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### Base Lives

The following table summarises the effective lives of stormwater assets used in the valuation.

Asset	Life Years	Asset	Life Years
<b>Reticulation</b>		<b>Stormwater Ponds</b>	
- AC	65	- Dam & pond	
- CLS & RC	100	- Pipes etc	100
- PVC, VC & EW	70	- Nodes, Impvts channels	60
- PE	80		30
Manholes, Connections	70	<b>Watercourses</b>	
Rodeyes, soakholes	70	- Unlined	Indefinite
		- Lined stone & Concrete	40
Inlets / Outlets	60	- Lined full concrete	50
		- Timber	25

Table 7.2: Asset Lives used in June 2001 Valuation

### Valuation Forecasts

Given the level of capital works proposed over the next 20 years in this AM plan, the replacement value of stormwater assets is estimated to increase by \$258 million, from \$738 million (end 2001/02) to \$1,030 million (2022/23) assuming that there are no changes to the assets "effective lives". This is illustrated in the following figure.

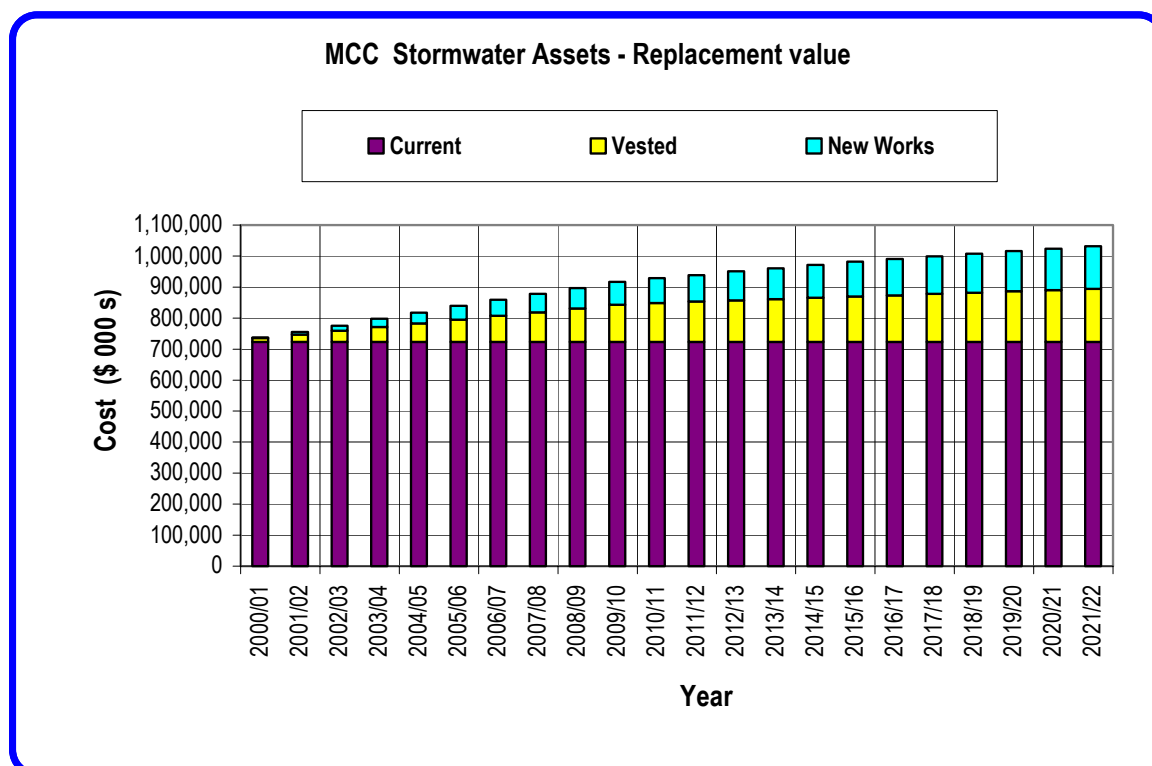


Figure 7.2: Projected Replacement Value

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## 7.2. **Financial Forecasts**

### 7.2.1 **Renewal Expenditure**

Renewal expenditure covers major work which does not increase the assets' design capacity but restores, rehabilitates, replaces, or renews an existing asset to its original capacity. Work over and above restoring an asset to original capacity is 'new work' (or development) expenditure.

However it is impractical to base replacement decisions solely on an asset life. It will always be necessary to use other criteria such as failure rates to trigger the replacement works. The recommended strategy for renewal works is to provide a long-term budget and commit renewal projects on service criteria as outlined in section 6.

In this AMP, renewal expenditure projections have been based on the 2001 Valuation data, and the timing of renewals on the basic asset lives (in accordance with the International Infrastructure Management Manual). This has showed a requirement for approximately \$1 million p.a.

This data was based on Council officers' "top down" evaluation of asset age and condition, and from the year 2010 onwards, the expenditure is projected to increase dramatically. The main increases being: -

2010	to	\$ 1.7 million
2020	to	\$ 5.8 million
2030	to	\$ 7.6 million
2034	to	\$14.2 million

This trend reflects the relative youth of Manukau City, with a large proportion of the infrastructure being constructed since the 1970's.

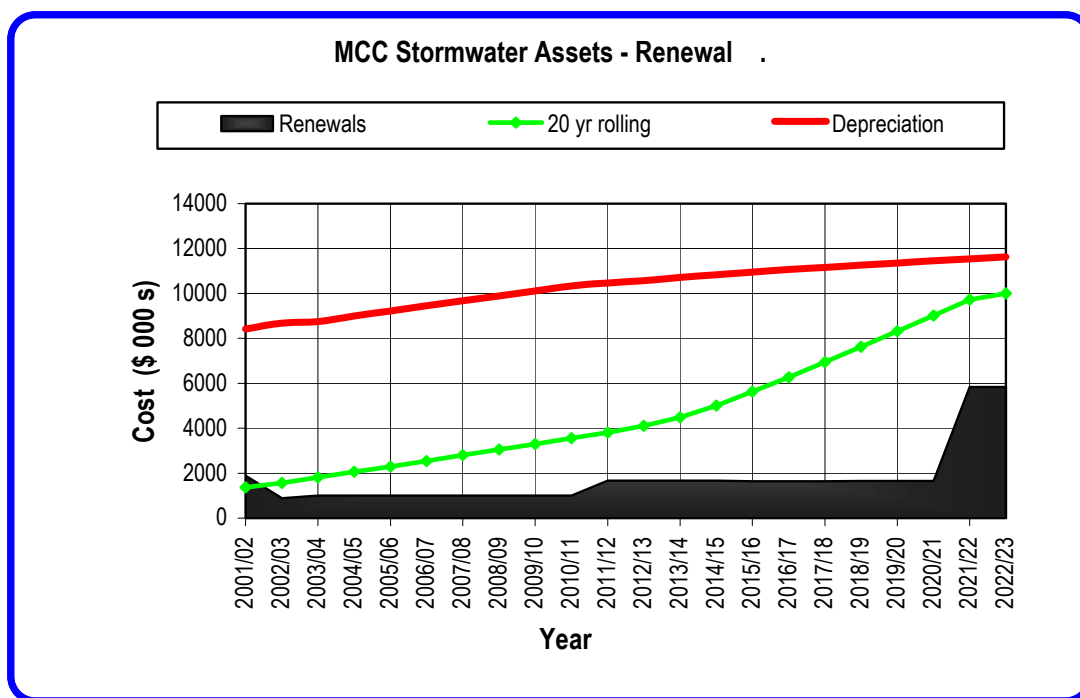
The more recent (June 2001 and 2002) valuation uses data from Council's PAMS database. However the date information from PAMS is less reliable, and the renewal projection based on age is even lower and further into the future than outlined above.

Consequently the existing \$1 million p.a. figure for renewals is considered an appropriate figure for the period 2003 to 2011.

The level of renewal expenditure is shown below on Figure 7.3, which shows the average for the next 20 years is \$1.8 million pa.

See also section 7.2.3, which discusses the Decline in Service Potential.

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	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's
Depreciation	8,420	8,684	8,992	9,217	9,455	9,679	9,899	10,109	10,331	10,466	8,992
Renewals	1,892	888	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,668	1,000
20 Year Rolling	1,359	1,560	2,056	2,299	2,547	2,797	3,048	3,302	3,556	3,810	2,056
	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's
Depreciation	10,576	10,717	10,827	10,946	11,066	11,162	11,258	11,355	11,452	11,540	11,629
Renewals	1,668	1,668	1,668	1,647	1,647	1,647	1,649	1,660	1,660	5,841	5,841
20 Year Rolling	4,107	4,489	5,006	5,632	6,266	6,947	7,627	8,315	9,017	9,728	10,004

Figure 7.3: Renewal Expenditure

7.2.2 Relationship between Renewals and Depreciation

It is important to recognise that depreciation is a funding mechanism for renewing the stormwater assets. Funding is required to replace the asset over the life of that asset (60 to 100 years). In the short term (20 years), asset renewal will be driven by the business risk exposure (BRE) based on service considerations, and will typically not match the depreciation allowance over the same period.

Based on the recent valuation and the renewal of existing stormwater network, figure 7.4 (calculated from 1998 valuation data) shows Renewals and Depreciation figures over 60 years.

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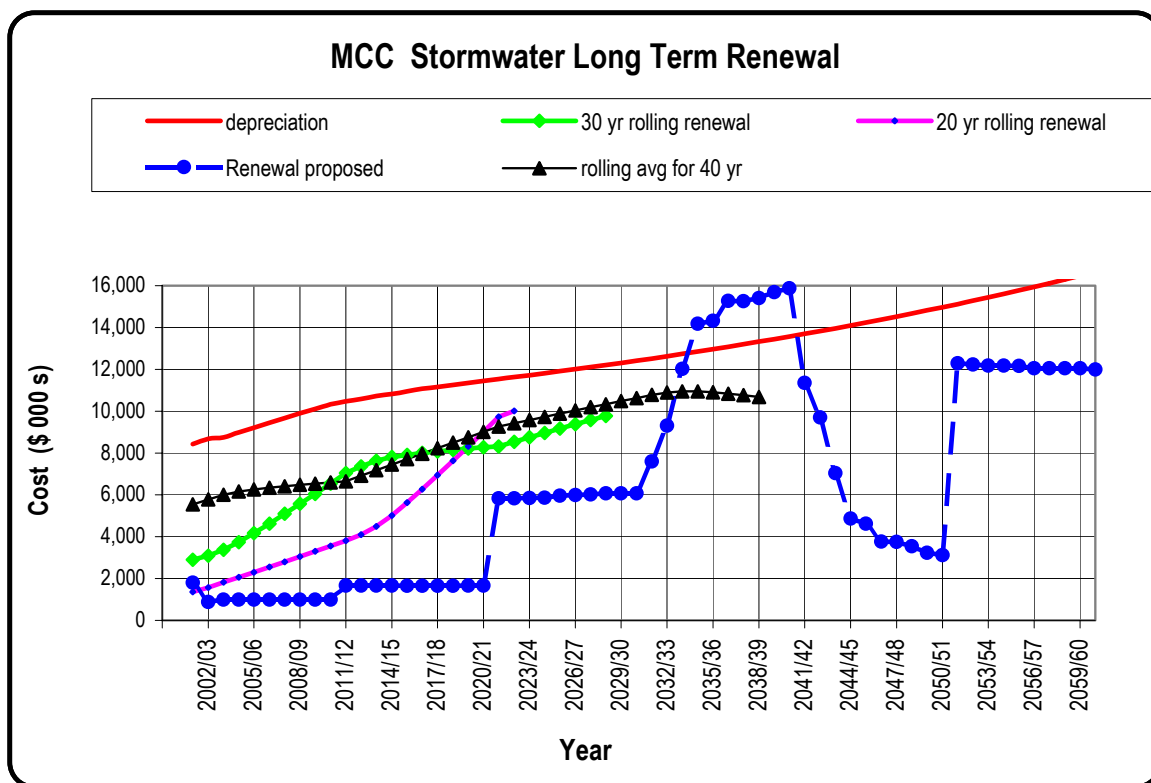


Figure 7.4: Renewals and Depreciation

The above figure has highlighted the following issues:

- The current depreciation determined from the valuation is too high.
- The level of long-term Renewals Capex could be insufficient to maintain the capital value to an acceptable service potential.
- Low base lives assumptions
- Limited information on condition and performance.

It is recognised that both the renewals and depreciation allowance will change with the new CCTV and results from other capital projects. This will improve the confidence (accuracy, completeness and reliability) of data used to plan renewal projects and determining values over the next few years.

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### 7.2.3 Decline in Service Potential

#### Decline in Service Potential

The measure of Decline in Service Potential (DISP) is depreciation. This has been calculated by the finance department as part of the Annual Plan preparation. The Service Potential of assets is restored mainly by renewal works, therefore it is useful to compare levels of renewal expenditure and depreciation levels.

Based on the June 2002 valuation and proposed renewal expenditure in 2003/04, the depreciation charge exceeds the proposed renewal expenditure by approximately \$7.7 million

This level of DISP (superficially an under-spend on Renewal) is acceptable in Manukau City where the average age of assets is relatively low compared to the expected life. The proposed level of renewal is shown on Figure 7.3.

#### Depreciation

The existing assets are depreciated on a straight-line basis according to the age and base life data given in the PAMS (Hansen) database, and determined in conjunction with the valuation (as at June 2001 and 2002).

It is perceived that this AMP and the valuation need to be linked through using the same base lives, remaining useful lives and unit rates. According to valuation 2001, base lives, unit rates and replacement values are the same, but remaining lives may change depending on the condition of pipes. Sufficient condition and maintenance data is not available to support the base lives, which can be used for long-term asset management planning purposes.

The date information from PAMS is less reliable than the 1998 assessment by MCC officers and the renewal projection based on age is even lower and further into the future than the 1998 forecast. Figure 7.3 therefore uses the 1998 data to calculate a conservative (ie., earliest likely) renewal expenditure.

### 7.2.4 Capital Expenditure

Capital expenditure comprises Renewal and New Development works. New Development work in turn is divided into three categories

- **New Works -Growth** – any asset development that is required as a result of growth.
- **New Works- Developers** – Are funded from developers cash contribution (as opposed to assets vested to Council by developers). They are growth driven assets and are used mainly for flood control works.
- **New Works- LOS** – any asset development that is required as a result of a change in service levels.

The expenditure on New Works is relatively low (compared to the asset value) as the network is generally extended by developers who add reticulation in accordance with Council standards. The new infrastructure is then handed over to Council who own and operate it and undertake maintenance, renewal etc. as required. New stormwater assets vested to Council by developers have been estimated at \$12 million p.a. for the next 10 years and thereafter \$4.1 million p.a.

Renewal expenditure is discussed above in Section 7.2.1

#### New Work Growth

Developers Contribution funded works have previously been budgeted at \$1 million p.a. This AMP forecasts an increase associated with the new growth nodes planned for the city. (See growth nodes below)

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Expenditure for Land purchases mainly for Water Quality (WQ) ponds is projected at \$2.0 million p.a. for the first three years (due to network development at Flat Bush catchment) and then \$1.0 million p.a. indefinitely. These are mostly for WQ pond land in Greenfield catchments, and as such are a growth item rather than LOS.

### Growth Nodes

The Growth Node figures were originally estimated in November 2000. Some rationalisations of the projections have since been undertaken during the preparation of the LTFS and preparing long-term financials in 2002.

Development costs for Growth Nodes are included as follows:

- Manurewa \$5.8 million over 15 years
- Howick \$7.5 million over 15 years
- Flat Bush \$ 40.5 million over 15 years
- Papatoetoe/Hunters Corner \$ 9.8 million over 15 years

Contributions from developers are expected to increase in line with the following:

Development within and around the node will occur over 50 years. Developers' contributions will build up over the first 5 to 10 years until Council costs for new work in the area are fully recovered.

The New Works (growth) is expected to be made up as follows: -

	2003/04 \$000's	2004/05 \$000's	2005/06 \$000's	2006/07 \$000's	2007/08 \$000's	2008/09 \$000's	2009/10 \$000's	2010/11 \$000's	2011/12 \$000's	2012/13 \$000's
Growth Node Amount	4,291	7,576	5,480	6,628	5,177	4,456	3,488	4,456	2,939	1,962
<b>Total</b>	<b>4,291</b>	<b>7,576</b>	<b>5,480</b>	<b>6,628</b>	<b>5,177</b>	<b>4,456</b>	<b>3,488</b>	<b>4,456</b>	<b>2,939</b>	<b>1,962</b>
	2013/14 \$000's	2014/15 \$000's	2015/16 \$000's	2016/17 \$000's	2017/18 \$000's	2018/19 \$000's	2019/20 \$000's	2020/21 \$000's	2021/22 \$000's	2022/23 \$000's
Growth Node amount	4,694	8,182	2,083	2,163						
<b>Total</b>	<b>4,694</b>	<b>8,182</b>	<b>2,083</b>	<b>2,163</b>						

**Table 7.3: Growth Node Expenditure**

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### New Works LOS

This item includes both water quality and flood protection works. The expenditure forecast for 2003/04 includes:

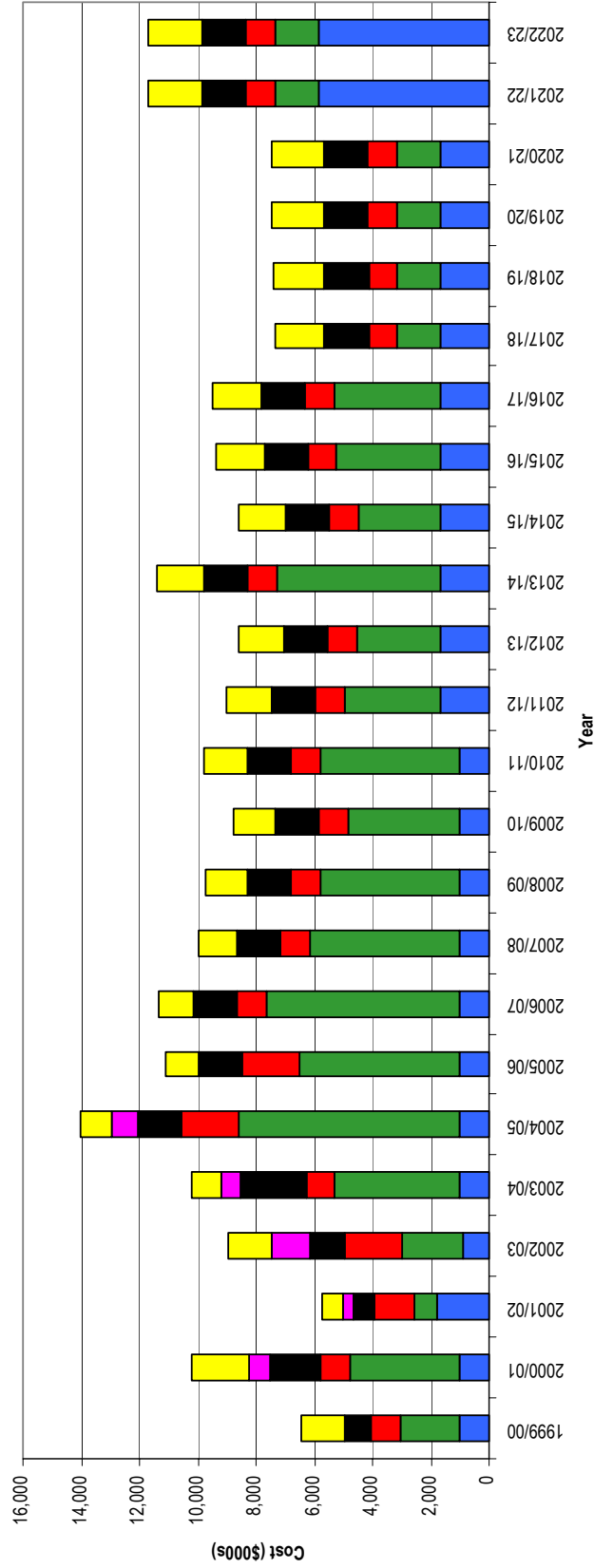
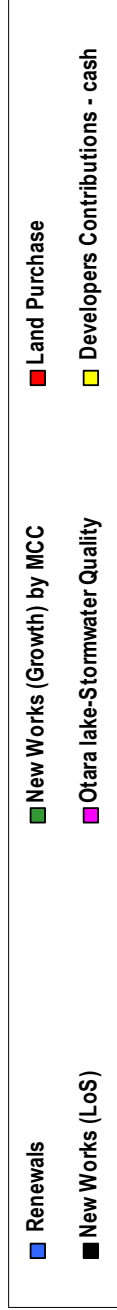
- \$0.7 million for Otara lake development
- \$2.222 million for general works as has been allocated in previous years. This amount is estimated to be split 40:60 between water quality and flood protection works.
- Over the next few years the required amount is expected to increase to \$1.5 million. ie \$0.6 million for water quality and \$0.9 million for flood protection.

The exact 'New Works – LOS' expenditure required is an estimate, however additional catchment planning is to be undertaken which will identify new asset requirements to meet water quality LOS. It is known that intervention is required to reduce pollution in receiving waters. ARC requirements are being developed and a large number of new discharge consents are to be renewed in the next few years. With these consents, there may be an increase in the funding required to meet the water quality objectives.

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STORMWATER ASSET MANAGEMENT

MCC Stormwater - Capital Expenditure



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	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
	\$000's Actual	\$000's Actual	\$000's Actual	\$000's Plan	\$000's Plan	\$000's Plan	\$000's Plan	\$000's Plan	\$000's Plan	\$000's Plan	\$000's Plan	\$000's Plan	\$000's Plan	\$000's Plan	\$000's Plan	\$000's Plan	\$000's Plan	\$000's Plan	\$000's Plan	\$000's Plan	\$000's Plan	\$000's Plan	\$000's Plan	\$000's Plan
Renewal	1,000	1,000	1,812	880	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,668	1,668	1,668	1,668	1,647	1,647	1,647	1,649	1,660	1,660	1,660	5,841
New Works (Growth) MCC	2,040	3,780	750	2,100	4,291	7,576	5,480	6,628	5,177	4,816	3,848	4,816	3,299	2,892	5,624	2,812	3,583	3,663	1,500	1,500	1,500	1,500	1,500	1,500
Land purchase	1,000	1,000	1,369	2,000	1,000	2,000	2,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
New Works (LOS)	931	1,745	712	1,150	2,222	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Otaru lake	0	706	380	1,321	702	888	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Developers Contrib' Cash	1,475	1,995	715	1,500	1,000	1,073	1,145	1,218	1,319	1,421	1,450	1,501	1,530	1,559	1,588	1,618	1,649	1,680	1,712	1,745	1,778	1,812	1,846	1,881
<b>Total</b>	<b>6,446</b>	<b>10,226</b>	<b>5,738</b>	<b>8,951</b>	<b>10,215</b>	<b>14,037</b>	<b>11,125</b>	<b>11,346</b>	<b>9,996</b>	<b>9,737</b>	<b>8,798</b>	<b>9,817</b>	<b>8,997</b>	<b>8,619</b>	<b>11,380</b>	<b>8,598</b>	<b>9,379</b>	<b>9,490</b>	<b>7,359</b>	<b>7,394</b>	<b>7,438</b>	<b>7,472</b>	<b>11,687</b>	<b>11,722</b>

Figure 7.5: New Development and Capex Expenditure

Assets vested by Developers not included.

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### 7.2.5 **Operations and Maintenance**

The expected maintenance expenditure is based on current levels of service and expenditure levels. The future expenditures are expected to grow in line with the population growth of the City. The main component of stormwater maintenance is the expenditure for stormwater maintenance contracts.

Additional allowance has been made for the following:

- WQ Pond cleaning increasing as more new ponds are built.
- Riparian planting over the next 5 years.

The expected operations expenditure (for water quality and flood protection) is based on current levels of service and expenditure levels. The level of expenditure is assumed to continue growing at a rate of 1.9% pa.

Comprehensive Catchment Discharge Consent (CCDC) expenditure - Costs to update consents in line with the integrated regional approach have been allowed over the next five years.

#### **Alternative Operations & Maintenance Budget**

Consideration is required to be given to an optimistic (or lower cost) alternative budget for the next 3 years 2003/04 to 06/07.

Areas where savings could be considered include:

- Maintenance of Watercare and pond areas where cost could be reduced by less mowing and clearing of vegetation.
- Reduced cesspit checking and clearing

These measures are likely to be reflected by higher stream levels and roading flooding in the event of high rainfall and would provide only minor savings.

On the contrary, expectations are that costs in the water quality area are expected to increase. Indications from ARC and Environmental groups are that a higher level of protection of the environment is required. This will require additional works and expenditure to improve wWater quality ponds and watercourses throughout the city. A recently completed catchment study supports this view and is cited as a reference (refer Section 9).

Cost projections for additional work over the next 10 years show an increase of 18% pa. The work required includes:

- Modelling of Stormwater catchments
- Collection of complete asset data for watercourses and ponds
- Monitoring of water quality

To emphasise the needs in the water quality area, the following photographs show the state of some areas of the system.



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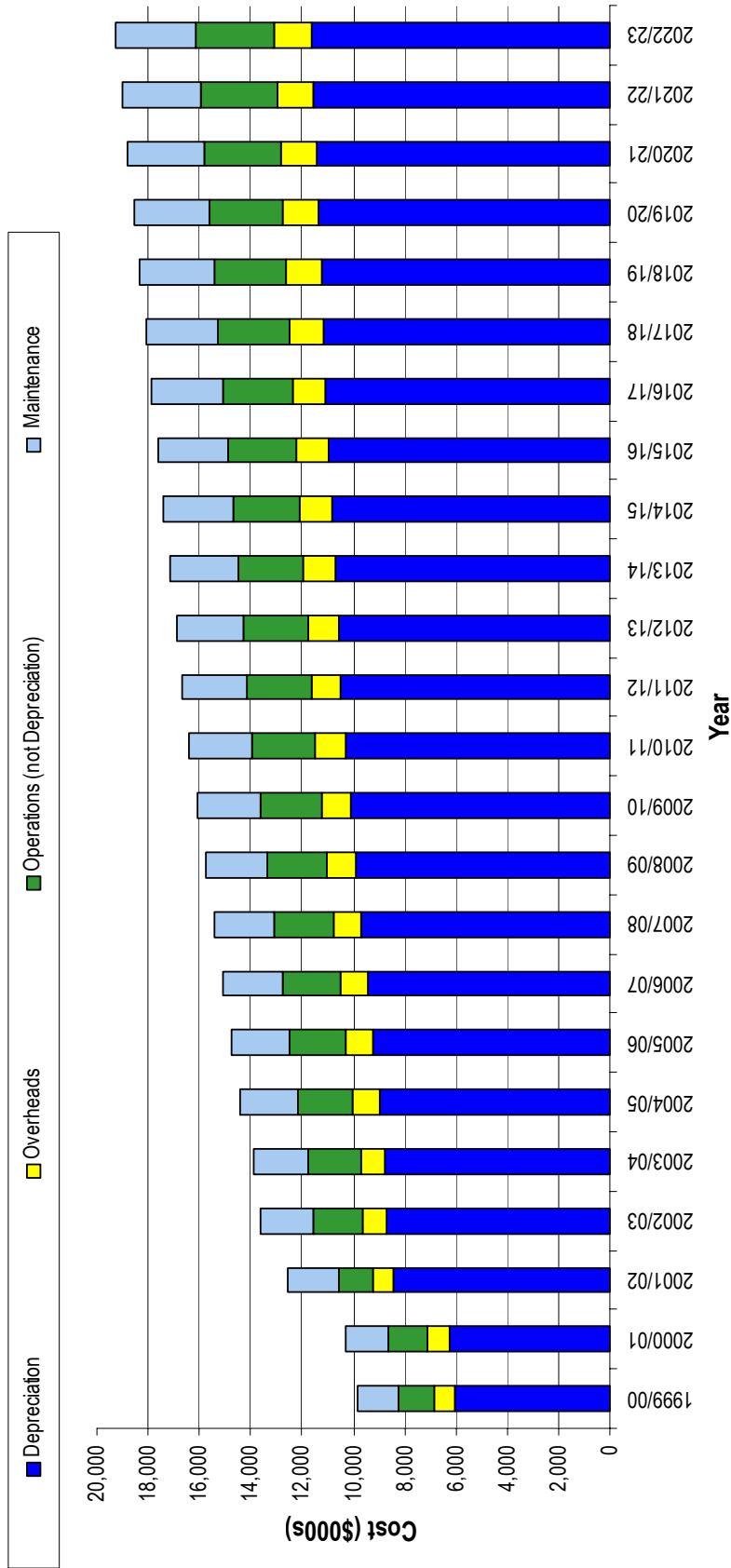
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Maintenance of the watercourses and ponds has, in the past, been less rigorous than that for the pipe reticulation. The establishment of an asset register for watercourses and ponds and the keeping of records needs urgent attention so that assessments of stream condition can be recorded, and a programme of work to catch up on the backlog of maintenance be undertaken.

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STORMWATER ASSET MANAGEMENT

MCC Stormwater - Operations & Maintenance



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STORMWATER ASSET MANAGEMENT PLAN



	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's	\$000's
Stormwater	6,069	6,228	8,420	8,684	8,744	8,992	9,217	9,455	9,679	9,899	10,109	10,331	10,466	10,576	10,717	10,827	10,946	11,066	11,162	11,258	11,355	11,452	11,540	11,629
Depreciation	756	885	792	935	981	1,029	1,054	1,074	1,094	1,115	1,136	1,158	1,180	1,202	1,225	1,248	1,272	1,296	1,321	1,346	1,371	1,397	1,424	1,451
Overheads	1,429	1,556	1,336	1,965	2,061	2,162	2,214	2,256	2,299	2,343	2,387	2,433	2,479	2,526	2,574	2,623	2,673	2,724	2,775	2,828	2,882	2,936	2,992	3,049
Operations	1,600	1,646	2,013	2,014	2,113	2,216	2,269	2,313	2,356	2,401	2,447	2,493	2,541	2,589	2,638	2,688	2,739	2,791	2,844	2,899	2,954	3,010	3,067	3,125
Maintenance	<b>9,854</b>	<b>10,315</b>	<b>12,561</b>	<b>13,598</b>	<b>13,899</b>	<b>14,399</b>	<b>14,754</b>	<b>15,098</b>	<b>15,428</b>	<b>15,758</b>	<b>16,079</b>	<b>16,414</b>	<b>16,665</b>	<b>16,893</b>	<b>17,154</b>	<b>17,386</b>	<b>17,630</b>	<b>17,877</b>	<b>18,102</b>	<b>18,331</b>	<b>18,562</b>	<b>18,796</b>	<b>19,023</b>	<b>19,254</b>
<b>Total Opex</b>																								

Figure 7.6: Operations and Maintenance

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### 7.3. Long Term Financial Plan/Long term Council Community Plan (LTCCP)

The total expenditure on the Stormwater activity includes works under the categories New Development, Renewal, and Maintenance and Operations. These categories are necessary to enable financial planning in accord with the Local Government Amendment Act No. 3 and Act 2002. This requires separate accounting treatment for works, which affect asset condition and value in different ways.

**Operations and Maintenance** expenditure is in line with the MCC 10 year Long Term Financial Strategy (LTFS) or Long Term Council Community Plan. The expenditure figures include overheads charges.

**Capex and Renewal** expenditures including LOS & Growth driven groups are also in line with the strategic plan. For further information refer to Section 7.2.3

**Deferred maintenance.** Since the estimate of the deferred maintenance was determined in 1998 showing a total of approximately \$2.9 million outstanding, about \$1.0 million has been spent per annum, and the backlog can be considered caught up. We note however that the estimate was entirely unrelated to any 'on the ground' assessment of any backlog of work, and a more reliable figure will become available when regular condition monitoring and the asset register are in place.

#### 7.3.1 Reconciliation with Long Term Financial Strategy

	2001/0 2 \$000's	2002/0 3 \$000's	2003/04 \$000's	2004/05 \$000's	2005/06 \$000's	2006/07 \$000's	2007/08 \$000's	2008/09 \$000's	2009/10 \$000's	2010/11 \$000's	2011/12 \$000's
<b>This AMP</b>											
Desired expenditure (incl Overheads etc)	4,141	4,914	4,987	5,231	5,357	5,459	5,562	5,668	5,776	5,885	5,997
Depreciation	8,420	8,684	8,703	8,901	9,120	9,323	9,524	9,729	9,929	10,130	10,239
As updated Dec 2002											
<b>Total Operations &amp; Maintenance</b>	<b>12,561</b>	<b>13,598</b>	<b>13,690</b>	<b>14,132</b>	<b>14,477</b>	<b>14,782</b>	<b>15,086</b>	<b>15,397</b>	<b>15,705</b>	<b>16,015</b>	<b>16,236</b>
Renewal	1,812	880	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,668
New Work (Growth) -council	2,169	4,100	5,291	9,576	7,480	7,628	6,177	5,816	4,848	5,816	4,299
New Works (LOS)	1,092	2,471	2,923	2,388	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Developer's Contribution - cash	715	1,500	1,000	1,073	1,145	1,218	1,319	1,421	1,450	1,501	1,530
<b>* Total Capex and Renewal</b>	<b>5,738</b>	<b>8,951</b>	<b>10,214</b>	<b>14,037</b>	<b>11,125</b>	<b>11,346</b>	<b>9,996</b>	<b>9,737</b>	<b>8,798</b>	<b>9,817</b>	<b>8,997</b>

	2001/02 \$000'S	2002/03 \$000'S	2003/04 \$000'S	2004/05 \$000'S	2005/06 \$000'S	2006/07 \$000'S	2007/08 \$000'S	2008/09 \$000'S	2009/10 \$000'S	2010/11 \$000'S	2011/12 \$000'S
<b>LTFS – 2001 - 2011</b>											
Operations & Maintenance (Incl. Overheads & Depreciation)	12,738	13,264	13,871	14,524	15,105	14,550	15,009	15,557	15,978	16,277	16,603
<b>* Total Capex and Renewal</b>	<b>11,392</b>	<b>8,424</b>	<b>9,344</b>	<b>13,785</b>	<b>9,980</b>	<b>10,128</b>	<b>8,677</b>	<b>8,316</b>	<b>7,348</b>	<b>8,316</b>	<b>7,467</b>

Table 7.4: AMP and LTFS reconciliation

Note - all are gross expenditures with no allowance for subsidies.

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### 7.3.2 **Comment on Variance (between AMP and awarded budget)**

Variance between this AMP projection and the 2001-2011 LTFS are due to the following:

- Otara lake projections have been updated and result in reduced gross expenditures of

In 2002/03	from \$1,270,000	to \$1,321,000
In 2003/04	from \$2,800,000	to \$702,000
In 2004/05	from \$630,000	to \$702,000

- Stormwater improvements have been updated and result in increased expenditures of

In 2002/03	from \$1,154,000	to \$1,150,000
In 2003/04	from \$3,053,000	to \$4,291,000
In 2004/05	from \$3,118,000	to \$7,576,000

- The requirement for New Work (Growth) has increased by \$1,000,000 in 2002/03 to 2005/06 for additional land purchase and additional \$500,000 from Developer's contribution to allow for more work in support of the new growth areas at Manurewa, Howick and Flat Bush.

In 2002/03	from \$4,270,000	to \$5,600,000
In 2003/04	from \$5,291,000	to \$6,291,000
In 2004/05	from \$9,667,000	to \$10,649,000

#### **Operations and Maintenance Expenditure (Opex)**

A breakdown of the differences between the overall opex proposed and budgeted figures are as follows: -

<b>Operations &amp; Maintenance</b>	<b>AMP 2002/03 Proposal \$000's</b>	<b>2002/03 Budget \$000's</b>
<b>Depreciation</b>	8,522	8,684
<b>Operations including overheads</b>	2,764	2,900
<b>Maintenance</b>	1,840	2,014
<b><u>OPEX TOTAL (incl. Depreciation)</u></b>	<b>13,126</b>	<b>13,598</b>

**Table 7.6: OPEX reconciliation breakdown**

#### **Capital Expenditure (Capex)**

In the 20 year forecast (from the 2002/03 AMP) increases in the capex budget over the 20 years mainly reflect development in the growth nodes.

A breakdown of the differences between the overall capex proposed and budgeted figures are as follows: -

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	AMP 2001/02 Proposal \$000's	2001/02 Budget \$000's	AMP 2002/03 Proposal \$000's	2002/03 Budget \$000's
<b>Renewals</b>	1,000	1,000	1,000	880
<b>New Works (Growth) - by council</b>	1,000	625	2,000	2,000
Land purchase	1,000	600	1,000	1,000
Developers Contributions – cash	1,000	625	1,000	1,364
Expenditure estimate for New Nodes Manurewa (2002) Flat Bush Howick Papatoetoe/Hunters Plaza	2,000	0	2,500	0
<b>New Works (LOS)</b>	900	1,107	1,154	1,650
Otara lake	3,500	1,010	1,800	2,301
<b>CAPEX TOTAL (incl Renewal)</b>	<b>10,400</b>	<b>4,968</b>	<b>10,454</b>	<b>9,195</b>

Table 7.7: CAPEX reconciliation breakdown

**New Works, Land purchase and Developers cash** have been increased.

**New nodes Capex** expenditure has slipped one year but is expected to be required in the 2003/04 timeframe.

**New works (LOS)** has a slightly increased budget resulting the allocation to specific projects. This increase offsets some of the New Work (Growth) reduction and has no affect on the long-term expenditure projections.

**Otara Lake** This project is expected to be completed in 2003/04.

Further information can be obtained from the regular Otara Lake project reports.

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## 7.4. Data Reliability

### 7.4.1 Assumptions

Stormwater assets covered by this AMP are the urban SW assets.

- Council staff have developed this programme and no formal consultation has been undertaken with the public.
- It is assumed that regulations relating to stormwater systems will remain essentially the same over the planning period (ie 20 years to June 2023).
- No allowance has been made for inflation over the 20-year planning period. That is, all costs are as at 30 June 2001 and use construction costs derived at that date (all exclusive of GST).
- A long-term average growth rate of 1.8% has been factored in as appropriate. The derivation of this figure is discussed in section 4.

The following general assumptions have been made in preparing the 20-year cashflow forecasts.

- (a) Maintenance and operations allocations are largely based on maintaining current service levels.
- (b) The present management system will remain the same.
- (c) Growth in expenditure is based on population forecasts by statistics NZ, ARC and others.
- (d) The following guideline has been proposed to clarify categorisation of expenditure between maintenance, and capital expenditure. It is planned to provide a table of various activities (and their categories) for further clarity. The guideline proposed is that expenditure on physical works will be judged **Maintenance** (and therefore not capitalised) **IF** it does not involve the replacement (either by renewal or new work) of a complete component (as defined and held on the asset register) **AND** the value of the work done (including design, project management etc) is less than \$20,000.
- (e) The determination of, asset replacement value, depreciated value, and renewal projections are based on the data in the GHD Ltd valuation dated 30 June 2001 (reference 1). In addition to the basic asset identity (diameter, material and lengths), this data includes an assessment of age and residual life.
- (f) The remaining lives of the assets have been calculated using the 'base life' consistent with the International Infrastructure Management Manual, but the modifications as proposed for age, service, condition, and performance have not been applied. The depreciation has been calculated on a simple straight-line basis. It is felt that the data is not yet sufficiently reliable to support further refinement.

### 7.4.2 Data Accuracy and Reliability

The asset data used for depreciation and renewal calculations has been taken from the PAMS database. The data has been transferred to an Excel spreadsheet and analysed. We have a good level of confidence in the original data as to pipe length and locations, although some error has been noted regarding built dates of assets.

In August 1999 and 2002 a check was conducted to ensure that the total asset quantum as held by the GIS system (and subsequently the PAMS system) was in line with the data used for renewal and depreciation calculations. The numbers agreed within 1%, which is considered satisfactory.

Resource consents and Catchment Plans have not been included as assets.

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Condition information on the stormwater reticulation (which represents 95% of asset value) has been based on a workshop session and review with Council officers. During the 1999/2000 year, a sample of approx. 15km of asset has been surveyed and condition rated by CCTV. The results are:-

- The two main pipe materials in the 1999 CCTV sample were Concrete and Asbestos Cement (AC). Of the two AC showed a higher proportion of grade 5 (17%). Almost 90% of the sample was concrete of which 13% was grade 5.
- The pipes in the area surveyed were intended to be representative of the city and are mostly less than 25 years old (approx. 85%).
- Although it is too small a sample to work from (approximately 1% of the total asset) a calculation of the deferred backlog of expenditure (or deferred renewal) based on this would give a total of approximately \$35,000,000.
- It is important to realise a single sample from one locality cannot reliably reflect the asset throughout the city. Many local factors such as soils, use and construction methods can influence asset reliability and condition. Consequently we recommend continuation of the condition monitoring surveys to build up the sampled asset.
- Confidence in the data in this AMP has been assessed at  $\pm 30\%$ .

#### 7.4.3 **Data Audit**

During the period December 2001 to January 2002, GHD undertook an overview data audit of stormwater assets. The Data Audit and Improvement Report outline the data investigation process and findings, and outline a recommended strategy for Manukau City Council (MCC) to follow in developing and improving their asset data and systems. This has identified the current levels of data completeness, asset register currency, validation processes, maintenance procedures and accuracy, as well as asset hierarchy information and perceived data needs for stormwater assets.

Some of the key findings of this audit are:

- MCC needs to develop a “best appropriate practice” approach to continuous improvement of the existing stormwater asset registers (eg Hansen IMS and GIS). This is necessary to ensure accuracy and completeness of asset registers, which support decision-making on short and long terms asset management.
- MCC needs to define and implement stormwater asset data standards (including maintenance, condition and performance data requirements).
- MCC needs to develop and implement stormwater assets handover processes and procedures.

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Tables below summarises the current status and key elements in a typical improvement programme recommended for MCC stormwater assets.

Required Inputs Timetable	Current Status	2002	2003	2004
Asset Register Hierarchical Level	4	4/5	5	5
% Complete	70-75%	85%	90%	100%
Physical Characteristics/attributes	75-80%	90%	90%	100%
Valuation to Hierarchical Component	4	4/5	5	5
Effective Lives (% adopting Condition Based Depreciation-CBD)	Estimated	35% CBD	45% CBD	55% CBD
Capacity/Demand	10-25%	50%	80%	90%
Replacement Costs/Activity Costs	5-10%	80%	90%	100%
Condition Assessment (Simple)	10-50%	100%	90%	100%
Condition Assessment (Detailed)	5-10%	25%	35%	45%
Performance records/failure History	0-10%	25%	45%	65%
Maintenance procedures	90%	100%	90%	100%
Maintenance Costs	5-10%	80%	90%	100%
Risk assessment-Consequence of failure	None	40%	80%	90%
Risk assessment-probability of failure	None	40%	80%	90%
Identified failure Modes	None	10% ORDM	30% ORDM	50% ORDM
Data Standards	Varied	80%	90%	100%
Asset Handover Procedures	Varied	80%	90%	100%

**Table 7.8: Stormwater Assets Data Improvement Priorities**

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STORMWATER ASSET MANAGEMENT

Projected Asset Repl. Value \$ Millions	738	755	775	796	816	838	857	877	895	915	927	937	949	959	970	980	989	997	1,006	1,014	1,022	1,030	
<b>Stormwater Budget</b>	<b>2001/02</b>	<b>2002/03</b>	<b>2003/04</b>	<b>2004/05</b>	<b>2005/06</b>	<b>2006/07</b>	<b>2007/08</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>	<b>2011/12</b>	<b>2012/13</b>	<b>2013/14</b>	<b>2014/15</b>	<b>2015/16</b>	<b>2016/17</b>	<b>2017/18</b>	<b>2018/19</b>	<b>2019/20</b>	<b>2020/21</b>	<b>2021/22</b>	<b>2022/23</b>	
Maintenance & Operations	\$000's 4,141	\$000's 4,914	\$000's 5,155	\$000's 5,407	\$000's 5,537	\$000's 5,642	\$000's 5,750	\$000's 5,859	\$000's 5,970	\$000's 6,084	\$000's 6,199	\$000's 6,317	\$000's 6,437	\$000's 6,559	\$000's 6,684	\$000's 6,811	\$000's 6,940	\$000's 7,072	\$000's 7,207	\$000's 7,343	\$000's 7,483	\$000's 7,625	
Renewals	1,812	880	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,668	1,668	1,668	1,668	1,647	1,647	1,647	1,649	1,660	1,660	5,841	5,841	
New Works (Growth) - by council	2,169	4,100	4,291	7,576	5,480	6,628	5,177	4,816	3,848	4,816	3,299	2,892	5,624	2,812	3,583	3,663	1,500	1,500	1,500	1,500	1,500	1,500	1,500
New Works (LOS)	1,092	2,471	2,924	2,388	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Developers Contributions - cash	715	1,500	1,000	1,073	1,145	1,218	1,319	1,421	1,450	1,501	1,530	1,559	1,588	1,618	1,649	1,680	1,712	1,745	1,778	1,812	1,846	1,881	1,881
Developers Contributions - vested	11,377	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	6,000	4,125	4,125	4,125	4,125	4,125	4,125	4,125	4,125	4,125	4,125	4,125	4,125
Infra' Auckland funding (mainly Otara lake)	-445	-1,800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asset Disposal	362.4	176	216	200	160	204	200	200	200	200	334	334	334	334	329	329	329	330	332	332	1,168	1,168	1,168
Depreciation	8,420	8,684	8,744	8,992	9,217	9,455	9,679	9,899	10,109	10,331	10,466	10,576	10,717	10,827	10,946	11,066	11,162	11,258	11,355	11,452	11,540	11,540	11,629
Total Operation & Maintenance	12,561	13,598	13,876	14,326	14,676	14,983	15,292	15,606	15,918	16,232	16,457	16,663	16,872	17,084	17,298	17,515	17,735	17,957	18,183	18,411	18,633	18,858	18,858
Total Capex (incl renewals)	5,738	8,951	10,214	14,037	11,125	11,346	9,996	9,737	8,798	9,817	8,997	8,619	11,380	8,598	9,379	9,490	7,359	7,394	7,438	7,472	11,687	11,722	11,722
D/ISP	(6,608)	(7,804)	(7,744)	(7,992)	(8,217)	(8,455)	(8,679)	(8,899)	(9,109)	(9,331)	(8,798)	(8,908)	(9,049)	(9,159)	(9,299)	(9,419)	(9,515)	(9,609)	(9,695)	(9,792)	(5,699)	(5,788)	(5,788)

Table 7.9: Stormwater Financial Summary

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## SECTION 8

### ASSET MANAGEMENT IMPROVEMENT PLANS

- 8.1 *AM Improvement Process*
- 8.2 *OAG Minimum criteria*
- 8.3 *Progress During Year*
- 8.4 *Proposed Improvements*
- 8.5 *Monitoring and Review Procedures*

## 8. ASSET MANAGEMENT IMPROVEMENT PLAN

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## 8.1 AM Improvement Process

It is intended that the development of this AMP is part of an ongoing process and that the document will be reviewed and updated regularly. This review process involves using improved knowledge of customer expectations and information from AM systems and databases. This will enable MCC to optimise decision-making and activities, review outputs, develop strategies, introduce risk management and extend the planning horizon.

This chapter describes: -

- The Office of the Auditor General's (OAG) criteria.
- The specific improvements proposed for this AMP over the next two years.
- The procedures proposed in the council for monitoring and review.

## 8.2 OAG Minimum criteria

	Criteria	This plan	Improvements to address
1	Define the Levels of Service (LOS)	Lists some measures but provide inadequate statistical data. Improvements are proposed	Improvement Numbers 6.1
2	Define the Timeframe	Defines life cycles	
3	Describes the Asset	Information is held in supporting databases	1.1, 1.5, 6.2
4	Include financial information	Includes 20 year forecasts, and reconciled with LTFS	-
5	Enable Decline in Service Potential (DISP) to be recognised	DISP is estimated from life and age data.	1.1, 1.5, 6.2
6	Gives assumptions and confidence levels	Yes	-
7	Contain Improvement Program	Yes	-
8	Prepared by Qualified persons	Yes and reviewed internally and by NZ Audit	-
9	Commitment of Council	Subject to council approval.	-
10	Regular Reviews	Reviewed in November 2002	-

**Table 8.1 - OAG Criteria**

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### 8.3 Progress During Year

Progress was made during the 2001/02 year as follows.

- PAMS database was reviewed and updated at Manukau Water. Links for maintaining consistency with GIS data have been established.
- A series of Unit Rates has been established for use in Financial Contributions and for the valuation.
- The valuation has been updated including component-based results for Pipe and manholes (as required for the new valuation rules). Water Quality ponds and Watercourses were specifically itemised and valued. The AMP has been updated to reflect new valuation information.
- Stormwater Priority System (based on MS Access is in use) has been reviewed and updated.
- Open watercourses policy was developed and inventory collected.
- Streams and outfalls asset inventory data captured.
- CCDC applications were lodged to ARC.
- Review of renewal and new capital projects were undertaken.
- Data audit was carried out to identify the gaps at MMI level.
- CCTV data populated into Hansen.

Progress against 2002/03 AMP Improvement items is: -

Priority	Task Reference No	Tasks	Status
1	1.1 & 1.2	Develop LOS descriptions and measures & Review LOS	Deferred
1	1.3	Review all financial cashflow projections outlined in the 20 Yr LTFS	Completed & ongoing
1	4.1	Gap Analysis & Confidence review	Complete
	4.2	Develop strategy and update AMP	Partial
1	4.3	Prepare schedule of future maintenance and renewal works	Partial –Renewals & Capex done
2	8	Incl CCDC, and Life cycle -AMP	CCDC applications lodged
2	3.1	Continue pipe condition monitoring	Ongoing
2	3.2	Initiate/continue with capacity studies	Desktop study completed 50% of the City & Ongoing
1	3.3	PAMS & GIS - Improve documentation and recording systems	PAMS Database reviewed & updated
4	3.4	Assess data needs and develop collection priorities and methods.	Underway under AMST

**Table 8.2: Progress on Improvements**

### 8.4 Proposed Improvements

The following briefly outlines the steps, which will be taken to improve the various processes, information, and systems, which affect Asset Management of the stormwater asset.

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These measures will increase the range and accuracy of information available and thereby enable more accurate projections and improved asset strategies as well as more confident financial projections.

The proposal is to pursue these improvements (and the AM plan itself) over the next two years. Before the two years are up further improvements will be specified to ensure ongoing development of this Plan.

AM improvement activities may be conveniently grouped under the following four broad headings:-

- AM Process Improvements, including AM plan reviews.
- AM Information System Improvements.
- AM Data Improvements.
- Level of Service (LOS) improvements.

Table 8.3 sets out a draft programme indicating when the various AM improvement tasks should be addressed over the next 2 financial years.

An estimate of costs of implementation is shown in Table 8.4.

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Priority	Title Previous Ref.	Task Reference No	Task Description	Category	Requirements for Task Completion	Milestone Dates	Depends On
		<b>1</b>	<b>IMPROVEMENTS – KNOWLEDGE OF ASSETS</b>				
<b>2</b>	Data Improvements 3.3	<b>1.1</b>	Continue to develop PAMS, to support decision-making and the management of stormwater assets.	Data and Systems	Register in use – reports available and linkage developed	Ongoing	e.g. IT, GIS, & Corporate Issues. Is a Manukau Water project
<b>3</b>	Data Improvements	<b>1.2 – 1.3</b>	Enter WQ ponds and open channel data into PAMS & GIS			2003/04	
<b>2</b>	Data Improvements 3.4	<b>1.4</b>	Implement sound documentation and recording techniques, including data collection and entry, updating and data validation Include - customer service queries/complaints, and - that records are kept of actual maintenance and renewal costs. - capture overhead costs and work orders	Process	PAMS updating in place Improvements	Ongoing	Data and process Item 3.3 Corporate issues
<b>2</b>	Data Improvements 3.1	<b>1.5</b>	Continue condition-rating studies including CCTV and physical inspections of stormwater pipes and related structures. Complete sufficient field-work on assets to achieve the required confidence levels.	Process	Complete 16km system pa.	Ongoing- Mar annually	Item 3.3
<b>1</b>	Data Improvements	<b>1.6</b>	Review and correct PAMS - age data and other attributes. Dia., materials, size. Need linkage of location to consents data Improve Renewal projections in AMP	AMP (Process)		Ongoing	Item 3

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STORMWATER ASSET MANAGEMENT PLAN

Priority	Title Previous Ref.	Task Reference No	Task Description	Category	Requirements for Task Completion	Milestone Dates	Depends On
1	Data Improvement	1.7	Reconcile valuation data into PAMS		Valuation report available	2003/04	
		2	<b>IMPROVEMENTS – ACCOUNTING &amp; COSTING</b>				
3	Costing Improvements	2.4	Determine Depreciation based on Condition and performance information.			Jan 04	3.4, 4.2
		3	<b>IMPROVEMENTS – SECONDARY DATA</b>				
5	Data Improvements	3.1	Secondary data – capture overland flow paths in asset register			Review annually	
		4	<b>IMPROVEMENTS – ASSET MAINTENANCE</b>				
4	Maintenance Strategy 4.2	4.1 - 4.2	Review Management Strategy (ie Plan and tactics) and update SLA accordingly	Process	SLA updated	Jun 04	
4	Maintenance Strategy	4.3	Develop cost of consequence and failures	Process	Figures available to include in Risk analysis	Jun 04	
3	Maintenance Strategy	4.4	Review policy for analysis of maintenance information (and determine MMI levels), prior to establishing data collection procedures	Process		Oct 03	Need a workshop with Manukau Water.

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Priority	Title Previous Ref.	Task Reference No	Task Description	Category	Requirements for Task Completion	Milestone Dates	Depends On
		<b>5</b>	<b>IMPROVEMENTS – STRATEGIC PLANNING</b>				
<b>3</b>	Strategic Planning 2.1 & 2.2	<b>5.1</b>	Organisational issues – Adopt AM vision & policy Review and improve individual asset management strategies. Incorporate stormwater policies including water quality, upgrades, watercourse, development and disposals etc. Review as appropriate: standards, Mgt techniques and monitoring, including Quality Assurance procedures. Incorporate, as appropriate, management techniques such as project ranking and selection procedures, optimisation opportunities, and condition and capacity rating.	(Process)	Ongoing Policies MW, IT staff & Others	Aug 2003,	Data & Item 3.3
<b>4</b>	Strategic Planning 5	<b>5.3</b>	Develop Risk Management. Incorporate risk management approach and obtain detailed condition information on critical assets. Relates to and follows item 4.3.	AM Plan (Process)	Risk management	Nov 2005	Corporate issue viz other operating systems ie roading parks
<b>2</b>	Strategic Planning	<b>5.5</b>	Staff training in strategic planning and AM generally.		Ongoing	Review annually	Links to Mgt for performance process MFP
<b>5</b>	Data Improvement	<b>5.4</b>	Establish hydraulic modelling of existing system. Link to predicted growth in nodal areas.			Review annually	

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Priority	Title Previous Ref.	Task Reference No	Task Description	Category	Requirements for Task Completion	Milestone Dates	Depends On
		<b>6</b>	<b>MISCELLANEOUS</b>				
<b>3</b>	Develop LOS 1.1 & 1.2	<b>6.1</b>	Develop Level of Service - cost consequences related to LOS. - Undertake consultation and review with customers over levels of service, including targets. - Develop LOS descriptions and measures. Determine meaningful key targets. Require a broad range of LOS, which reflect customer needs and preferences.	LOS	review, and estimate.	Oct 04 Dec 05 Mar 2004	Data and cost info Item 3.3
<b>1</b>	AMP update 3.2	<b>6.2</b>	Network capacity assessment – Define tasks & initiate process. (Capture capacity results from Financial Contribution figures)	Process	Align with ongoing FC process	Ongoing	Item 3.3
<b>3</b>	AMP update 8	<b>6.3</b>	Define scope and outline process for covering CCDC and linking ARC requirements into the AMP. . Covers environmental monitoring, regional strategy, and relationship to Capex& Opex projections.	Process & AM Plan	Tasks defined and timetable	Nov 2003	MCC-ARC

Table 8.3: Improvement Tasks

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STORMWATER ASSET MANAGEMENT PLAN



Priority	Task Ref.	Task Description	2002/03 AMP		2003/04 Forecast		2004/05 Forecast	
			Cost (\$000)	Resource (days)	Resource (days)	Cost (\$000)	Resource (days)	Cost (\$000)
2	1.1	Continue to develop PAMS, to support decision-making	50	5	5	5	5	5
3	1.2 – 1.3	Enter WQ ponds and open channel data into PAMS & GIS		5	0		5	0
2	1.4	Implement sound documentation and recording techniques, including data collection and entry, updating and data validation	10	10	15	10	15	15
2	1.5	Continue condition-rating studies including CCTV and physical inspections	50	3	50	3	50	50
1	1.6	Review and correct PAMS age Data and other attributes		5	5	5	5	5
1	1.7	Reconcile valuation data into PAMS	3 pd	3	3	3	0	0
3	2.4	Determine Depreciation based on Condition		5	10	5	5	5
5	3.1	Secondary data – capture overland flow paths in asset register		2	5	2	5	5
2	4.1 – 4.2	Review Management Strategy (ie Plan and tactics) and update SLA accordingly		5	2	5	2	2
4	4.3	Develop cost of consequence and failures					5	15
3	4.4	Review policy for analysis of maintenance information	5 pd	10	10	10	5	10
3	5.1	Organisational Issues – Adopt AM vision and policy, review and improve individual asset management strategies	20	15	40	10	20	20
4	5.3	Develop Risk Management, corporate risk management approach		10	20	5	10	10

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Priority	Task Ref.	Task Description	2002/03 AMP		2003/04 Forecast		2004/05 Forecast	
			Cost (\$000)	Resource (days)	Resource (days)	Cost (\$000)	Resource (days)	Cost (\$000)
5	5.4	Establish hydraulic modelling of existing system						
2	5.5	Staff training in strategic planning, and AM generally		12	12	16	12	16
3	6.1	Develop Level of Service <ul style="list-style-type: none"> <li>- Cost consequences related to LOS</li> <li>- Undertake consultation and review</li> <li>- Develop LOS descriptions and measures</li> </ul>		9	5	5	5	10
1	6.2	Network capacity assessment – Define tasks & initiate process	35 and 5 pd	15	15	25	15	25
3	6.3	Define scope and outline process for covering CCDC	8 pd	8	8	20	8	20
		<b>Totals</b>		122 md	1082 md	\$230		\$213

Table 8.4: Improvement Program and Costs

Note – “pd” equals person-days

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## 8.5 Monitoring and Review Procedures

The AM plan is a living document, which is relevant and integral to daily, AM activity. To ensure the plan remains useful and relevant, the following processes must be implemented:

- Formal adoption of the plan by Manukau City Council by 30 June each year.
- Revise the AM plan annually to incorporate outcome of service level review and new knowledge resulting from the AM improvement programme. The next cycle is to be completed by February 2004.
- Complete annual quality assurance audits of AM information to ensure the integrity and cost effectiveness of data collected.
- Peer review: Annual internal audits will be undertaken to assess the effectiveness with which the AM plan meets corporate objectives. Periodic internal audits will be undertaken to assess the adequacy of AM processes, systems, data and external audits are to be undertaken to measure AM performance against 'best practice'.

Table 8.5 outlines the procedures and timetables adopted to achieve these objectives.

Activity	Action	Target Date
AM Plan Development	<ul style="list-style-type: none"> <li>• Adoption of AM plan by Manukau City Council.</li> <li>• Complete next revision of AM plan (version. 2004/05)</li> <li>• Annual update and enhancement,</li> </ul>	<ul style="list-style-type: none"> <li>• June 2003</li> <li>• April 2004</li> <li>• Annually</li> </ul>
AM Plan Peer Review	<ul style="list-style-type: none"> <li>• Annual review of plan context by AM Team</li> <li>• External review of technical content, with results reported in Annual Plan.</li> <li>• Review of the AM plan and formal adoption by Manukau City Council.</li> </ul>	<ul style="list-style-type: none"> <li>• January each year</li> <li>• February each year</li> <li>• March each year</li> </ul>
AM System	<ul style="list-style-type: none"> <li>• Confirm data collection and entry standards and quality assurance processes</li> <li>• Undertake quality audits on data integrity and report results</li> <li>• Review data collection and entry standards and quality assurance processes</li> </ul>	<ul style="list-style-type: none"> <li>• Annually</li> <li>• Annually</li> <li>• Annually</li> </ul>

**Table 8.5: AM Monitoring and Review Programme**

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## SECTION 9

### REFERENCES AND ACKNOWLEDGEMENTS

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n:\...infrastructure policy\amps\2002-03		Document Type: PUBLIC	9-1

## 9. REFERENCES AND ACKNOWLEDGEMENTS

Material from the following Manukau City Council documents has been used in the preparation of the asset management plan:

1. Long Term Financial Strategy (LTFS) (2001 to 2011).
2. Tomorrow Manukau
3. Annual Report (year ending 30 June 2002).
4. Business Plan 2002/2003.

Material from the following documents has been used in the preparation of this asset management plan:

5. Regional Growth Forum – Capacity for growth.
6. Regional Growth Forum – Draft regional growth strategies to 2050 (July 1998).
7. Statistics New Zealand population data.
8. Tamaki Estuary Pollution Action Plan (June 1996).
9. NAMS International Infrastructure Management Manual (IIMM) version 1, April 2000.

Material from the following reports prepared for Manukau City Council by various consultants has been in the preparation of the asset management plan: -

10. Manukau Stormwater Valuation, GHD Ltd, August 2001
11. Various Urban Areas of the City – Catchment Management Plans, Manukau Consultants..
12. Urban Areas of the City – Guidelines for the Design of Urban Drainage Systems in Manukau City, Beca 1989..
13. Howick Ward – Sommerville Sub-Catchment Study, Beca, 1989.

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