



**YORKE PENINSULA COUNCIL**

**COMMUNITY WASTEWATER  
MANAGEMENT SYSTEMS (CWMS)  
INFRASTRUCTURE ASSET  
MANAGEMENT PLAN**

**MAY 2009**

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**Typical Activated Sludge Treatment Plant**



**Gravity Effluent Drains Under Construction**

**Figs 1 and 2 CWMS Infrastructure**

**CWMS  
INFRASTRUCTURE ASSET MANAGEMENT PLAN**

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# SYNOPSIS

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YORKE PENINSULA COUNCIL

**CWMS**  
**INFRASTRUCTURE ASSET MANAGEMENT PLAN**  
MAY 2009



## YORKE PENINSULA COUNCIL

### CWMS INFRASTRUCTURE ASSET MANAGEMENT PLAN

## SYNOPSIS

### 1. Compliance

This document has been prepared in accordance with the requirements of Sec 122 of the Local Government Act 1999 by GPE Pty Ltd in consultation with Council staff, primarily the Director Engineering Services, the Infrastructure Co-ordinator (Water/Waste water), and the Manager, Finance.

### 2. IAMP Outputs

The modelling seeks to identify the current inherent necessary commitment of Capital Renewal Expenditure, in order to retain the existing CWMS Network.

### 3. Methodologies and Data Sources

Expenditure modelling herein is based on;

- methodologies developed by the IPWEA and Jeff Roorda and Associates; and
- first-principles construction of year-by-year capital renewal expenditure needs from an assessment of estimated aggregated remaining useful lives for each asset group; and
- recognising the imprecise nature of infrastructure lives, costs and performance, a high and low range estimate of future costs have been evaluated. Actual costs are most likely to fall within the limits of these estimates. The mid-range scenario has been incorporated into this report.

The Plan has consciously been developed using readily-available information. Current data across all systems (eg, condition and remaining useful life of each component) have been taken from the CWMS Audits (LGA 2004-2006) and Council's Inventory Sheets for the Yorke Peninsula Council. Ongoing regular updates of the Inventory Sheets are likely to occur, allowing the CWMS Infrastructure Asset Management Plan to be



updated, as required by the Act, within four years from November 2008 (ie, within two years of the election of a new Council).

Where no data existed, figures were either hypothecated from similar Council areas elsewhere in the State, or in discussion with staff.

For the sake of simplicity, aggregated information at the strategic level across the various CWMS asset categories has been used, eg, simple drain lengths and unit rates per metre (not per Class), average relaying costs per metre (not per locality), etc.

***It is important that the reader understands the principal purpose of this edition of the IAMP is to identify aggregated asset consumption and gross Capital Renewal Expenditure needs for each asset class at the network level, not at the individual segment level.***

In preparing the Plan, extensive input has been provided by experienced Council staff, whose local knowledge has ensured that practical, realistic values have been assigned to the model parameters, including useful lives and unit costs (see Appendix 1.2). Generally, assigned lives are conservative, ie, ***in practice longer lives may be experienced***, depending on the timeliness and appropriateness of system maintenance and repair practices.

A 1-70 year capital renewal expenditure scenario (CRE) has been constructed for all CWMS asset components from first principles and the database, producing histograms of likely renewal years. These were derived from a combination of

1. interpretation of the condition information from the existing database (where these were available); and/or
2. best-guesses of the age or remaining life profiles of asset groups, from local knowledge.

Ongoing monitoring of the field situation and Council's unit costs, and updating of age and condition data will eventually produce more refined outputs.

#### **4. Limitations and Exclusions**

The Plan at this stage does not include committed new capital works. ***Generally in the case of CWMS, these will be “donated” assets. If not, they need to be added to proposed expenditure in the years in which they are to occur, since this expenditure is additional to Council's long-term maintenance and Capital Renewal expenditure.***

It is important to note that any capital expenditure on new assets will add to the ongoing renewal expenditure requirements (but not necessarily in the short term).

Aggregated data give a good approximation of long-term average needs for Capital Renewal expenditure. The plan is NOT intended as a works programming document for any one year at this stage of its development, but it is a gross indicator of the overall capital renewal expenditure needed on CWMS averaged over short and long term periods.

Certain other items have not been costed into the first (simplified) plan, although the level of expenditure in the recent past has included some upgrade component due to replacement of obsolete components with current-standard items. It is unlikely that these have been identified in expenditure records as upgrades.

Items not specifically incorporated into the plan include:-

- New CWMS assets from potential growth, either donated or Council-funded
- Specific works identified in the individual system audits carried out by Council. These have not been costed individually. However, there is an ongoing program of replacement and upgrading of items such as alarms, sludge pumps and switchboards. Assumptions could be made as to the split between renewal and upgrade portions of recorded expenditure for the aggregated modelling. However, for the sake of simplicity, ***even though expenditure on upgraded equipment is not strictly renewal, it is nevertheless inherent in future replacement items, and is therefore treated as renewal expenditure in the model.*** No other known major deficiencies which would require significant ***new*** capital works are thought to exist; the known deficiencies should all be covered by allocation of funds to continue the ongoing program of replacement/upgrade works implemented by Council over the past two years or so.
- “Disposal” of any “surplus” CWMS assets. No CWMS’s within the actively-replaced network are regarded as superfluous, ie, there are no potential savings in capital renewal expenditure by closing any CWMS.

## 5. General Routine Maintenance and Levels of Service

For the first edition of the Plan, the fundamental assumption is made that the Level of Service provided by the existing network, as it is presently maintained by Council, is reasonable. It has been noted that Council has



embarked on a program of improved compliance and preventative maintenance expenditure. The Plan assumes that there is room for the level of expenditure on compliance to be maintained at the current level.

Therefore, and with the above proviso, general maintenance practices and levels of expenditure are assumed to be “about right”. Unless a detailed condition-based model is populated, and Levels of Service are prescribed, then the best indicator of the appropriateness of maintenance expenditure derives from public perceptions, lack of complaint, manageable level of faults, blockages and call-outs, and the general “feel” of management for the overall health of the network. In Yorke Peninsula’s case, the evidence is strong that recent routine maintenance effort and expenditure is appropriate on a network-wide basis for the next few years at least (but not always at an individual component level). However, there may be a case for increased expenditure on line-flushing, pump-station cleanouts and septic tank desludging, based on the number of systems for which flushing has not apparently yet been commenced.

This is not to be confused with obvious major deficiencies in some components; major known deficiencies require **renewal**, not maintenance.

It should be understood that, in the very long term, there is already a large gap between **predicted** capital renewal expenditure need, and historical **actual** capital renewal expenditure.

The main point is to emphasize that an upwards change in standards of maintenance needs to be quantified and disclosed to the community (eg, by inclusion in the Council Budget Papers for information of the community), if such is to occur. The requirement for community consultation is encompassed by provisions of the Local Government Act relating to the annual Budget cycle and Council’s Business Plan. Infrastructure Asset Management Plans (required pursuant to Sec 122) constitute part of the financial and business plans of Council, and therefore need to be included in the consultation process.

Council may also wish to inform communities about the potentially higher scrutiny and raised compliance standards (and costs) imposed by the Regulators, and Council’s consequential need to exercise due diligence in relation to the various Conditions of Approval and Licencing of their CWMS assets.



## 6. Gap Estimation and Expenditure Adjustment Options

### 6.1 General Comment on Gap Estimation

In assigning input values to the various parameters of the model, it is recognised that, with some notable exceptions, much of Yorke Peninsula Council's CWMS network is generally in good condition (supported by the Audit Reports and Inventories).

An assessment has been made of the current state of health and remaining useful lives of the various categories of CWMS asset components. This has allowed an estimation of the future capital renewal expenditure needs to be made, with an approximation of when those works are likely to be needed. Expenditure needs are modelled into the years when they are apparently due (from the current available data), primarily allocated on the basis of assessed end-of-useful life. ***It should be noted that life-estimation is not a precise science, so the results should be regarded as indicative only.***

Recent past expenditure records have then been compared with the long-term average requirements and shorter term requirements. Council's proposed real increases in Service Charges have also been taken into account to show the changing sustainability ratio over the next few years.

### 6.2 Findings

The appendices contain calculated long-term sustaining levels of necessary Capital Renewal Expenditure for the principal CWMS asset subgroups.

The most significant findings for Yorke Peninsula are;-

- In the short to medium term, current levels of Capital Renewal Expenditure meet and exceed the inherent requirement, a very sound position (100% sustainable) in which Council finds itself with its CWMS network.
- Over the long term, there is a relatively small estimated gap between predicted capital renewal expenditure need and actual capital renewal expenditure, averaged over the past few years and this year's budgeted expenditure. The gap is roughly 20% of the estimated currently-available CWMS Capex budget of \$381,000 pa.
- There is ample time to review the Plan and costings before any major changes need to be made to current charges and practices



- An important assumption is the ongoing raising of the general residential Service Charges to at least the level indicated in Council's forward financial planning documents (supplied in part to GPE) at approximately \$350 per connection per annum for occupied properties (in 2008 prices).

### **6.3 1-10 and 11-20 Year Gap Estimates**

#### **6.3.1 1-10 Years**

Referring to the 1-10 year construct "model" of Appendix 1.1, the modelling shows a requirement for approximately \$124,000pa of Capital Renewal Expenditure compared with current expenditure of up to \$180,000pa.

This does not indicate over expenditure presently, but a concentration or "backlog" of essential renewal and concomitant upgrading of pumps, switchboards, telemetry and control systems.

Therefore there is no "gap" in funding during this period.

#### **6.3.2 11-20 Years**

The estimated Capital Renewal Expenditure need in the second ten year period is \$219,000 pa, indicating the need to allocate more of the available CWMS Capex budget to renewal. On the indications from Council's forward Service Charges proposals, the additional funds will be available, thus maintaining the Sustainability Ratio at 100%.

## 7. Testing the Plan

The mathematical modelling and spreadsheets are designed to allow multiple trials of parameter values to be tested.

***It is particularly important to test the results by substituting different cost and life figures if and when they become available.***

The findings of the first edition of the CWMS IAMP can be used to:-

- Identify items for careful checking, debate and adoption of unit cost figures and useful lives
- Provide input to Council's long term financial and business plans, on the basis of the CWMS indicators of renewal funding requirements
- Form the basis for informing communities about the cost of mandatory Compliance Levels of Service to be maintained or raised (eg the two primary Regulators, namely, the EPA and Department of Health)
- Form the basis against which to assess Council's capacity to invest in new capital works and upgrades, or to accept ownership of additional CWMS infrastructure from new land developments, by adding their life-cycle costs to the known existing assets total life-cycle cost
- Demonstrate to Council the fluctuating nature of annual asset preservation and renewal costs
- For annual budget purposes, to indicate the total amounts required to fully fund renewal works for the whole CWMS Asset. ***Within those allocations, Council managers should have the authority and responsibility to determine actual priorities across the whole spectrum of individual asset components, based on current inspection and other agreed determinants***
- Identify any gaps, shortcomings or need for updating of data (condition, risk factors, redundancy, statutory compliance etc)
- Identify any gaps or needs in systems (eg, GIS and Asset Register systems, corporate accounting and reporting systems, job cost recording systems including depot timesheets and job numbering)
- Form the basis for future (expanded) revisions of the IAMP



- ***This Plan should not be used as a tool for determining actual works programs, which require much greater detailed evaluation of current asset attribute data on an individual basis***

## **8. Applying the Findings of the Plan**

The findings of the first edition of this CWMS Infrastructure Asset Management Plan should be applied with caution. As stated, the completeness, currency and accuracy of the multitude of data variables lie within broad confidence levels only. The results should be used as gross indicators of the sustainability of the asset overall, in the knowledge of the intent to pursue a continuous program of improvements to the Plan in future updates.

Council has recently invested in staff resources to commence data capture on the extent, condition and costs of their CWMS's, and intends to maintain the quality and currency of its database. The individual system audits are a good example of the commitment of Council to improved information and records for CWMS.

Ongoing improvements to the financial modelling of capital renewal requirements will come about through gradual completion of detailed attribute data of the myriad components of the network, careful monitoring of actual unit costs and achieved useful lives. Changes to these inputs have a direct effect on the annual asset consumption figures.

Adding any proposed new capital works expenditure or "big ticket" upgrade works into the Plan will ensure that sustainability is addressed at the time of making decisions on whether to proceed with such works, or not.

Should Council wish to change the Level of Service provided by any component of its CWMS Network (eg, compliance or increased maintenance effort), the financial information in the Plan should be modified to reflect the potential costs of so-doing.

## **9. Continuous Improvement Program**

A step-wise Improvement Schedule to the first Plan would be as follows;-

1. careful checking, debate and adoption of unit cost figures and useful lives in this edition
2. completion of full records of system records (drawings, quantities, condition etc) in a formal user-friendly database

3. full accounting for future Capital Renewal expenditure and sourcing of funds for same (grants, connection and headworks fees, service charges, rebates and exemptions)
4. costing and inclusion of proposed upgrade capital works (where these are not covered by normal budget allocations)
5. ongoing in-house review of unit cost rates and achieved useful lives
6. Costing of mandatory Compliance Levels of Service and/or required once-off improvement works
7. visual examination of gravity drains for better life estimation (CCTV)
8. refining the modelling into a greater number of components, valuation of components by technical class (eg, Rising Main Pressure classes). This should only be undertaken if the approximate figures and coarser component aggregation prove to be insufficiently accurate for gross financial planning purposes

Suggested Program:	Item 1	Immediate and ongoing
	Item 2	Years 1-5
	Item 3	Years 3-4
	Item 4	Years 2
	Item 5	Ongoing
	Item 6	Years 2
	Item 7	Long term
	Item 8	Ongoing, if warranted

## 10. Conclusion

The principal objective of Council's first CWMS Infrastructure Asset Management Plan is to model and bring to account an estimate of the inherent Capital Renewal Expenditure requirement embodied in the *existing* CWMS network.



Individual asset groups have been modelled as well as the combined Total CWMS Assets. Indicative Capital Renewal Expenditure needs have been charted for each asset subgroup over their estimated life cycle periods.

A substantial gap between necessary and actual Capital Renewal Expenditure has been identified. **The results should be regarded as indicative only**, i.e., the funding “gap” should not be regarded as an accounting figure, but as a guide to Council and Managers on the overall expenditure needs on the CWMS Assets. Short, medium and long term scenarios have been modelled.

In the period to 40 years, the Sustainability Ratios look very sound. Estimated Capital Renewal Expenditure requirements appear to be fully coverable within Council’s current CWMS Capex capacity. That is to say, the sustainability ratio is 100%.

In the long term (beyond 40 years) the ratio drops to around 82% (but only 40% at the current rate of specific renewal expenditure. However the capacity is there to achieve 82% without increasing Capex funds).

The models can be re-run easily (and need to be) if and when more precise data become available, or to check the impact of different assumptions about the life and unit costs pertaining to groups and subgroups of the CWMS Assets.

Future editions of the Plan will benefit from implementation of the recommended Continuous Improvement Program, particularly from more comprehensive attribute, condition and unit cost data.



## APPENDIX 1.1

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YORKE PENINSULA COUNCIL

**CWMS**  
**INFRASTRUCTURE ASSET MANAGEMENT PLAN**  
MAY 2009



## **YORKE PENINSULA COUNCIL**

### **CWMS**

### **INFRASTRUCTURE ASSET MANAGEMENT PLAN**

## **APPENDIX 1.1: Tables and Charts of Capital Renewal**

### **1.1 Tables and Charts**

#### **1.1.1 Aggregated Temporal Capital Renewals**

##### **1.1.1.1 Long Term Aggregated Renewal Graph**

##### **1.1.1.2 Treatment Plants Graph**

##### **1.1.1.3 10 and 20 Year (Aggregated) Graph**

##### **1.1.1.4 Consensus Data**

#### **1.1.2 Asset Data**

##### **1.1.2.1 All Assets and Schemes (Inventory)**

##### **1.1.2.2 Gravity Pipes Graph**

##### **1.1.2.3 Gravity Pipes Data**

##### **1.1.2.4 Rising Mains Graph**

##### **1.1.2.5 Rising Mains Data**

#### **1.1.3 Pumps Profile**

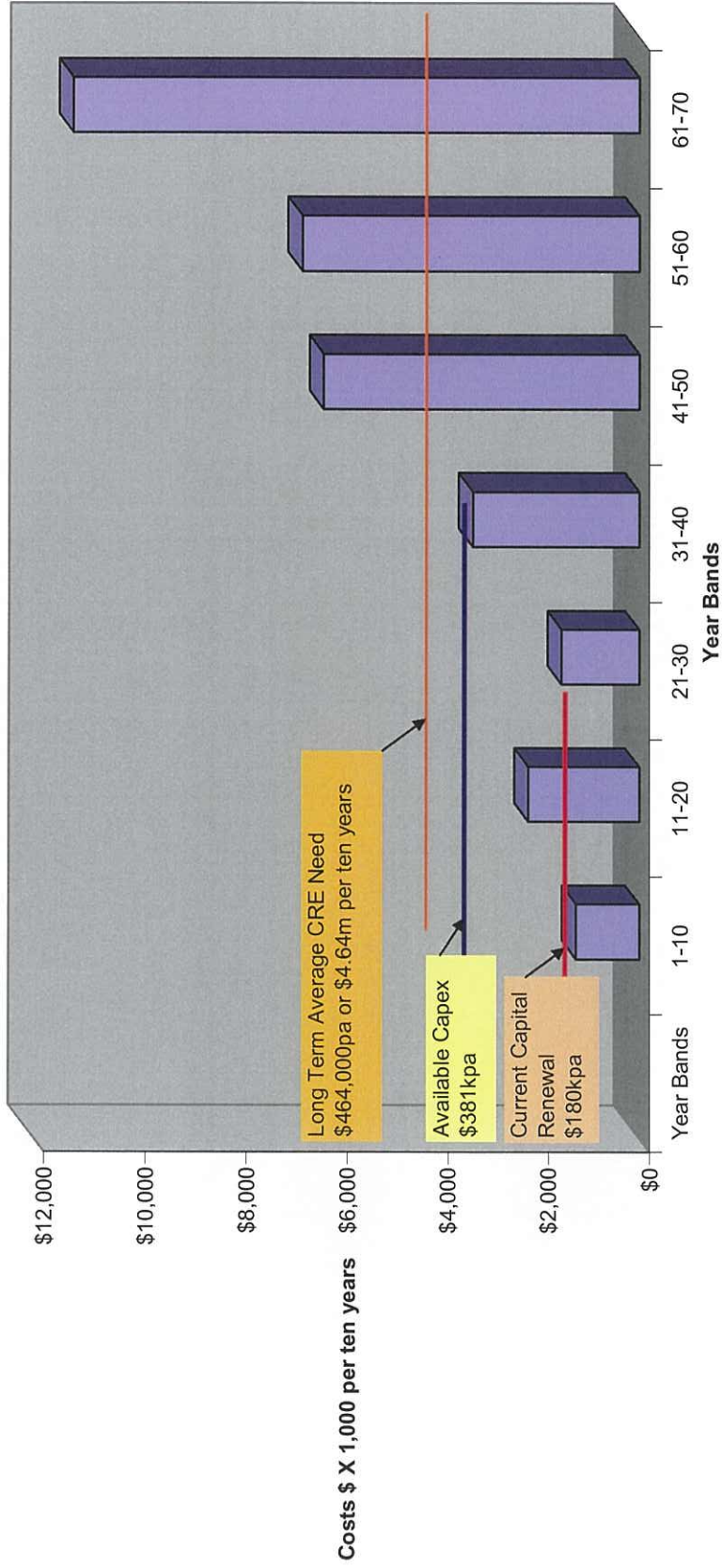
##### **1.1.3.1 Pumps Replacement Graph**

##### **1.1.3.2 Pumps Profile Data**





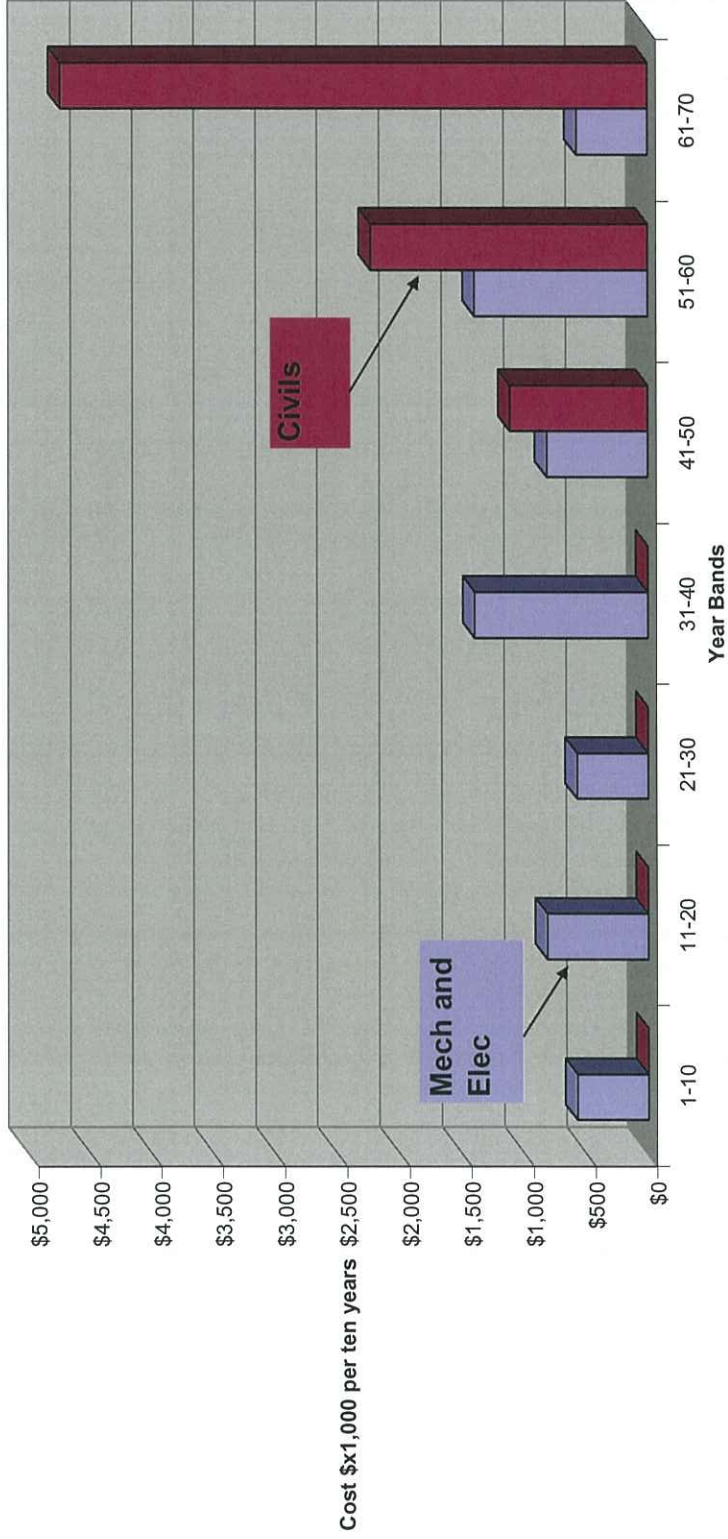
### Aggregated Long Term Replacement



### 1.1.1.1 Long Term Aggregated Capital Renewal Expenditure Requirements



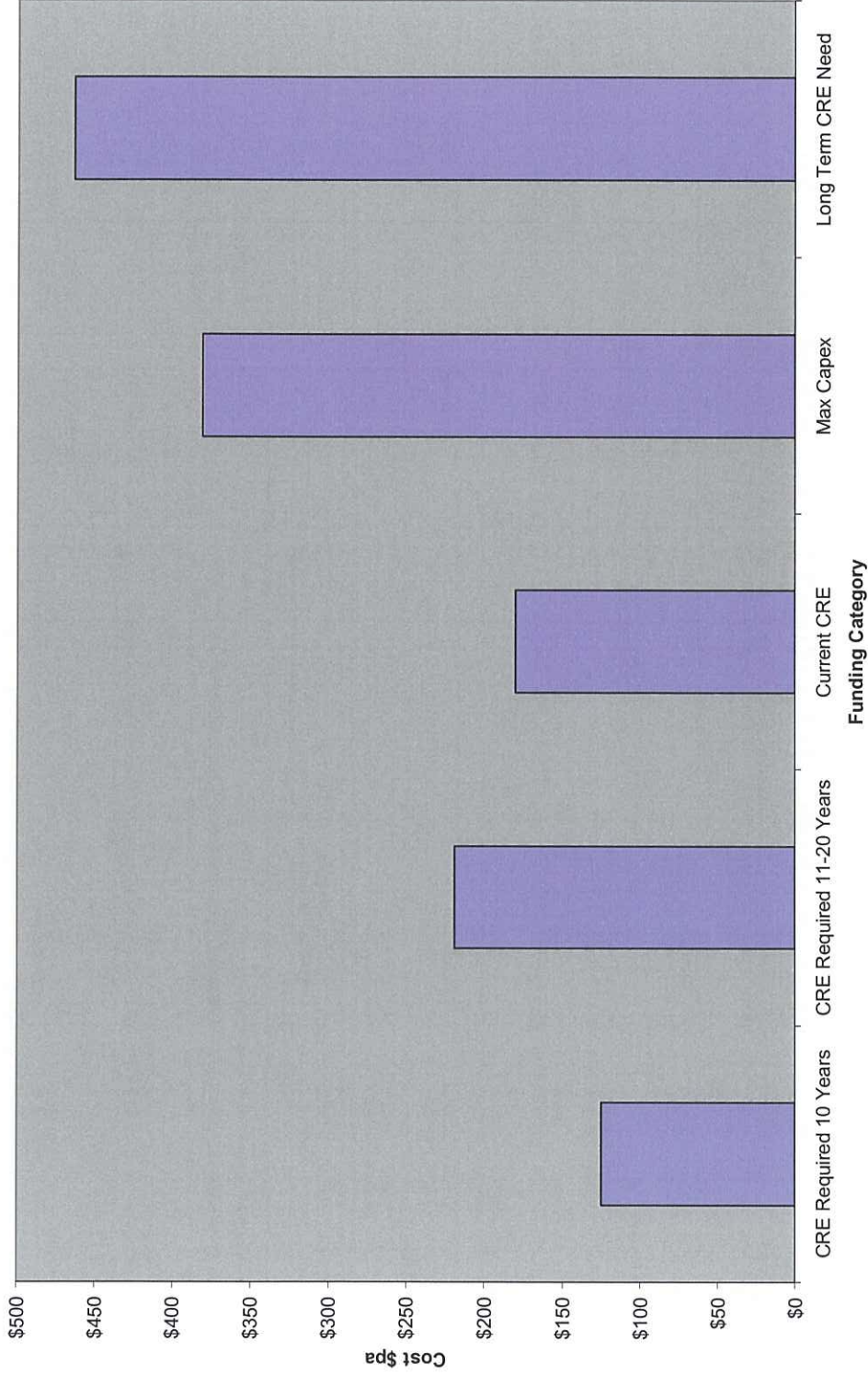
### Treatment Plant Renewals



### 1.1.1.2 Treatment Plants Capital Renewal Expenditure Requirements



Funding Picture by Period



### 1.1.1.3 10, 20 Year & Long Term Aggregated Capital Renewal Expenditure Needs vs Current Expenditure



CWMS Gross Weighted Average Capital Renewal Requirement

Component Unit	Meas.	Unit	Renew	Current	Re	Useful	Life	Long	YEAR BANDS COSTS IN 1,000's											
									1-10	11-20	21-30	31-40	41-50	51-60	61-70					
Gravity Drains																				
PVC 100mm	29493	80	2359440	70	33706.29	0	114.3188	293.6425	248.57	1720.386	180.4444	1611.671	Gravity							
150mm	9618	100	961800	70	13740	14.57005	457.2754	17.93237	322.7826	1072.58	14.57005	457.2754	Rising							
225mm	959	190	182210	80	2277.625	165.8744	112.0773	154.6667	154.6667	89.66184	171.4783	153.372	Pumps							
VC 100mm	10670	80	853600	60	14226.67	322.7826	457.2754	322.7826	780.058	457.2754	780.058	322.7826	PS Mech							
150mm	2574	100	257400	60	4290	68240.58	84033.33	0	0	358.6473	717.2947	1524.251	PS Civ							
Rising Mains All Classes													TP Mech							
Small bore	8354	45	375930	50	7518.6	0	0	0	0	1118.092	2236.185	4751.892	TP Civ							
70-80mm	7648	55	420640	50	8412.8	0	0	0	0	401.1846	802.3692	1705.034	Reuse Civ							
90-110mm	3950	95	375250	40	9381.25	62125.64	161.3913	228.6377	161.3913	390.029	228.6377	390.029	Other							
>110mm	5180	130	673400	40	16835	42147.65	464320.5	1245.627	2192.68	1531.424	3298.211	6269.561	Total							
													32482.72							
Pumps													464.0388							
Large Subi	46	3600	165600	15	11040	124562.7	219268	153142.4	329821.1	626956.1	669653.3	1124868								
Small Subi	10	2500	25000	15	1666.667															
Large Abov	2	4000	8000	20	400	13106.67														

Pump Stations ex Pumps  
 Year Band: 1-10 11-20 21-30 31-40 41-50 51-60 61-70  
 1245.627 2192.68 1531.424 3298.211 6269.561 6696.533 11248.68

Gross Weighted Average Capital Renewal Requirement  
 464320.5 pa  
 NOTE: A 10% change in useful lives will cause a range of Capital Renewal Requirement of +/-  
 46432.05 pa

Current Estimated Operating and Maintenan 484000  
 Estimated Compliance Expenditure Gap 20000 Extra Compliance Costs: nominal allowance  
 Estimated Total Income Year 1 modified\*\* 705000 Modified to account for proposed Service Charge increases  
 Current Estimated Renewal Expenditure 180000  
 Current Estimated Total Capital Funding Avai 381000

Sustainability Current 38.76632 %  
 Achievable 82.05536 %

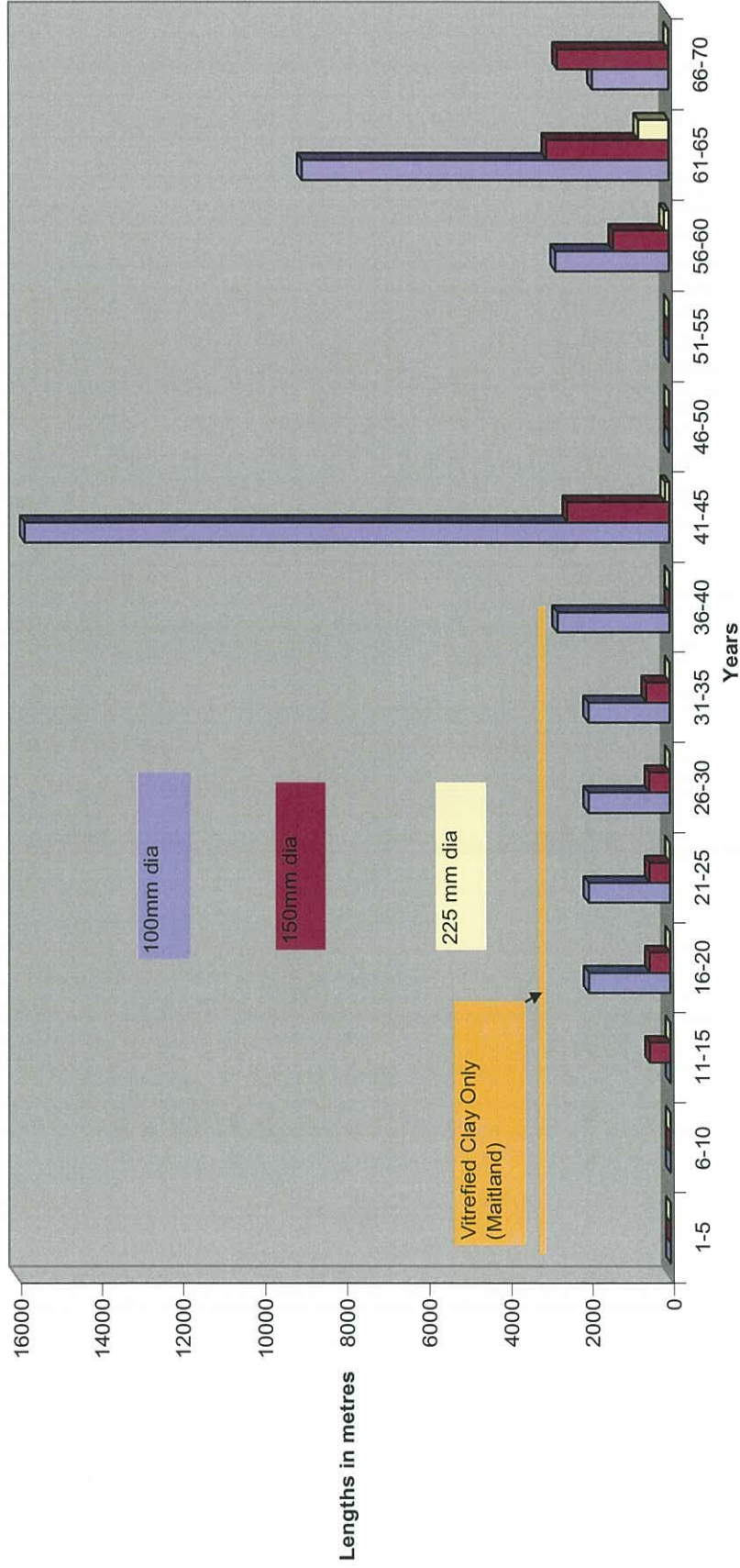
\*\*NOTE: Excludes loan repayments of \$200,000 pa

1.1.1.4 Consensus Capital Renewal Expenditure Need - Data





### Gravity Replacements

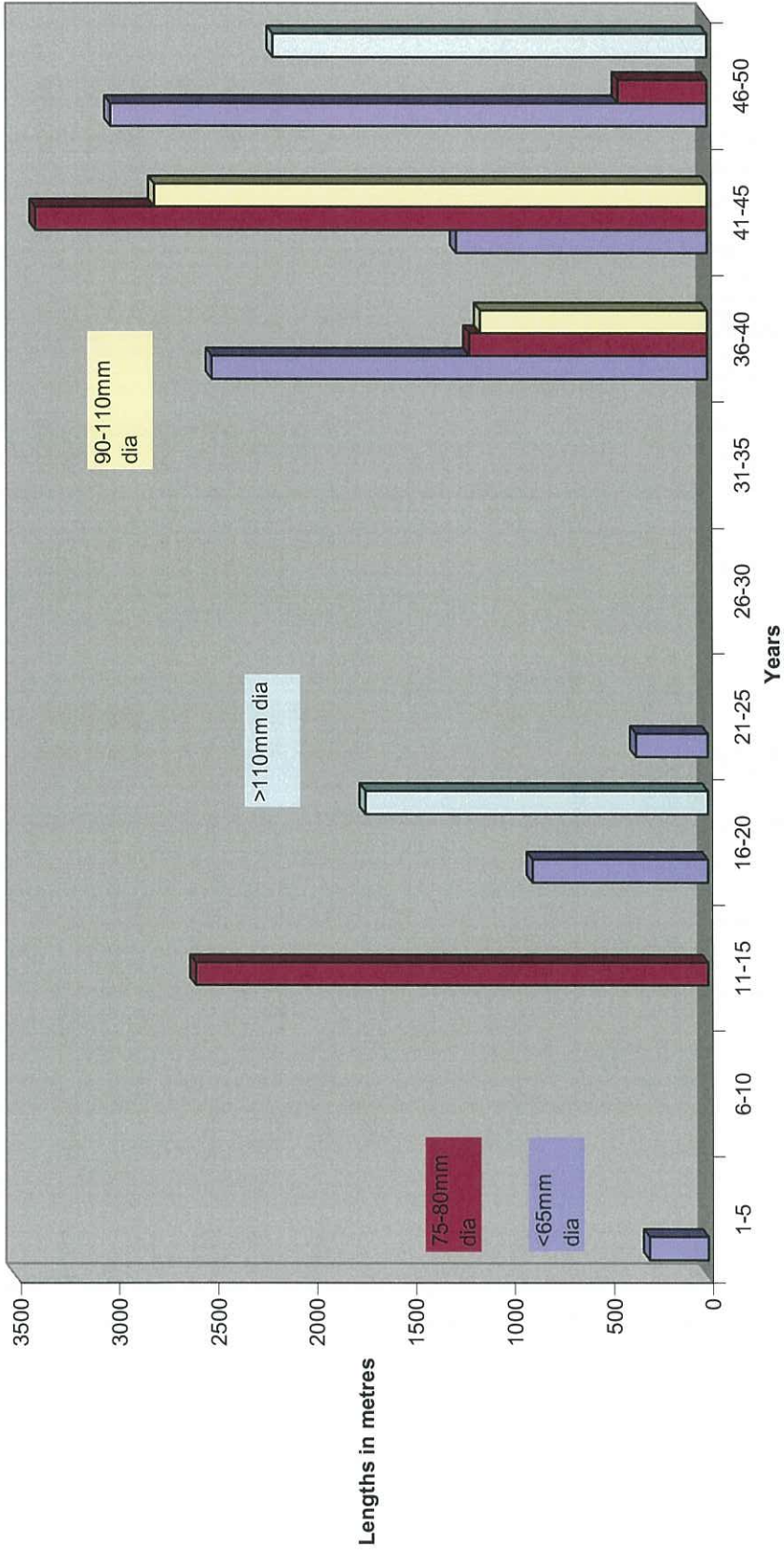


### 1.1.2.2 Gravity Pipe Capital Renewal Expenditure Needs by Diameter





### Rising Main Replacement



### 1.1.2.4 Rising Mains Capital Renewal Expenditure Needs by Diameter





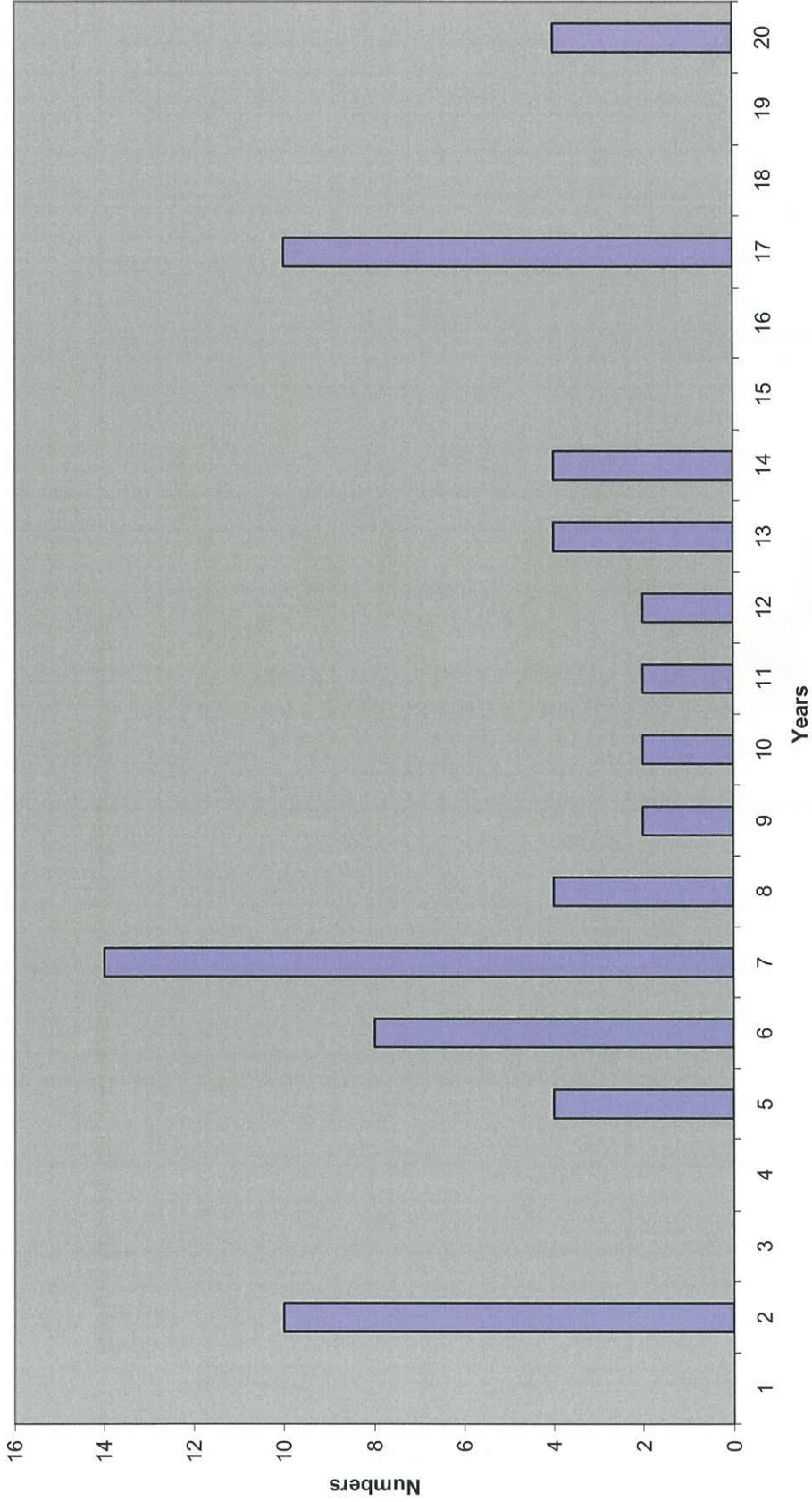
**RISING MAIN 50 YEAR LIFE**

Age	40-63 mm	63-75 mm	75-80mm	100mm	150mm	Condn	Due	<60	75-80	90-110	>110	<60	75-80	90-110	>110
26	366	488	2					24	366				300		
			1		2980		1	16	488			16			
44	150		1					12	150	1733		12	1733		
	150		0					4	150			4			13500
14	300		2					2	150			2			407865
	600		2					36	300			36			16470
9	300		2					36	600			36			288475
9	180		2					41	300			41			958800
9	130		2					41	180			41			13500
9			2					15	130			15			407865
9			9					15	700			15			
9			9					15	160			15			
11	400		1					41				41			
11			2					39				39			
11	670		2					39	670			39			
10	940		2					40	940			40			
10			2					40				40			
10			2					40				40			
10			2					40				40			
2			2					42				42			
8	460		2					42	460			42			
8			2					42				42			
7			2					43				43			
7			2					43				43			
6			2					44				44			
4	1900		2					46	1900			46			
9			2					41				41			
3			2					47				47			
3	400		2					47	400			47			
2	170		2					48	170			48			
2	550		2					48	550			48			
8	200		2					42	200			42			
7			2					43				43			

**1.1.2.5 Rising Mains Capital Renewal Expenditure Need - Data**



### Pump Replacements



### 1.1.3.1 Pumps Replacement Schedule – Numbers per Year



Age	Raw No	Year Due	Number	Pumps	Pumps
1	0.066667	15			
2	0.133333	14		10	2
3	0.2	13			2
4	0.266667	12		4	2
5	0.333333	11		8	2
6	0.4	10		14	1
7	0.466667	9		4	1
8	0.533333	8		4	2
9	0.6	7		2	2
10	0.666667	6		2	2
11	0.733333	5		2	2
12	0.8	4		2	2
13	0.866667	3		4	2
14	0.933333	2		4	2
15	1	1			2
16	1.066667			0	0
17	1.133333			10	0
18	1.2				2
19	1.266667			4	2
20	1.333333				2
21	1.4				2
22	1.466667				2
23	1.533333				2
24	1.6				2
25	1.666667				2
26	1.733333				2
27	1.8				2
28	1.866667				2
29	1.933333				2
30	2				2
31	2.066667				2
32	2.133333				2
33	2.2				2
34	2.266667				2
35	2.333333				2
36	2.4				2
37	2.466667				2
38	2.533333				2
39	2.6				2
40	2.666667				2
41	2.733333				2
42	2.8				2
43	2.866667				2
44	2.933333				2
16	1.066667	1			11
17	1.133333	2			10
18	1.2	3			10
19	1.266667	4			10
20	1.333333	5			10
21	1.4	6			10
22	1.466667	7			2
23	1.533333	8			2
24	1.6	9			2
25	1.666667	10			2
26	1.733333	11			2
27	1.8	12			2
28	1.866667	13			2
29	1.933333	14			2
30	2	15			2
31	2.066667	1			2
32	2.133333	2			2
33	2.2	3			2
34	2.266667	4			2
35	2.333333	5			2
36	2.4	6			2
37	2.466667	7			2
38	2.533333	8			2
39	2.6	9			2
40	2.666667	10			2
41	2.733333	11			2
42	2.8	12			2
43	2.866667	13			2
44	2.933333	14			2
1			1		3

### 1.1.3.2 Pumps Profile Data



## APPENDIX 1.2

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YORKE PENINSULA COUNCIL

**CWMS**  
**INFRASTRUCTURE ASSET MANAGEMENT PLAN**  
MAY 2009



**YORKE PENINSULA COUNCIL**

**CWMS  
INFRASTRUCTURE ASSET MANAGEMENT PLAN**

## **APPENDIX 1.2: Source Documents and Data**

### **1.2 Source Documents and Data**

- 1.2.1 Values of CWMS from Council (modified)**
- 1.2.2 Example Council Audit (1 of 14 audits) Updated 2009**



Scheme	Current Replacement Value	Depreciation 2007/08	Written Down Value
Ardrossan / Tiddy Widdy	\$ 4,613,666.00	\$ 58,145.00	\$ 2,360,718.00
Maitland	\$ 2,465,288.00	\$ 33,117.00	\$ 756,980.00
Black Point	\$ 769,639.00	\$ 13,077.00	\$ 485,170.00
Yorketown	\$ 2,858,757.00	\$ 48,242.00	\$ 2,099,912.00
Sultana Point			
Rogues Point			
Bluff Beach	\$ 21,871.00	\$ 364.00	\$ 20,777.00
Hardwicke Bay	\$ 287,467.00	\$ 5,133.00	\$ 277,201.00
Chinaman Wells			
Port Victoria	\$ 249,537.00	\$ 5,096.00	\$ 236,456.00
Port Vincent Marina	\$ 1,479,735.00	\$ 17,275.00	\$ 836,312.00
Port Vincent Rise			
Stansbury	\$ 1,144,445.00	\$ 19,074.00	\$ 1,365,732.00
Foul Bay			
Point Turton	\$ 13,890,405.00		

Add 22% to give 09 costs and 6 private schemes => approximately \$19.6m

\$ 16,946,294.10  
 \$ 2,700,000.00  
**\$ 19,646,294.10**

**1.2.1 Values of CWMS from Council (adjusted to 2009)**

## 1.2.2 Example Council Audit – Maitland



### District Council of Yorke Peninsula Community Wastewater management schemes

#### Township-Maitland

### Gravity Drains Date 19/3/2007

Reviewed 12/5/2009

	Details	Comments
<b>Total length</b>	13,243 meters	Vitruce Clay- Earthen ware
<b>Age of system</b>	Installed 1965	42 yrs <b>44 yrs</b>
<b>Design life</b>	50 years	life remaining -8 years
<b>Materials</b>	Earthen ware	2574 mtr of 150mm 10669 mtr of 100mm
<b>Replacement costs</b>	\$860,000	As at 2005 pricing
<b>Manholes</b>	Very large and heavy needs two people to lift lid, this process also lets dirt and rubble enter drain system	Consideration needed to replace all lids so only a small manhole needs to be lifted to get access to drain- <b>new access chambers lids are currently being installed</b>
<b>Summary</b>	Maitland's gravity drain system is currently in poor condition. Ongoing breakages and blockages are a continual problem for the councils engineering department. Trail work with high pressure drain cleaning and CCTV inspections Programmed for March 07 will better assess condition of drains Strong diesel smell coming from southern side of town to be investigated Continue 4 yearly desludging of septic tanks	



## Pump Stations

Number of stations - 2

Station number-1	Details	Comments
<b>Location</b>	South Terrace	
<b>Type/Manufacturer</b>	Mono pumps	Single pump station
<b>Installed</b>	1965	
<b>Alarm/Telemetry</b>	Red flashing light on shed	Rely on public to inform council of any faults- no telemetry
<b>Switchboard</b>	Very basic	Etsa meter and circuit breakers moved mid 2006 off stobie pole and installed into stand alone cabinet
<b>Tanks</b>	Average	
<b>Lids</b>	Concrete	
<b>Signage</b>	None	Authorized personal and confined space signage needed
<b>Vents</b>	None	Needs consideration if pump station upgraded
<b>Sheds</b>	Very poor	Access to pumps difficult
<b>Pipe work</b>	Average	
<b>Valving</b>	Average	
<b>Surrounds</b>	Average	
<b>Summary</b>	The current mono pumps are due for replacement, twin submersible pumps and new switchboard to be installed in coming years- <b>no upgrade as of yet</b>	





Station number-2	Details	Comments
<b>Location</b>	Clinton road	On footpath
<b>Type/Manufacturer Installed</b>	Mono pumps –Itt Flygt 1965	Single pump station-Twin pump station 11/2006
<b>Alarm/Telemetry</b>	Red flashing light on top of shed New Cell visor sms system	Rely on public to inform council of any faults -no telemetry-installed
<b>Switchboard</b>	Very basic-new two control switch board installed	Etsa meter and circuit breakers mounted on stobie pole-etsa meter mover into top of new board
<b>Tanks</b>	Average	
<b>Lids</b>	Concrete	one new aluminium hinged lid installed
<b>Signage</b>	None	Authorized personal and confined space signage needed
<b>Vents</b>	None	Needs to be considered when station upgraded
<b>Sheds</b>	Very poor no shed needed	Difficult to access pump
<b>Pipe work</b>	Average replaced	Flush point installed
<b>Valving</b>	Average	Due for replacement-replaced
<b>Surrounds</b>	Average	Footpath needs building up and some vegetation removed
<b>Summary</b>	This pump station programmed for upgrade in early 2007, Itt Flygt pumps are to be installed along with new switchboard and etsa meter moved. Costing \$18,000-completed	



## Rising mains

<b>Pump station number-1</b>	<b>Details</b>	<b>Comments</b>
<b>Location</b>	West along South Terrace right into Eldon street, into pit in Howard street	
<b>Lengths</b>	150 meters	Estimate
<b>Age</b>	1965 -42yrs	
<b>Material</b>	40mm pvc	Unsure of class
<b>Flushing points</b>	none	Can be flushed at end of line
<b>Summary</b>	Only a small rising main, no history of any faults, breakages or blockages. Possible future cleaning maybe required and flushing point installed at pump station when upgraded	

<b>Pump station number-2</b>	<b>Details</b>	<b>Comments</b>
<b>Location</b>	Travels due west from pump station along adjoining properties fence line to Burlington street to pit on western footpath	
<b>Lengths</b>	150meters	Estimated
<b>Age</b>	1965 -42 yrs	
<b>Material</b>	40mm pvc	Unsure of class
<b>Flushing points</b>	none	Can be flushed at end of line
<b>Summary</b>	Only small rising main, there has been blockages in the past ,flushing point at pump station will need to be considered when station upgraded- <b>flush point installed</b>	



## Treatment plants

	Details	Comments
<b>Manufacturer</b>	Aero flow	
<b>Year</b>	1994	
<b>Age</b>	13 years <b>15</b>	
<b>Capacity</b>	451 connections-@1200 EP people or around 190,000 litres per day	Currently around 125,000 litres per day consistently flows through this plant Around an additional 65,000 litres is allowed before any upgrading size of plant needed
<b>Summary</b>	Plant size is more than adequate for Maitland current population, future extra connections would be allowed [up to 65,000litrs or around 100 connections] If and or when the remainder of Maitland is considered Department of health approvals to be located	

## Intermittent aeration tank

	Details/condition	Comments
<b>Concrete tank</b>	Good –Diameter 9.1 metres Depth 2.2 metres Water height 1.7metres 160,000 litres	No signs of cracking some slight pitting of internal wall near aerator
<b>Aerator -Number</b>	1	
<b>-Size</b>	750 kilowatt 415 volt	



<b>-Condition</b>	Average
<b>Summary</b>	Generally in good condition, ongoing aerator maintenance essential

### Aeration Anoxic Tank

	<b>Details</b>	<b>Comments</b>
<b>Concrete tank</b>	Good – Diameter 9.1 metre Depth 2.2 metre Water height 1.7 metres 160,000 litres	No signs of cracking some slight pitting of internal wall near aerator
<b>Aerator-Number</b>	1	
<b>-Size</b>	750 kilowatt 415 volt	
<b>-Condition</b>	Average	Bearings slightly noisy, due for replacement- <b>replaced</b>
<b>Return activated sludge pump [ras]- Size</b>	300	
<b>-Condition</b>	Average	
<b>-Pipe work</b>	Average-pvc	Some cracking around tank entry
<b>Waste activated sludge pump [was]-Size</b>	Itt Flygt	
<b>-Condition</b>	Good	
<b>-Pipe work</b>	Good	
<b>Decant arms-condition</b>	Good	
<b>Solenoid Valves-brand</b>	Aeroflot –twin Goyen controls	24 volt model 20bl2
<b>-Condition</b>	Good	



<b>Water height measure-Type</b>	Float type-upgraded to Hydro static	Possible upgrade to new technology needs considering
<b>-Condition</b>	Some signs of weathering	Due for replacement
<b>Summary</b>	In generally good condition ,ongoing maintenance needed	

## Decant tanks

<b>Chlorine contact tanks</b>	<b>Details</b>	<b>Comments</b>
<b>-size</b>	Diameter 3.5 metres Depth 2.6 metres Overflow height 2.0 metres	3 tanks in total
<b>-Condition</b>	Good	
<b>-Security</b>	Good	
<b>-Signage</b>	Good	Confined space signage needed
<b>Water height measuring</b>	3 level floats ,1 alarm float	Adequate –upgraded to hydro static
<b>Decant pumps</b>	2 grundfos dep10 pumps	New pumps installed late 2005
<b>Pipe work</b>	80mm Hdpe to top of first dam Pvc around top of dam to upper dam	Replaced when new pumps installed Two small leaks in pvc need repairing -repaired
<b>Valving</b>	Good	Replaced when new pumps installed
<b>Overflow</b>	Good	Any overflow of plant is piped to an old evaporation pond for containment
<b>Summary</b>	Decant tank capacity and condition is very good ,upgrading of pumps, valving and pipe work in 2005 has resolved several faults- tanks cleaned on a regular bases	



## Waste Activated Sludge Tank

	<b>Details</b>	<b>Comments</b>
<b>Size</b>	160,000 litres	Desludged regularly
<b>Tank condition</b>	Good	
<b>Roof condition</b>	Poor	Rusting badly, will be due for replacement in the near future
<b>Pipe work</b>	Good	
<b>Summary</b>	In generally good condition, when new roofing installed tank will be improved	

## Switchboard

	<b>Details</b>	<b>Comments</b>
<b>Timers</b>	Mechanical	Some controls very hard to access
<b>Switches</b>	ok	extra switches needed for chlorine pump
<b>Electrical safety switch</b>	Present	For general power outlet only
<b>Lights/test buttons</b>	ok	Alarm test button needed
<b>Summary</b>	<p>A very basic switchboard with very little operator control available</p> <p>A general upgrade to a plc unit needed so more adjustment available during peak periods and also power savings during night time can be obtained- <b>new switchboard installed 09/08</b></p>	



## Dialler/Telemetry

	Details	Comments
<b>Brand</b>	Nidac landline	
<b>Age</b>	1994 -14 years	Very basic
<b>Condition</b>	Poor	This brand being phased out
<b>Summary</b>	Unit has been disconnected because landline is damaged and the cost saving available with a gsm unit has determined that a new dialler is needed, currently on order- <b>upgraded with new switchboard</b>	

## Flow meters

	Details	Comments
<b>Brand</b>	ABB Mag meter	New
<b>Age</b>	October 2006	
<b>Condition</b>	Very good	
<b>Annual flow</b>	45,625,000 litres	Estimated
<b>Average daily flow</b>	125,000 litres per day	Summer 06/07
<b>Summary</b>	Very good tool in the day to day running of the plant also will be helpful in the determining as to weather Maitland's gravity drain network has much infiltration during winter- <b>no increase in flow for the last two years</b>	



## Filtration

	Details	Comments
<b>Brand</b>	None	
<b>Age</b>	None	
<b>Condition</b>	-	
<b>Summary</b>	A filtration plant could be installed at this treatment plant but the cost would be large, the current treatment process is producing good quality water so there is no current need for any filtration	

## Chlorine Dosing

	Details	Comments
<b>Brand</b>	Grundfos	Dms 4-7 b 3 litres /hour
<b>Age</b>	2007	-
<b>Condition</b>	Good	-
<b>Pipe work</b>	Average, need better quality in future	New 2007
<b>Holding Tank</b>	1800 litres	Good new 2007
<b>Bunting</b>	1200 litres emergency storage	Good new 2007
<b>Signage</b>	Some extra signage needed	Protective clothing Hazardous substances
<b>Emergency Shower</b>	None	-
<b>Storage</b>	Separate area outside main shed	Good, well ventilated
<b>Msds sheets</b>	Present and available	





<b>Summary</b>	Chlorine dosing system reinstated in 2007 after many years disconnected Performing well, consideration needed for the future purchasing of more signage and an emergency shower
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**Storage sheds**

	<b>Details</b>	<b>Comments</b>
<b>Security</b>	Good	
<b>Condition</b>	Good	
<b>Fire extinguisher</b>	Present and inspection up to date	
<b>Summary</b>	Is in good condition and is adequate for plant	

**Water Supply**

	<b>Details</b>	<b>Comments</b>
<b>Supply</b>	Main pressure	
<b>Pressure</b>	Good	
<b>Summary</b>	Very adequate	

**Compound**

	<b>Details</b>	<b>Comments</b>
<b>Fencing</b>	Good	
<b>Gates</b>	Good	



<b>Security</b>	Good	
<b>Signage</b>	None	Authorized personnel only and hazardous substances signs needed
<b>Summary</b>	In generally good condition	

## Treated water reuse

	<b>Details</b>	<b>Comments</b>
<b>Description</b>	Treated water is pumped into either of two storage dams where it can be mixed with stormwater	Works well, all water is used by either golf course or bowls club
<b>Condition</b>	Good	
<b>Storage</b>	Two large dams	High evaporation levels
<b>Irrigation system</b>	Maintained by golf club	
<b>Transfer pump</b>	Second hand centrifugal pump electrically controlled from treatment plant shed , transfers water from lower dam to top dam	Pump and pipe work due for upgrade also needs to be stored in its own [vandal proof] shed on side of dam - <b>new shed erected</b>
<b>Summary</b>	If extra water becomes available consideration should be given to supplying other areas of town possibly town oval, nature strips, or road building. Department of health approvals for storage dams needs to be investigated, Have they already been approved?	



## Water Quality

	<b>Details</b>	<b>Comments</b>
<b>Overall</b>	Poor- <b>has improved and generally very good</b>	Needs to be improved
<b>Treatment plant</b>	Has improved with the reinstatement of the chlorine dosing system Last two samples E-coli –one below and one <u>above</u> desired levels Suspended solids –both below desired levels Bod –one below and one <u>above</u> desired levels	Hopefully will continue to improve with closer monitoring Desired levels as set by department of health E-coli 100/100ml Suspended solids 30mg/l Bod 20mg/l
<b>Irrigation</b>	Last two samples E-coli both slightly <u>above</u> desired levels Suspended solids-one <u>above</u> one below desired levels Bod –both below desired levels	Hopefully will continue to improve with closer monitoring
<b>Summary</b>	Continue monitoring both plant results and water sample results to see if they improve, some small improvement at the plant should help results- <b>no longer a concern</b>	



## Occupational Health and Safety

### **Any issues that have become apparent during audit**

1. Improved signage needed-**some new signage installed**
2. Emergency shower facility needed at treatment plant in case of chemical spillage
3. Manual handling issues with lifting manhole covers-**being resolved with new lids**
4. Continue using personal protective equipment when handling waste water and chlorine
5. Several areas classified as confined spaces

## Overall scheme review and priorities

1. Develop annual gravity drain cleaning and inspection program to eventually clean all drains in Maitland and access problem areas that may need replacement-**a large area of Maitland's drains have been cleaned over the last two years -some drains several times over**
2. Investigate to see if both treatment plant and storage dams have department of health approval's
3. Upgrade both pump stations to include two submersible pumps at both location ,new switchboard, telemetry and flushing **points-one station done**
4. Upgrade switchboard , water level indicator and telemetry at treatment plant-**done**
5. Replace dam pump, pipe work and house in shed -**new shed erected, dam pump overhauled**
6. Replace all town manhole covers with easier to handle covers, so its only a one man operation to check drain-**currently being done**
7. Investigate strong diesel smell coming from southern side of town
8. Replacement of waste activated sludge [was] tank **roof-on order**