# WATER & SANITATION

## Draft Executive Summary of the Water Services Development Plan

## 2012/2013

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CITY OF CAPE TOWN ISIXEKO SASEKAPA STAD KAAPSTAD

# DRAFT WATER SERVICES DEVELOPMENT PLAN (WSDP)

## FOR

# CITY OF CAPE TOWN 2012/13 – 2016/15

# EXECUTIVE SUMMARY

*The guiding document for the service is the WSDP of which this is the Executive Summary and which is updated annually. It is a product of the current IDP process and will become a Sector Plan of the IDP 2012/13 document.*

*Please note that this version is a major update which coincides with the IDP 5-year term of office plan.*

Draft: 23 February 2012, 10h27



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# 1. INTRODUCTION

## 1.1. Introduction with focus on Basic Services

The Water and Sanitation Department has made significant progress in the provision of services since the formation of one administration for the City of Cape Town (COCT), but some critical challenges remain, as summarised below.

Institutional arrangements and strategies have been put in place to overcome the challenges and to meet key policy as well as legislative requirements. Progress on the objectives as set out in DWA's critical policy document, the National Strategic Framework for Water Services (September 2003), were measured at an January 2012 baseline in Table 1, to follow below.

However, following on a 2012 review of available data on the current (January 2012) number of informal settlements and the total household estimate in the City, the estimates for both these household figures have now been evaluated significantly higher. The better informal settlement count was obtained by door-to-door surveys found necessary by the Solid Waste Department, replacing the previous aerial photo count which failed to identify all the households residing under one visible roof. The conclusion is reached that previous household numbers were underestimated for the past couple of years, largely increasing the challenge for sanitation provision and to a much lesser extent for water provision.

The number of taps fitted to a single communal standpipe had to be reduced from two to one, to limit the associated problems of excessive grey-water ponding and health risks. This combined with a GPS-survey confirmation of the actual serviceable taps remaining has led to a large drop in the number of available taps, despite the number of standpipes being increased every year for several years.

The growing housing challenge in the COCT has given rise to increasing number of backyard dwellers in public rental stock, COCT has drafted a backyarder policy which will include the supply of basic services such as electricity, refuse removal, water and sanitation. For water and sanitation this will be an individual metered connection via a water management device and a sewer connection with a prefabricated toilet. The increased density reduces the cost of infrastructure but increases the water demand and sewer load considerably.

The re-adjustment in base information limits the usefulness of a year-on-year comparison as required by the DWA indicators, but is nevertheless given along with the latest known information to allow forward planning as per the backlog eradication programme

**Table 1: Water and Sanitation Service Level Indicators (as at January 2012)**

| SANITATION | | | WATER | |
|---|---|---|---|---|
| No of toilets in informal settlements | 33 677 | | No of taps in Informal settlements | 7 176 |
| Avg Toilet servicing ratio, informal settlements | 3.37 | | Servicing ratio applied | 25 |
| - | - | | Potential Informal settlement HH serviced | 179 400 |
| HH serviced in informal settlements | 113 587 | | Informal Settlement HH serviced | 179 400 |
| Avg HH per toilet, informal settlements | 5.76 | | Avg HH per tap, informal settlements | 27.03 |
| Backlog in informal settlements | 80 364 | | Backlog in informal settlements | 14 551 |
| Formal HH serviced | 909 231 | | Formal HH serviced | 909 231 |
| Total HH serviced | 1 022 818 | | Total HH serviced | 1 088 631 |
| Total backlog | 80 364 | | Total backlog | 14 551 |
| % all HH serviced | 93% | | % all HH serviced | 99% |
| % Informal settlement HH serviced | 59% | | % Informal settlement HH serviced | 92% |
| % Poor HH serviced | 87% | | % Poor HH serviced | 98% |

To ensure and to measure the level of progress, internal service level targets for the City of Cape Town, over and above the national standards, are in use.

**Table 2: National and City minimum basic service standards compared**

| Service | National Standard (*) | City Standard |
|---|---|---|
| Sanitation | Easy access to a safe, reliable, private toilet facility which is protected from the weather, ventilated, low smell, hygienic, minimises the risk of spreading diseases and enables safe treatment and/or removal of human waste and wastewater in an environmentally sound manner including communicating hygiene. | Ditto but with an added minimum specification of at least 1 toilet per 5 households.<br><br>As recently identified, the backyarder policy will be piloted in selected areas of the city. This will consist of a metered water and sanitation HH connection to backyard dwellers. The connection will also have a demand management facility. |
| Water | A basic water supply facility within 200m of dwelling, delivering at least 25 l/ person/ day at a minimum flow of 10 l/min in the case of communal water points, or 6 000 litres of water per month in the case of yard or house connections. | Ditto but with an added minimum specification of at least 1 tap per 25 households. |

*(*) As defined in the Strategic Framework for Water Services, Sep-03*

To address the backlogs indicated above, the Department of Water and Sanitation has developed a vision which seeks to position it as a leader in the provision of these essential services.

### 1.2. Vision and Mission of Water and Sanitation

The vision of Water and Sanitation Services in Cape Town is:

| VISION STATEMENT |
| --- |
| To be a beacon in Africa for the provision of Water and Sanitation services |
| **MISSION STATEMENT** |
| We pledge to achieve our vision by creating a centre of excellence in Water and Sanitation Department through:<br>• Optimizing resources<br>• Implementing environmentally-sustainable interventions<br>• Continuous improvement and knowledge management<br>• Good governance<br>• Customer satisfaction and excellent stakeholder relationships<br>Values<br>• Integrity: We maintain the highest level of ethics and fairness in our interaction with each other, our customers and other stakeholders.<br>• Respect: We respect each other's opinion, beliefs, position and contribution to the Department including those of our customers and other stakeholders. All employees are equal in their contributions.<br>• Customer focus: We meet customers' needs by providing excellent service, optimal product performance and efficient support system. Our customers are the reason for our existence. The environment is our silent customer who shall receive an equal share of our services.<br>• Trust: Our business model and relationship is based on trust. A "Yes" shall mean a Yes and a "No" shall mean a No. Our common purpose, integrity and honesty shall constrain us to have trust in each other. Trust shall be felt, experienced, lived and seen in our Departmental family.<br>• Transparency: We operate safely, openly, honestly and with care for the environment and the community. Transparency shall be defined by the customers and stakeholders we serve.<br>• Professional: We use the right skills or competencies to find appropriate solutions enriched with compassion, innovation, sustainability, cost-effectiveness, accountability and excellence. |

### 1.3. Business Focus Area

The Water and Sanitation department has adopted the framework for the attributes of effective water and wastewater utility management developed by the American Water Works Association (AWWA) as a balanced scorecard for its business management. The framework covers all aspects of the Water and Sanitation business necessary to position the department to achieving and contributing effectively and efficiently to the achievement of the City vision. The following are the ten attributes that have been adopted:

a) **Product Quality:** looks at the ability of the department to meet the potable water quality standards licence conditions, the Department of Water Affairs general wastewater effluent standards, environmental management requirements and ecological needs.

b) **Customer Satisfaction:** looks at the ability of the department to provide basic services to all residents in the City, eradication of sanitation backlogs, provision of affordable service, meeting Service Charter standards, level of service and standard of service. The department seeks to provide services to backyarders on a direct basis in agreement with the landowners such as the Directorate of Human Settlements and private household owners.

c) **Employee and Leadership Development:** the department has a challenge to develop and retain its employees and ensure high levels of motivation among employees. This challenge demands that the department must ensure adequate staffing levels, skills retention, succession planning and individual development of employees so that their progression into management or a specialist function is supported adequately.

d) **Operational Optimisation:** this attribute forces the department to review its business processes to ensure timely on-going cost-effective, reliable and sustainable service provision in all its operations. The department is challenged to minimise resource utilisation, losses and take advantage of technological advancement to better its efficiency levels in providing water and sanitation services.

e) **Financial Viability:** the focus is for the department to improve its collection ratios and ensure that the tariffs, charges or any levies are total cost-recovering in nature. In addition there is a need to reduce high debt levels and improve the willingness to pay by its consumers. The investment into infrastructure must also be well-timed, synchronized with mutual projects and appropriate funding explored to ensure a good return on investment. The cost of capital must be minimised and the challenge is how to achieve this given the consolidated nature of the investment decisions in the City. The department must also ensure effective utilisation and timely maintenance of its assets to sustain revenue growth levels that is in sympathy to the consumer base growth.

f) **Infrastructure Stability:** this business attribute requires the department to understand when to create and dispose of an asset, the condition of its assets, lifecycle costs, the associated costs to be incurred in unlocking asset value, to sustain the business. The department must ensure timely maintenance, repair, rehabilitation, replacement and upgrading of existing infrastructure. The lifecycle costs of the assets must be well understood and asset management plans developed. The department is currently developing asset management plans to be integrated into the SAP system modules and this process is a huge challenge that requires time and resources to complete.

g) **Operational Resilience:** this business focus area requires the department to ensure adequate risk management for its water and wastewater business. To this end the department has developed the draft Wastewater Risk Abatement Plan and the draft Water Safety Plan and the Department of Water Affairs' requirements of these plans are increasingly becoming stringent. The establishment of operational tolerance levels that ensures adequate management of the legal, regulatory, financial, environmental, safety, and national disaster risks are still to be finalised. Servitude Encroachment is a risk to the department that affects the operational resilience of its service provision value chain.

h) **Community Sustainability:** this focus area ensures infrastructure investment laid job creation for communities in the City of Cape Town. This will assist in improving the disposable income of households and enhance their ability to pay for water and sanitation services. The department must ensure that its operations, services output and by-products such as sludge and wastewater effluent do not harm the environment and compromise community health. Infrastructure Management and Operations must be managed to ensure efficient utilisation of water resources, energy and promote economic

vitality with minimum impact on the environment. Efforts should therefore be made to ensure investments are green and climate change impact is managed.

i) **Water Resource Adequacy:** As it is, this business attribute focuses on the ability of the department to ensure security of water supply. The department has a challenge to ensure that by 2017 a new source of water supply to the City will have been developed either directly by the department or through Department of Water Affairs. The department has to keep pace with future customer needs for basic services and economic expansion through long term resource planning, long term demand analysis and conservation of the existing resources.

j) **Stakeholder Management:** this attribute requires the department to identify the representatives of various stakeholders and ensure adequate engagement in issues that affect them. The political leadership and interest group representation in Informal Settlements is a challenge for the department in its quest to eradicate service backlogs. The department must also ensure adequate engagement with the Department of Water Affairs, the Provincial Government and other directorates in the City for the purpose of optimising investments into improvement programs and risk management.

### 1.4. Critical Challenges

Out of the business focus areas described above, COCT has identified the following as critical challenges, which can be clustered into four categories:

(a) Financial viability

- Collection ratio and willingness to pay for services
- Metering and billing
- Ensuring full cost recovery and acceptability of the tariffs by the consumers
- Reduction in unaccounted for water
- High financial requirements
- High cost of doing business
- High debt due to non-payment

(b) Customer satisfaction

- Meeting Service Charter standards
- Provision of basic services to Informal Settlements and Backyarders
- Availability of services for infrastructure expansion
- Appropriate service standards and level of service
- Eradication of sanitation backlogs
- Provision of affordable service

(c) Water Resource Academy

- Achieve water demand targets through intensified WDM strategy
- Development of additional water sources
- Treated effluent re-use and its acceptance
- Provision of adequate infrastructure to meet City development/growth needs

(d) Employee development (internal)

- Establish effective institutional arrangement
- Sufficient staff resourcing, skills retention and development
- Increasing productivity, efficiency and effectiveness in the operations of the business

(e) Operational Optimisation

- ISO 9000 certification
- ISO 17025 laboratory certification
- Processes re-engineering and right-sizing of the department

(f) Product quality

- Meeting the licence conditions for Wastewater Treatment Works
- Meeting the amended SANS 241 standards

(g) Operational Resilience

- Water Safety Plan development;
- Wastewater Risk Abatement Plan
- Servitude enhancement
- Developing and managing the Risk Register

- Asset Management

The strategies to face these challenges are dealt with under the appropriate section of the plan following.

**Strategic Objectives**

In order to implement the business plan, strategic objectives have been set as follows:

| Strategic Objectives | Target |
|---|---|
| To implement ISO 9001 for all our services in the next five years | 2015/16 |
| To achieve Green Drop status for 60% of the waste water treatment plants (ie 15 plants) | 2015/16 |
| To achieve 95% waste water effluent quality | 2015/16 |
| To ensure the presence and dominance in Africa of the water-, wastewater- and air pollution-testing services | 2015/16 |
| To reduce unaccounted for water to 16% in the next five years | 2015/16 |
| To provide basic or emergency sanitation services to all residents of the city | 2015/16 |
| To provide basic water to all residents in the city | 2015/16 |
| To increase productivity levels by 15% | 2015/16 |
| To achieve 90% customer satisfaction levels in all our services | 2015/16 |
| To develop Asset Management Plans for the Department | 2012/13 |
| To be the reference City for water matters in the country | 2015/16 |
| To grow the training school and achieve SETA accreditation for the training modules(e.g. process controllers, artisans) | 2012/13 |
| To minimise river systems pollution by reducing sewage overflows by 20% | 2015/16 |
| To improve revenue collection to 96% | 2015/16 |
| To construct an office block for the department | 2015/16 |
| To be information efficient | 2012/13 |
| To increase security of supply for the bulk water supply system: percentage potable water production capacity of peak week demand to120% | 2016/17 |
| To increase the effluent re-use by 15% of potable demand | 2015/16 |
| To roll out automation and remote control pilots on treatments and pump stations | 2014/15 |

## 1.5. Aligning the WSDP and IDP

The challenge of WSDP is to maintain an existing Water and Sanitation service for the city as well as being able to provide services for rapidly increasing number of households in a sustainable way. This has to be achieved in the context of providing basic needs, ensuring economic growth, maintaining an ageing infrastructure, limiting negative environmental impact, managing water resource scarcity and consolidating a transformed metro administrative infrastructure. The following matrix depicts how the IDP focus areas will be accommodated in the Strategic thrusts of the WSDP.

**Table 3: IDP PRIORITY ISSUES RELATING TO WATER SERVICES**

| Strategic Focus Area | Objective | Outcome | Water Services Business Elements | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1. Socio - Economic Profile | 2. Service Level Profile | 3. Water Resource Profile | 4. Water Conservation / Demand | 5. Water Services Infrastructure Profile | 6. Water balance | 7. Water Services institutional arrangements Profile | 8. Customer Service Profile | 9. Financial profile | 10. List of Projects |
| | | | Page Numbers | | | | | | | | | |
| 1.THE OPPORTUNITY CITY | Objective 1.1 - Create an enabling environment to attract investment to generate economic growth and job creation | . P1.1(c) Identify and promote catalytic sectors, such as oil and gas | x | | | | | | | | | |
| | Objective1.2 - Provision and maintenance of economic and social infrastructure to ensure infrastructure-led growth and development | P1.2(c) Maintenance and investment in utilities infrastructure programmes | | | | | | | | | | |
| | | P1.2(d) Investing in Infrastructure Programme | | | | | | | | | | |
| 2. THE SAFE CITY | | No direct Water Service's objectives. | | | | | | | | | | |
| 3. THE CARING CITY | Objective 3.2 Promote a sustainable environment through the efficient utilization of resources | P3.2(a) Sustainable utilisation of scarce resources such as water and energy | | | x | x | | | | | x | x |
| | | P3.2(b) Water Conservation and Water Demand ManagementStrategy | | | x | x | | x | | | x | x |
| | Objective 3.3 Providing services to all the citizens of the city. | P3.3(a) Service Delivery Programme. Taps and toilets installed in informal settlements | | x | | | x | | | x | x | x |
| | Objective 3.4 Ensure innovative human settlements for increased access to those that need them. | P3.4 (a) – Innovative Housing Programme | x | x | | x | x | x | | x | x | x |
| | Objective 3.6 Provide for | P3.6(b) Backyarder Service Programme | | x | | | x | x | | x | x | x |

| Strategic Focus Area | Objective | Outcome | Water Services Business Elements | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1. Socio - Economic Profile | 2. Service Level Profile | 3. Water Resource Profile | 4. Water Conservation / Demand | 5. Water Services Infrastructure Profile | 6. Water balance | 7. Water Services Institutional arrangements Profile | 8. Customer Service Profile | 9. Financial profile | 10. List of Projects |
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| | the needs through improved services in informal settlements and backyard residences | | | | | | | | | | | |
| | Objective 3.7 Provision of effective Environmental Health services. | P 3.7(a) Environmental Health Care Programme | | | x | x | | | | | | x |
| 4. THE INCLUSIVE CITY | Objective 4.2 Ensure responsiveness by creating an environment where citizens can communicated with and be responded to. | P4.2 (a) Managing service delivery through the service management process (C3 notification responsiveness) | | x | | x | | | | x | | |
| | | 4.2(d) Building strategic partnerships programme | | | | x | | | | | | x |
| | Objective 4.3 Provide facilities to make citizens feel at home | P4.3(e) Call centre Programme | | x | | | | | | x | x | x |
| 5. THE WELL-RUN CITY | No direct link to Water Services objectives | | | | | | | | x | | | |

# 2. ESSENTIAL QUESTIONS

## 2.1. What is the backlog of water services?

The majority of Cape Town's population, both in formal and informal settlements, receives potable water service levels that generally meet the National minimum standards as required by the Water Services Act 108 (of 1997).

Based on previous informal settlement household estimates, the % households with access to sanitation as monitored on a quarterly basis along with other Key Performance Indicators for the Departmental Scorecard appeared to exceed 100% at June 2011.

However it is acknowledged that many of the toilet types cannot comfortably sustain use by more than 3 households while others work best for only 1 household. Taking these variable servicing ratios and the variation in density of service points from settlement to settlement into account, it is estimated that approximately 80 364 (as at January 2012) households still need a better service compared to 84 625 (as at October 2011).

Table 1 a shows the large number of toilets installed during the 2010/11 (up until January 2012) financial year but much work remains. The growing density in many informal settlements constrains Water and Sanitation's ability to adequately provide further sanitation services.

The revised household estimates combined with the necessitated policy change to only use 1 tap per standpipe also mean that the 100% score for households having access to potable water already attained several years ago, has been lost. At the maximum ratio of 25 informal households per tap (a standard set by the City of Cape Town), and with the number of serviceable taps in use confirmed by GPS survey, a backlog of approximately 14 551 is indicated at January 2012. The % of all households serviced is back at 98.7% while 19.73% of all households in the city are supplied from standpipes.

The maintenance of these temporary services often carry high maintenance cost due to frequent cleaning and frequent repair or replacement due to vandalism. It is not financially sustainable and requires a National initiative or at the very least an order of magnitude improvement in the level of funding from the Equitable Share grant. The cost of these services is to a large extent being subsidised by the formal sector.

### 2.2. What is the status of supply to higher levels of service?

Service levels to all formal developed areas are, as far as can be determined, at the highest level of service: a flush toilet and water connection in-house or yard. This constitutes 92.3% of the consumer households. The backyarder policy will increase the number of connections per Erven.

### 2.3. What is the Cost to eradicating backlogs?

To eradicate the sanitation service backlog and service the influx of people in informal settlements, the Water and Sanitation Department is implementing a service provision program that is integral to the 10-year Housing Plan.

The total capital requirement over the next 5 years from 2010/11 to 2015/16 to primarily cover sanitation backlog eradication is estimated at R152.5M including allowing for a 5% household growth. Part of the funding is also required for the replacement of black buckets as well as to cater for additional service demand growth in informal settlements due to the influx of people.

R11.0M is required to resolve the water backlog and provide for the anticipated growth in demand.

The proposed programme for eradicating the backlog according to the Strategic Objective target of 2015/16 is listed in the following Table 4.

**Table 4: Proposed backlog eradication programme as at June 2011**

| SANITATION | [illegible] | Cap | Step | 2011/12 | 2012/13 | 2013/14 | 2014/15 | 2015/16 | [illegible] |
|---|---|---|---|---|---|---|---|---|---|
| % Informal settlement HH serviced | 55.4% | 44.6% | 8.9% | 67.1% | 76.5% | 85.0% | 92.8% | 100.0% | |
| Toilets needed (Backlog eradication) | 30 931 | 26 390 | 5 278 | 36 209 | 41 487 | 46 765 | 52 043 | 57 321 | |
| Aditional Toilets (Address influx) | | | | 37 209 | 42 487 | 47 765 | 53 043 | 58 321 | |
| **Capital Requirement (R / M)** | **@ R10 000 per unit avg** | | | **53** | **53** | **53** | **53** | **53** | **264** |
| **Allocated Budget (R / M)** | ***Current 5 Year Plan*** | | | **20.5** | **20.5** | **20.5** | **40.5** | **50.5** | **152.5** |
| Toilet Shortfall | ***@ Allocated Budget*** | | | 3 228 | 3 228 | 3 228 | 1 228 | 228 | |
| % Informal settlement HH serviced | ***@ Allocated Budget*** | | | **59.0%** | **61.1%** | **62.9%** | **69.0%** | **76.7%** | |
| % HH Basic Service Shortfall | ***@ Allocated Budget*** | | | 8.1% | 15.4% | 22.1% | 23.8% | 23.3% | |
| WATER | [illegible] | Cap | Step | 2011/12 | 2012/13 | 2013/14 | 2014/15 | 2015/16 | [illegible] |
| % Informal settlement HH serviced | 91.6% | 8.4% | 1.7% | 95.2% | 96.6% | 97.8% | 98.9% | 100.0% | |
| Taps needed | 7104 | 2470 | 494 | 7 598 | 8 092 | 8 586 | 9 080 | 9 574 | |
| Additional Taps (Address Influx) | | | | 7 798 | 8 292 | 8 786 | 9 280 | 9 774 | |
| **Capital Requirement (R / M)** | **@ R4 000 per tap** | | | **2** | **2** | **2** | **2** | **2** | **10** |
| **Allocated Budget (R / M)** | **Current 5 Year Plan** | | | **2.0** | **2.1** | **2.2** | **2.3** | **2.4** | **11.00** |

The Backyarder policy will be focused on public rental stock backyarders and with the following estimated basic cost.

| Item Description | Cost Estimate per Installation |
|---|---|
| Water connection, Sewer connection and top structure (including meter) | R13 255 |

The city has started the programme in Factreton which has 156 units with an estimated total cost of R2,067,780 for the water and sanitation connection.. The annual maintenance cost is an estimated R1 600/unit. Although W&S will have to plan and allow for the basic free and indigent component of the service, the programme will be driven by the Cities Housing Department.

USDG funding of R26m has been provided for the backyarder strategy and has been provided tothe Human Settlement Directorate.

The City's Housing programme is funded through National grants. Servicing of the informal settlements is funded by the Water and Sanitation department with partial recovery of cost from the national Equitable Share. Depending on the speed of implementing this programme, as for in-situ upgrading or the "decanting" of such settlements to developed formal areas, the informal settlement programme needs to adapt.

**2.4. What is the strategy to eradicate backlogs?**

Provision of Sanitation and water backlogs are predominantly in the Informal Settlements and backyarders. A policy for the provision of services to backyarders is still to be finalised. A draft policy position of providing backyarders with a metered water standpipe and sewer connection on a service ratio of 1 facility to 5 (five) households is being piloted on Council owned rental stock in Factreton, Langa and Hanover Park. The water is connected through a water management device and a tag is allocated to each household to dispense the water. This is intended to provide a number households with a high level of service.

Up to and including 2011, the strategy has been to provide a basic level of service such that at most 5 informal households on average share one toilet. Going forward it is the intention to achieve a more desirable minimum convenience ratio for each type of toilet. For example, some toilet types can only sustainably support 1 household each, while others can service more.

A revised and rationalised Informal Settlement Servicing Strategy is under development, made all the more challenging by the updated larger number of households having to be serviced.

The new backyarder policy which is intended to provide backyarders with a metered water and sewer connection will provide a number households with a high level of service although water supply will be via a demand management device.

The technology choice and level of service to be provided in informal settlements remains a challenge. In this strategy, the Department has divided all informal settlements into categories of appropriate service standard determined by the availability and status of land, existing infrastructure, and hydrology of area and economics of providing a sustainable service as summarised in the following table:

**Table 5: Servicing Strategy Categories**

| Cat | Land type | Bulk Infrastructure | Distributed space available within settlement | Service Standard |
|---|---|---|---|---|
| A1 | Govt owned land, occupation permitted | Available within economical distance | Adequate | 1 |
| | | | Inadequate | 2 |
| | | Not available within economical distance | Adequate | 3 |
| | | | Inadequate | 4 |
| A2 | Private land, occupation permitted | NA (No investment on private land allowed) | Adequate | 3 |
| | | | Inadequate | 4 |
| B | Adverse physical conditions, temporary occupation | NA | Adequate | 3 |
| | | | Inadequate | 4 |
| C | Occupation prohibited | NA | Adequate | 3 |
| | | | Inadequate | 4 |

| No | Service standard target |
|---|---|
| 1 | Waterborne sanitation 1:5, taps to 1:25 |
| 2 | Managed all-in-one waterborne ablution facility with janitorial service, supplemented by porta-pottis on demand. Incorporates taps and basins to 1:25 |
| 3 | Container or dry sanitation to technology-specific household ratio. Taps to 1:25 |
| 4 | Managed all-in-one conservancy tank ablution facility with janitorial service, supplemented by porta-pottis on demand. Incorporates taps and basins to 1:25 |
| Note | All service points to be within 100m walking distance of households served |

Water and Sanitation Services are ideally opting for dehydration or flush toilets. A promising new prefabricated unit which can serve up to 17 households is being piloted, excellent for the managed ablution facility proposed. The use of pour-flush alternative technology is being discontinued due to operational problems. "Greenfields" housing projects are undertaken by the Housing Department to receive residents moved from land that cannot be developed.

The City subscribes to "the water ladder" concept (as proposed in DWA's "Strategic Framework for Water Services, September 2003"). Whereas the City's priority is to first provide an emergency level of service to households in all settlements, it is also extending the coverage and density of services in each settlement beyond the basic level as funds allow.

**Table 6: Profile of all Domestic consumers, January 2012**

| [illegible] | COUNT | HH SERVICED |
|---|---|---|
| Chemical | 4 596 | 22 980 |
| Container | 5 506 | 27 530 |
| Bucket | 1 157 | 1 157 |
| Portapotti | 12 015 | 12 015 |
| Pitliner | 312 | 1 560 |
| Dry Sanitation | 187 | 935 |
| Conservancy tanks | 370 | 1 850 |
| Dehydration (Enviroloo) | 166 | 664 |
| Dehydration (Afrisan) | 450 | 450 |
| Anaerobic | 48 | 96 |
| Flush | 8 870 | 44 350 |
| FORMAL | - | 909 231 |
| **TOTAL** | **33 677** | **1 022 818** |

## 2.5. What is the status of all water and sanitation infrastructure?

The existing infrastructure condition is deteriorating due to continued under-funding for essential maintenance/ replacement of aging assets over an extended period. Major pipe collapses or bursts have occurred over the past years and such pipes are in urgent need of extensive repair or even replacement.

An estimated minimum of R60M/annum is required for each of Sewer pipe replacement and Water pipe replacement including Bulk lines respectively, in the case of water pipes to achieve an acceptable burst rate of less than 10 bursts/100m/ yr.

Key components of existing infrastructure in rapidly-developing regions of the City do operate at peak level during periods of high demand. Capacity improvements will be required to enable development. The Department has developed an Infrastructure Master Plan that shows the Water and Sewer upgrading requirements for all development areas.

The bulk water system in the northern areas of the City is under increasing stress during peak periods due to the rapid growth in that area and further development must be accompanied by infrastructure upgrade and extension. The northwest corridor also needs upgrading of the infrastructure. Seawater desalination is an alternative technology being evaluated to supply water to both these regions, in addition to the proposed Bulk Water Augmentation scheme, which will provide the infrastructure to route water to this area from the Berg River Dam via large diameter bulk pipelines, a 500 Megalitre per day water treatment plant and two 300 Megalitre bulk storage reservoirs. The feasibility study for a desalination scheme is in progress and 1/3 of the study has been completed. (SDBIP, September 2011).

- **Backyarder Programme**

The services as provided by Water Services ( Reticulation ) will be in the form of a concrete structure housing a water borne toilet on the inside, with a washing trough and tap fixed to the outside of the structure, being placed in the backyard where shack dwellings are in place .

The water through a tap on the outside will be regulated through a tagging system, where each backyard shack will be provided with a tagging device, and the supply to the toilet and basin will be regulated through a management device. The supply to this unit will be taken off the main house supply, and all of the free portions, together with the main dwelling's free portion will be deducted from the account rendered to the main dwelling.

The first phase of this Project has identified 3 Pilot Areas, being Factreton (Maitland), Hanover Park and Langa, and the service will be to Council owned, rented stock erven only.

Area Committees are in place in all three areas with surveys being carried out simultaneously. Factreton has been identified as the 1st Project within the Pilot and work will commence in October 2011.

Registered backyarders will be listed as indigent and therefore entitled to the free services that the City provides. This will put more users onto the billing system.

## 2.6. How will administrative management be improved?

The Department is committed to consistently and continually provide the highest quality water and sanitation services that meet and exceed the requirements and expectations of our consumers by ensuring the implementation of a Quality Management System that complies with ISO 9001:2008. To this end, both a Quality Statement and Customer Service Charter have been accepted for implementation. There is also a Department-wide ISO certification project being undertaken.

Together with the Risk Management programmes being implemented, these initiatives will ensure quality and minimise risks.

Scientific Services Branch has achieved ISO 17025 SANAS Accreditation in August 2011 for Chemistry and Hydrobiological methods. Microbiology Section envisage to accredit two methods in 2012.

The following business improvements initiatives are receiving focused attention:

- Quality objectives established, Quality Policy documented and signed by Director.
- ISO 9001:2008 Quality structure documented within Water & Sanitation.
- Branch Quality Representatives appointed.
- Internal assessment and internal assessment training planned.
- Use of ISO 9001:2008 consultant where evr possible.
- Business improvement for support service model in progress.
- Development and re-engineering of business processes andprocedures within the branches
- Internal communication suggestion boxes to be roll out throughout the branches.

The following efficiency enhancements are receiving focused attention;

- Integration of Information Management Systems through development of a Data Integration and Monitoring System.
- Integration and standardisation of Automation control and monitoring of plants via Scada-telemetry.
- GIS geodatabase development for effective management and planning of the infrastructure.
- Water quality management through the Laboratory Information Management System (LIMS).
- Maintenance and life-cycle of equipment.

- Capacity building and training of staff.
- Testing the viability of Automatic Metering Reading of consumer meters (AMR): the Pilot installation and testing on 1 900 consumer meters was finalised during 2010. Its further rollout in industrial/commercial areas is being planned.
- Adoption of Integrated Master Plan
- An Integrated Asset Management Plan is being developed on a coordinated basis across directorates in the City, based on establishing an accurate infrastructure asset register, geodatabase and master data.
- Integrated Risk Management.
- Development of the staffing strategy

# 3. WATER SERVICES BUSINESS ELEMENT SUMMARY

## 3.1. Socio-economic profile

### 3.1.1. Situation Assessment

In 2010 the total population of Cape Town was estimated to be approximately 3.82 million (City of Cape Town Stats. In terms of population trends, the population of Cape Town grew by 36.4% between October 1996 and March 2007 and by 20.9% between October 2001 and March 2007. In 2010 the estimated annual population growth was 3%.

HIV and Aids also influence population growth, and pre-2008 trends indicate a lower mortality rate than that originally predicted. The overall trend is that Cape Town's population will continue to grow each year although at a slower rate than previous years. The number of people living in informal settlements has been growing at an increasing rate and the current housing backlog is estimated at approximately 350 000 units.

**Table 7: The Socio-Economic Status Index profile of Cape Town, by Health Department districts, 2008**

| City of Cape Town | % Adults (20+) with highest qualification < Grade 12 | % Economically Active Unemployed | % Households with income below annual threshold | Annual income threshold | % Labour force in unskilled occupations | SES Index |
|---|---|---|---|---|---|---|
| 1996 Census | 67.07 | 19.55 | 24.66 | R12 000 | 22.85 | 33.53 |
| 2001 Census | 62.03 | 29.38 | 39.00 | 19 300 | 21.46 | 37.97 |
| 2009 | 49.88 | 24.15 | 34.63 | 42 000 | 19.91 | 32.14 |

Source: Strategic Development Information and GIS Department

The Socio Economic Status (SES) index and Service Level index has been used as an indicator of poverty in Cape Town. The higher the index the greater the depth of poverty being experienced. These indexes have been regarded as an important measure of quality of life and are based on income, education, occupational status, type of dwelling and access to services.

The SES index for Cape Town rose from 33.53 in 1996 to 37.97 in 2001 and then declined to 32.14 in 2009 (see Table 7). This indicates that there may have been a decline in the general levels of poverty in Cape Town since 2001. The biggest contributor to the decline in the index is the percentage of adults with their highest qualification less than Grade 12 and the percentage of the labour force in unskilled occupations has also declined.

Unemployment rose sharply in 2001 but has shown some decline since. There has been an increase in the percentage of households earning below the income threshold since 1996.

## 3.2. Future trends, strategic gaps and implementation strategies

### 3.2.1. Strategic gaps:

There is a need for national guidelines on the provision of water and sanitation in the informal settlements but also to additional dwellings in backyards, for the want of which the City has developed its own.

Water and Sanitation Services aim to provide an affordable service to poor households. A free basic service is provided, in the form of the first 6 kℓ/month water supply and the first 4,2kℓ of sewerage conveyance and treatment free of charge to all consumers per month. The City is providing an indigent grant of R47/month to cover an additional water consumption of 4.5kl/month and the corresponding sewage treatment, taking the form of an account reduction to qualifying ratepayers. The number of indigent households qualifying for the Indigent grant either on a property value less than R300 000 are 211 879 as at end of December 2011, while another 1 456 (as at January 2012) qualify for the grant based on income level. The latter value fluctutates on a month to month basis and is dependent on number of applications received and number of applications which have expired.

The Water Demand Management Integrated Leaks Repair Projects, initiated at the end of 2005 and rolled out on a phased basis since then, is a major initiative to ensure that these household's plumbing leaks are minimized and that monthly bills for these services become affordable.

With the implementation of a policy to install Water Management Devices on a prioritised basis, households defined as indigent now have a mechanism to prevent water consumption reaching unaffordable levels and also prevents leaks causing high water losses. It is being installed across a range of household's income groups to the same end goal. A total of More than 53 994 water management devices have been installed as at the end of June 2011.
In order to improve and maintain the condition of the infrastructure, there will be pressure on tariffs to increase at or above inflation over the short- to medium-term. This coupled with the extraordinary burden of very high national electricity tariff increases, is making it extremely difficult for the City to address all needs.

The large number of communities that have embarked on service delivery protest throughout the country has emphasised the need for the City to be transparent in dealing with the challenge of addressing needs while keeping tariffs as low as possible.

# 4. SERVICE LEVEL PROFILE

## 4.1. Situation Assessment

With respect to Domestic consumers, the latest February 2011 City estimate of 1 103 182 households included 193 951 (as at July 2011) in informal settlements, while the remainder of 909 231 in the formal sector included at least 115 248 (as at February 2011) backyard dwellers.

Across all formal registered consumer categories the City's billing system (SAP) shows 622 360 consumers (refer to Table 8).

**Table 8: No of Consumer Units within each Consumer category (as at 31-Dec2011)**

| **COCT Consumer units** | |
|---|---|
| Commercial | 13 187 |
| Government | 352 |
| Industrial | 4 522 |
| Miscellaneous (incl. Homeless Shelters) | 6 179 |
| School-Sportfields | 1 388 |
| Domestic Cluster | 6 373 |
| Domestic single residential | 579 550 |
| Departmental Cluster | 2 686 |
| Municipal Water | 7 434 |
| | 621 671 |
| **External consumer units** | |
| Bulk & Other | 689 |
| **Total consumer units** | 622 360 |

Source of Consumer Unit breakdown: Billing system (SAP)

There is a backlog in both Sanitation and Water services as described earlier.

The formal households and other land use categories all have a metered water connection to the house or yard, with almost all households and other land use categories (excepting a few with septic tank facilities) having flush sanitation on site.

At this stage, the Backyarder policy as envisaged will only be on Council owned public rental stock and will be reviewed in years to come to include backyarders on private property in order that backyarders may have access to basic services and are not exploited by the main tenant. All registered backyarders in the programme will also be regarded as indigent. Formal domestic consumers receive the first 6 kiloliters of water per month free as well as the corresponding 4.2 kilolitres of sanitation service. Informal areas have communal standpipes and water is provided free, as is Sanitation. Both are at a lower-than desirable servicing ratio, with water much less of challenge to improve than sanitation.

The key challenge for sanitation when provided communally or even shared by 5 HH is maintaining and keeping it clean. A vandalized or unacceptably dirty toilet results in people using the open field which leads to safety risks particularly for women and children.

## 4.2. Future Trends and goals

### 4.2.1. Residential consumer units

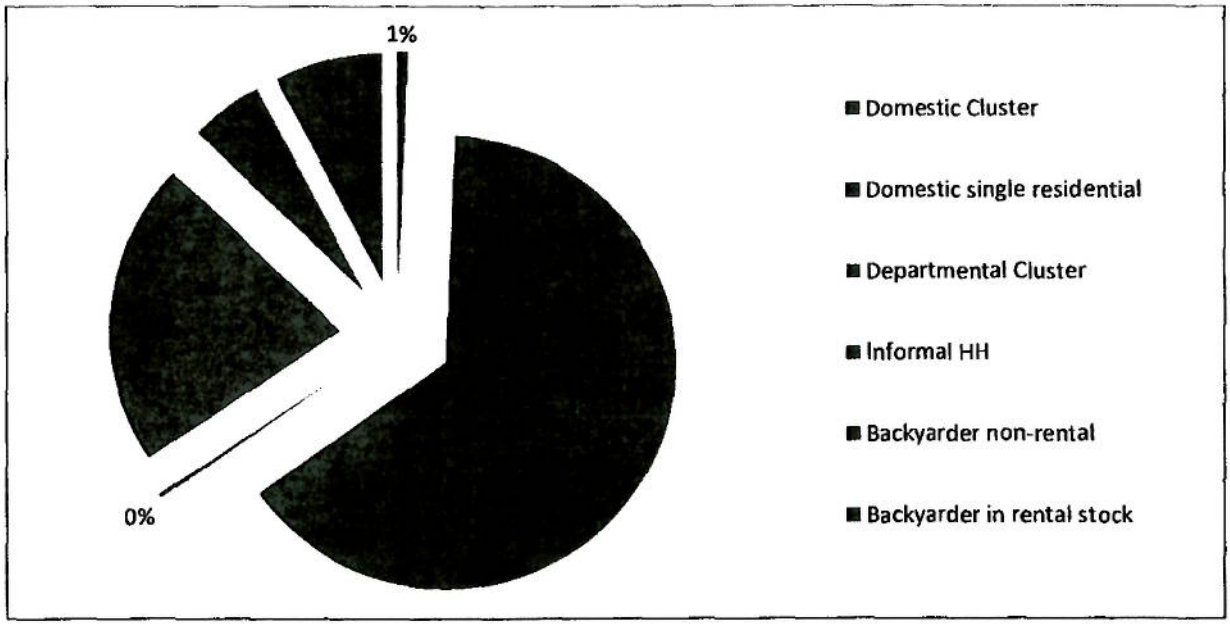



**Figure 1: Breakdown of residential consumer units as at 31 December 2011**

This break down in residential consumers emphasises the need to focus on improved water and sanitation services onto informal household consumers and backyarders. In total they make up 35% of residential customer base. The continued rapid increase in informality could lead to large number of City households being pushed into accepting lower levels of service.

### 4.2.2. Public institutions and 'dry' industries; wet industries; industrial consumer units

All have connections on-site.

### 4.2.3. Strategic gaps

- The backlog in acceptable service levels of sanitation in informal settlements needs to be bridged.
- At the moment the total number of backyard dwellers in public rental stock are 68 500. The pilot of 156 in Factreton will provide valuable lessons in dealing with the total need.
- With respect to the effluent discharged from Industrial sites, non-complying and polluting trade effluent occasionally impacts heavily on the wastewater treatment process serving the catchment. The size and efficiency of the inspectorate has been increased over the past few years, while Water, Sanitation and Effluent By-laws have been consolidated and rewritten for the City. Nevertheless the challenge to obtain cooperation from consumers remains high.

### 4.2.4. Implementation strategies

- Residential consumer units: Water & Sanitation's informal settlement programme aims to eradicate the sanitation backlogs and maintain a minimum level of service to poor households.
- Industrial consumer units: The inspectorate is using an engaging, cooperative approach with consumers, more comprehensive integrated by-laws as well as more frequent inspections and measurements to improve the quality of industrial effluent, prevent pollution in a pro-active manner and reduce water wastage.

# 5. WATER RESOURCE PROFILE

## 5.1. Situation Assessment

### 5.1.1. The Western Cape Water Supply System

The Western Cape Water Supply System (WCWSS), comprising raw water storage and conveyance infrastructure, supplies water to Cape Town, surrounding towns and urban areas and agriculture. The various components of the WCWSS are owned and operated by the COCT, DWA and Eskom.

The COCT and DWA operate the WCWSS in an integrated manner to ensure that the storage of water is maximized and spillage is minimized during current and future hydrological years.

The annual yield of the WCWSS, including the recently completed Berg River scheme, is 556 million kl per annum.

The major raw water supply schemes of the WCWSS are the Riviersonderend, Voelvlei and Berg River Schemes, owned and operated by the DWA, and the Wemmershoek and Steenbras Schemes, owned and operated by the City of Cape Town. The total storage capacity of the six major dams on November 2011 is 898 300 million kl, only 78.5% of total storage capacity is occupied.

A long-term 16 year record of the storage level of the WCWSS is shown below.

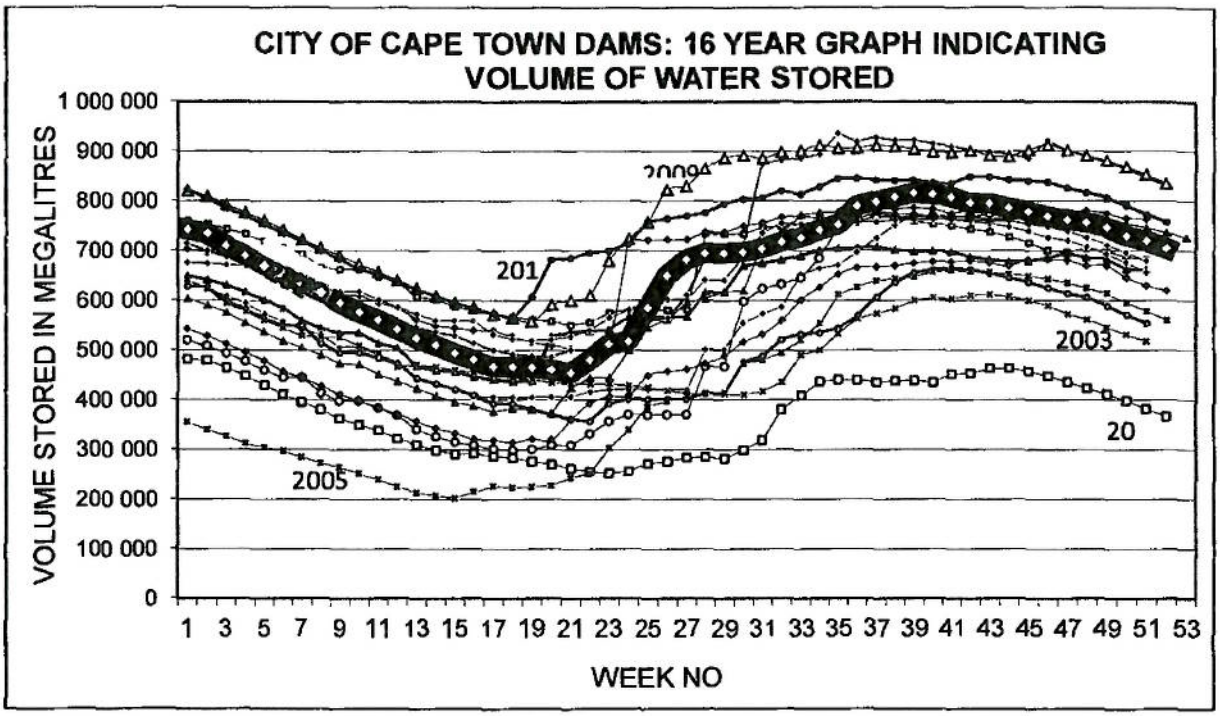



**Figure 2: 16 year long term history of reservoir storage capacity**

### 5.1.2. Water Resources Supplying Cape Town

The COCT's allocation of water from the WCWSS, with the additional yield of the Berg River scheme, is 398 million kl per annum. Including the Berg River scheme, the COCT obtains 74% of its allocated water from DWA owned sources, with the balance of 27% from COCT owned sources. The resources supplying the COCT and its allocation from these resources are shown in Table 9.

The COCT produced 336.64 million kl of potable water during the 2010/11 financial year.

### 5.1.3. Water returned to the resource

The COCT obtains most of its raw water from mountainous catchments outside of its municipal area, and therefore most of the COCT's treated wastewater effluent is not returned to the raw water resource. A percentage of the effluent produced at the Westfleur Treatment Works at Atlantis is used to artificially recharge the aquifer from which water was abstracted for potable supply as part of the Atlantis Water Supply Scheme.

**Table 9: Cape Town's allocation from the WCWSS (as at December 2011)**

| | *Million kl /annum* | *% of Total* |
|---|---|---|
| **DWA Owned Schemes** | | |
| Theewaterskloof | 118 | 29.6% |
| Voëlvlei | 70.4 | 17.7% |
| Palmiet | 22.5 | 5.6% |
| Berg River | 81 | 20.3% |
| **Subtotal DWA Schemes** | **291.9** | **73.2%** |
| | | |
| **CCT Owned Schemes** | | |
| Wemmershoek | 54 | 13.5% |
| Steenbras | 40 | 10.0% |
| Lewis Gay and Kleinplaats Dams | 1.8 | 0.5% |
| Land en Zeezicht Dam | 1 | 0.3% |
| Table Mountain Dams | 3.5 | 0.9% |
| Albion Springs | 1.5 | 0.4% |
| Atlantis Groundwater Scheme | 5 | 1.3% |
| **Subtotal CCT Schemes** | **106.8** | **26.8%** |
| | | |
| **TOTAL ALLOCATION** | **398.7** | |

## 5.2. Quality of water

The quality of water produced at the COCT's water treatment plants is strictly monitored on a continual operational basis by the Bulk Water Branch to ensure compliance with the South African National Standard (SANS 241:2011) on drinking water quality. The Scientific Services Branch also conducts routine sampling and analysis of potable water produced at all water treatment plants, as well as inspection of treatment processes.

Efforts are at an advanced stage to acquire SANS 17025 certification for the laboratory quality testing. Expansion of the laboratory is a necessity for improving its capability to undertake a wide spectrum of tests.

The water quality report below indicates the analytical data and approximate distribution for Cape Town drinking water for June 2011. The SANS Specification is also stipulated on this report. Water Compliance has exceeded the target of 96% at 98% (SDBIP, December 2011).

**Table 10: Class 1: Drinking Water Quality for December 2011 (SANS 241 requirements per population size; 1 sample: 20 000 population)**

| Item no | Water Supply Outlets | Sample Points Per Water Supply Outlet | Sample Points Sampled | Number of Samples Taken for August | | % Compliance SANS 241:2011 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | August Month | | 12 Month Rolling Average | |
| | | | | Chemical | Microbiological | Chemical | Microbiological | Chemical | Microbiological |
| 1 | Water Treatment Plant | 10 | 9 | 30 | 30 | 99 | 100 | 98 | 100 |
| 2 | Reservoir * | 26 | 23 | 80 | 91 | 97 | 100 | 97 | 99 |
| 3 | Distribution * | 105 | 88 | 321 | 347 | 95 | 100 | 97 | 100 |
| 4 | Informal Settlements * | 43 | 37 | 61 | 63 | 100 | 99 | 98 | 96 |
| 5 | Total | 184 | 157 | 492 | 531 | 97.8 | 99.8 | 97.5 | 98.8 |

## 5.3. Future Trends and Goals

The Bulk Water, Reticulation and Scientific Services Branches of the Department will have to take note of any future water quality requirements and then, as a result, put the necessary steps in place to meet these requirements. The international and national specifications for drinking water are changing all the time with specifications becoming more stringent and with new ones being added e.g. possible future water analysis for radioactivity, viruses, EDC's, etc. The City of Cape Town will have to put measures in place to meet these future requirements, e.g. purchase of new specialized analytical equipment to perform these measurements, stricter process control at the water treatment plants, etc. With proper coordination within the Department, these future water quality requirements can be met.

### 5.3.1. Strategic gap analysis

The WCWSS Reconciliation Strategy included recommendations of interventions that needed to be implemented or studied further to ensure that potential schemes could be implemented in future when required. Table 11 summarizes these interventions being implemented or studied further.

**Table 11: Interventions to be implemented or studied further**

| Intervention | Study Level Required | Responsibility |
|---|---|---|
| **Existing Feasibility Studies in Progress** | | |
| Water Demand Management | Intervention to be implemented | COCT |
| TMG Aquifer Feasibility Study | Feasibility | COCT |
| Pilot Desalination Plant | Feasibility | COCT |
| TMG Regional Monitoring | Monitoring | DWA |
| Invasive alien plant clearance | Ongoing | DWA |
| Voelvlei Phase 1 | Update feasibility | DWA |
| Mitchell's Pass Diversion | Pre-feasibility/feasibility | DWA |
| UpperWitRiver Diversion | Pre-feasibility | DWA |
| Raising Steenbras Lower Dam | Pre-feasibility | DWA |
| Upper Molenaars Diversion | Pre-feasibility | DWA |
| Water Re-use | Pre-feasibility | DWA/COCT |
| **Future Studies Required** | | |
| Newlands Aquifer | Pre-feasibility | COCT |
| CapeFlats Aquifer | Feasibility | COCT |
| LourensRiver Diversion Scheme | Pre-feasibility | COCT |

Although the above table provides a number of augmentation options, a decision on the preferred option of the augmentation scheme will be decided in March 2012.

## 5.4. Regulation

### 5.4.1. Situation assessment

The Water Pollution Control Inspectorate's function is the protection of municipal infrastructure and the environment against pollution. The unit comprises of 25 Inspectors, 90% of which are Peace officers, who regulate public institutions and the industrial/commercial sector.

About 300 dischargers are monitored on a monthly basis, and for the 2010/11 financial year, an average of 10% of these were non-compliant. The billed income for the 2010/11 year for industrial effluent was ~R16 442 339.33 and R 8 962 992.82 for treated effluent. Between October 2010 and June 2011, 108 fines were issued for illegal discharges to storm water.

The Wastewater & Industrial effluent by-law has been amended and is currently in the process of Council approval. Previously there no fines for the Treated Effluent and the Wastewater & Industrial effluent by-law, but recently spot fines have recently been approved by the Magistrate committee and effective immediately. This will enhance the enforcement arm of the unit.

## 5.5. Future Trends and Goals

### 5.5.1. Strategic gap

With respect to the effluent discharged from Industrial sites, non-complying and polluting trade industrial effluent occasionally impacts heavily on the wastewater treatment processes serving the catchmentand as a result, poor quality effluent ends up being discharged into our rivers. Parameters of concern for in the sewer system include fats, other foreign objects (sand, tools, tyres, rags, etc), toxic substances and , stormwater ingress. In the case of the stormwater system, the common offence is mainly polluted wash water containing oils ,silt and grease from vehicle washing.

### 5.5.2. Implementation strategies

Industrial consumer units: The inspectorate is using an engaging, cooperative approach with consumers, more comprehensive integrated by-laws as well as more frequent compliance

monitoring inspections. and measuremand enforcement in the form of fines and full legal processes where needed.ents This approach is crucial in achieving our goal to improve the quality of industrial effluent discharged into the sewer system. , prevent pollution in a pro-active manner and reduce water wastage.

A campaign on educating the communities (all sectors) around sewer blockage causes, consequences and prevention iss is continually rolled outcurrently underway in phases across the city, as a means to protect the infrastructure and the environment against pollution. In addition to the education and awareness program, in addition to there is an on-going infrastructure replacement /& refurbishment programs. Furthermore, the unit Inspectorate is also in the process of appointing consultants to install an in-line monitoring tool/system to assist inenhance the continuous quality monitoring of industrial effluent, in particular form from the metal finishersfinishing sector, in order to prevent or promptly respond to illegal discharges.

As far as the storm water ingress challenge, services of consultants have been sought to assist with detailed investigations on above and below ground sources responsible for the stormwater ingress to sewer so that plans to deal with such can be put in place

# 6. WATER CONSERVATION AND DEMAND MANAGEMENT

## 6.1. Situation assessment

### 6.1.1. Water Demand Management Interventions

The efficient use of scarce water resources for the City of Cape Town's growing needs and the aim to maximize on the use of existing infrastructure are critical factors that drive the Water Demand Management and Water Conservation Strategy.

The Department is applying the resources required to implement water demand management interventions, including: (a) reduction of non-revenue water, (b) reduction of high pressure, minimum night flow for residential consumers, (c) education programmes, (d) plumbing leak and meter repair programmes, (e) pipe replacement, effluent re-use, water restrictions and stepped tariffs.

## 6.2. Trends and goals

### 6.2.1. Water Demand Management Interventions

Water demand management is an essential core requirement for sustainability of water supply to the City. In circumstance where water consumption is controlled to the levels expected in the Water Conservation and Water Demand Management strategy, deferment of the next water resource scheme to approximately 2029 can be achieved.

In the 2010/11 financial year, a number of successful WC/WDM projects were implemented of which notable projects were:

- **Pressure Management** was successfully implemented in Crossroads/Plumstead /Retreat/Marina Da Gama/Lavender Hill. The **savings are estimated at 2.28 Ml/day;**
- 20 574 dysfunctional consumer water meters were replaced;
- 95 users were supplied with **Treated Effluent** which accounts for **30 Ml/day** of re-use (Potable Water replacement of **12.66Ml/day**);
- ± 100 Caretakers of schools were trained ;
- 60 **Schools** were visited and **leaks repaired ;**
- **Awareness and Education with** approximately **2 688** workshops;
- Approximately **200 households were** visited for the **Integrated Leaks Repair** project.

### 6.2.2. Strategic gaps and goals

**Table 12: Strategic Gaps**

| | |
|---|---|
| Resources | Inadequate financial resources |
| | Inadequate human resources to implement WC/WDM strategy |
| | Water balance not developed to IWA standard. |
| Technical capacity and tools | Ineffective management information and monitoring systems |
| | Inadequate demand measurement systems and tools |
| | No detection programme in place to identify water leaks before they become bursts |
| | Water balance model not yet developed to level of all water supply zones |

The levels of demand reduction planned for to a level of no more the 2.5% growth. This target has been far exceeded at 1.66% for 2010/11 financial year. If funding on WDM is not continually prioritised to enable the planned programmes, the factors of economic growth and consumer behaviour will outstrip the gains made.

### 6.2.3.Implementation Strategy

The Water Conservation and Water Demand Management Strategy are being followed in order to budget for and implement several initiatives in parallel.

Top priorities are the rollout of further Water Demand Management Devices on a prioritised suburb-by-suburb basis.

Further pressure reduction schemes are being designed for implementation.

The Automated Meter Reading Pilot installation on consumer meters has been finalised. Decisions on future roll-out options City-wide will follow and be considered for future budgets on a priority basis. Advantages indicated by preliminary evaluation include:

- synchronised simultaneous reading for an entire suburb
- more reliable readings with far fewer estimations
- Immediate loss detection at a consumer
- Immediate knowledge of a meter failure or tampering
- the ability to analyse water balance and losses by individual supply zones

The Strategy is currently being reviewed in terms of its level of success and updated accordingly.

# 7. WATER SERVICES INFRASTRUCTURE PROFILE

## 7.1. Situation assessment

The Financial "book" value of the water and sewer infrastructure stood at R2.78 billion at 30 June 2011. However, the Replacement Value is estimated considerably higher, escalated at CPIX rates from a 2003 Independent Auditing evaluation.

**Table 13: Infrastructure of Water and Sanitation Services -Estimated Replacement cost**

| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
|---|---|---|---|---|
| Bulk Water (including water pump stations, water retic and reservoirs) | | | | 75.0 |
| Dams and Catchments | 11 No | 1 438.8 | 0.50% | 7.3 |
| Water Treatment Works | 12 No | 1 576.4 | 1% Civil, 4% Mech/Elec | 32.9 |
| Waste Water Treatment Works incl Sea Outfalls | 24 No | 2 191.6 | 1% Civil, 4% Mech/Elec | 45.5 |
| Water Reticulation (incl Bulk Lines) (GIS 23-06-2011) | 11 086 | 14 900.3 | 1% | 63.7 |
| Sewer Reticulation (GIS 23-06-2011) | 8 541 | 6 843.8 | 1% | 64.2 |
| Depots | 21 No | 90.7 | 0.50% | 0.5 |
| Water Pump Stations | 114 No | 484.7 | 0.5% Civil, 4% Mech/Elec | 7.7 |
| Sewer Pump Stations | 381 No | 438.7 | 0.5% Civil, 4% Mech/Elec | 11.4 |
| Reservoirs | 122 No | 1 957.3 | 0.50% | 4.0 |
| | | **29 922.4** | | **312.2** |

The Bulk Water Supply System comprises: 11 raw water dams owned and operated by the City of Cape Town; 12 water treatment works with a current approximate potable water production capacity of 1600Ml/day; 32 pumpstations; 24 bulk reservoirs with a total storage capacity of 2 825Ml; and 659km of raw and potable water pipelines, ranging from 300mm to 2 400mm in diameter.

## 7.2. Trends and goals

The water supply and wastewater reticulation networks jointly account for 72% of the total replacement value. The water distribution networks experienced 6 645 bursts to water mains in 2010/11 compared to 6 169 in 2009/10.

### 7.2.1.Strategic gaps

Historically, maintenance of infrastructure was mostly reactive. This is evidenced by the backlog of overdue maintenance and replacement projects.

Especially in the City's growth areas the water and sewer infrastructure are severely stressed:

- West Coast / Parklands development corridor
- De Grendel / N7 development node
- Northern development/Fisantekraal corridor
- Bottelary development corridor
- Fast-track housing projects (e.g. N2 Gateway)
- Maccassar / AECI development node

The strong growth trend in the City is making it difficult to maintain a balance between requirements and available resources.

### 7.2.2.Implementation strategies

The City has undertaken an accelerated programme to improve the replacement of water distribution network mains, especially in areas that experience a high incidence of bursts, such as the Tygerberg district. More importantly, Water and Sanitation Services is implementing an Asset Management Programme (AMP). This will ensure that:

- Assets are maintained proactively rather than reactively,
- The total asset lifecycle is managed to maximise life of asset,
- Maintenance work is effectively coordinated,
- Operational downtime is significantly reduced.

The strategies for ensuring that wastewater treatment capacity is maintained include:

- Integrate planning for new works and extensions with the other branches and ensure that additional wastewater treatment capacity is provided where needed at the right time,
- Provide sufficient funding (EFF and MIG funds) to address the backlog in WWTW capacity and provide for growth.

To ensure long term sustainability, Water and Sanitation Services has by 2010 developed an Integrated Master Plan. The objectives of the master planning process are:

- To balance demand and capacity, all water and sanitation branches will use the same base data, assumptions and design parameters to ensure consistency,
- Infrastructure plans within Water and Sanitation Services are fully aligned,
- Alignment with the City's Spatial planning and IDP strategies are achieved,
- To provide sound information on which capital budgets for future years can be improved, and
- The plan is kept up to date annually to ensure reliable planning based on it.

An automation, monitoring and technology programme is being driven in the department towards achieving maximum efficiency and optimum utilisation of staff resources in a "smart" way. To this end, cooperation has been pursued with leaders in the field such as the Norwegian Oslo Waterworks and the Danish Hydraulic Institute.

There is intention to offset the disadvantages of the existing sprawl of the CoCT with reference to infrastructure by concentrating development in identified densification zones / corridors.

In line with the IDP Focus Area of infrastructure led development and economic growth the WSDP will:

- Focus on maintaining and replacing aging existing infrastructure
- Improve delivery of services to informal areas, and
- Promote efforts to densify the city by reviewing and upgrading infrastructure to accommodate higher residential density.

The following framework plan indicates progress and future plans.

**Table 14: Automation, monitoring and technology Framework plan**

| ACTION | PROGRESS | TIMEFRAME | IMPLEMENTATION COST |
|---|---|---|---|
| Plant SCADA upgrades. (Bulk, Wastewater, Pump stations). | SCADA upgrades completed at Atlantis, Blackheath and Steenbras WTP. Visnet implemented Software and partial commissioning at Wildevoelvlei WWTW Additional license required and connection to corporate network.<br><br>And Wemmershoek Dam WTW. Complete | 5 years (2014) | R10M for current Reticulation system phase. Full system scope being developed. |
| Bulk & Zone meter automation | Further zones delineated (201) and zone meters installed. | All Water Zone meters logged by 2014. | |
| Customer meter automation | AMR pilot installation completed May 2010. Extensive evaluation undertaken in N2 Gateway, SunsetBeach and Epping Industria. Various technical, meter supply and process issuesaddressed.<br><br>Prepayment meters to be investigated and piloted. | AMR Phased rollout planned in priority industrial or commercial areas over a multi-year timeframe (2020) for entire City.<br><br>Prepayment pilot 2011. | R1.5M pilot phase.<br><br>R50M excluding meter replacement. |
| Integrated Information System | DIMS development (Danish Hydraulic Institute) with major DWA grant completed. Integrates key major Water and Sanitation information systems in browser map-based dashboards. | Completed and handover October 2010 | R7M (R5M DWA grant) |
| Integrated Master Planning | Integrated Master Planning project completed. Skills transfer and software rollout to all users as well as central server installation underway. | Handover completed<br><br>New tender to be awarded 2012 | R14.5M |
| Technical Dperating Centre process improvements | SAP-GIS Integration being implemented under control of SAP. Includes: GIS & SCADA integration in SAP, C3 Notifications, Tetra Radio comms and spatial tracking, Mobile Asset Management. | 2012 | R10M. |
| SCADA/Telemetry masterplan | Contract has been awarded to develop a new master station for all reservoirs and pump stations, including the supply of RTU's. Also included is the development of data from the new telemetry system to the database that DIMS will harvest.<br><br>Master plan completed<br><br>Tender in place for the procurement of RTUs Factory Acceptance Test complete snag list being resolved. Test RTU in field trials. | 2011 | |
| Automated Water Analysis | Process lab Units already installed at 9 Bulk Water Depots.<br><br>Installation of 8 computers and Connectivity testing to be in March 2010. | Completion end March 2010. | R693 000 |
| Air Quality Monitoring System(Service provider to Health Dept.) | Tender awarded April 2010. | Completed 2010 | R1.3 Million |

# 8. WATER BALANCE

## 8.1. Situation assessment

Using water and billing figures, the unaccounted-for water (UAW) for the overall supply system from Bulk Water Treated to end consumer billing is 19.8% (2010/11).

The Non-Revenue Water (NRW) is defined as the volume of water used by the municipality for which no income is received where revenue water includes Free Basic water which is billed at a zero rate (Wegelin *et al*). Below is the Non-revenue Water balance according to IWA standard.

**Table 15: Non-revenue water demand, 2010/11 Financial Year**

<table>
<tr><td rowspan="8">System Volume Input 922.31 Ml/d</td><td rowspan="4">Authorised Consumption 739.71 Ml/d</td><td rowspan="2">Billed Authorised Consumption 706.10 Ml/d</td><td>Billed metered consumption 706.10 Ml/d</td><td rowspan="3">Potential revenue Water 706.10 Ml/d</td><td>Free Basic Water 105.22Ml/d</td></tr>
<tr><td>Billed unmetered consumption 0 Ml/d</td><td>Recovered revenue 553.94 Ml/d</td></tr>
<tr><td rowspan="2">Unbilled Authorised Consumption 33.61 Ml/d</td><td>Unbilled Metered Consumption 21.70 Ml/d</td><td>Non-payment 46.94 Ml/d</td></tr>
<tr><td>Unbilled Unmetered Consumption 11.91 Ml/d</td><td colspan="2" rowspan="4">Non Revenue Water 216.21 Ml/d</td></tr>
<tr><td rowspan="4">Water Losses 182.6 Ml/d</td><td rowspan="2">Apparent Losses 55.71 Ml/d</td><td>Unauthorised Consumption 9.59 Ml/d</td></tr>
<tr><td>Customer Meter Inaccuracies 46.12 Ml/d</td></tr>
<tr><td rowspan="3">Real Losses 126.89 Ml/d</td><td>Leakage on Transmission and Distribution Mains</td></tr>
<tr><td>Leakage on Overflows at Storage Tanks</td></tr>
<tr><td>Leakage on Service Connections up to point of customer meter</td></tr>
</table>

## 8.2. Future trends and goals

The City has in principle adopted international best practice with respect to reporting on water balance and will stop reporting on UAW as soon as more accurate data is available.

### 8.2.1. Strategic gap analysis

The SABS 0306:1999 standard discourages the use of percentage losses to quantify water losses in the distribution network.

### 8.2.2. Implementation strategies

A very high priority is being given to a comprehensive Water loss reduction strategy with detail action plans being developed for each of Technical losses (Pipe bursts, Leakage, Treatment losses, System losses), Apparent losses (illegal connections, metering inefficiencies, unmetered authorised consumption, unauthorised consumption, Billing/accounting, meter reading).

Phased Installation of more zone- and bulk supply meters are being implemented as well as automated remote logging thereof to accurately measure input into water supply zones.

An added benefit of the Integrated Master Plan project is the creation of an accurate and up-to-date historic record of consumption by Ervin that can be used to derive water and sanitation demands. The first comprehensive and reliable dataset became available in January 2010. This data will be used together with zone meters and bulk meters to achieve a water balance based on smaller pressure zones. This will enable losses to be pinpointed and reduced or eliminated.

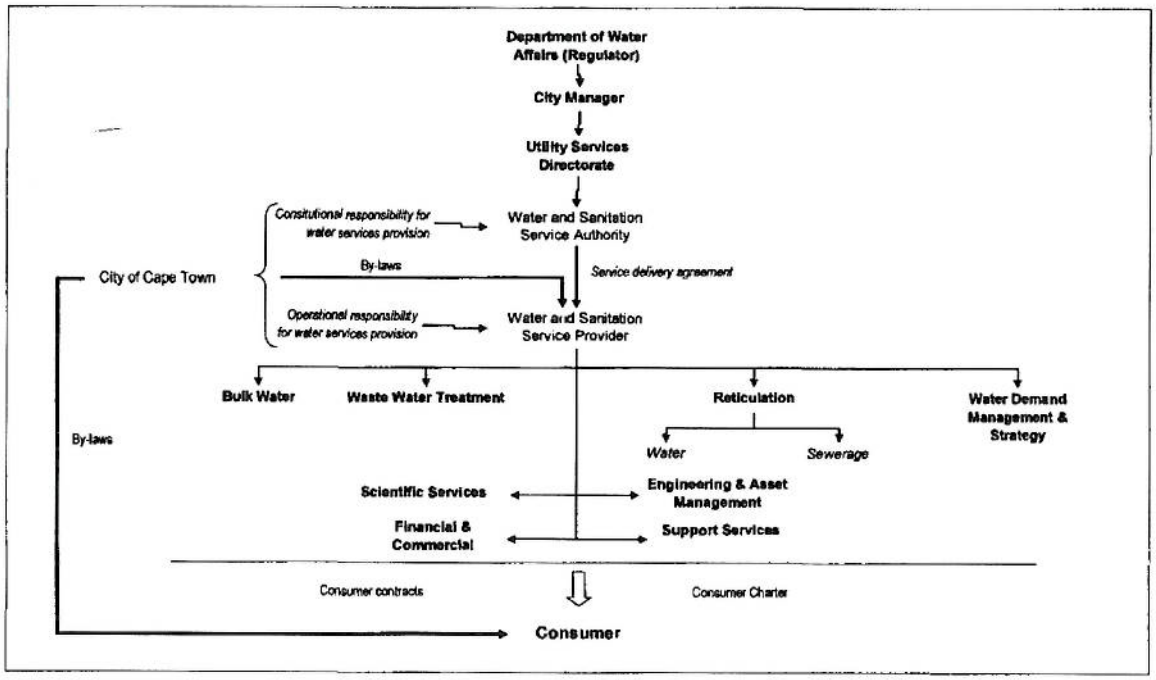
The DIMS project recently implemented has as a focus area the reporting of the latest Demand and Loss information to the IWA standard.

# 9. WATER SERVICES INSTITUTIONAL ARRANGEMENTS

## 9.1. Situation assessment

The new City of Cape Town and the Water and Sanitation Services entity was formed with the amalgamation of the Cape Metropolitan Council and the 6 metropolitan local councils in December 2000.

**Table 16: Water Service Institutional Arrangements**




Source: Water Demand Management Strategy

On 28 November 2001, Council authorized Water and Sanitation Services as it was called then to operate as fully-fledged and functional internal business unit in order to ensure maximum independence and minimum constraints. In practice this has not been implemented further.

**Risk Management:** Work has started on an Integrated Risk Management Programme with the appointment of a Risk Manager and the development of a strategy. attached Risk Register has been developed.

**Safety:** All procedures were reviewed and risks still need to be identified.

## 9.2. Future trends and goals

The appointment and retention of technical staff (engineers, scientists and IT personnel) remains a high priority.

### 9.2.1. Strategic gap analysis

The City of Cape Town is currently undertaking the constitutional responsibility for water service provision (as the Water Services Authority (WSA)) as well as the operational responsibility (as the Water Service Provider (WSP)). The City has not separated the service authority and service provision function to establish a municipal entity, preferring to operate the service as an internal ring-fenced department. At the moment, there is no service delivery agreement between WSA and WSP in place.

### 9.2.2. Implementation strategies

**Institutional reform:** The City's strategic intent, aligned with the national agenda and as stated in the IDP is:

- Sustainable use of scarce resources such as water
- achieving operational, financial and other efficiencies which will enhance equitable, affordable and effective service delivery and sustainable development;
- Increase service provision (taps and toilets in formal settlements)

**Human resources:** It is the City's strategic intent to develop and retain a skilled and motivated staff according to the Staffing Strategy and the Workplace Skills Plan. A strategy to hold onto staff is a talent management programme currently underway which intends to hold onto qualified and experience staff through a career development and succession plan. This effort will help to hold onto institutional knowledge.

# 10. CUSTOMER SERVICE PROFILE

## 10.1. Situation assessment

Although under stress in certain regions, necessary infrastructure is in place to ensure an adequate quality of service to formal households. All customers receive water that is fully treated. There are mechanisms in place to attend to customer complaints and queries.

A survey is undertaken on an annual basis to gauge the customer satisfaction in formal domestic, informal domestic and business sectors and to identify specific issues of concern. Recent stats will be available once the census has taken place in 2011.

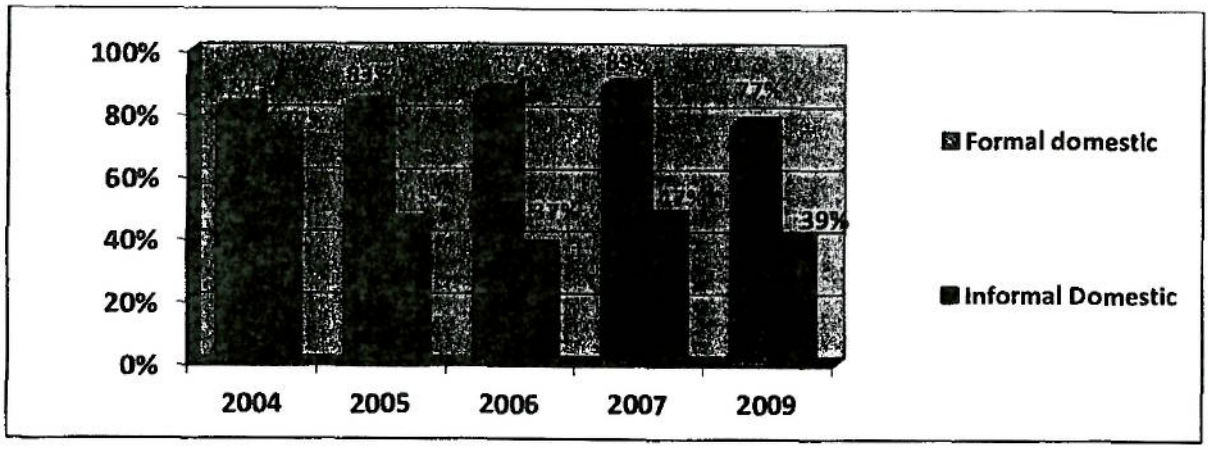



**Figure 3: Customer satisfaction levels over time**

The general conclusions are:

- The increasing satisfaction level for respondents living in formal residential areas has shown a downturn.
- Respondents living in informal residential areas are generally dissatisfied.
- 82% of business respondents are satisfied.

This could be an indication that residents do not understand the reasons for a basic level of service as opposed to a full level of service. An alternative argument could be that people whether in a formal or informal settlement will only be satisfied with a full level of service and that

the level of satisfaction in informal settlements will always remain low due problems related to communal toilets.

## 10.2. Future Trends and goals

The goal is to ensure that the percentage of customers satisfied with the service continues to increase and reaches 95% within the next 5 years.

### 10.2.1. Strategic gap analysis

There is no consolidated information on response times to complaints and queries and to repairing water and sewer mains. An integrated information system dealing with these matters is under development by the Technical Operating Centre.

### 10.2.2. Implementation strategies

- Ensuring water pressure standards are maintained to improve areas of extreme high or low pressures.
- The Education and Awareness Campaign will be extended to affect behaviour change in residential customers towards reducing water consumption, and that all customers have a better knowledge of water efficient fittings.
- Establishment of a system at the Technical Operating Centre to ensure that customer complaints are measured and followed up.
- The AMR project promises to bring improved customer satisfaction around metering and billing.
- Appointment of staff for critical vacancies.
- Have a public awareness on level of service and affordability
- The survey question in informal settlements should be structured differently

# 11. FINANCIAL PROFILE

## 11.1. Situation assessment

### 11.1.1. Capital expenditure and sources

Capital expenditure incurred during the year 2010/11 amounted to R390.9 million with an expenditure level reached against the current budget.

**Table 17: Water and Sanitation capital expenditure 2010/11**

| Area (Rmillion) | 2008/09 | 2009/10 | 2010/11 |
|---|---|---|---|
| Bulk Water | 35.3 | 25.2 | 19.2 |
| Reticulation | 290.5 | 219.6 | 149.6 |
| Wastewater Treatment | 253.4 | 235.5 | 121.5 |
| Water Demand management | 44.5 | 8.9 | 14.6 |
| EAMS | 20.3 | 26.2 | 36.9 |
| Informal Settlements | 18.0 | 24.8 | 21.1 |
| Meter Replacement | 7.1 | 9.90 | 14.6 |
| Information Technology | 7.8 | 8.90 | 7.3 |
| Technical Operation Centre | 1.0 | 5.90 | 1.1 |
| Master planning | 2.0 | 3.90 | 0.4 |
| Other | 4.4 | 2.2 | 4.6 |
| **TOTAL** | **684.3** | **571.0** | **390.9** |

Capital expenditure is financed from

(i) CRR (Capital Replacement Reserve) a fund replenished from surplus in previous financial year,

(ii) EFF (External Financing Funds) loans obtained by the City, attracting interest and depreciation charges and having a direct impact on the tariffs or

(iii) CGD (Capital Grants & Donations).

### 11.1.2. Operating Costs and income

In 2010/11 operating costs amounted to approximately R4.5 billion and a deficit of some R125m. The deficit can mainly be contributed to the lower than anticipated collection ratio on amounts billed.

### 11.1.3. Tariffs and Charges

**Table 18: Water and Sanitation tariffs trends**

| WATER TARIFFS (Rands) | 2006/07 | 2007/08 | 2008/09 | | |
|---|---|---|---|---|---|
| *0-6 kℓ* | - | - | - | - | - |
| *+6-12 kℓ* | 2.56 | 3.05 | 3.33 | 3.66 | na |
| *+6-10.5 kl* | na | na | na | na | 3.99 |
| *+12-20 kℓ* | 5.46 | 6.50 | 7.10 | 7.81 | na |
| *+10.5-20 kl* | na | na | na | na | 8.51 |
| *+20-40 kℓ* | 8.08 | 9.63 | 10.52 | 11.57 | na |
| *+20-35 kl* | na | na | na | na | 12.61 |
| *+40-50 kℓ* | 9.98 | 11.90 | 12.99 | 14.29 | na |
| *+35-50 kl* | na | na | na | na | 15.58 |
| *+50 kℓ* | 13.17 | 15.70 | 17.14 | 18.85 | 20.55 |
| Domestic cluster | 5.47 | 6.52 | 7.12 | 7.83 | 8.62 |
| Commercial | 5.83 | 6.95 | 7.59 | 8.35 | 9.18 |
| Industrial | 5.83 | 6.95 | 7.59 | 8.35 | 9.18 |
| Schools/sport | 5.15 | 6.14 | 6.70 | 7.37 | 8.11 |
| Government | 5.53 | 6.59 | 7.20 | 7.92 | 8.71 |
| Municipality | 5.15 | 6.14 | 6.70 | 7.37 | 8.11 |
| Miscellaneous | 5.53 | 6.59 | 7.20 | 7.92 | 8.71 |
| Misc (external) | 6.61 | 7.88 | 8.60 | 9.46 | 10.41 |
| Bulk Tariff | 2.21 | 2.37 | 2.59 | 2.59 | 2.85 |
| SANITATION TARIFFS (Rands) | | | | | |
| *0-4.2 kℓ* | - | - | - | - | - |
| *+4.2-8.4 kℓ* | 1.68 | 3.78 | 4.01 | 4.29 | na |
| *+4.2-7.35 kl* | na | na | na | na | 4.67 |
| *+8.4-14 kℓ* | 4.10 | 8.04 | 8.52 | 9.12 | na |
| *+7.35-14 kl* | na | na | na | na | 9.94 |
| *+14-28 kl* | na | 8.79 | 9.32 | 9.97 | na |
| *+14-24.5 kl* | na | na | na | na | 10.87 |
| *+28-35 kℓ* | n/a | 9.23 | 9.78 | 10.46 | na |
| *+24.5-35 kl* | na | na | na | na | 11.41 |
| Industrial & Commercial | 2.51 | 5.65 | 5.99 | 6.41 | 7.05 |
| Departmental/Municipal | 2.31 | 5.20 | 5.51 | 5.90 | 6.49 |
| Domestic Cluster (>4.2 kℓ) | 4.04 | 9.10 | 9.65 | 9.65 | 9.65 |
| TARIFF ANALYSIS (Rands) | | | | | |
| **Overall average** | **4.82** | **6.60** | **7.18** | **8.12** | **8.85** |
| Year-on-year growth | 2.3% | 37.0% | 8.8% | 13.1% | 9.0% |
| Water average | 5.77 | 6.80 | 7.49 | 8.77 | 9.61 |
| Year-on-year growth | -0.9% | 17.9% | 10.1% | 17.1% | 9.6% |
| Sanitation average | 2.44 | 6.22 | 6.60 | 6.98 | 7.51 |

Tariff increases have been set higher than inflation during the last number of years due to the escalated focus on repairs and maintenance of current infrastructure as well as the growth in the capacity requirement in the capital infrastructure programme.

As we get closer to requiring an augmentation scheme, the tariffs will have to be reviewed in order to cover costs of augmentation. This awareness that we will constantly be faced with a decision of when, what method and cost of any scheme that will be implemented.

#### 11.1.4. Free Basic water and sanitation

The first 6 kilolitres of water supplied to all residential dwellings in the municipal area and the first 4.2 kilolitres of sewage removed from all residential dwellings in the municipal area is free. Fixed charges do not apply to dwellings occupied by domestic households.

A R38 Indigent Grant is applicable to the water and sanitation tariff for qualifying households. The net result is that an Indigent household can consume an additional 4.5kl water per month and can discharge an additional 3.15 kilolitres wastewater per month (with sewerage disposal 70% of water consumption) without attracting any charges.

This subsidy would be ineffective without the ongoing Integrated Leaks Repair and Fixit Projects aimed at repairing leaks, reducing consumption, reducing monthly bills and eliminating arrears of properties occupied by Indigent households. (Refer to the Water Conservation and Demand Management Strategy.)

### 11.2. Trends

The Operating budget will increase in line with the City's Medium-Term Revenue and Expenditure Framework (MTREF). This reflects the need for increasing demands to repair and maintain current infrastructure and the requirement of resources to operate new infrastructure. Consequently, there is pressure on annual tariffs increases to exceed inflation.

The long-term Capital budget requirement is summarised Table 19.

**Table 19: Long-term Capital requirement for 10 years from 2012/13**

| | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bulk Water | 27 650 000 | 135 850 000 | 212 881 000 | 453 002 000 | 708 060 000 | 404 830 000 | 321 095 000 | 308 973 000 | 93 108 000 | 58 569 000 | 2 724 018 000 |
| Reticulation | 357 016 700 | 457 011 507 | 388 097 950 | 325 604 020 | 314 000 000 | 279 000 000 | 282 750 000 | 281 450 000 | 252 500 000 | 256 000 000 | 3 193 430 177 |
| Waste Water Treatment | 172 900 000 | 198 450 000 | 234 050 000 | 296 650 000 | 237 400 000 | 223 400 000 | 262 400 000 | 240 400 000 | 219 400 000 | 246 900 000 | 2 331 950 000 |
| WDM & Strategy | 20 015 000 | 13 000 000 | 22 250 000 | 2 500 000 | 2 500 000 | 64 850 000 | 64 850 000 | 69 600 000 | 100 000 | 100 000 | 259 765 000 |
| EAM | 68 374 000 | 44 288 493 | 22 452 050 | 27 095 980 | 37 318 578 | 58 728 943 | 76 763 038 | 70 898 042 | 79 202 266 | 88 615 265 | 573 736 655 |
| Other Branches | 11 500 000 | 10 400 000 | 10 400 000 | 15 000 000 | 20 781 422 | 22 195 005 | 25 115 937 | 25 858 000 | 26 338 760 | 27 035 000 | 194 624 124 |
| Total | 657 455 700 | 859 000 000 | 890 131 000 | 1 119 852 000 | 1 320 060 000 | 1 053 003 948 | 1 032 973 975 | 997 179 042 | 670 649 026 | 677 219 265 | 9 277 523 956 |
| | | | | | | | | | | | |
| | | | | | | | | | | | TOTAL |
| New Infrastructure | 362 353 700 | 510 300 000 | 496 831 000 | 776 752 000 | 963 841 422 | 630 480 000 | 577 869 000 | 530 223 000 | 295 908 000 | 312 819 000 | 5 457 377 122 |
| Replacement Infrastructure | 227 688 000 | 218 861 507 | 240 247 950 | 283 104 020 | 305 500 000 | 331 750 000 | 365 500 000 | 370 500 000 | 287 000 000 | 266 500 000 | 2 896 651 477 |
| New Plant | 40 828 000 | 44 962 493 | 32 982 050 | 35 135 980 | 45 830 578 | 64 740 943 | 68 534 038 | 75 388 042 | 84 172 266 | 94 065 265 | 586 639 655 |
| Water Demand | 19 860 000 | 12 900 000 | 22 250 000 | 2 500 000 | 2 500 000 | 22 750 000 | 17 750 000 | 17 500 000 | 0 | 0 | 118 010 000 |
| Other | 6 726 000 | 71 976 000 | 97 820 000 | 22 360 000 | 2 388 000 | 3 283 005 | 3 320 937 | 3 568 000 | 3 568 760 | 3 835 000 | 218 845 702 |
| Total | 657 455 700 | 859 000 000 | 890 131 000 | 1 119 852 000 | 1 320 060 000 | 1 053 003 948 | 1 032 973 975 | 997 179 042 | 670 649 026 | 677 219 265 | 9 277 523 956 |

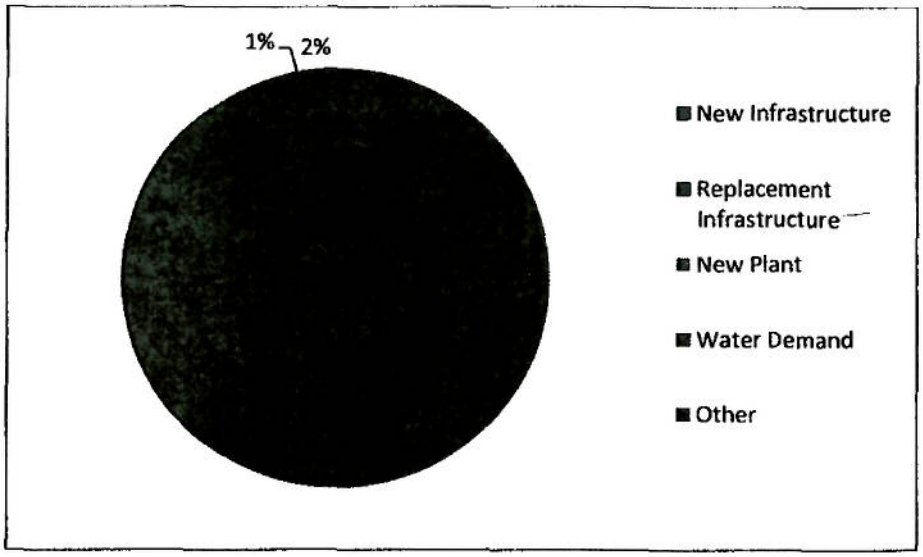



**Figure 4: Long-term capital requirement by Investment Category**

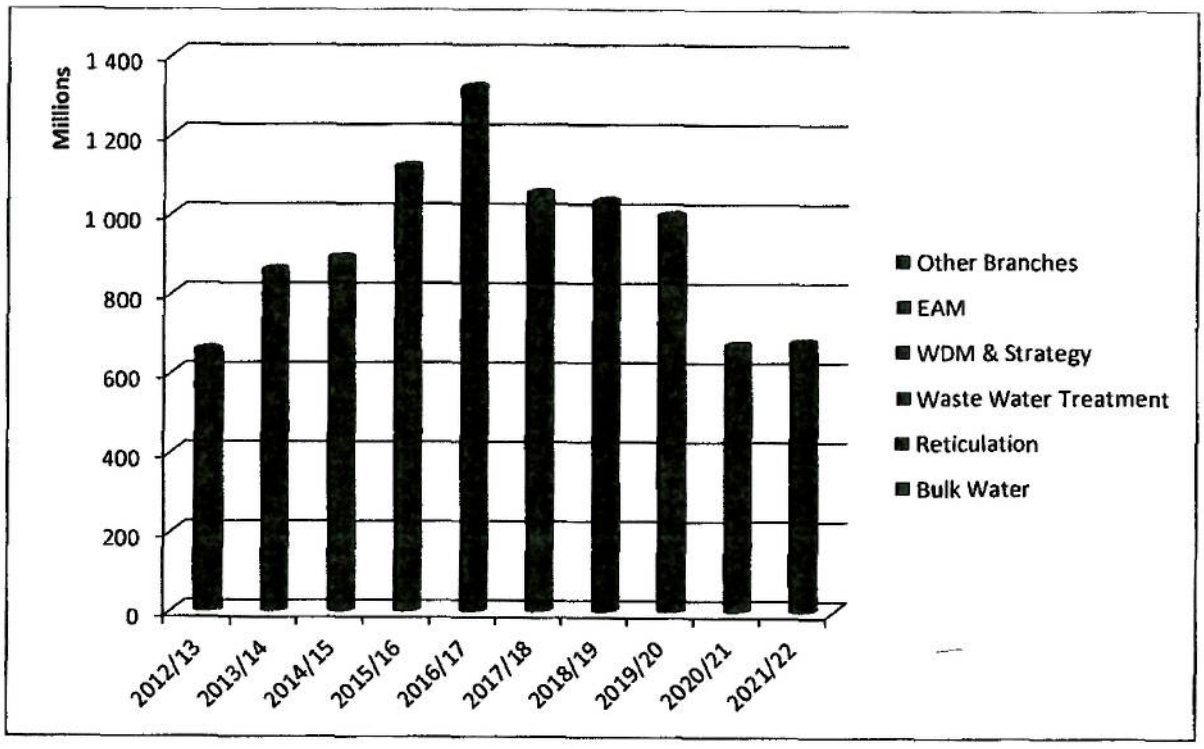



**Figure 5: Long-term capital requirement by Branch**

### 11.2.1. Strategic gaps

**Capital budget**: The high requirement for necessary infrastructure is driven largely by growth and economic development as well as the refurbishment of current infrastructure which places severe pressure on the City's Capital Budget.

**Operating budget:** It is difficult to reach optimum levels of staff, maintain acceptable levels of infrastructure maintenance and carry the impact of the capital programme within the financial constraints during difficult economic conditions.

### 11.2.2. Implementation strategies

To achieve the required Capital Budget, it is necessary to maximise the use of Grant funding and to make optimal use of the Capital Replacement Reserve (CRR) within the financial constraints.

The pressure on the operating budget needs to be addressed via above-inflation tariff increases and initiatives to ensure that money due to the City is collected. There is a benefit envisaged from the pilot Prepayment project, apart from metering efficiency gains and data purification project.

General strategies:

- Making adequate provision for the poor by maintaining a stepped tariff cross-subsidising the shortfall in the free basic service.
- Further relief to the poor via assistance to indigent customers.
- Investigation and debate into the use of Prepayment meters.
- Escalated focus on the collection of debt by increasing the capacity.
- Escalated focus on revenue protection and metering efficiency.
- Ensuring that adequate cash reserves are maintained to cover legislated funds.

| APPROVED BY: | MANAGER: WATER DEMAND MANAGEMENT & STRATEGY | | |
|---|---|---|---|
| Name & Surname: | ***Zolile Basholo*** | Signature: | |
| Date: | 23/02/2012 | Comment: | |
| | | | |
| | | | |
| APPROVED BY: | DIRECTOR | | |
| Name & Surname: | ***Philemon Mashoko*** | Signature: | |
| Date: | 23/2/12 | Comment: | |
| | | | |
| | | | |
| APPROVED BY: | EXECUTIVE DIRECTOR | Acting. | |
| Name & Surname: | ***Lungile Dhlamini*** | Signature: | |
| Date: | 23/2/2012 | | |
| | | | |
| | | | |