



OVERVIEW OF Water Demand Management Initiatives: A City of Cape Town Approach

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Making progress possible. **Together.**

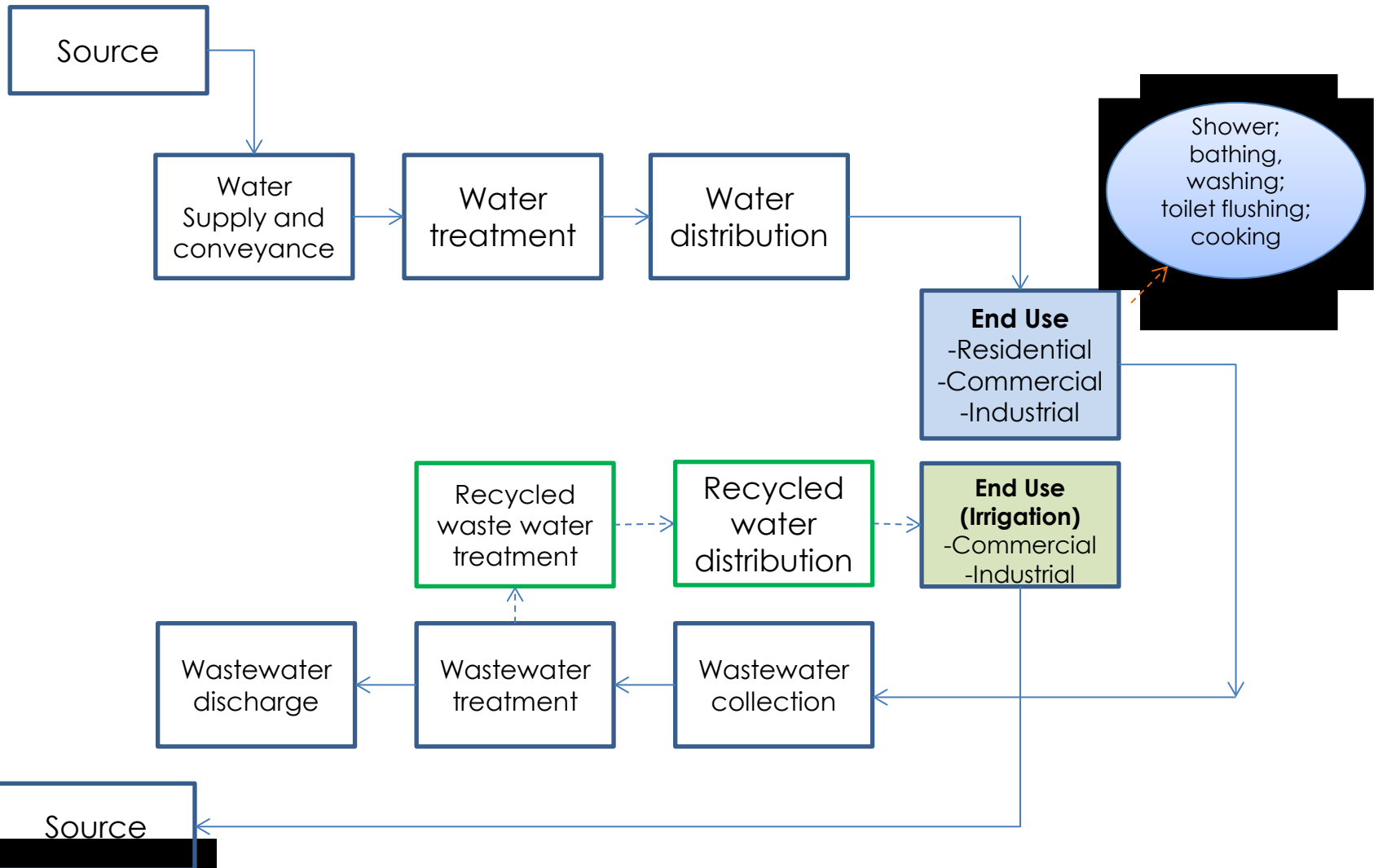
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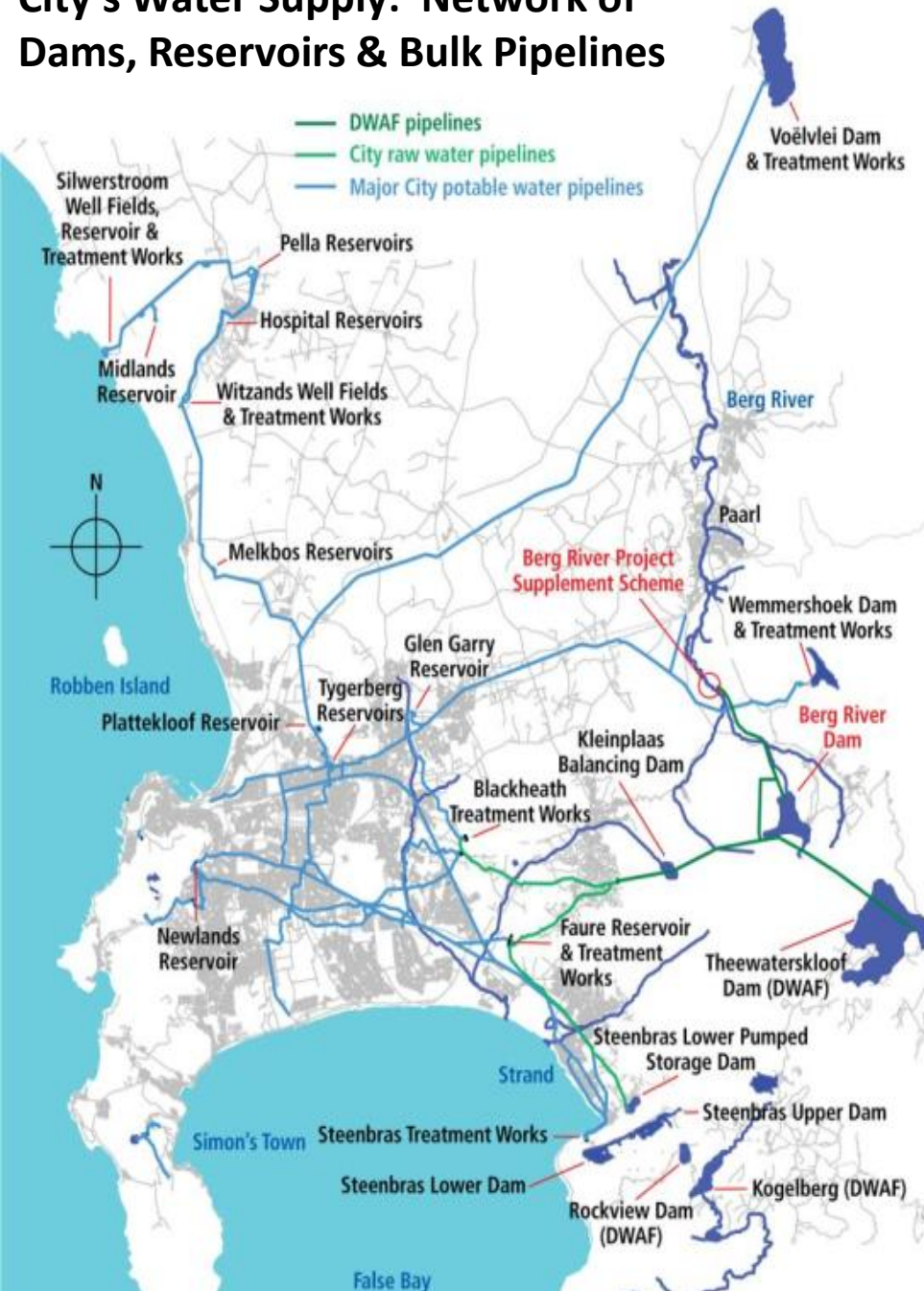


WATER VALUE CHAIN OF THE CITY OF CAPE TOWN

Water Value Chain within the City of Cape Town (Reticulation)



City's Water Supply: Network of Dams, Reservoirs & Bulk Pipelines



BULK WATER SYSTEM PROFILE

- Supplied from 14 Dams
 - Capacity of 6 major dams is 898 300 000 m³
 - 11 owned and operated by the City
 - 12 Water Treatment Plants (1 650 Ml/d)
 - 26 Bulk Reservoirs (Total storage 2 740 Ml)
 - Atlantis Groundwater Scheme
 - artificially recharged aquifer system
- Large diam bulk conveyance pipelines –
 - 630 km
- Water quality: Controlled and monitored operationally at the WTPs and independently by Scientific Services Branch;
- Level of supply assurance from WCWSS is 97% (in terms of the Raw Water Supply Agreement between the City and the Department of Water & Sanitation)
- Population supplied: over 3.8 million
- Households served: over 1.1 million

City of Cape Town Consumer Profile

- Bulk Consumers
 - Stellenbosch Municipality
 - Drakenstein Municipality
 - Farmers
- Reticulation
 - Commercial
 - Residential
 - Industrial
 - Schools and Parks
 - Municipal
 - Informal Settlements

2014/15 Water Demand:

Bulk Consumers (External)

Annual Average Daily Demand: **103.5 MI/day**

Reticulation Consumers

Average Annual Daily Demand: **764.4 MI/day**

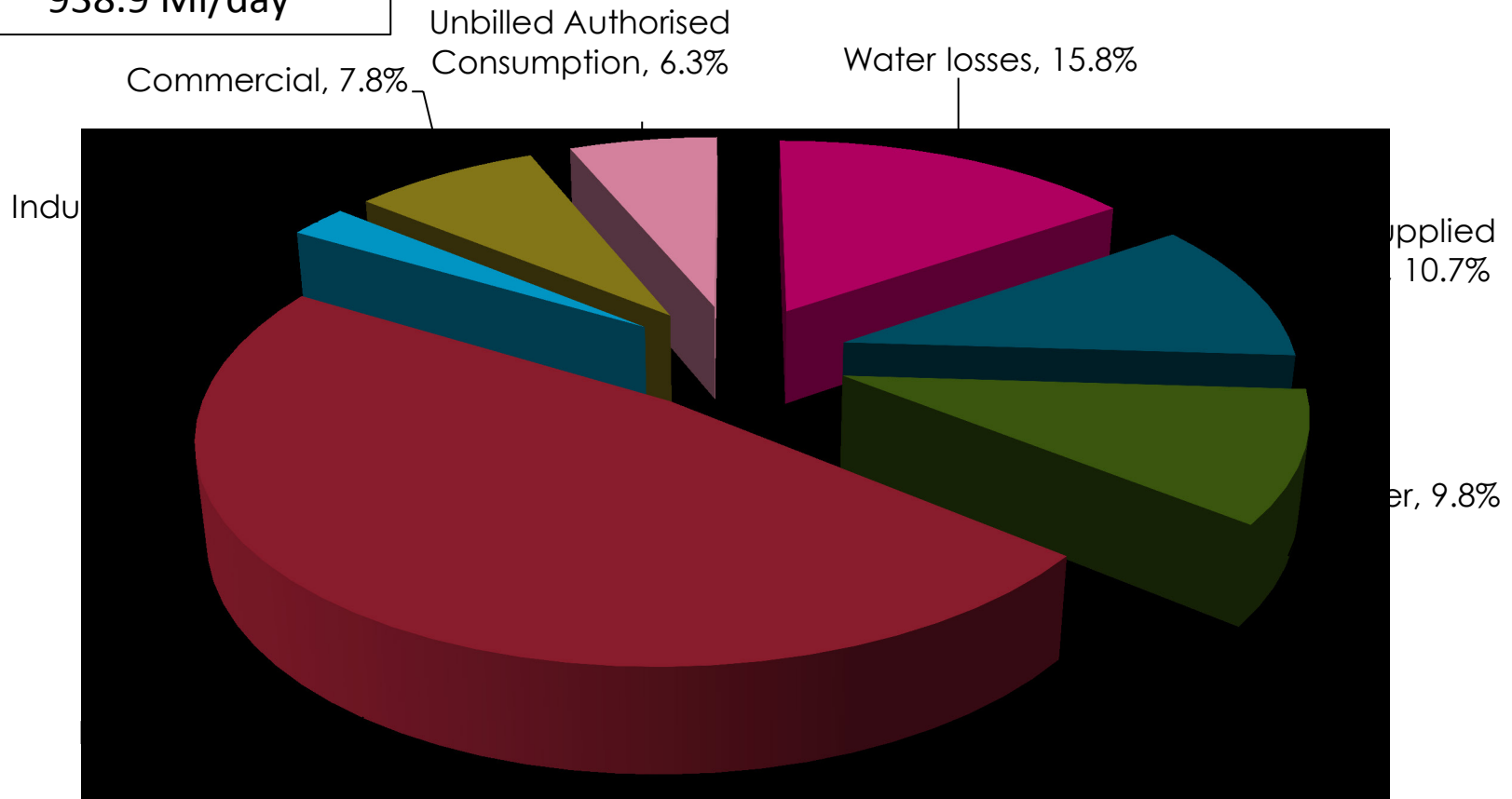
Peak Week Demand: **1208 MI/day** (Jan '14)

Peak Day Demand: **1296 MI/day** (29 Jan '14)

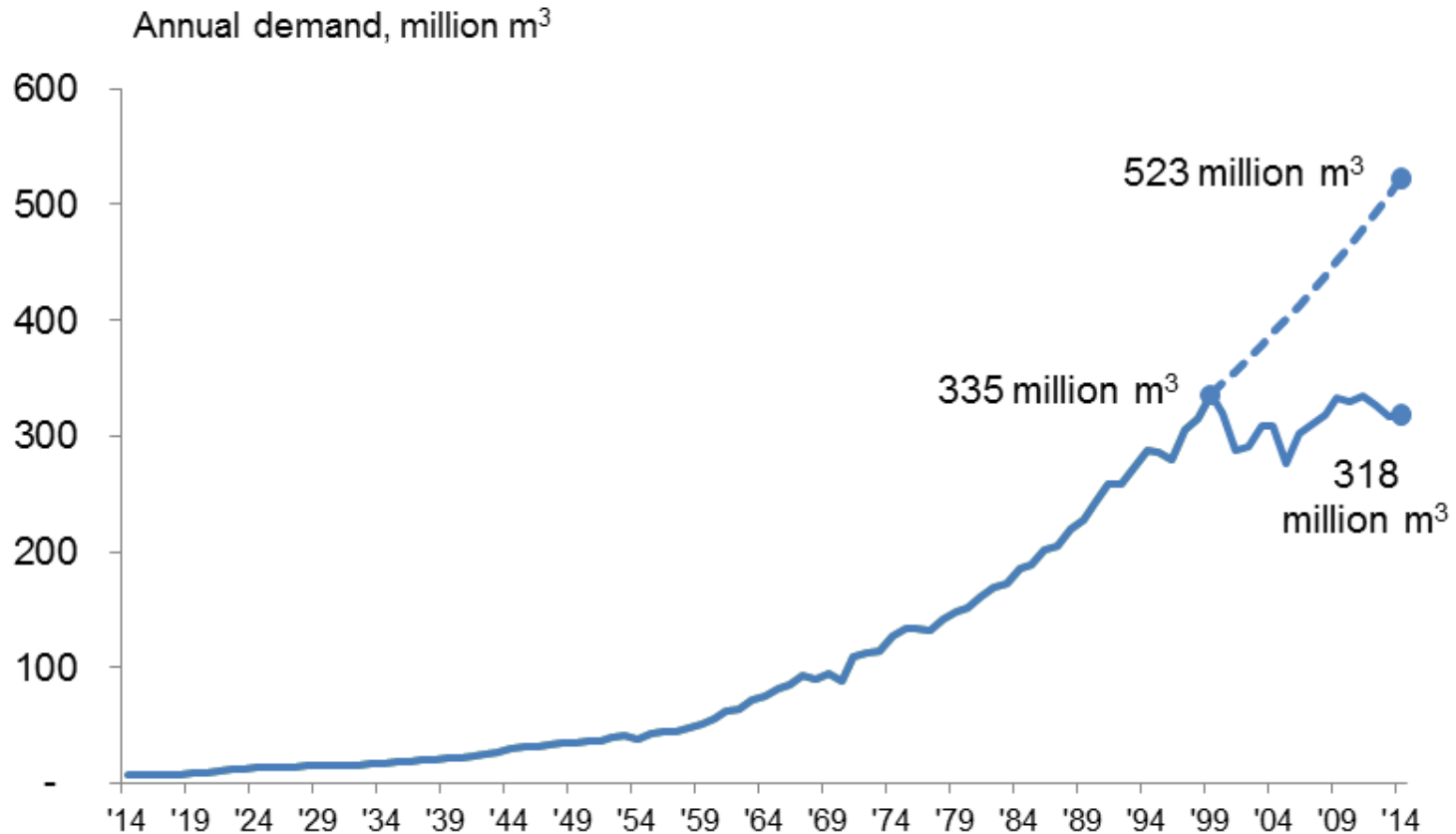


City of Cape Town Sector Usage (14/15 Financial Year)

Total Water Treated:
938.9 MI/day



Actual demand growth 1999 – 2014 vs Unconstrained growth



Factors that influenced demand growth after 2000

Water restrictions in 2000/01 and 2004/05

Water restrictions were implemented in 2000/01 and 2004/05, after periods of low winter rainfall.

The City commits to implementing WDM as part of approval of Berg River Scheme

The raw water supply agreement between the City and DWS was signed in 2003, for the construction of the Berg River Scheme. One of the conditions of approval of the Scheme was that the City would implement water demand management.

The City approves and implements a 10 year WDM Strategy

The City approved its 10 year water demand management strategy in 2007. A dedicated water demand management section was established in the City's water and sanitation department, responsible for implementing the strategy.

Berg River Scheme completed

The construction of the Berg River Scheme was completed in 2007.



Strategic Goals of Water Demand Management Strategy

Goal A:	Water Loss < 15% <ul style="list-style-type: none">- Apparent loss reduction- Real loss reduction	Quantitative
Goal D:	Non-revenue Water < 20% <ul style="list-style-type: none">- Unbilled authorized consumption- Apparent losses- Real loss	
Goal E:	Demand growth < 2%	Qualitative
Goal B:	On-going effective management systems and implementation of Integrated Water Management Plan	
Goal C:	Mobilise resources according to the Water Conservation and Water Demand Management Strategy.	

CITY OF CAPE TOWN OVERALL WATER BALANCE

IWA Water Balance for 2014/15 Financial Year (Overall) in kilolitres

(A) System Input 342 696 438 100%	(B) Authorised 288 394 954 84.2%	(D) Billed 266 229 322	(H) metered 266 229 322	External Customers 37 764 262	(Q) Revenue Water 266 229 322 77.7%
			(I) Unmetered 0	Internal Customers 228 465 060	
		(E) Unbilled 22 165 632	(J) Metered 13 345 632	Informal Settlements 10 998 792	
	(K) Unmetered 8 820 000		Formal Metered Unbilled 2 346 840		
	(C) Losses (UAW) 54 301 484 15.8%	(F) Apparent Losses 22 897 637	(L) Unauthorised 2 790 210		
			(M) Meter Inaccuracies 20 107 427	(N) Mains 20 834 871	
		(G) Real Losses 31 403 847	(O) Storage 300 100		
			(P) Connections 10 268 876		

- Top down methodology
- Water loss (and NRW) increased from last year
- Reasons:
 - Higher temperatures
 - Increased consumption (especially unbilled authorised – could be underestimated) – 2015 recorded as the driest year since 1904
 - Increased fire events (volume not recorded in the WB therefore by default it would fall within the losses volume)



DEMAND MANAGEMENT INTERVENTIONS

Water demand management interventions

Technical interventions:

- District Metered Areas (DMA's)
- Pressure management
- Treated effluent use
- Water pipe replacement
- Active Leak detection and Repair (Three teams)
 - Team 1: Field Measurements
 - Team 2: Basic Leak Detection (visual surveys)
 - Team 3: Specialist non-visible leak detectors
- Water management devices
- Meter replacement
- Zone metering
- Building plumbing retrofit

Service investigation



Preferred real loss reduction approach (Criteria)

Real Loss Reduction Intervention	Preferred Priority Implementation Order	Relative Benefit Ranking	Relevant Cost Ranking	Relevant Implementation Time Ranking
Pressure Management	1	1	1	1
Active Leak Detection	2	3	2	2
Speed & Quality of Repair	3	4	3	3
Mains rehabilitation/ replacement	4	2	4	4

Pressure management projects (coupled with pipe replacement)

Khayelitsha pressure management project (2001)

Estimated savings:
9 Mm³/a



Mitchells Plain pressure management project (2008)

Estimated savings:
2.4 Mm³/a



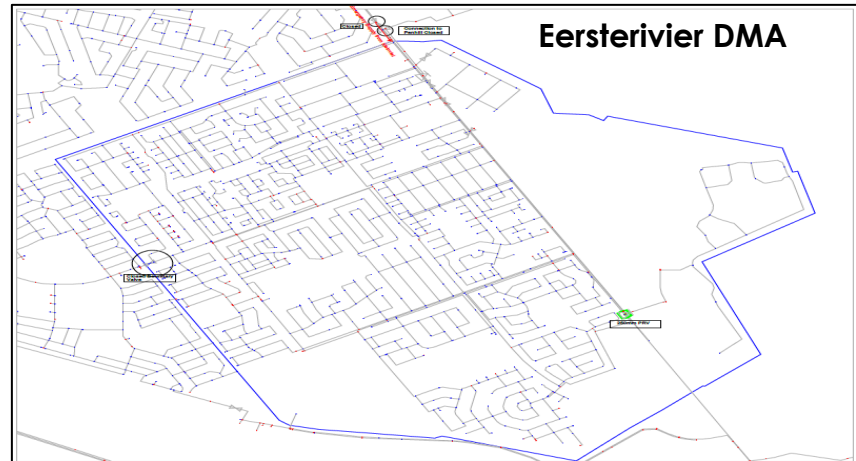
Other notable pressure management projects, with estimated savings:

- Mfuleni: 0.4 Mm³/a
- Gugulethu: 2.6 Mm³/a
- Langa: 0.5 Mm³/a
- Eersteriver: 1.2 Mm³/a
- Brentwood Park: 0.04 Mm³/a
- Browns Farm: 0.6 Mm³/a
- Wesbank: 0.3 Mm³/a
- Delft: 0.6 Mm³/a
- Grassy Park: 0.6 Mm³/a
- Crossroads: 0.2 Mm³/a
- Plumstead & Retreat: 0.6 Mm³/a
- Fisantekraal: 0.2 Mm³/a
- Marina de Gama: 0.6 Mm³/a

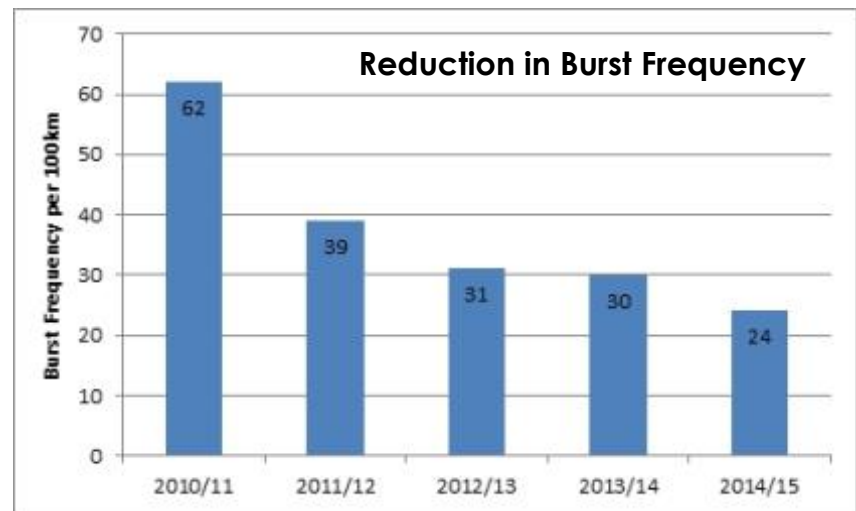
Decrease in burst main frequency

In addition:

Pipe replacement, aligned with pressure management intervention (where applicable)



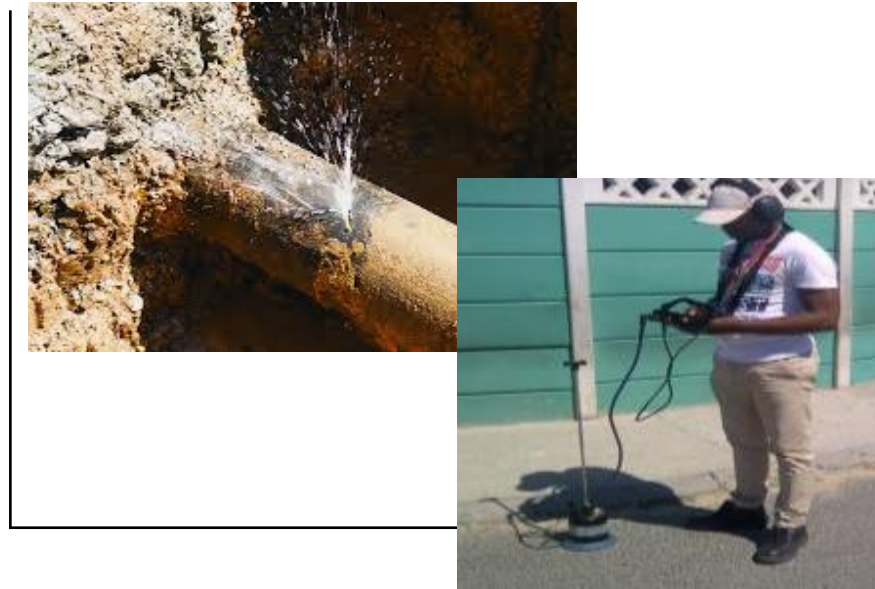
	2011/12	2012/13	2013/14	2014/15
Length of water reticulation mains replaced (m)	89 975	70 270	55 418	48 622
No. of repairs to burst mains	4 085	3 306	3 213	2 569



Active Leak Detection and Repair

	2011/12	2012/13	2013/14	2014/15
No. Repairs:				
Connections, Meters, Sluices, Valves & Fire Hydrants	26 574	41 437	40 696	35 356
Associated Estimated Savings (kl/annum)	2 287	3 580	4 592	3 887

	2011/12	2012/13	2013/14	2014/15
No. Meters Replaced/re-fixed/relocated	8 272	5 450	5 656	6 453
No. Water Management Devices Installed	17 556	7 468	17 989	32 111
No. Repairs on connections	27 203	28 933	36 968	33 133



Description	Subzone's statistics						Totals
	Highbury	Highbury Park	Wesbank	Mfuleni	Du noon	Pella	
Zone's Statistics							
Length of watermains (km)	20.39	15.34	22.91	58.617	32.083		149.34
Pipeline Material	Fibre cement	Fibre cement	Fibre cement	Fibre cement	Fibre cement		Fibre cement
No. of properties	1259	943	3204	8441	3025		16872
located leaks statistics							
Total No. leaks located	46	12	77	215	40	23	413
Dates in Months when leaks detection was done	2013	2013	2014	2014/15	2015	2015	1.8 yrs
Dates in Months when leaks were repaired	Fixed	Fixed	Leaks fixed except leaking meters with WMD	In planning	In planning	In planning	generally leaks are not fixed



Industrial meter audit Investigation and illegal connections

- Infrastructure Analyse
- Prioritise according to age of the area and consumption profile
- Includes illegal connection investigation
- Identify damaged meters and Replace meters
- +/-20 industrial areas were covered
- To name a few :
 - Atlantis Industrial Area
 - Paarden Eiland
 - Athlone Industria

Speed and Quality of Repair (e.g pipe burst etc)

1st Level Response

Determine:

- repair responsibility (Municipal or Private)
 - repair level, resources required
 - shut-off area
 - shut-off sequence, recharge sequence
 - re-charge main on completion
 - Monitor Pressure Zones, daily Pressure Monitoring Charts
- Require knowledge of infrastructure configuration
-

2nd Level Response

Semi-skilled Supervisor/ Driver + 2 staff + 1 ton LDV + tools

- Effects minor repairs
 - Meter replacements
 - Repairs pipes, valves, hydrants
 - Rebuild hydrant boxes
 - Replace covers etc.
-

3rd Level Response

- Plumber/ Senior Foreman + 4 staff + 3ton Vehicle
 - Install New Connections 20mm and up
 - Repairs burst water mains up to 250mm
-

4th Level Response

- Senior Foreman, Senior Handymen, 10 Workers, Machine Operator, 5 ton crane truck with Driver
 - water main Replacement or new Installations
 - Burst main repairs above 250mm
-





Speed and Quality of Repair

Benefits of the Levels of response

- Rapid response to complaints
- Shut down burst mains quickly (less wastage)
- Reduce risk of private damage
- Reduce risk of public liability – e.g vehicles into hole
- Staff utilisation optimised, eliminate overtime

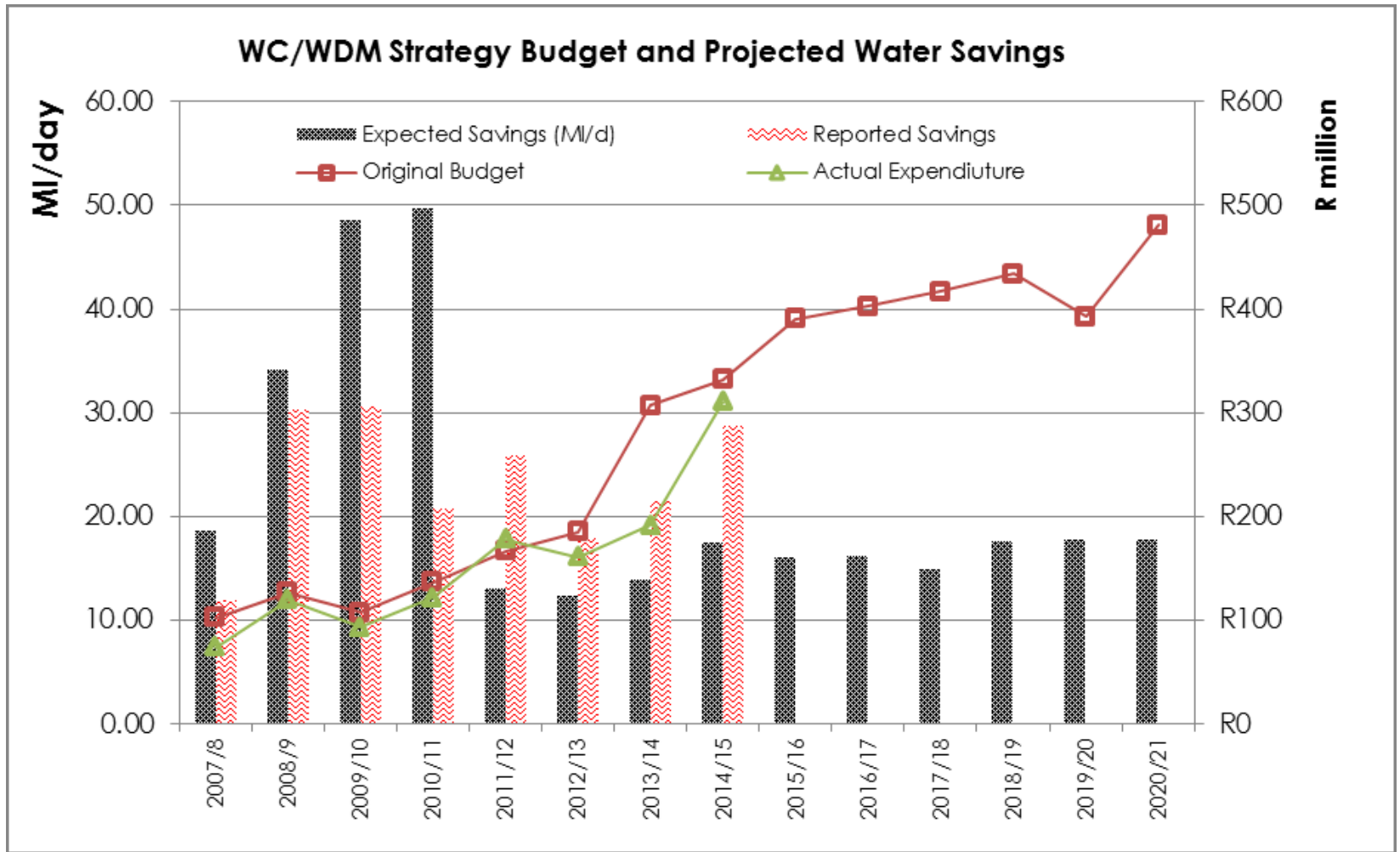
Treated Effluent Re-use

- More than 200 users are connected
- Mostly used for irrigation and industrial purposes
 - Golf courses
 - City Parks
 - Schools
 - Farmers etc
- In 2014/15 approximately 6% of potable water was off-set




SAVINGS ACHIEVED AGAINST PROJECTIONS

Current savings against projections



Water Conservation Programme

“Keep Saving Water” Website

| City Home | | Site guide | | Site index | Search this site...  Wed, 3 Feb 2016

Keep Saving Water

City of Cape Town > English > Keep saving water

Keep Saving Water

The City encourages residents to consciously save water every day, especially during summer when demand soars along with the high temperatures. Everyone needs to be aware of what a precious resource water is, and how to use it sparingly.

This website is full of **water saving tips** for you to apply. Once you've started making your own savings, be sure to spread the word – tell your family, your friends, your work colleagues, people in your community and your neighbours.

Saving water is the right thing to do. You can save money, reduce the risk of water restrictions and make a personal contribution to our environment.


Learn about your responsibility in terms of the **Water By-law**. For further information, download our poster ([English](#) | [Afrikaans](#) | [isiXhosa](#)) or watch the Water By-law video ([English](#) | [Afrikaans](#) | [isiXhosa](#)). Please note that more stringent restrictions may be applicable during [water restrictions](#).

Executive Mayor Patricia de Lille launches the Keep Saving Water campaign

In November 2011 the Executive Mayor, Patricia de Lille, launched the **Keep Saving Water** campaign.

At the launch the Mayor said, “We must look beyond the water we can see coming from our taps and think of the whole of society. If we waste water, someone will go without. And if we waste too much water, Cape Town will go without. But we can take measures to ensure the future of our water supply. We can take measures to live sustainably. I appeal to everyone in Cape Town to monitor their water usage, to save water, and to prevent waste. Businesses, industries and the corporate world must also play their part. We ask all sectors of the economy to join us in this pledge and save water.”

For more information about the campaign, download our [Keep Saving Water campaign presentation](#).



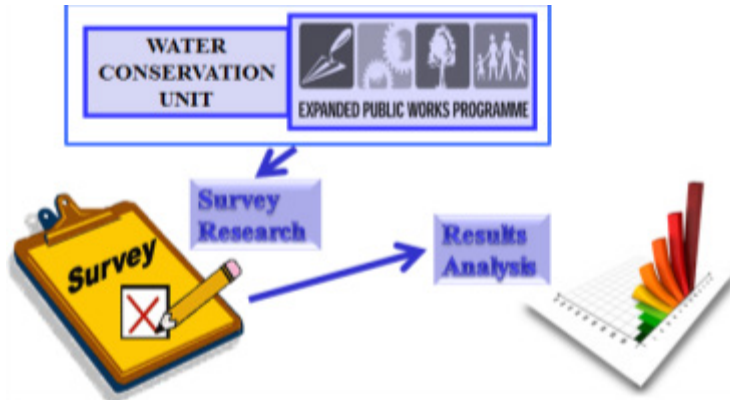
Education and Awareness Campaigns

- Door to Door Education

EPWP Pledge



Backyard dwellers



Education and Awareness Campaigns - Schools Intervention



Media Coverage - Restrictions



Website

- New website launched in December
 - includes Frequently Asked Question's (FAQ's)

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Making progress possible. Together

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Water and sanitation

City of Cape Town > English > Water > Water restrictions

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Water restrictions

The City of Cape Town has implemented **Level 2 water restrictions**, effective from 1 January 2016 until further notice.

As we are situated in a water-scarce region, the City imposes Level 1 restrictions (10% water savings) at all times. Because the City's dam levels are lower than the norm, **Level 2 restrictions** (20% savings) have been implemented to preserve the long-term sustainability of the resource.

20% reduction water tariffs

With **Level 2 restrictions** approved, customers will be charged from 1 January 2016 according to 2 reduction tariffs (**water | sanitation**) to encourage greater water-use efficiency. The tariff is design to be revenue-neutral when applied to the 10% reduced consumption levels. In other words, if an average customer reduces their consumption by 10%, their bill should remain at a similar rand value. Indigent customers' free allocation will not be affected. The free first 6 kl of water and 4.2 kl of sanitation a month for all residents will also not be affected.

The 2015/16 domestic full tariffs (stand-alone houses) for water are as follows:

Steps	Unit*	Level 1 (10% reduction) Normal tariffs Rands (incl VAT)	Level 2 (20% reduction) During restrictions Rands (incl VAT)
Step 1 (0 < 6 kl)	Per kl	R0	R0



International Award: C40 Cities-Adaption and Implementation of the WCWDM Strategy (2015)



National Award: WCWDM Sector Award (2013)



Independent Institutions Recognition (2013 and 2014)





Thank You

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