



# 2019 8th REGIONAL african water LEAKAGE SUMMIT

DBSA Vulindlela Auditorium, Midrand, Gauteng,  
South Africa, 28 - 29 August 2019

## Cape Town Drought Management

Presented by:  
Peter Flower Pr Eng

### Participating and supporting organisations :



# Cape Town Water



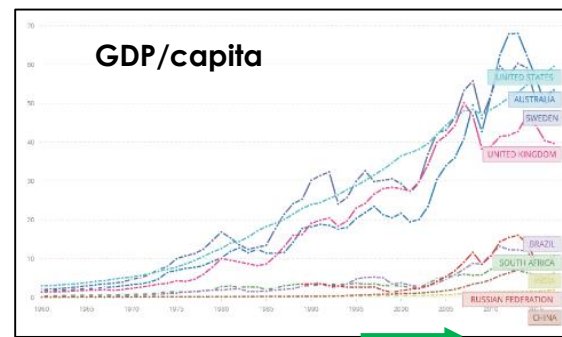
Peter Flower Pr Eng  
Former Director: Water & Sanitation at the City of Cape Town



**Population** ~4.2 million  
**Area** ~2,500 km<sup>2</sup>  
**SA GDP/capita** ~\$6,000  
**Gini Index** before tax ~0.61  
**Unemployment** ~27%



**HOUSEHOLDS**  
**Total** ~1,200,000  
**Informal** ~250,000  
**Indigent** ~270,000



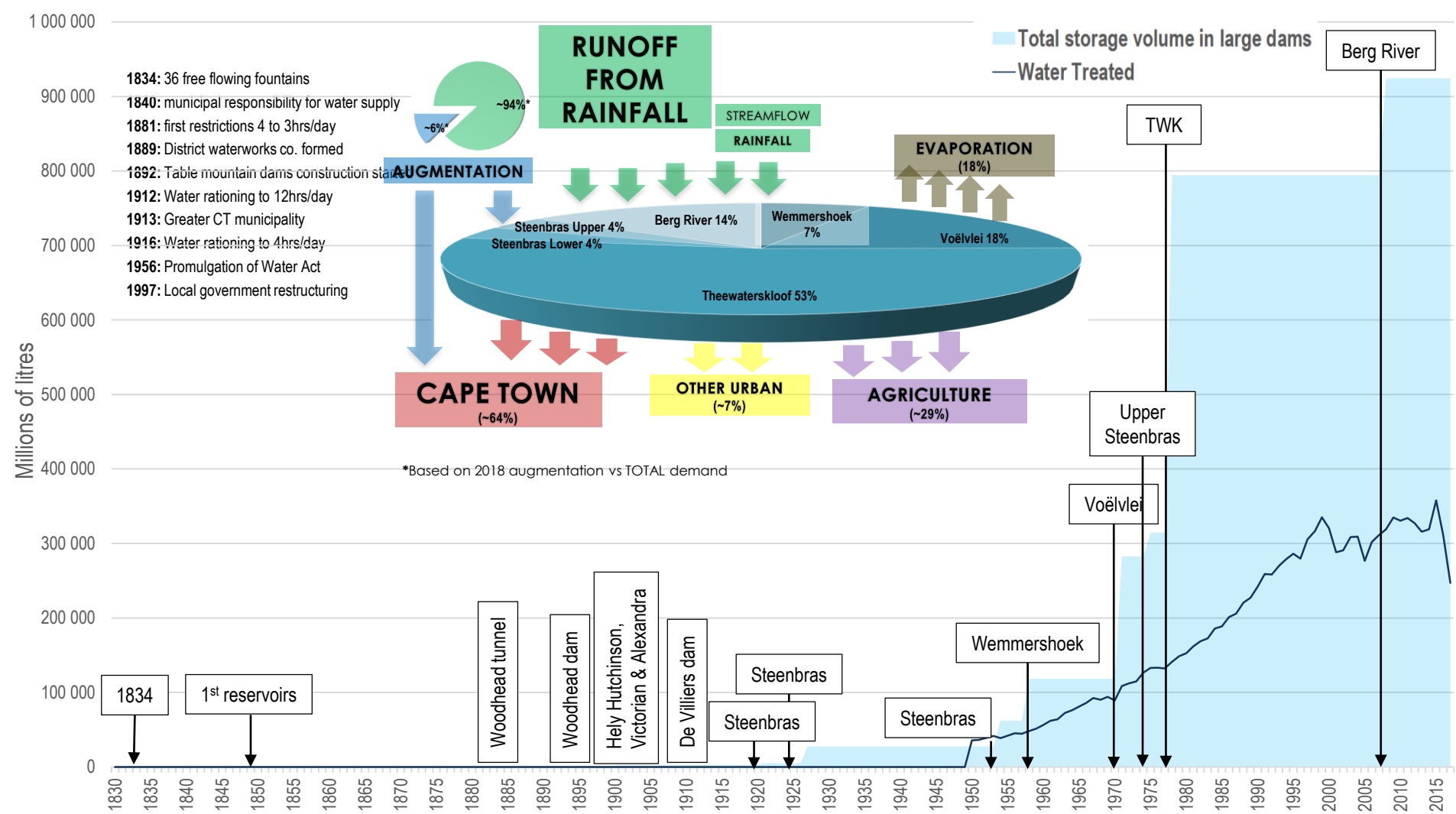
### ACCESS TO SERVICES

**Piped water** 99.8%  
**Electricity** 97.3%  
**Telephone** 93.5%

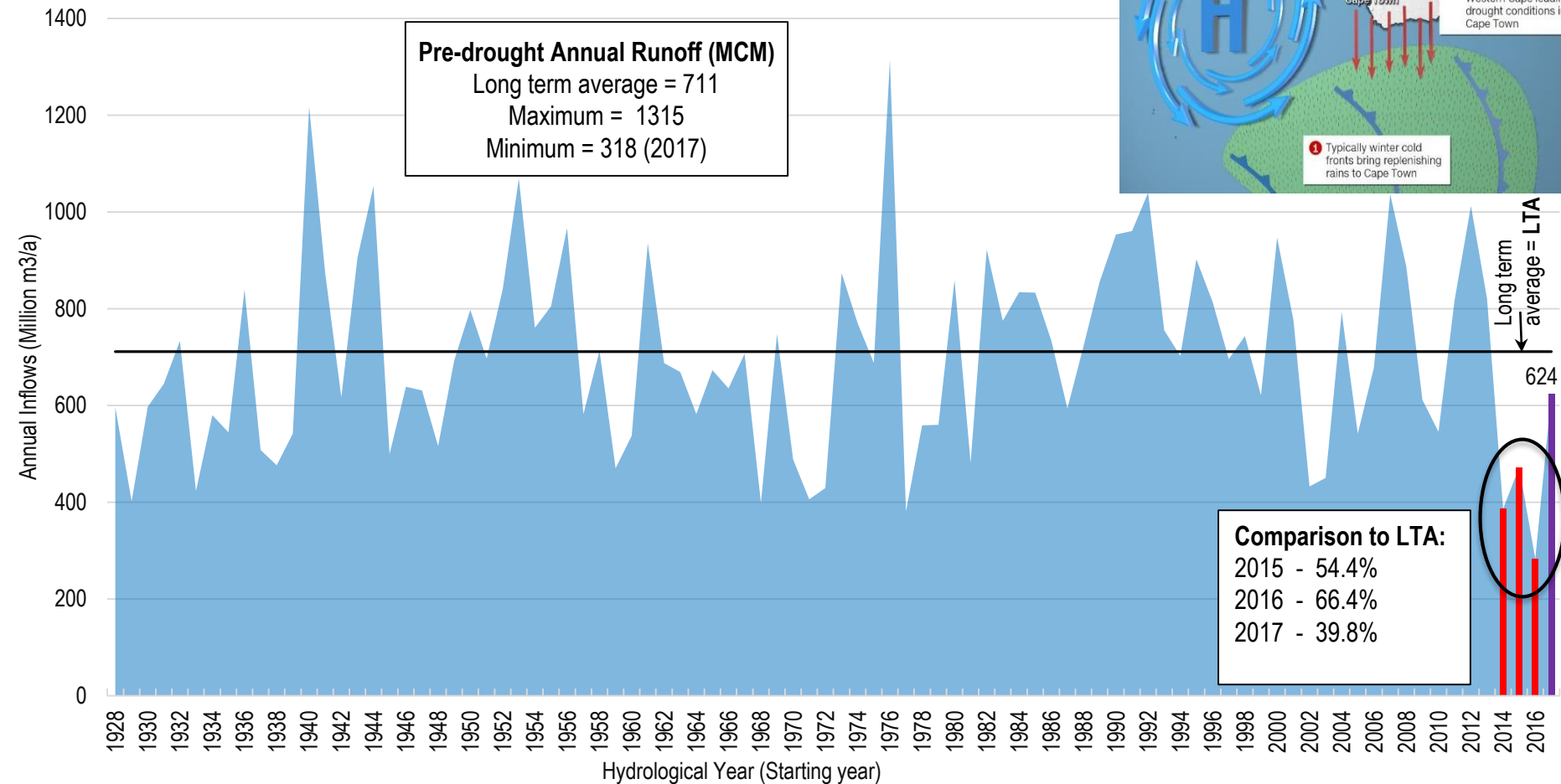
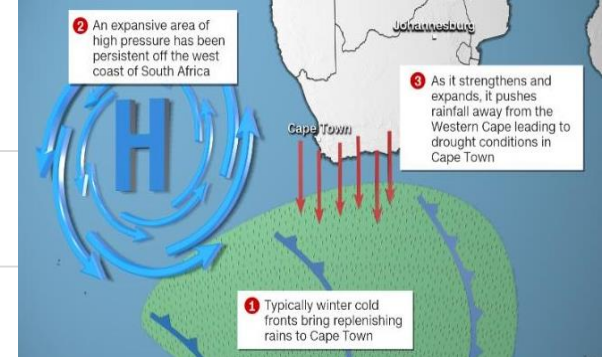


### WATER INFRASTRUCTURE

**Dams** - City - 3 major, 9 minor  
 - NDWS - 3 major  
**Water Treatment Ps** - 12  
**Pipelines** - 650 km Bulk  
 - 12 000 km Retic



# THREE YEARS OF VERY LOW RAINFALL (1 IN 590 YEAR EVENT)



# THRIVING INSIDE THE PERFECT STORM

Facing the challenges of  
a new and exciting world

**WATER**



**MEDIA**



???  
**POLITICS**  
???

**REVENUE**



**TRUST**



# Getting through the drought

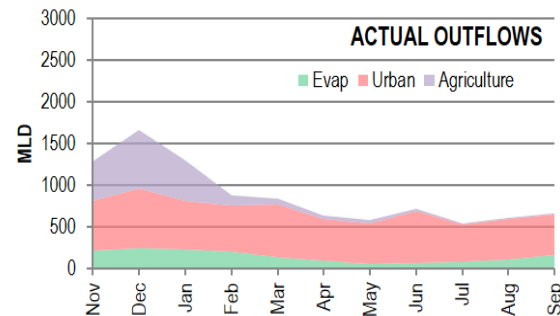
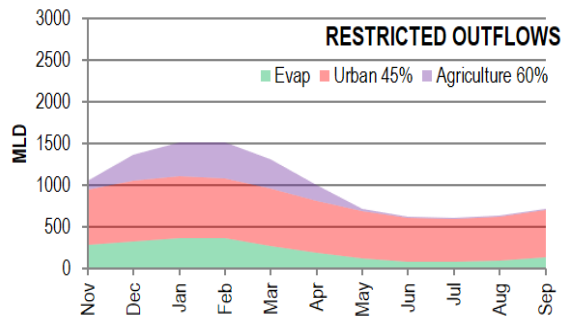
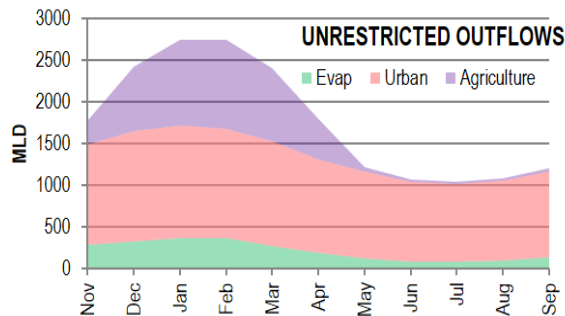
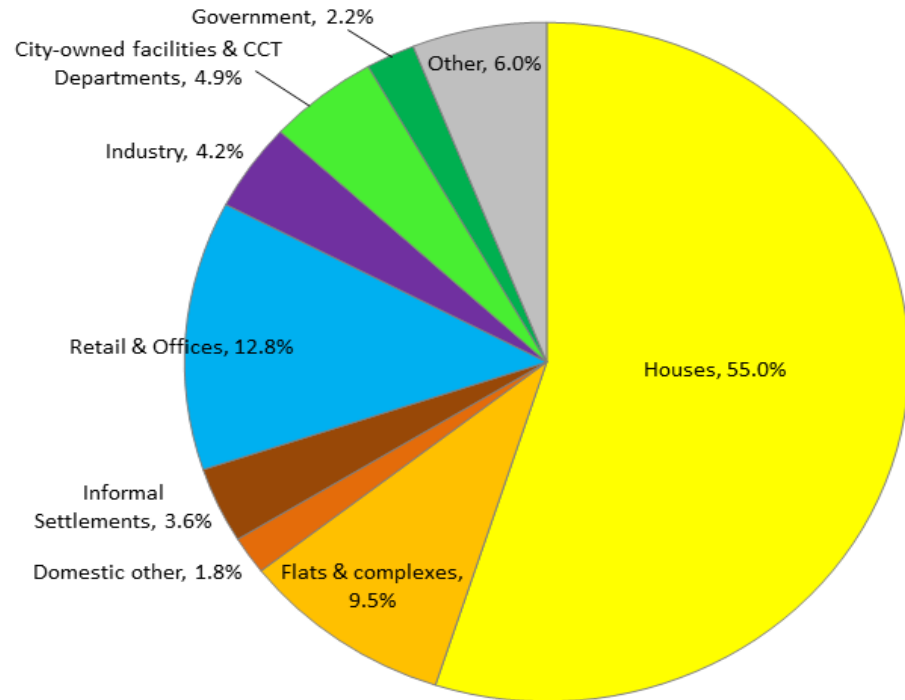
- A: Managing dam levels
- B: Managing demand
- C: Augmenting supply



# A: Managing dam levels

## WCWS System yield utilization:

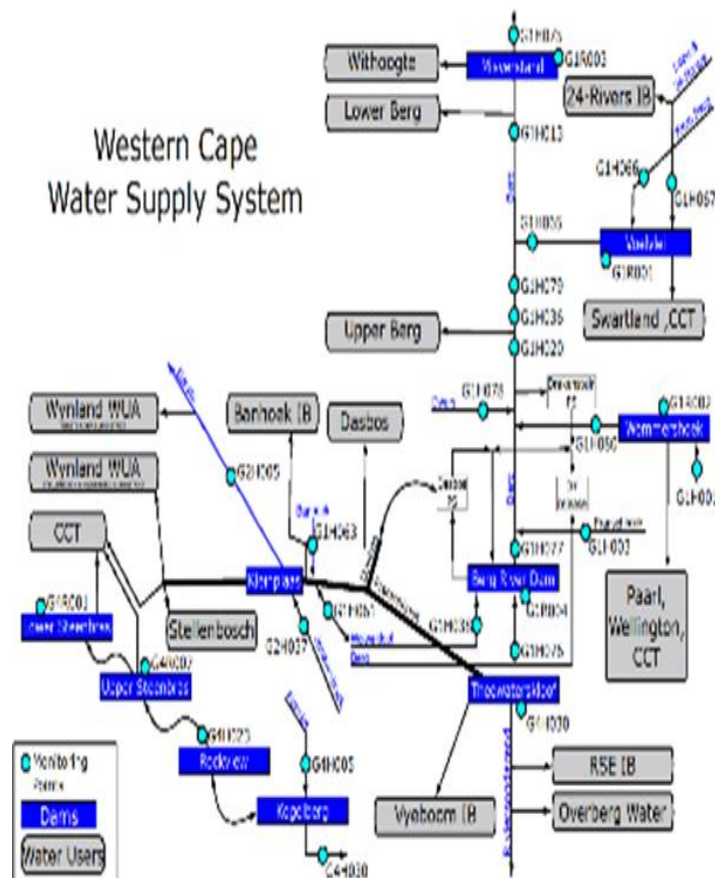
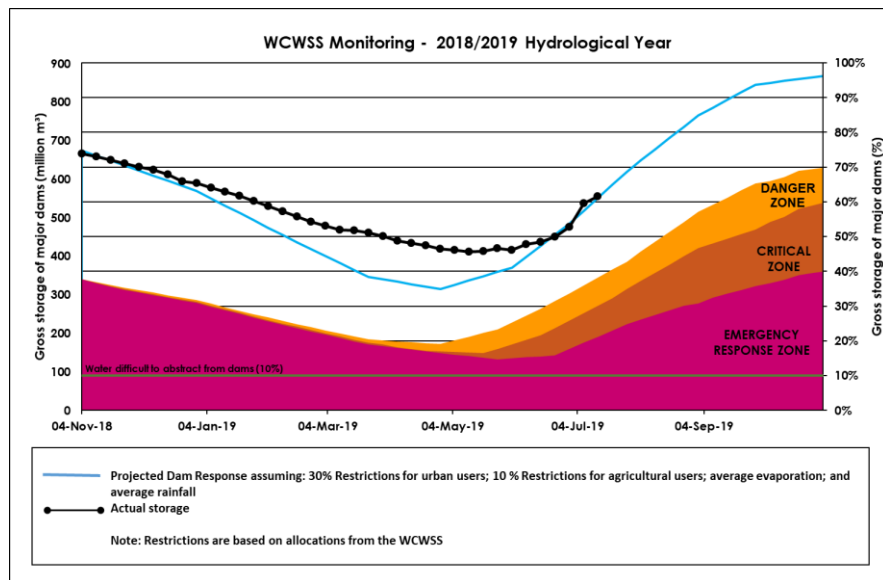
- 29% Agriculture - NDWS
- 7% Other urban – NDWS & CCT
- **64%** City of Cape Town
  - Residential **70%**
  - Commerce 13%
  - Industry 4%
  - Govt & other 13%



## A: Managing dam levels

**WCWSS**

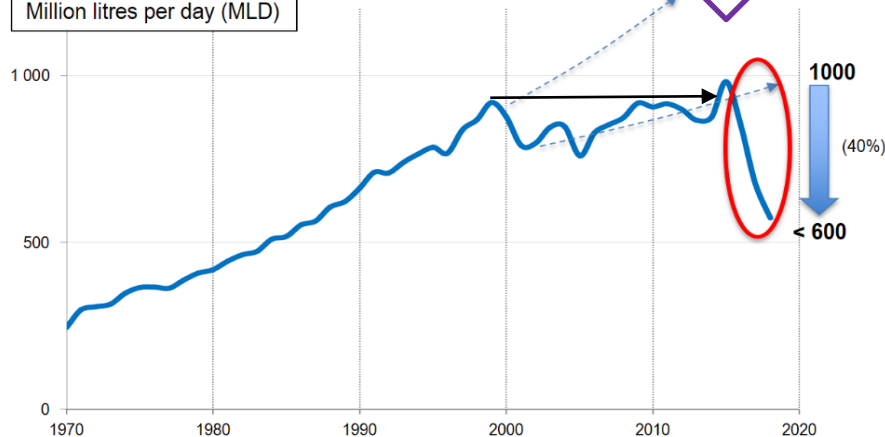
- NDWS and City Operations
- Yield maximized through City's BW infrastructure
- System model provides management information for operational optimization



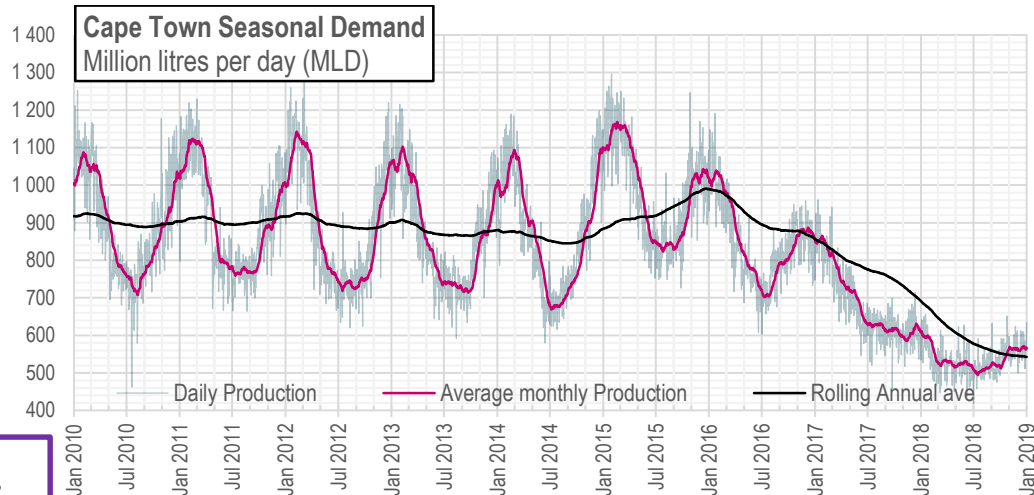
## B: Managing Water Demand

- Communication
- Restrictions & Tariffs
- Water flow restriction
- Pressure management

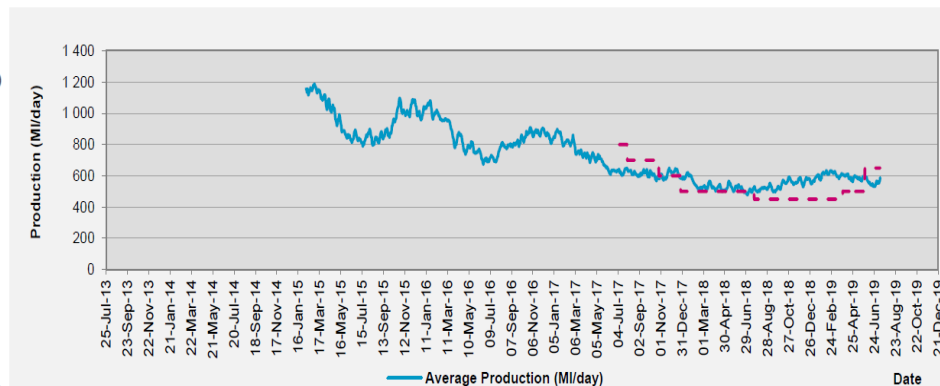
**Annual Water use**  
Million litres per day (MLD)



Water use as measured by the treated water supplied (includes losses), average for each year



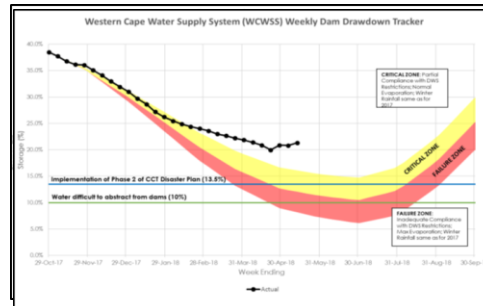
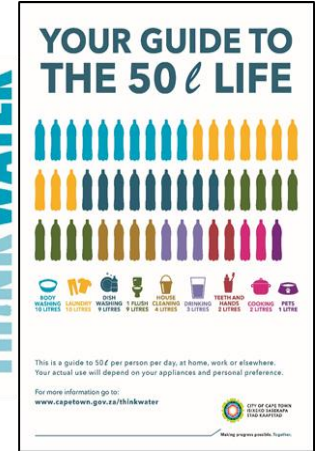
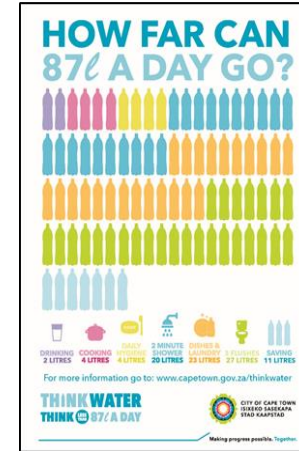
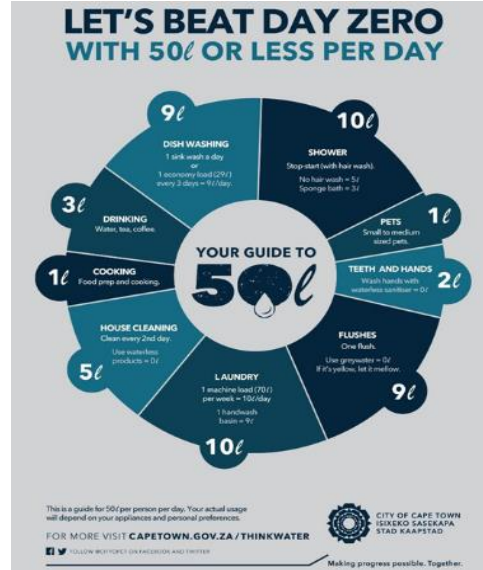
**Water Usage from large dams comprising the Western Cape Water Supply System**



# Water Demand management - Communication

- >4 million people (Diverse)
- Political environment
- Complexity
- Avenues
  - Printed press
  - Radio
  - Media engagement
  - Social media
  - Business & citizen engagement
  - Awareness & education
  - City Website – Info & advice

| MAXIMUM MONTHLY HOUSEHOLD QUOTA PER PERSON<br>Based on 50 litres per person / day   |                           |                                                                                                    |                         |
|-------------------------------------------------------------------------------------|---------------------------|----------------------------------------------------------------------------------------------------|-------------------------|
|    | 1 = 1 500ℓ<br>per month   |                   | 2 = 3 000ℓ<br>per month |
|    | 3 = 4 500ℓ<br>per month   |                   | 4 = 6 000ℓ<br>per month |
|  | * 5 = 7 500ℓ<br>per month | * Apply for a monthly quota increase<br>if there are more than FOUR people<br>living in your home. |                         |

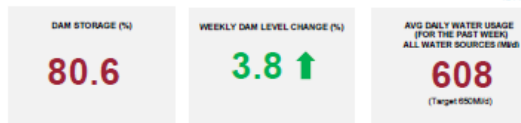


# Water Demand management - Communication



## City of Cape Town: Dam Levels Report

12 August 2019



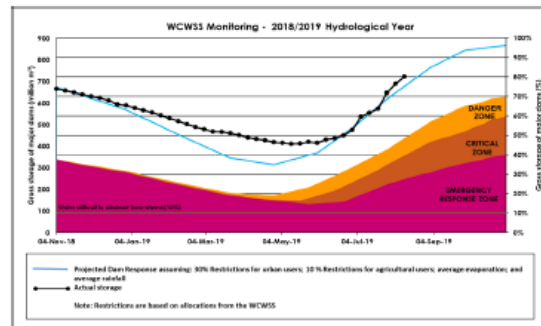
Disclaimer: The data depicted above is indicative and has been based on the City's own assessment of water use from the WCWSS. It is subject to official verification by the National Department of Water and Sanitation. Releases to Agriculture have stopped.

## Water Usage from large dams comprising the Western Cape Water Supply System



## Western Cape Water Supply System (WCWSS) weekly drought monitoring

This graph depicts total dam storage against potential system risk scenarios.



## Water stored in major dams comprising Western Cape Water Supply System (WCWSS)

| MAJOR DAMS      | CAPACITY (ML) | STORAGE        |               | STORAGE (%) |         |         |         |         |
|-----------------|---------------|----------------|---------------|-------------|---------|---------|---------|---------|
|                 |               | 12 August 2019 | Previous week | 2018        | 2017    | 2016    | 2015    | 2014    |
| BERG RIVER      | 130 000       | 101.7          | 100.5         | 78.1        | 48.1    | 82.9    | 94.0    | 94.0    |
| STEENSRAG LOWER | 33 517        | 30.9           | 30.7          | 92.7        | 90.6    | 83.2    | 89.5    | 89.5    |
| STEENSRAG UPPER | 31 767        | 101.0          | 101.9         | 96.1        | 85.3    | 96.6    | 101.4   | 101.4   |
| THEENWATERKLOOF | 480 188       | 70.8           | 67.8          | 43.4        | 23.8    | 49.3    | 74.4    | 74.4    |
| VOELVELD        | 164 095       | 83.2           | 78.8          | 47.6        | 21.9    | 56.8    | 48.2    | 48.2    |
| WEMERSHOEK      | 85 844        | 78.1           | 78.1          | 92.1        | 38.3    | 99.3    | 99.3    | 99.3    |
| TOTAL STORED    | 680 221       | 723 706        | 688 787       | 525 544     | 274 047 | 504 232 | 635 559 | 635 559 |
| % STORAGE       |               | 80.6           | 78.8          | 78.8        | 30.5    | 56.1    | 70.8    | 70.8    |

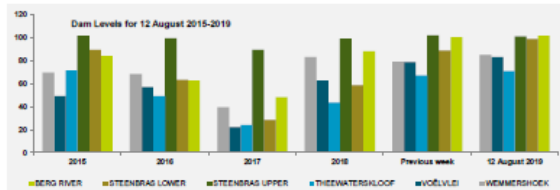
NOTES:

1) Capacity of the major dams of the Western Cape Water Supply System is 98.8% and that of the minor dams 0.8% of the combined capacity of the major and minor dams. Kindly note that all the Major Dams show gross capacity.

2) All figures are for 12 August for each year except for those in the second column, which gives the figures for the previous week of this year.

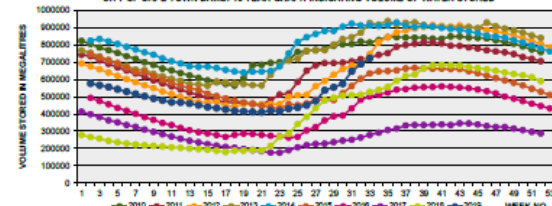
3) The last 10% of a dam's water is difficult to use, the usable water in the dam is approximately 10% less than the dam level.

4) Kindly note that when SteenSRag Upper splits, it splits into SteenSRag Lower



## Ten year graph Indicating volume of water stored in major dams comprising Western Cape Water Supply System (WCWSS)

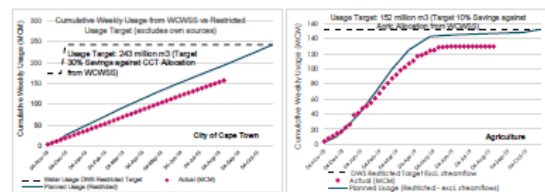
CITY OF CAPE TOWN DAMS: 10 YEAR GRAPH INDICATING VOLUME OF WATER STORED



## Water stored in minor dams within Cape Town

| MINOR DAMS                       | CAPACITY (ML) | STORAGE        |               | STORAGE (%) |       |       |       |       |
|----------------------------------|---------------|----------------|---------------|-------------|-------|-------|-------|-------|
|                                  |               | 12 August 2019 | Previous week | 2018        | 2017  | 2016  | 2015  | 2014  |
| ALEXANDRA (Table Mountain)       | 126           | 50.8           | 36.2          | 76.2        | 62.5  | 48.3  | 33.0  | 33.0  |
| DE VILLIERS (Table Mountain)     | 243           | 100.2          | 99.2          | 96.6        | 73.8  | 98.3  | 99.7  | 99.7  |
| HELY-HUTCHINSON (Table Mountain) | 225           | 100.3          | 98.8          | 96.8        | 100.0 | 99.8  | 99.8  | 99.8  |
| PLEINPLAATS (Table Mountain)     | 136           | 75.5           | 68.8          | 76.2        | 48.1  | 87.2  | 63.5  | 63.5  |
| LANCASH-SPEYERD (Table Mountain) | 491           | 75.9           | 75.9          | 100.0       | 65.5  | 90.0  | 25.0  | 25.0  |
| LEWIS GAY (Table Mountain)       | 182           | 97.4           | 97.7          | 92.9        | 92.6  | 97.2  | 101.8 | 101.8 |
| VICTORIA (Table Mountain)        | 128           | 102.7          | 98.2          | 102.4       | 101.5 | 79.3  | 70.4  | 70.4  |
| WOODHEAD (Table Mountain)        | 254           | 97.0           | 97.3          | 49.8        | 96.0  | 100.0 | 82.3  | 82.3  |

## Water usage from large dams comprising the Western Cape Water Supply System



The above graph tracks City of Cape Town (CCT) water usage against the Department of Water and Sanitation (DWS) restriction requirement against our unrestricted demand (or past usage). Restriction targets have changed as of 1 December 2018. CCT has been restricted at 30% against the WCWSS approved allocation to the CCT.

## Water Quality Sample Pass Rate

| Month  | Water Quality Compliance (%) | Target (%) |
|--------|------------------------------|------------|
| Jun-18 | 99.07                        | 90         |
| Jul-18 | 99.12                        | 90         |
| Aug-18 | 99.07                        | 90         |
| Sep-18 | 99.08                        | 90         |
| Oct-18 | 99.05                        | 90         |
| Nov-18 | 99.06                        | 90         |
| Dec-18 | 99.00                        | 90         |
| Jan-19 | 99.00                        | 90         |
| Feb-19 | 99.00                        | 90         |
| Mar-19 | 99.01                        | 90         |
| Apr-19 | 99.10                        | 90         |
| May-19 | 99.09                        | 90         |
| Jun-19 | 99.08                        | 90         |

Notes:

The table shows CCT drinking water quality compliance according to the South African National Standard 241:2015. Compliance, measured against all prescribed chemical and microbiological parameters, consistently exceeds the very high CCT target of 90%. (Overall compliance percentages of continuous sampling and analysis are released on a monthly basis. The latest available is for December).

## Rainfall

| RAINFALL (mm)             | 05-Aug | 06-Aug | 07-Aug | 08-Aug | 09-Aug | 10-Aug | 11-Aug | Total | LT Average |
|---------------------------|--------|--------|--------|--------|--------|--------|--------|-------|------------|
| Blackwater Upper          | 4.0    | 0.0    | 4.0    | 1.0    | 0.0    | 1.9    | 0.2    | 11.1  | 73.1       |
| Brooklands                | 4.0    | 0.0    | 0.0    | 1.0    | 0.0    | 4.0    | 6.0    | 26.0  | 142.2      |
| Newlands                  | 76.0   | 7.5    | 15.0   | 4.5    | 0.0    | 7.0    | 21.5   | 126.0 | 234.3      |
| SteenSRag                 | 2.2    | 0.0    | 7.0    | 8.0    | 0.0    | 1.0    | 4.7    | 21.2  | 118.6      |
| Table Mountain (Woodhead) | 25.0   | 0.0    | 18.0   | 0.0    | 0.0    | 8.0    | 71.0   | 126.0 | 186.5      |
| Theenwaterkloof           | 0.0    | 0.0    | 1.3    | 0.0    | 0.0    | 4.5    | 0.0    | 5.8   | 64.1       |
| Tygerberg                 | 4.3    | 0.0    | 6.8    | 2.0    | 0.0    | 2.5    | 5.5    | 21.1  | 75.4       |
| Voelvelde                 | 2.0    | 0.0    | 7.0    | 2.0    | 0.0    | 0.0    | 7.0    | 18.0  | 75.3       |
| Wemershoek                | 15.1   | 0.9    | 20.7   | 3.6    | 0.0    | 8.6    | 12.2   | 58.1  | 126.2      |
| Wynberg                   | 24.0   | 2.0    | 15.0   | 0.0    | 0.0    | 8.0    | 7.0    | 61.9  | 176.8      |

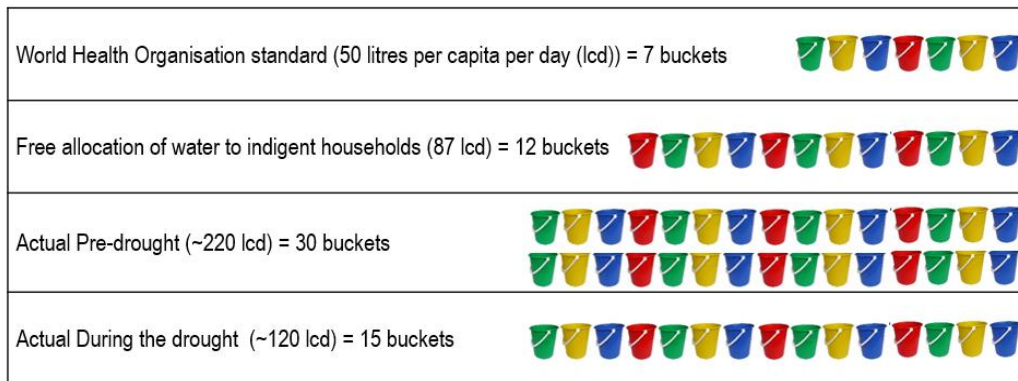
Note: Totals/cumulative rainfall for month indicated above LT Long Term

# Water Demand management – Restrictions and tariffs

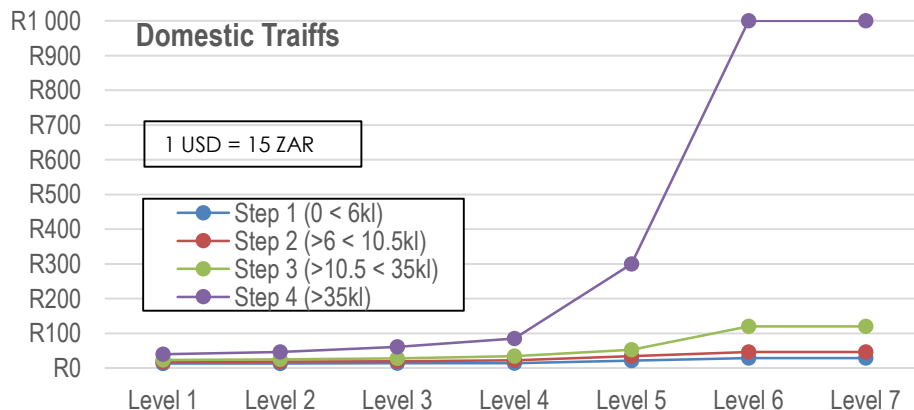
- Set of tariffs for each restriction level – maintain revenue stream
- Moving from 3 to 7 levels of restriction
- Ministerial approval for new tariffs
- Progressively punitive tariffs
- Steep increases in price
  - 6kl free up to June 2017
  - Introduced at R4/kl in July 2017
  - Increased to R26/kl in Feb 2018
  - Increased to R29/kl in July 2018
- Enforcement rules

## Gross per capita use

|             |         |
|-------------|---------|
| Summer 2015 | 250 lcd |
| Summer 2016 | 225 lcd |
| Summer 2018 | 150 lcd |
| Winter 2018 | 125 lcd |



(Assuming 7 litres per bucket)

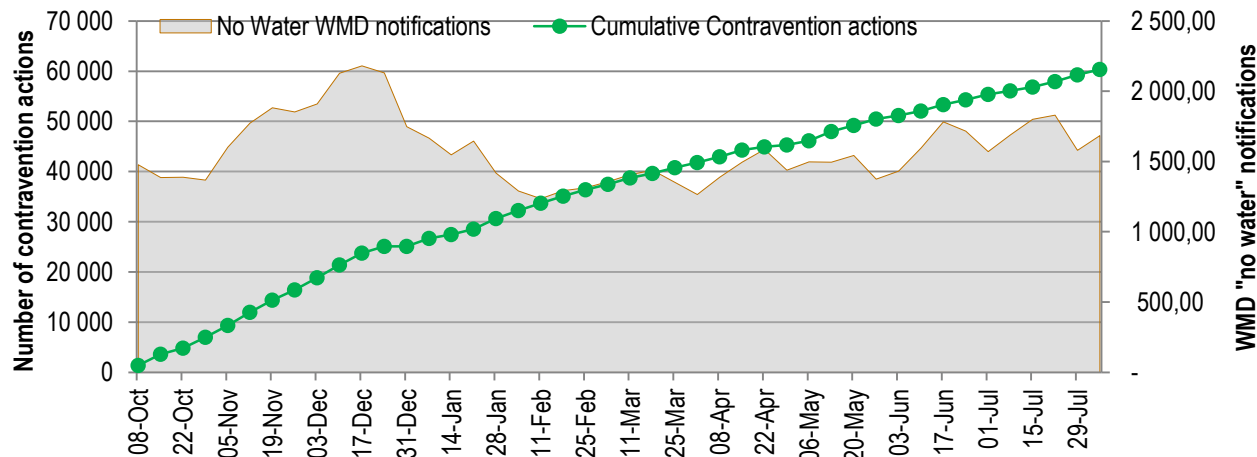


# Water Demand management – Restrictions and tariffs

| Date        | City/DWS               | Tariff | Demand (MLD) | Target demand (MLD) | Combined dam level | Limit pp | Requirements                                                                                                                                                                                                                                                                                                 |
|-------------|------------------------|--------|--------------|---------------------|--------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 Jan 2016  | City Level 2           | 2      | 1000         | 700                 | 55.4%              | -        | <ul style="list-style-type: none"> <li>Watering restricted to specific days and hours; No specific daily limit</li> <li>No automatic pool top-up</li> </ul>                                                                                                                                                  |
| 16 Sep 2016 | DWS 20%                | -      | -            |                     | 61.5%              | -        | <ul style="list-style-type: none"> <li>20% curtailment of all water use</li> </ul>                                                                                                                                                                                                                           |
| 1 Nov 2016  | City Level 3           | 3      | 900          | 650                 | 60.3%              | -        | <ul style="list-style-type: none"> <li>Watering restricted to using a bucket for potable water</li> <li>No pool top up without pool cover</li> </ul>                                                                                                                                                         |
| 1 Feb 2017  | City Level 3B          | 3      | 800          | 650                 | 38.7%              | -        | <ul style="list-style-type: none"> <li>Watering restricted to using a bucket for potable water during certain hours only</li> </ul>                                                                                                                                                                          |
| 1 Jun 2017  | City Level 4           | 3      | 660          | 600                 | 19.4%              | 100      | <ul style="list-style-type: none"> <li>No watering allowed with potable water</li> <li>Daily limit of 100 lcd encouraged</li> </ul>                                                                                                                                                                          |
| 1 Jul 2017  | City Level 4B          | 4      | 625          | 600                 | 25%                | 87       | <ul style="list-style-type: none"> <li>Daily limit of 87 lcd encouraged</li> </ul>                                                                                                                                                                                                                           |
| 3 Sep 2017  | City Level 5           | 4      | 600          | 500                 | 36.1%              | 87       | <ul style="list-style-type: none"> <li>Daily limit of 87 lcd encouraged; Households limited to 20kl/month</li> <li>Non-residential restricted to 20% saving compared to previous year</li> <li>Agricultural users to restrict to 30% saving compared to previous year</li> </ul>                             |
| 28 Sep 2017 | DWS 40/50%             | -      | -            |                     | 37.6%              | -        | <ul style="list-style-type: none"> <li>40% curtailment of all domestic and industrial; 50% curtailment of all agricultural water use</li> <li>The WC Provincial Head is delegated power to lift the water restrictions should the WCWSS recover to above 85% before 1 November 2018</li> </ul>               |
| 12 Dec 2017 | DWS 45/60%             | -      | -            |                     | 34%                | -        | <ul style="list-style-type: none"> <li>45% curtailment of all domestic and industrial; 60% curtailment of all agricultural water use</li> </ul>                                                                                                                                                              |
| 1 Jan 2018  | City Level 6           | 4      | 600          | 450                 | 31%                | 87       | <ul style="list-style-type: none"> <li>Daily limit of 87 lcd encouraged; Households limited to 10.5kl/month</li> <li>Non-residential restricted to 45%; Agricultural users to restrict to 60% saving compared to previous year</li> </ul>                                                                    |
| 1 Feb 2018  | City Level 6B          | 6      | 560          | 450                 | 25.9%              | 50       | <ul style="list-style-type: none"> <li>Daily limit of 50 lcd encouraged; Households limited to 10.5kl/month, but 6kl/month encouraged</li> <li>Non-residential restricted to 45% saving compared to previous year</li> <li>Agricultural users to restrict to 60% saving compared to previous year</li> </ul> |
| 1 Oct 2018  | City Level 5 (amended) | 5      | 520          | 500                 | 75.9%              | 70       | <ul style="list-style-type: none"> <li>Daily limit of 70 lcd encouraged; Households limited to 10.5kl/month</li> <li>Non-residential restricted to 40% saving and agricultural users to 50% compared to corresponding period in 2015 (pre-drought)</li> </ul>                                                |
| 1 Dec 2018  | City Level 3 (amended) | 3      | ~550         | 650                 | 70.3%              | 105      | <ul style="list-style-type: none"> <li>Daily limit of 105 lcd encouraged</li> <li>No household limit and percentage reduction restrictions not applicable for non-residential and agricultural users</li> </ul>                                                                                              |

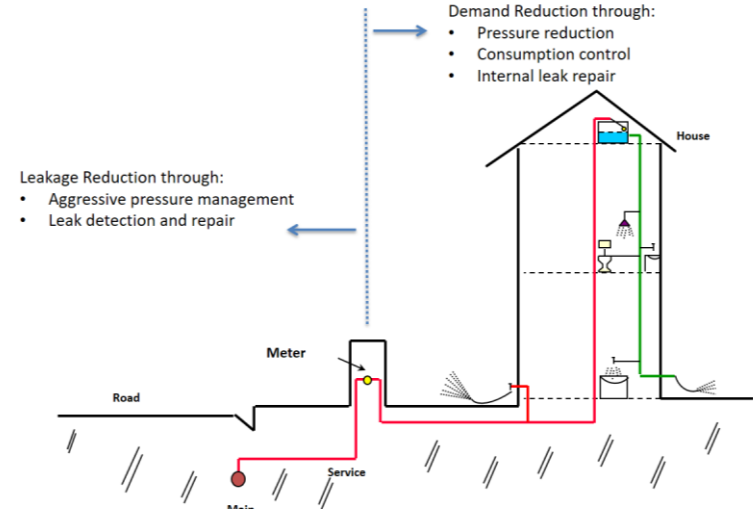
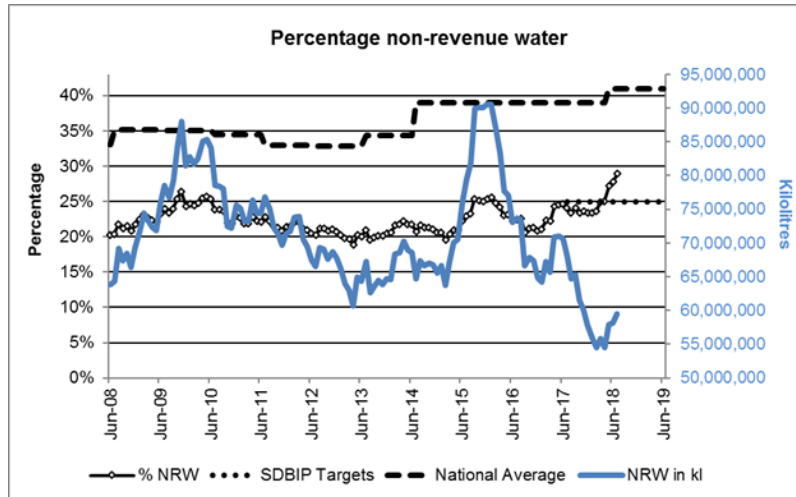
# Water Demand management – Flow restrictors

- Leak repair programme ~190,000 of 268,000 households done
- All meter replacements use these restrictors, but not set
- In September 2017 took decision to install at households using >20kl/month
- ~60,000 installed to date



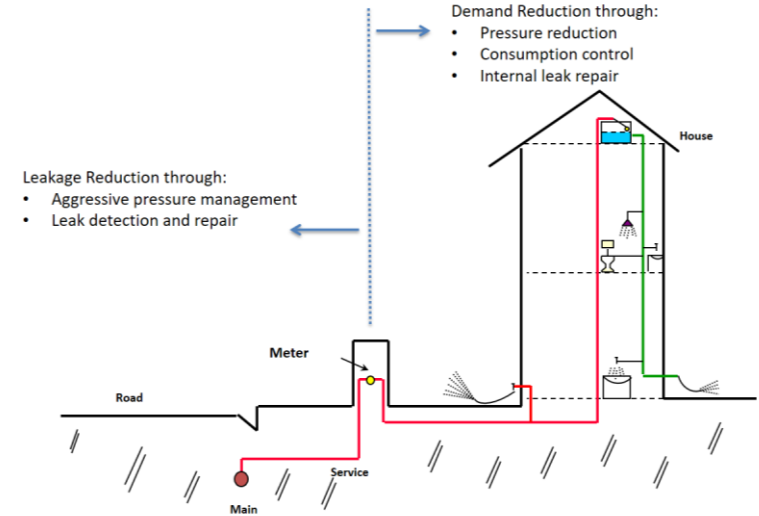
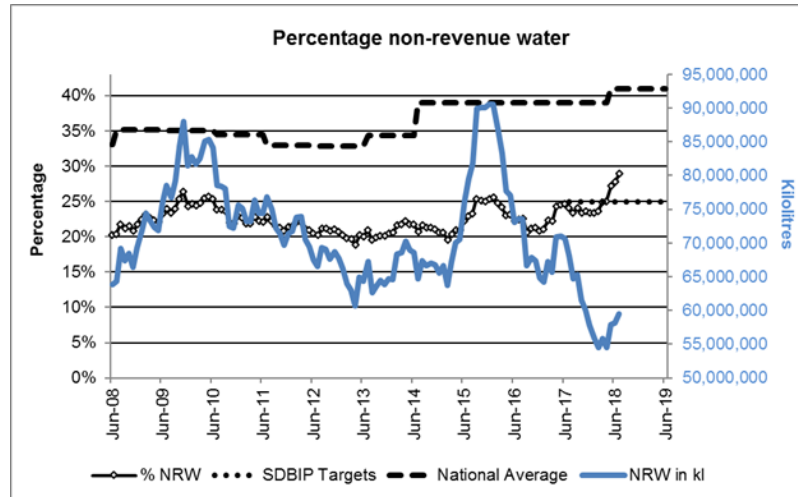
# Water Demand management – Pressure reduction

- >160 pressure management zones
- Currently managing 100 (15m/25m – mainly residential)
- Savings ~70MLD
- Leak detection & repairs
- Leak repair at household level
- Pressure managed reticulation 4,800/10,600km
- High user meter issues



# Water Demand management – Pressure reduction

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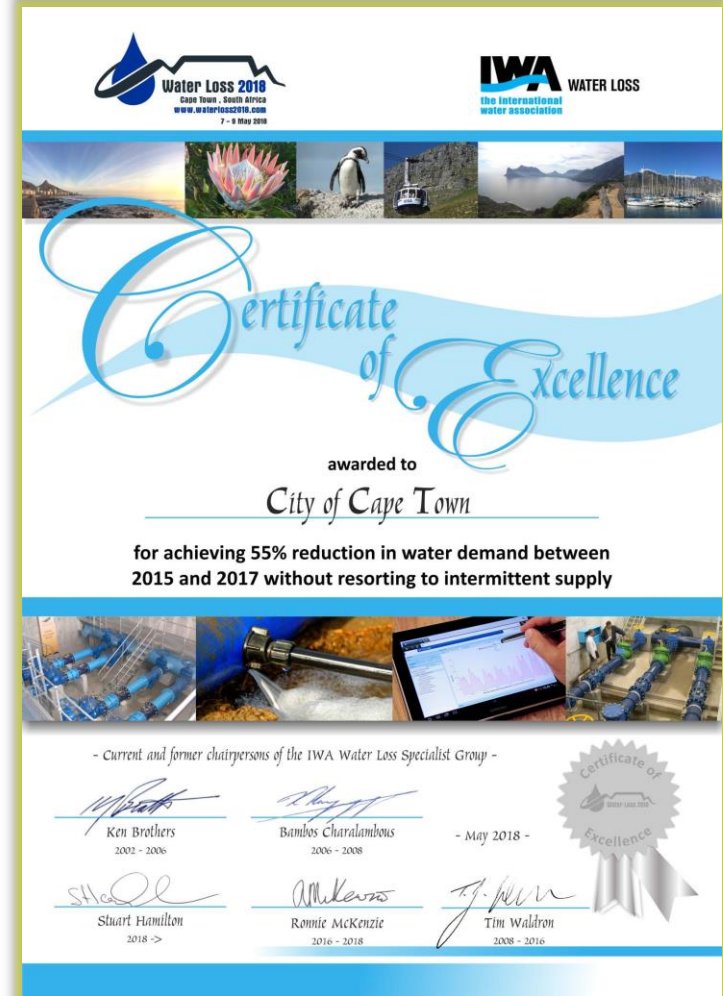
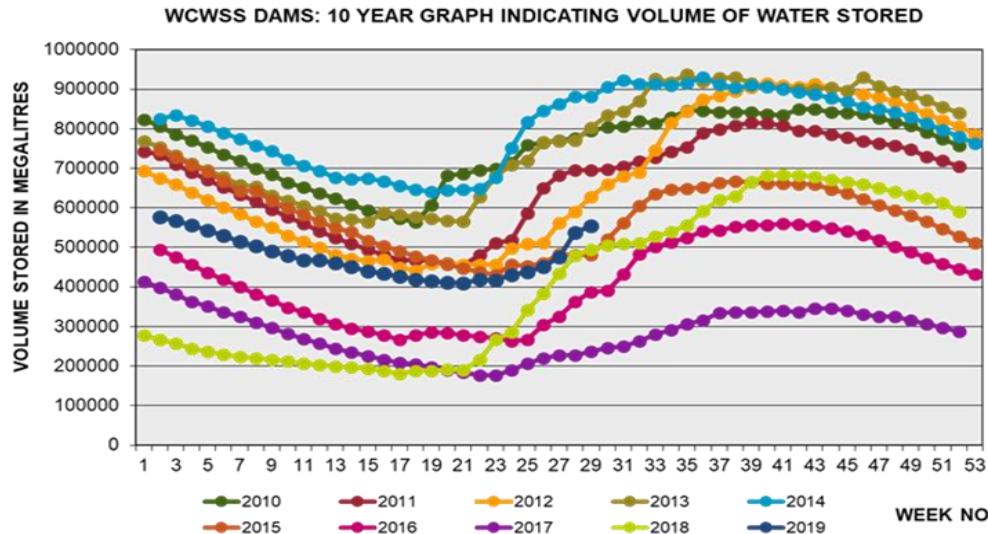
Khayalitsha (2001)  
Saving of 9 Mm<sup>3</sup>/a



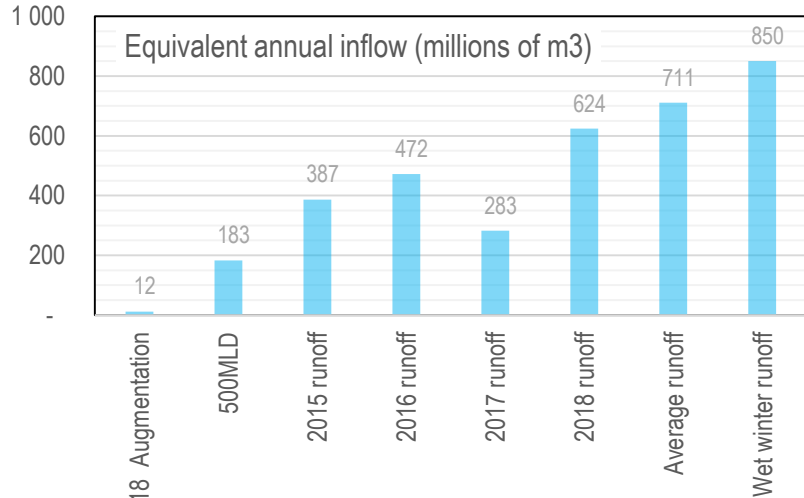
Mitchells Plain (2008)  
Saving of 3.4 Mm<sup>3</sup>/a

# Water Demand Management - Impact

**International Water Association recognition** for a **55% reduction** in water demand between 2015 – 2017, **without resorting to intermittent supply**.

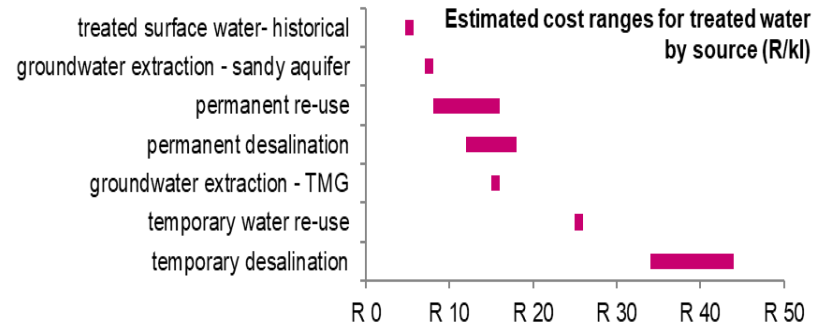


# C: Augmenting supply



## Water sources:

- New surface water;
- Improve yield of existing surface water-
  - Management,
  - Invasive alien plant removal
- Groundwater;
- Water re-use;
- Desalination



# GROUNDWATER: CAPE TOWN AND SURROUNDS - AQUIFERS

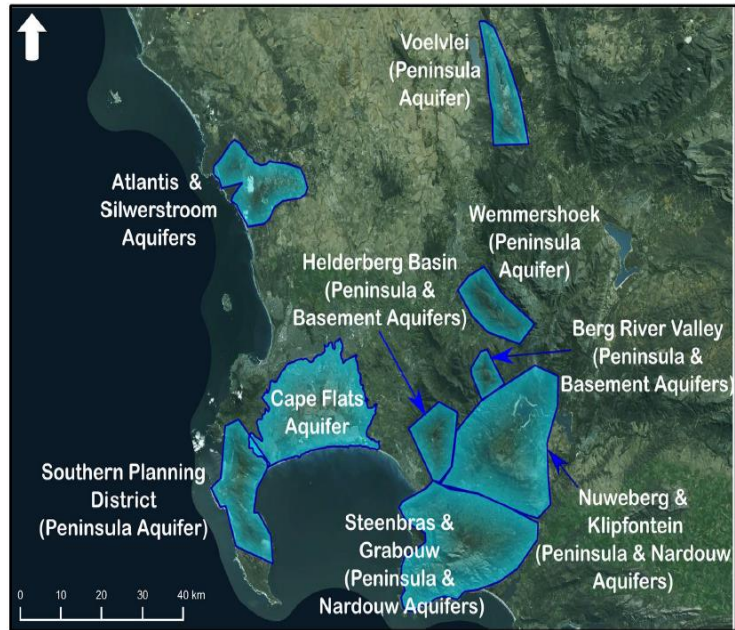


Figure 1-6 Nine projects identified by the CoCT to target groundwater resources in their Water Resilience Plan

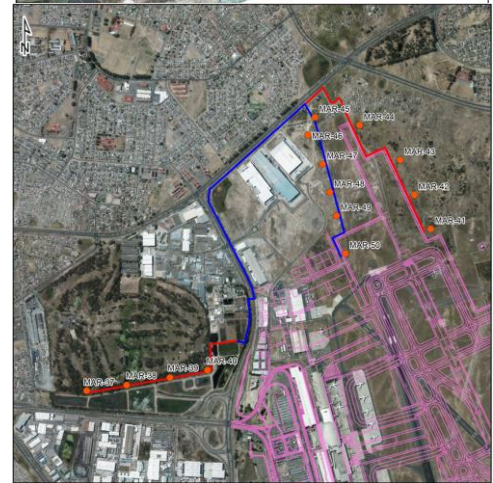


# GROUNDWATER: CAPE TOWN AND SURROUNDS - AQUIFERS

CFA RECHARGE / INTRUSION  
BARRIERS



CFA GROUNDWATER – COMBINED  
BOREHOLES

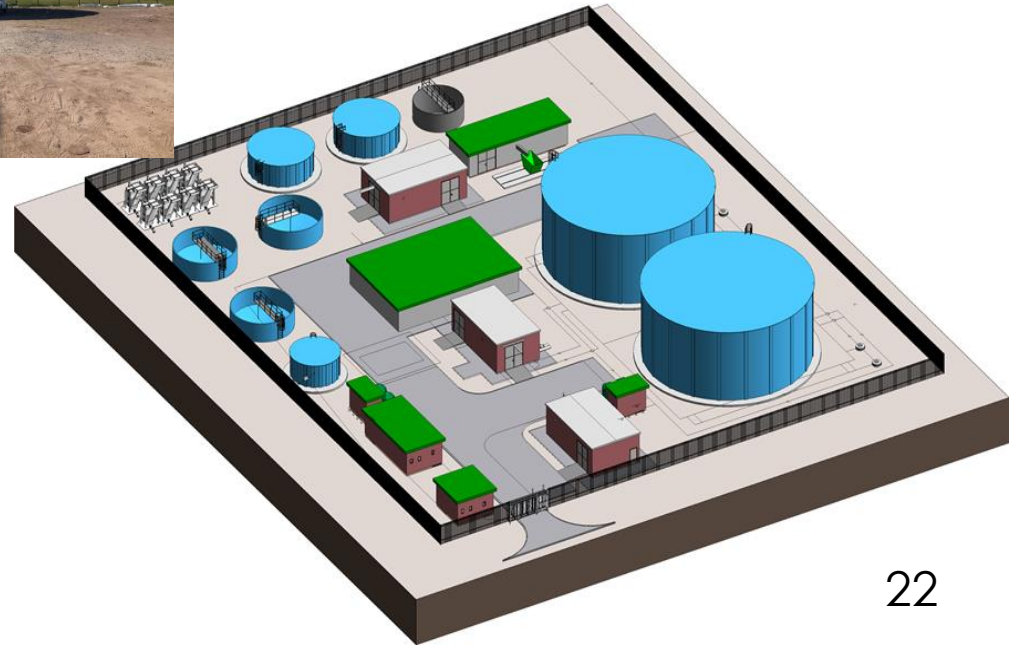


BORCHERDS QUARRY  
RECHARGE

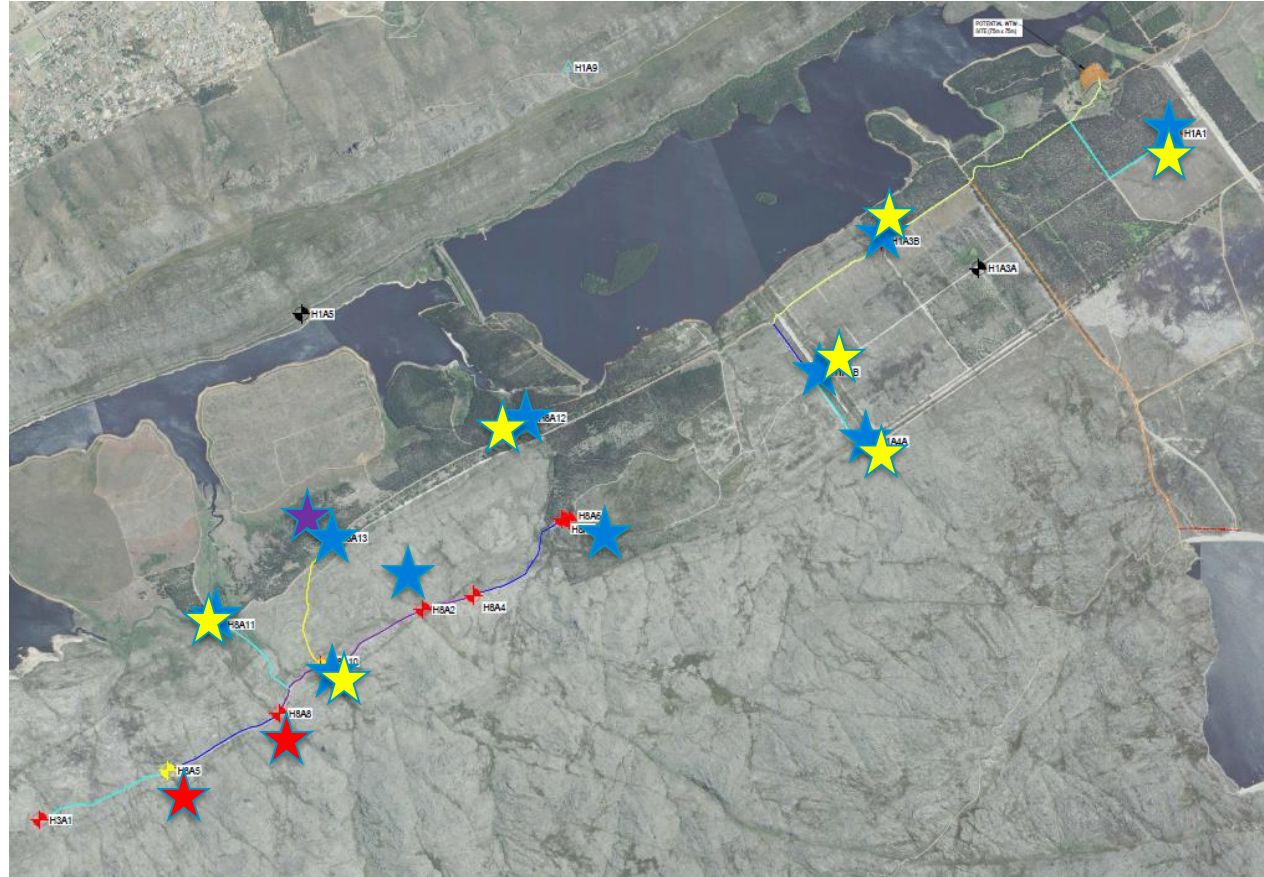
# GROUNDWATER: STORAGE TANKS – PHILIPPI CLUSTER

Potable water tank

Raw water tank



## GROUNDWATER: TMG AQUIFER



# Temporary Sea Water Desalination Projects



Strandfontein



Monwabisi



V&A Waterfront

Photographs courtesy  
Bruce Sutherland

# Looking to the FUTURE: Cape Town Water Strategy

## 5 commitments:

Commitment - (a willingness to give our time and energy to something that we believe in, a promise, a firm decision to do something)

1. We will work hard to provide **safe access to water & sanitation**
2. We will promote **wise use** by all water users
3. We will ensure **sufficient, reliable water from diverse sources**
4. We will work with our partners to guarantee **increased & shared benefits from regional water resources**
5. We will actively facilitate the transition to **a water sensitive city**

Link to current version of the Water Strategy on City of Cape Town website:

<http://resource.capetown.gov.za/documentcentre/Documents/City%20strategies,%20plans%20and%20frameworks/Cape%20Town%20Water%20Strategy.pdf>

**INCREASE RESILIENCE TO CHANGE**



## SAFE ACCESS TO WATER & SANITATION

**Our commitment:** The City will work hard to provide and facilitate safe access to water and sanitation for all of its residents in terms of well-defined minimum standards. In particular, the City will work with communities in informal settlements and with other stakeholders to improve the daily experience of access to water and sanitation, with an emphasis on building trust and increasing safety within these communities through this process.

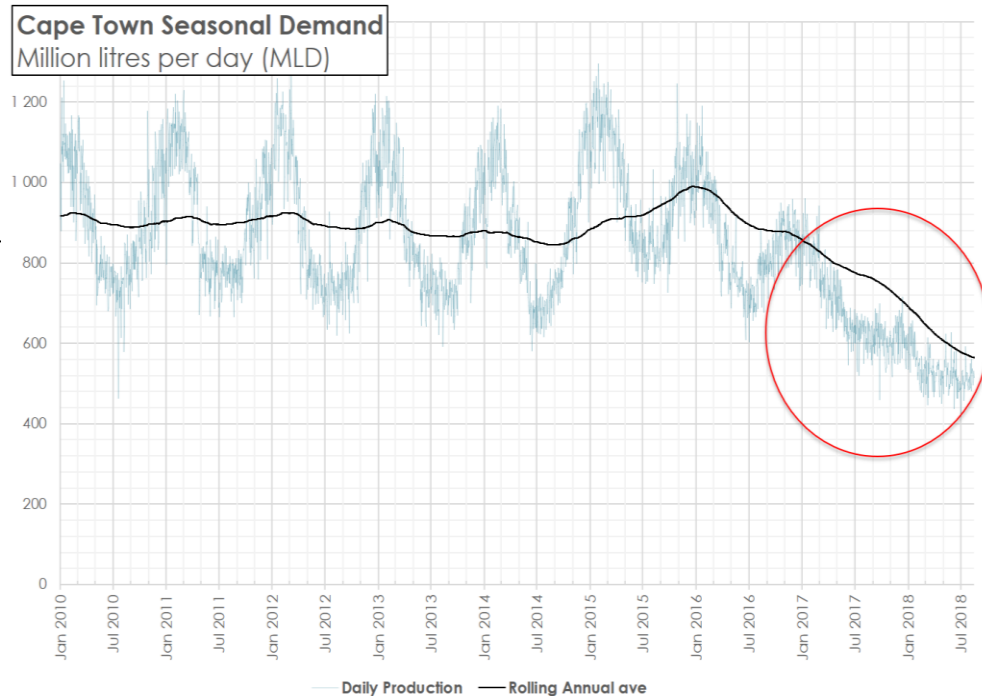
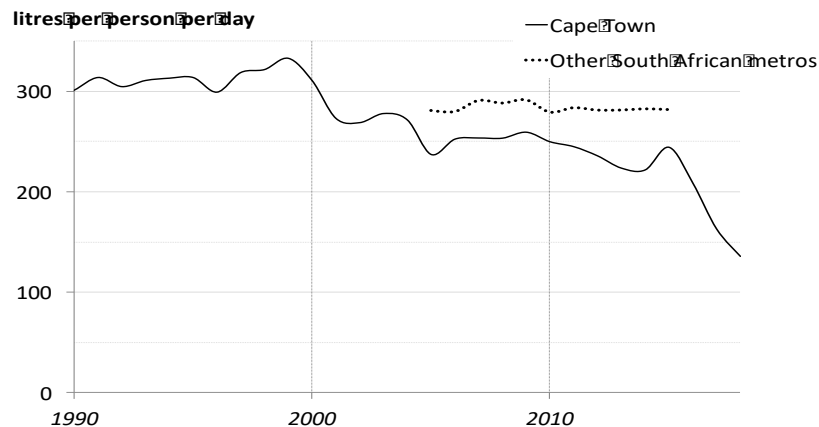
- The Focus on people is critical to re-establish the trust eroded in the drought
- The Inequality in society is stark – during the drought there was repeated insensitive media attacks on informal settlements wasting water.
- We believe that we need to put people first and emphasize our commitment to vulnerable people
- One of our main commitments to customer centricity is to improve the lived experience of residents in informal settlements.
- Formal services perform well in the context of SA measures – meeting and exceeding blue, green and no-drop standards.
- Standards in informal settlements have been exceeded, but there is great room for improvement.



## WISE USE

**Our commitment:** The City will promote the wise use of water by all water users. This will include promoting water conservation behaviour through:

- Pricing
- By-laws, building codes, other incentives
- Customer management & engagement
- Manage network – maximise use of available water
- Further reducing losses and waste



## SUFFICIENT, RELIABLE WATER

**Our commitment:** The City will develop new diverse supplies of water – including ground water, water reuse and desalinated water, cost-effectively and timeously to increase resilience and substantially reduce the risk of Cape Town needing to impose severe water restrictions in the future. The City is committed to building affordable new capacity of some 300 million litres per day over the next ten years, and in suitable increments thereafter, in a way that is adaptable and robust to changes in circumstances.

### APPROACH

- Planning in the context of uncertainty through scenarios;
- Future water demand is uncertain because of the very disruptive effect of the drought.
- Future water availability from rainfall is uncertain because of climate change.

#### STRESS TEST SCENARIOS

- Business as usual
- Low demand
- Climate stress

High water demand

Business as usual

Restricted supply

Low water demand

Water-wise

Climate stress

Incremental change in water availability from climate change

Step change in water availability from climate change

# SUFFICIENT, RELIABLE WATER (cont'd)

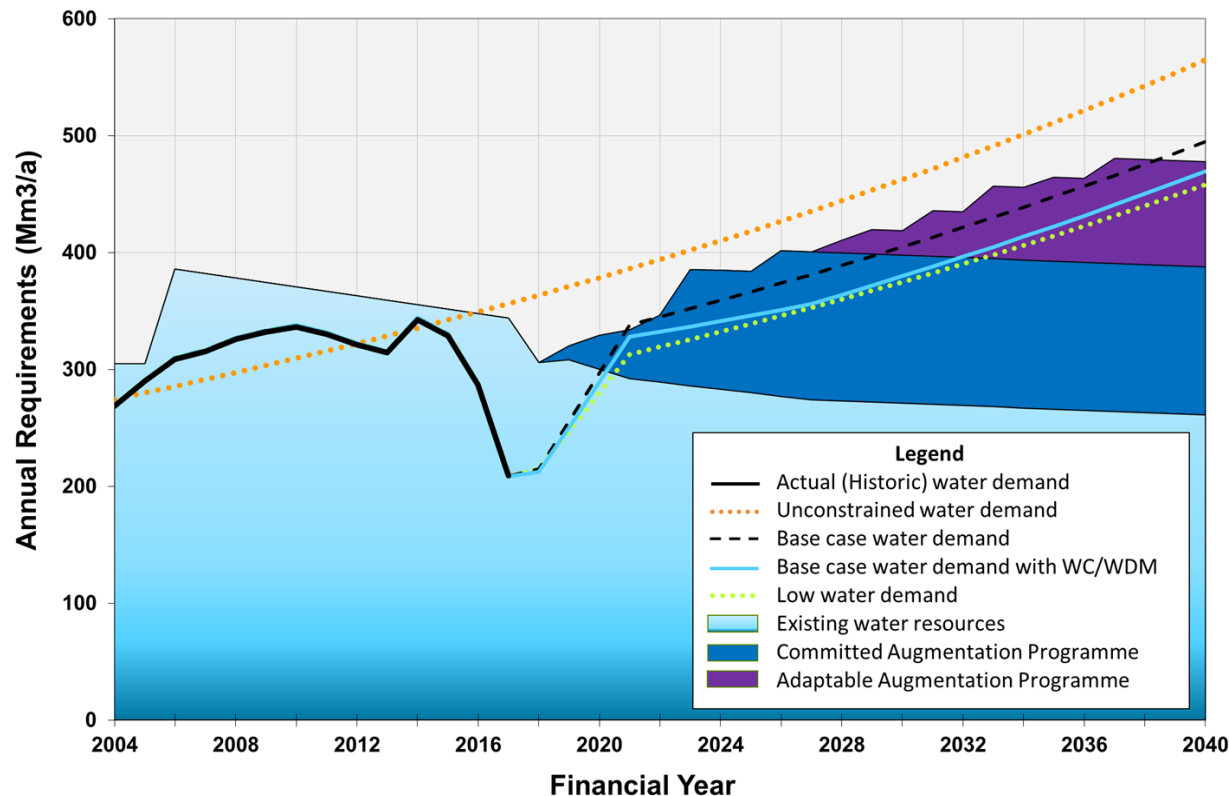
## THE NEW WATER PROGRAMME – COMMITTED AND ADAPTABLE

### Founding Principles:

- Low cost first - WDM, AIP removal, improve surface water management
- Existing funding commitments;
- Timing;
- Diversification and early learning;
- Adaptability and scalability;
- Earlier than needed;
- Phasing.

### Water sources:

- New surface water;
- Improve yield of existing surface water;
- Groundwater;
- Water re-use;
- Desalination



## SUFFICIENT, RELIABLE WATER (cont'd)

### THE NEW WATER PROGRAMME – 10 YEAR VIEW

| Intervention <sup>+</sup> | First Water | Effective yield |               | Total Capex<br>R million | Unit Capex <sup>++</sup><br>Rm /MLD | Operating cost <sup>+++</sup><br>R/kl |
|---------------------------|-------------|-----------------|---------------|--------------------------|-------------------------------------|---------------------------------------|
|                           |             | MI/day          | Million kl pa |                          |                                     |                                       |
| Demand management         | 2019        | 70              | 26            | 410                      | 6                                   | 3                                     |
| Alien vegetation clearing | 2019        | 55              | 20            |                          |                                     | ~1-2                                  |
| Management of WCWSS       | N/A         | 27              | 10            |                          |                                     | ~0.2-0.5                              |
| Cape Flats Aquifer P1     | 2020        | 20              | 7.3           | 610                      | 31                                  | 5                                     |
| Table Mountain Group P1   | 2020        | 15              | 5.5           | 375                      | 25                                  | 5                                     |
| Cape Flats Aquifer P2     | 2021        | 25              | 9.1           | 450                      | 18                                  | 5                                     |
| Atlantis Aquifer          | 2021        | 10              | 4             | 290                      | 29                                  | 8                                     |
| Table Mountain Group P2   | 2022        | 15              | 5.5           | 335                      | 23                                  | 5                                     |
| Table Mountain Group P3   | 2022        | 20              | 7.3           | 326                      | 16                                  | 2                                     |
| Berg River Augmentation   | 2023        | 40              | 15            |                          |                                     | ~3-5                                  |
| Water Re-Use P1           | 2024        | 70              | 26            | 1360                     | 20                                  | 5                                     |
| Desalination Phase 1      | 2026        | 50              | 18            | 1650                     | 33 - 40                             | 9                                     |
| Total including WDM       |             | 417             | 154           | 5806                     |                                     |                                       |
| Total new supply          |             | 347             | 128           | 5396                     |                                     |                                       |

1 USD = 14 ZAR

### Adaptable future new water programme:

| Intervention                          | Supply<br>MI/day |
|---------------------------------------|------------------|
| Ground water (further phases)         | 50               |
| Reuse schemes (2 <sup>nd</sup> phase) | 30               |
| Desalination (further phases)         | 100              |
| Surface water (new schemes)           | 100              |
| Total                                 | 250              |

- Trade-off between the reliability of water supply and it's cost.
- Rainfall is likely to become less reliable in future
- Doing nothing is not an option
- New and diverse supplies will increase reliability.
- The City will plan for a higher level of reliability. (98 -99,5%)
- The city will adopt scenario planning with annual reviews.
- The committed program balances risk and cost.

## INCREASED SHARED BENEFITS FROM REGIONAL WATER RESOURCES

- **Our commitment:** The City will work with key stakeholders and partners, including other urban and agriculture water users, and other spheres of government, to make the most of the opportunities to optimise the economic, social and ecological benefits of regional water resources, and to reduce the risks. The City will do this through collaborative processes. Regional refers to the region served by the WCWSS (Western Cape Water Supply System).

### ENGAGE & COLLABORATE

- Shared benefits
- Shared risks
- Options for the future
  - Amending and developing legal agreements – water rights
  - Better system management information with improved sharing
  - Ensure adequate funding for effective system operation
  - Professionalizing the management of the WCWSS
  - More inclusive and robust governance structure for the WCWSS
- A collaborative approach
  - Improve the analytical information-base;
  - Build stronger relationships between the key stakeholders;
  - Optimise the overall economic and social benefit of water;
  - Improve water resource management to ensure resilient outcomes;
  - Evolve institutional arrangements between the users and the DWS
  - Ensure more robust and transparent management of water resources.

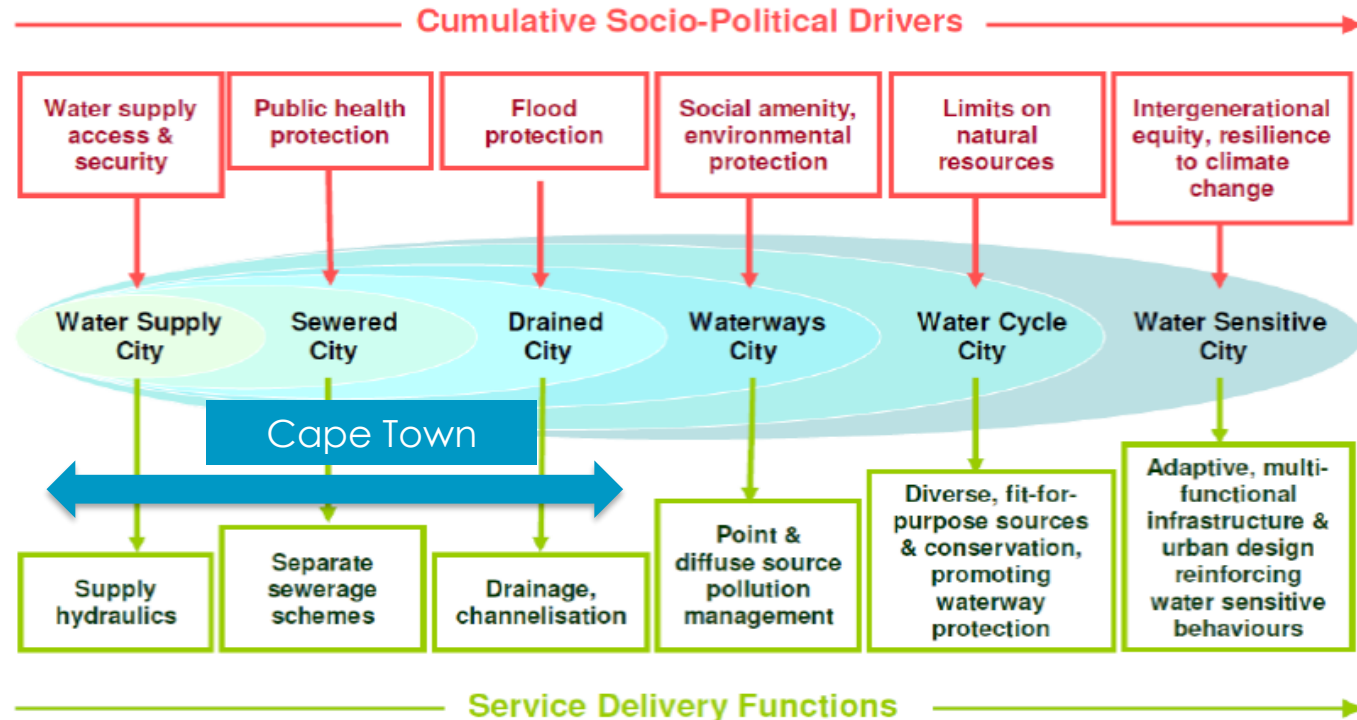


# A WATER SENSITIVE CITY

**Our commitment:** The City will transform the city over time into a water sensitive city that makes optimal use of stormwater and urban waterways for the purposes of flood control, aquifer recharge, water reuse and recreation, and is based on sound ecological principles. This will be done through new incentives and regulatory mechanisms as well as the way the city invests.

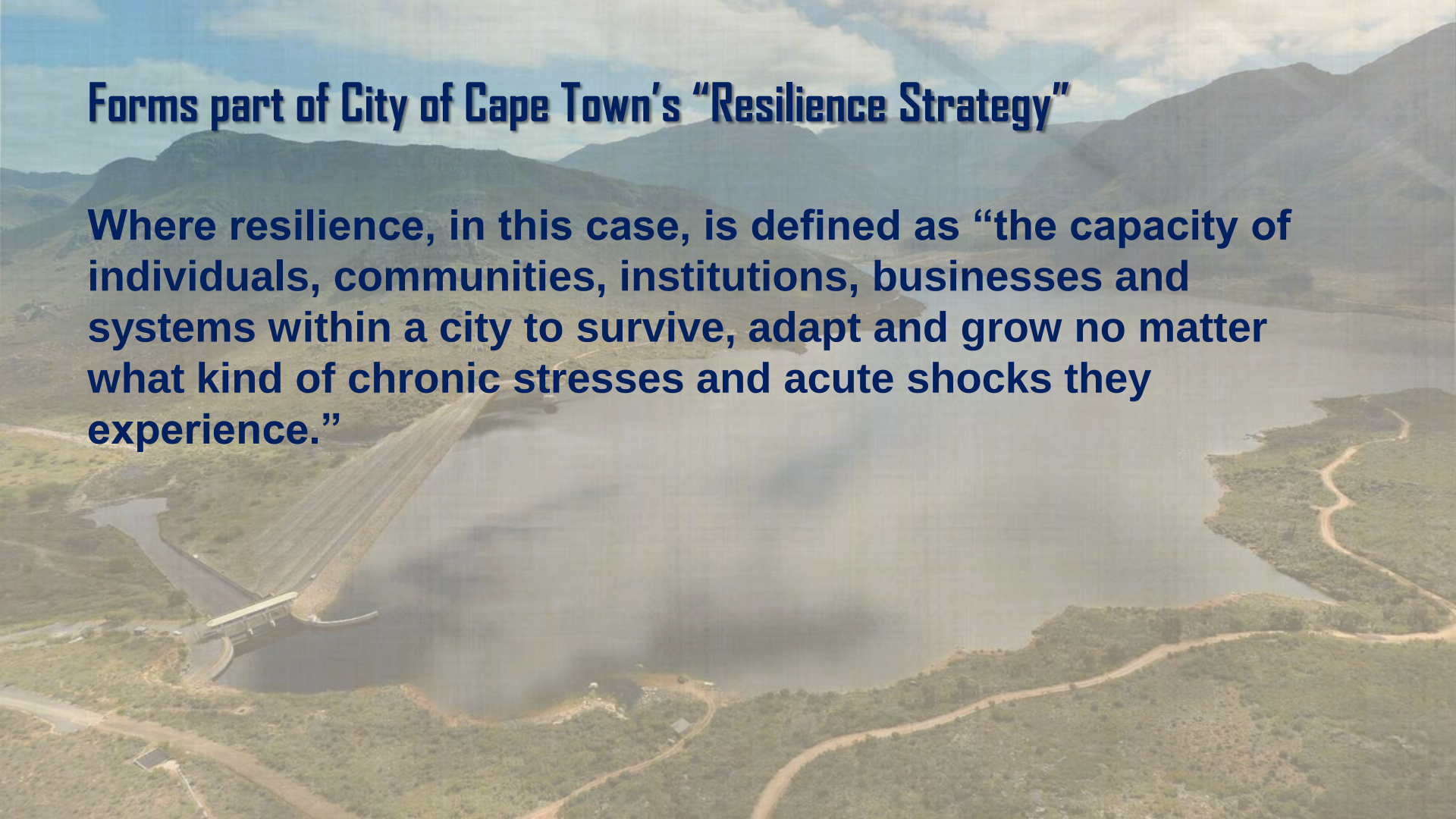
- **Economic and financial incentives** – the way the city levels taxes and service charges.
- **Regulatory mechanisms** – changing the rules of the game through, for example, land-use permissions and building codes.
- **Direct investments in infrastructure.**

In all three areas, the City will ensure that the benefits of any initiative to develop a water sensitive city will exceed the costs.



## **Forms part of City of Cape Town's "Resilience Strategy"**

**Where resilience, in this case, is defined as "the capacity of individuals, communities, institutions, businesses and systems within a city to survive, adapt and grow no matter what kind of chronic stresses and acute shocks they experience."**





My thanks to Dr Gisela Kaiser, former Executive Director: Informal Settlements, Water & Waste at City of Cape Town and the management and staff of the W&S Department for their dedication and tireless efforts in successfully responding to one of the worst droughts experienced in the region.