



UNIVERSITEIT
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STELLENBOSCH
UNIVERSITY

100

1918 · 2018

forward together · saam vorentoe · masiye phambili

Stellenbosch University Drought Response Plan

Mitigating the Western Cape Water Crisis

23 October 2018

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CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

DAM STORAGE (%)

23.5

WEEKLY DAM LEVEL CHANGE (%)

-0.4

decrease since last week

Level 6B Water Restrictions

- 50L per person per
- 45% saving on water consumption

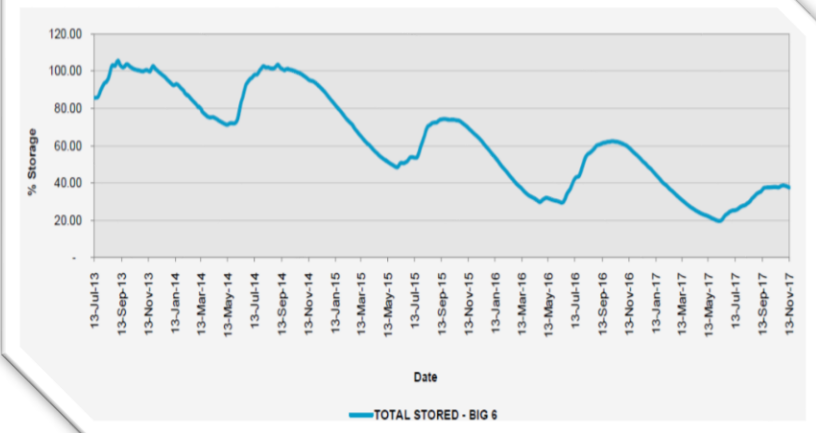


CURRENT DAY ZERO D

29 | 04 | 20

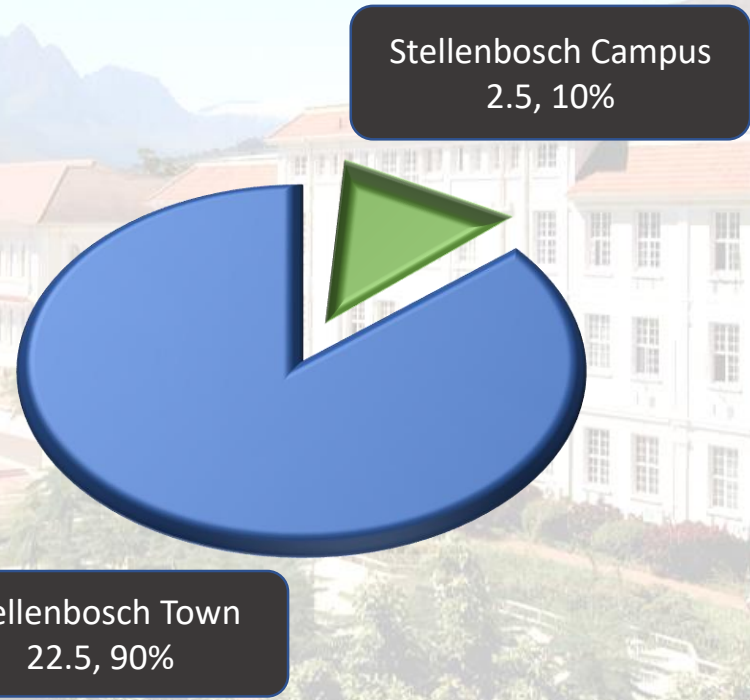
THE DAY THE TAPS WILL BE TURNED OFF

City of Cape Town Dams: Graph indicating % of water stored



Drought Challenge

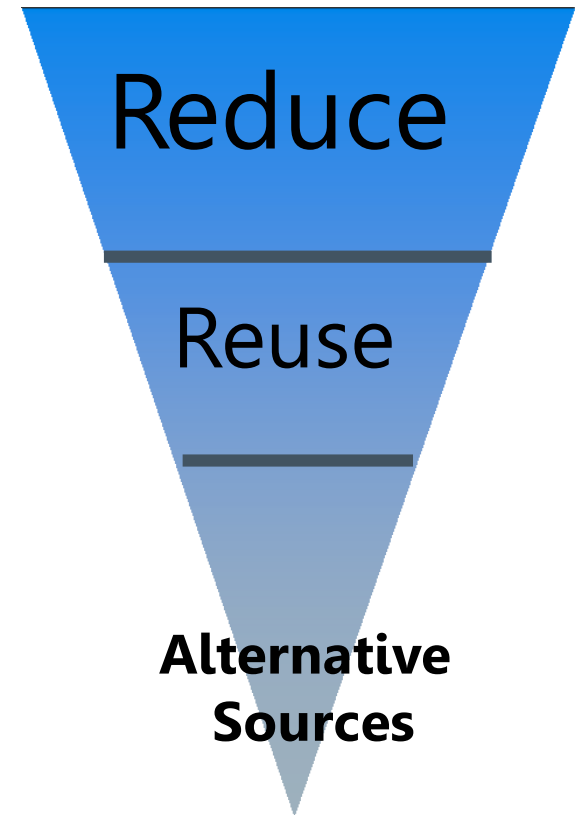
- Impact on Business as usual
- Mitigation and Resilience
- Water Optimization Study
- Drought Response Action plan
- Contingency groups



Which interventions to implement first?

‘Lowest hanging fruit’

- **Reduce**: Efficient fittings, pressure reduction
- **Reuse**: Rainwater harvesting, greywater reuse, WWTW treated effluent
- **Alternative Sources**: Groundwater abstraction & managed aquifer recharge (SuDS), Dam Water, River Water





Projects: 24



Re-use Waste Water

- Greywater from showers for toilet flushing



Reduce Water Consumption

- Measure
- Efficient Fittings
- Awareness Campaigns
- Reduce Leakage and Wastage

Alternative Water Sources

- Rainwater harvesting
- Storm water harvesting
- Groundwater: boreholes
- Augmentation schemes
- Treated waste water effluent
- Deep water lake

Reduce- Immediate Interventions

Efficient fittings

Shower heads



Tap aerators



Urinals



Washing machines



Cistern



Hand sanitizers



Drastic Measures

Bath



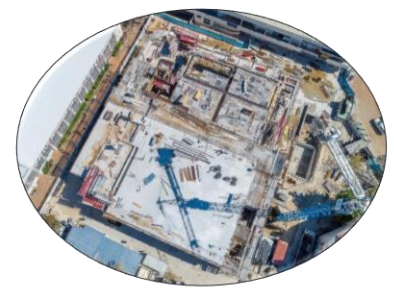
Irrigation



Car Wash



Construction



Events



Reduce- Immediate Interventions

- Plumbers regular meetings and repair
- Pressure reduction SU & municipal
- Leak detection
- Metering



Campus Water Meter Replacement Program

- Municipal Meters Old
- Leaks- save 60 Megalitres
- Live monitoring of each building
- Water profile of daily consumption
- Demand Management



Reduce-Awareness Program

- Awareness Presentation- program, competitions
- Radio, articles, website, screen, newspapers
- 2min showers
- Student initiatives:
 - Flush wheel
 - Timers
 - Reuse schemes
 - Great response



Congratulations!
YOU HAVE ENTERED OUR
WATER SAVING GAME



IF IT'S YELLOW: ONCE YOU HAVE USED THE LOO, MOVE THE WATER DROP TO THE NEXT BLOCK. IF YOU LAND ON BLOCK 3, YOU GET TO FLUSH!

IF IT'S BROWN: MOVE ALL THE WAY TO BLOCK 3 AND FLUSH!

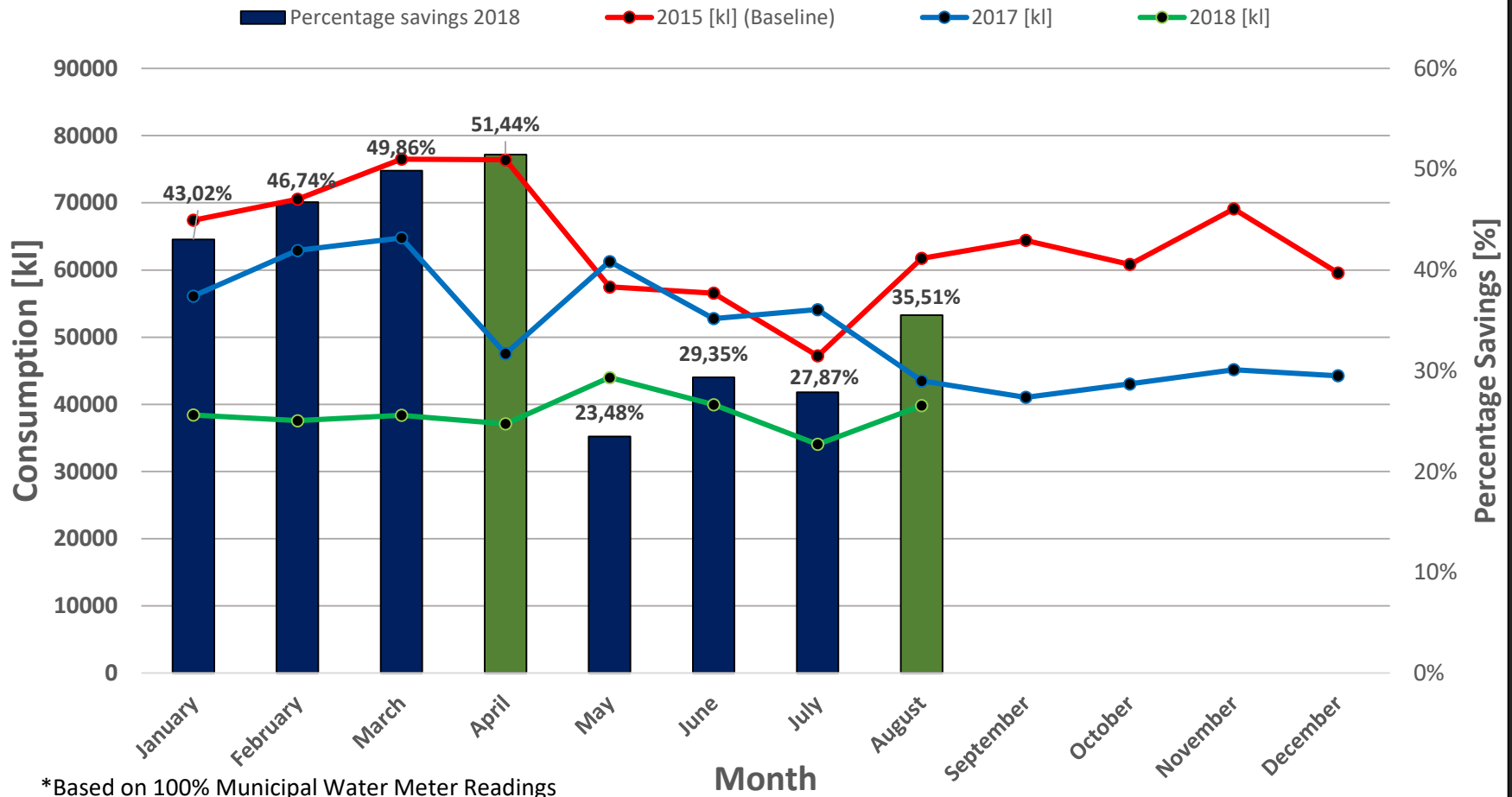
IF YOU HAVE JUST COME INTO THE BATHROOM AND THE WATER DROP IS ON THREE, MOVE IT ONTO 1 WHEN YOU ARE DONE.

<p>1 <u>DON'T</u> FLUSH</p>	<p>2 <u>DON'T</u> FLUSH</p>	<p>3 FLUSH!</p>
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Water Savings Achieved

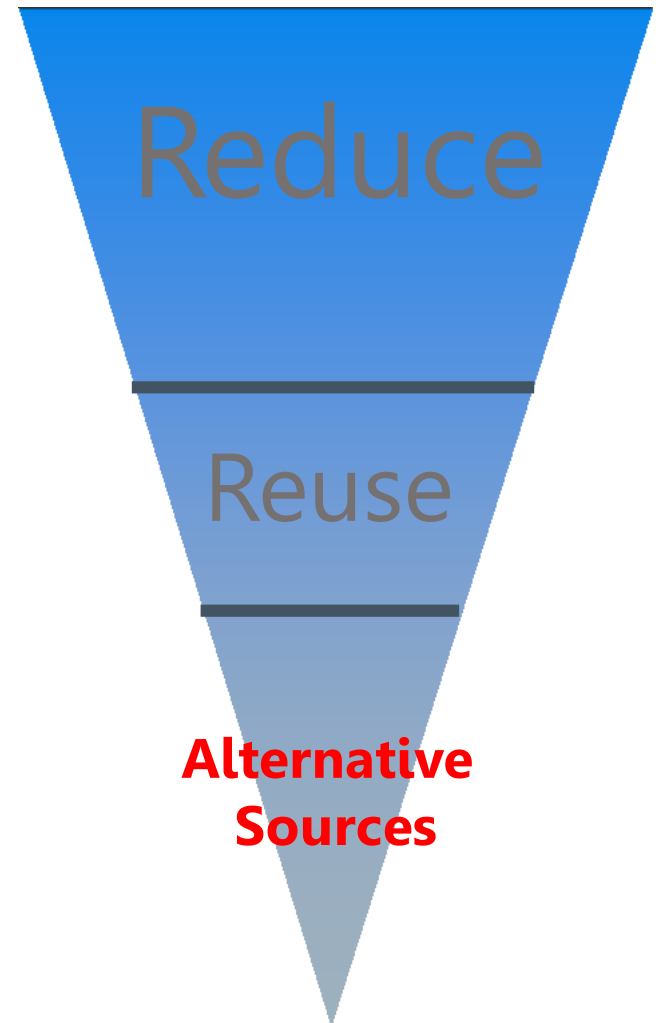
Stellenbosch University: Bulk water savings (Month-to-Month basis)



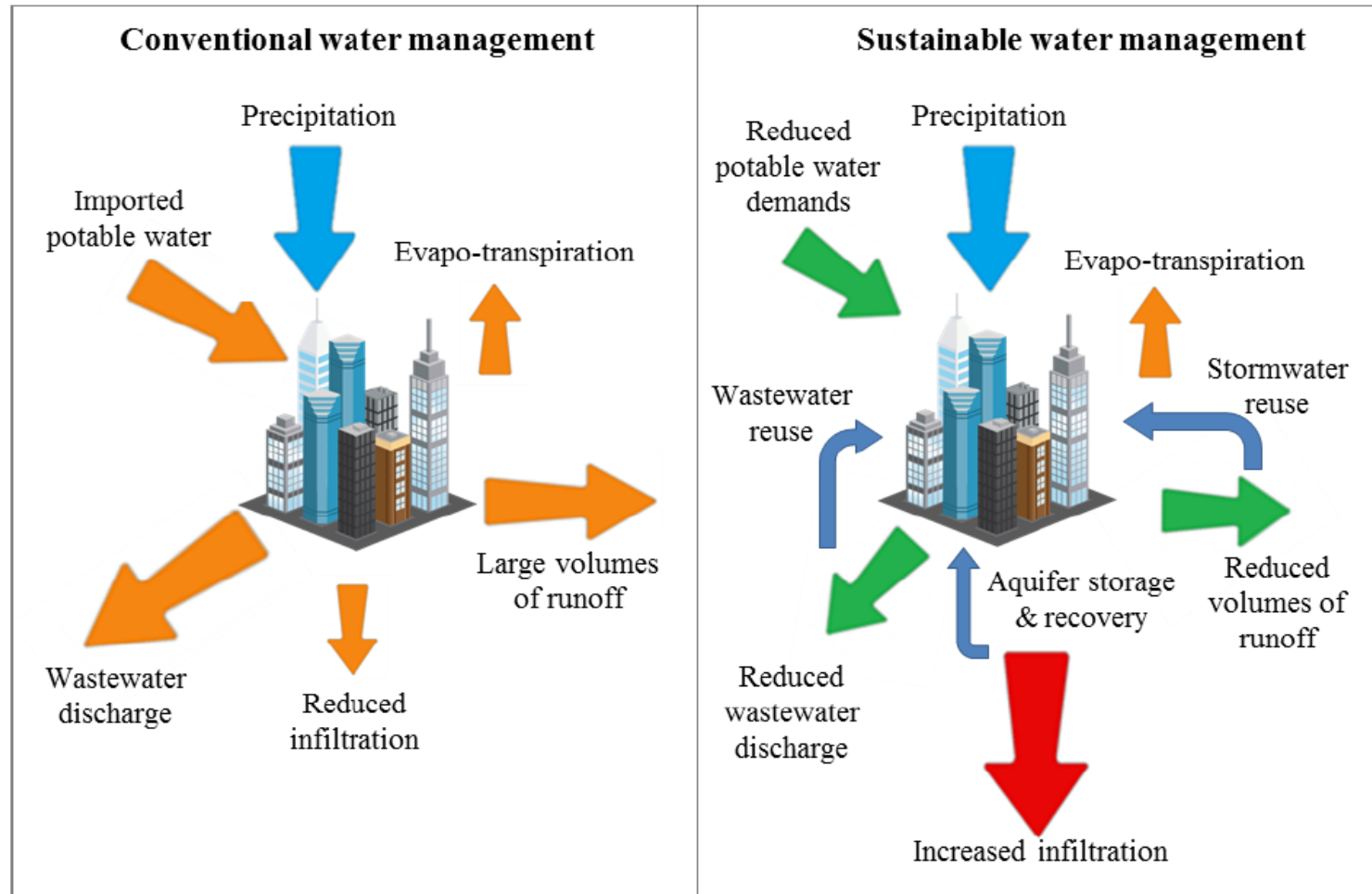
*Based on 100% Municipal Water Meter Readings

Water Augmentation

- Groundwater / Boreholes
- Rainwater
- Storm Water
- Greywater
- Water Use License

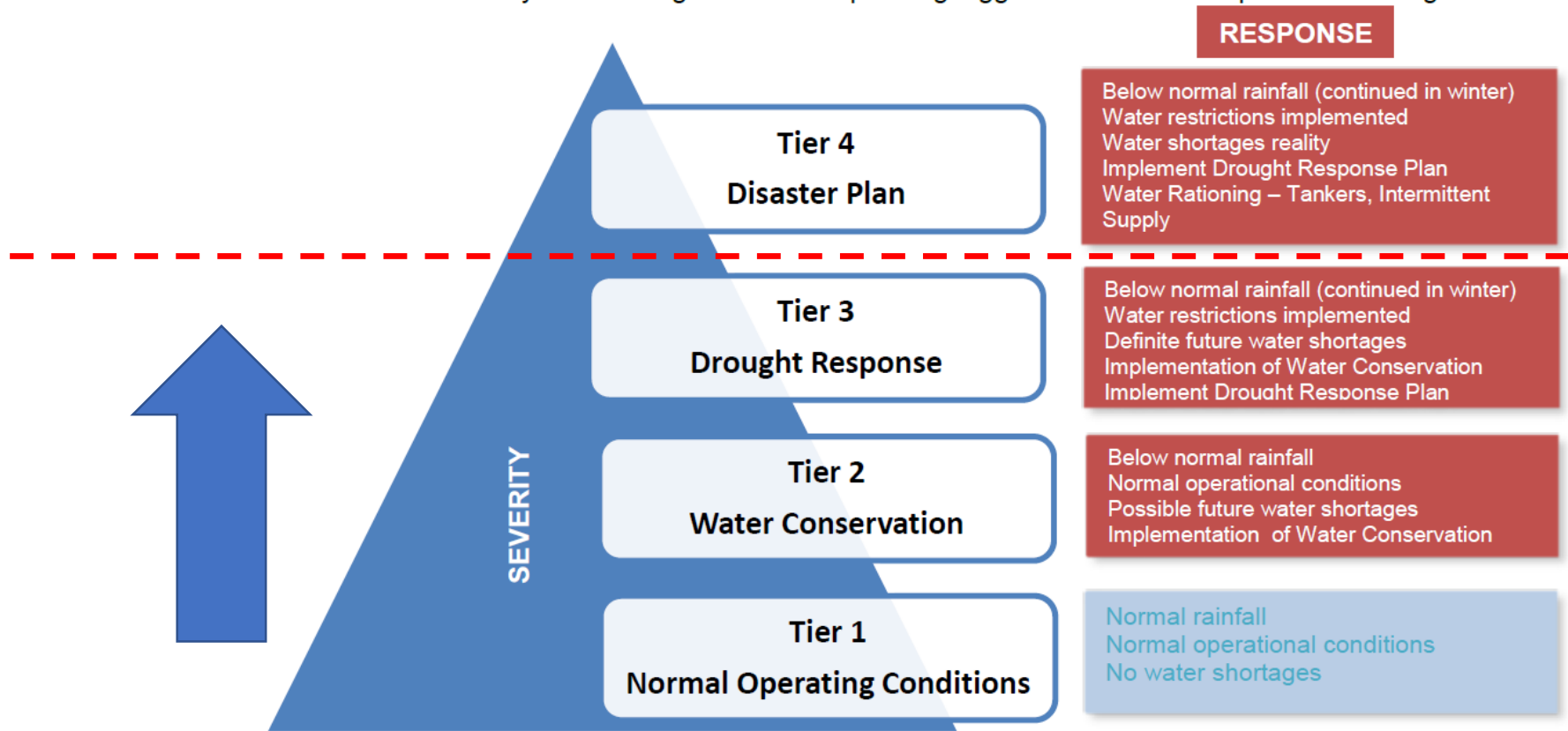


Paradigm Shift



Drought Response

It is proposed that the Drought Response Plan is planned in accordance with pre-determined tiers based on the level of severity of the drought with corresponding triggers and actions as per the following structure.



Drought Risk Profiling

Campus	Risk	Opportunity		
		Reduce	Re-use	Augment
	Infrastructure/ Operational			
Stellenbosch	Academic Research Administrative Reputation	Yes	Yes Greywater for toilet flushing and limited irrigation	Yes Irrigation only
Tygerberg Medical	Academic Research grants Administrative Reputation	Yes	Yes Greywater for toilet flushing and limited irrigation	Yes Potable water from groundwater
Bellville Business School	Academic Administrative Reputation	Yes	Yes Greywater for toilet flushing and limited irrigation	Yes, Potable water from Tygerberg Quarry stormwater
Mariendahl	Agriculture Economic Research	Yes	No	Yes, Potable water from groundwater and for animals
Worcester	Administrative Academic	Yes	No	Yes, Potable water from groundwater
Saldanha	Administrative Academic	Yes	No	TBC

Borehole Water Augmentation – Stellenbosch Campus



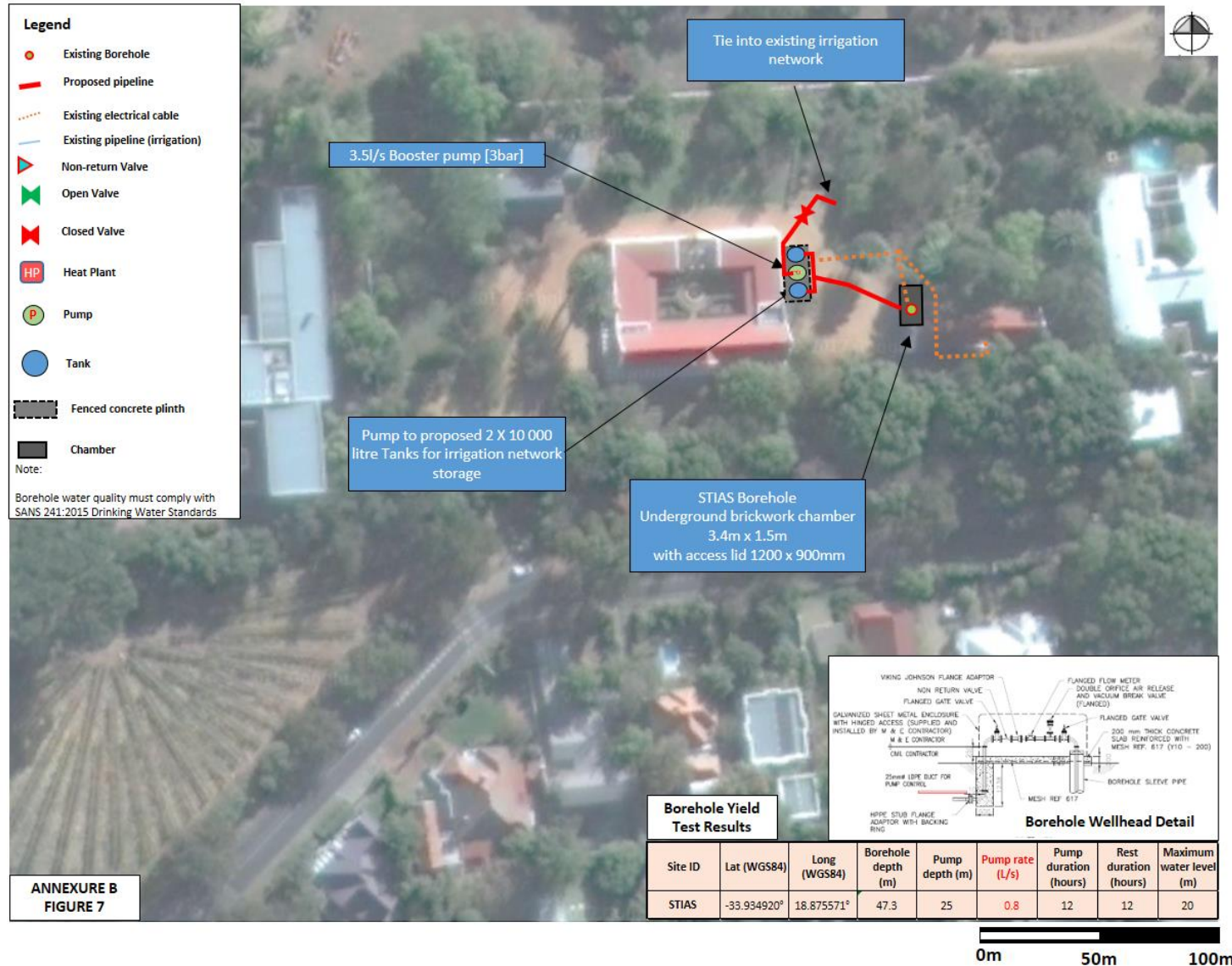
Existing Campus Boreholes:

Huis MacDonald	2 litres/sec
Heemstede	2 litres/sec
Coetzburg	1.5 litres/sec
Ou Hoofgebou	4.5 litres/sec
Taalsentrum	4.5 litres/sec
Wilgenhof	4.5 litres/sec
STIAS	0.8 litres/sec

Combined capacity
19.8 litres/sec
855 kl/day

Approx. 66% of daily irrigation demand now supplied from groundwater

Stellenbosch Campus Boreholes - STIAS

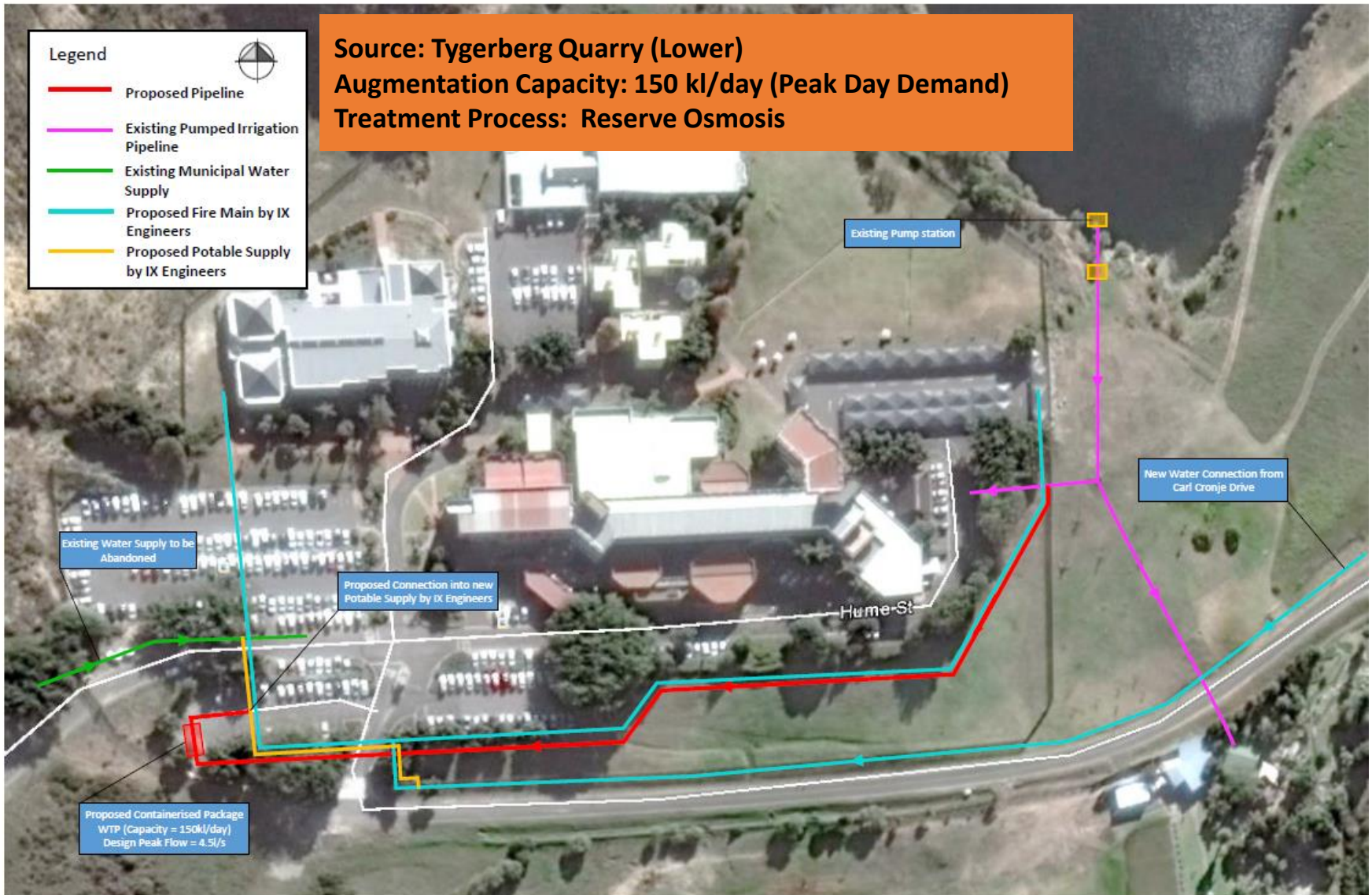


ANNEXURE B
FIGURE 7

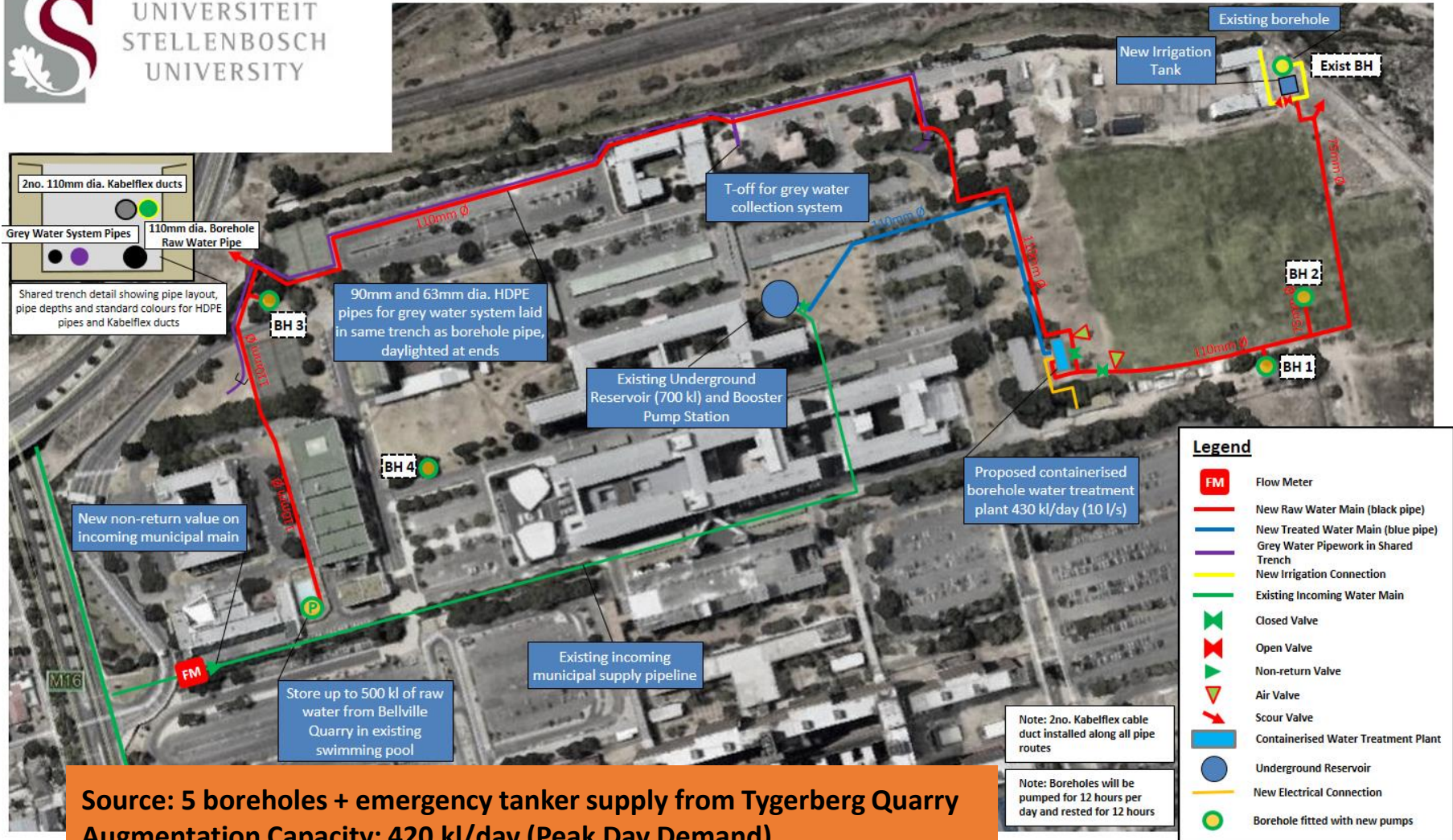
Stellenbosch Campus Borehole Installations (7 No)



Bellville Park Campus



Tygerberg Campus



Source: 5 boreholes + emergency tanker supply from Tygerberg Quarry
Augmentation Capacity: 420 kl/day (Peak Day Demand)
Treatment Process: Iron Removal, Filtration, Disinfection

Tygerberg & Bellville Campus Water Treatment Plants



- Target reduced consumption first – efficient fittings, public awareness
- To measure is to know – metering accurately reveals many anomalies
- Awareness Campaigns do work!
- Steering Committee must drive actions – co-ordination and prioritisation
- Regular STEERCOM meetings to drive progress and accountability
- Working with your Local Municipality
- Target to Low hanging Fruit – Do most economically beneficial interventions first

Bellville Campus Water Billing Analysis

WATER (Period 07/06/2017 to 07/07/2017 - 31 Days) (Actual reading)		
At 9 CARL CRONJE DRIVE, STELLENBOSCH UNIV / Erf 23974		
Meter no: 15781833 / Consumption 3760.000 kl / Daily average 121.290 kl		
* From 07/06/2017 : Consumption charge (schools/sport) (2910.968 kl X R 19.6500)		57200.52
* From 01/07/2017 : Consumption charge (schools/sport) (849.032 kl X R 21.6900)		18415.51
* Service charge (15781833) W100-140CT		167.37
		75783.40
SEWERAGE (Period 07/06/2017 to 07/07/2017 - 31 Days) (Actual reading)		
At 9 CARL CRONJE DRIVE, STELLENBOSCH UNIV / Erf 23974		
* From 07/06/2017 : Disposal charge (2765.419 kl X R 17.0900)		47261.02
* From 01/07/2017 : Disposal charge (806.581 kl X R 18.8600)		15212.11
		62473.13

Total potential cost saving = R846 000 per month

R 10 million per annum (excluding operational and electricity cost)



Item	2016-17 Pre-augmentation	2018 Post-augmentation	Comment
Stellenbosch Campus Potable Water Consumption	Average 65 000 kl/month	Average 40 000 kl/month	40% sustainable saving Saving R500 000 p/month
Stellenbosch Campus Irrigation	30 l/s pumped from Eersterivier	18 l/s (66%) now supplied from groundwater	60% saving in abstraction from Eersterivier
Coetzenburg Sport 3 x Pools & 2 x AstroTurf	Pools top-up and AstroTurf supplied from municipal potable supply	1.5 l/s from groundwater 2600 kl/month	Saving R52 000 p/month
Tygerberg Campus	400-500 kl/day from municipal potable supply	5 l/s from groundwater 6500 kl/month	Saving 50% of daily consumption Saving R130 000 p/month
Bellville Campus	130 -150 kl/day From municipal potable supply	130 kl/day from groundwater 4000 kl/month	Saving 100% of daily consumption Saving R80 000 p/month
Mariandahl Farm (Nov 2018)	140 kl/day From Municipal potable supply	140 kl/day from groundwater 4200 kl/month	Saving 100% of daily consumption Saving R84 000 p/month

Thank you!

