

# Drought Mitigation Measures 3 March 2016





SSW has a 30 year Concession Contract with the Ilembe District – commenced on 1 April 1999

Our <u>only source</u> of water since 1999 was from the <u>Hazelmere Dam</u>.

In late <u>September 2014</u> we were made aware of the critical level Dam and that the effects of <u>EL NINO</u> would result in the <u>Dam reducing</u> <u>even further</u>.

# Background



### In September 2014 we were the first WSP to declare water restrictions

#### WATER RESTRICTIONS BELOW-NORMAL RAINFALL CONDITIONS FOR GREATER PARTS OF SOUTH AFRICA

We have been notified by Umgeni Water that future weather forecasting systems are indicating strong probabilities for below-normal rainfall conditions for greater parts of South Africa. Umgeni Water is currently monitoring the water resources closely in response to possible impacts of El Niño. This monitoring includes dam storages, abstractions and demand patterns.

Below is information supplied by Umgeni Water showing the Hazelmere catchment, that is the source of our water supply.

11 Sep 2013 : 98% 04 Sep 2014 : 58% 10 Sep 2014 : 56%

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Water Restrictions have hence been implemented. The use of hosepipes, washing of driveways, roofs & vehicles as well as the use of irrigation systems is banned, until further notice.

#### Consumers who do not comply will be liable for a fine of R3000.

Restrictions will remain in place and you will be informed when these are lifted.

We urge consumers to practise water conservation and to visit our website to view the full list of water restrictions and to download necessary forms at www.sembcorp-sizawater.co.za. Customers can register their mobile numbers and email addresses for alerts from us. These can be sent to infosizawater@sembcorp.com or contact our Customer Services Department on 032 946 7200 during office hours, (please state your address).

### WATER SAVING TIPS:

- Start a compost pile. Using compost when you plant adds water-holding organic matter to the soil.
- Install covers on pools and check for leaks around your pool pumps.
- Zealously repair leaking toilet cisterns in your home to reduce water wastage.
- A dripping tap could waste as much as 90 litres of water a week, so please ensure that all dripping taps are repaired timeously.

siza water

concerving water for your future

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Office Hours: 032 946 7200 After Hours: 032 946 3188 Email: info-sizawater@sembcorp.com

www.sembcorp-sizawater.co.za

**Financial Analysis** 



### To hire Tankers to deliver lifeline water supply for our consumers

<b>COST OF TANKERING WATER PER MONTH</b>		
Value		Description
60 0	00	Population (approximately)
	40	Litres per person per day
2 400 0	00	Required Water to Truck in
		Assumed we found an alternate source within 70kms
		A truck would therefore do 4 to 5 loads a day at most
15 0	00	Litres - being truck capacity
75 0	00	Litres a truck would tanker per day
	32	No of Trucks Needed
R 7 000,	00	Cost per tuck per day
R 224 0	00	Cost per day for tankers
R 67200	00	Cost Per month (30 day avg month)

R6,7million with no revenue to offset the costs! This would make us unsustainable.

### Hence, we needed to explore alternatives.



# Alternatives a) Boreholes

- Risky in that the yield and quality are only known after incurring the drilling expense
- Getting the water into the network can be an expensive exercise
- Security concerns for remote locations
- Costly monitoring.
- Quality is not stable
- 22 boreholes drilled 8 commissioned 1 abandoned owing to quality deterioration
- Produces 370kl/d still insufficient for lifeline supply





- During droughts the river and stream yields also decline
- Rivers and streams are also polluted by upstream WWTW that are not meeting the regulated standards
- Land acquisitions may be needed for onsite treatment
- Getting the water to the water network may be expensive
- Not considered a viable and sustainable option during the drought





- Expensive upfront capital approximately R10m per megalitre
- High operating cost.
- Estimated cost of Water R13/kl
- Environmental Compliance
- Land acquisitions on the coast is expensive
- Not considered a cost effective solution at this stage, however we are exploring this for the long term



# Water Recycling



- Sembcorp's Changi NEWater Plant in Singapore produces 228 000 kilolitres of water per day
- This is <u>approximately 15% of Singapore's current Water Demand</u>
- Global Water Awards "Water Reuse Project of the Year", 2010



# **Recycled Water** Sembcorp Industries Global Expertise



- Sembcorp has advanced technologies to treat highly toxic Industrial waste water and convert same for reuse as well without the need for pretreatment.
- We are able to treat effluent with a chemical oxygen demand of up to 19,000 milligrams per litre and high salinity industrial wastewater with salinity of up to 50,000 milligrams per litre.



# Recycled Water – Frasers WWTW Pre Assessment & Testing



**Frasers WWTW is a Green Drop Accredited Plant** 



- Plant has received recognition from DWS Wilson Award of Excellence as well as special commendations in the Green Drop Audits
- Most of the incoming sewer is domestic in nature very little heavy metals
- In-house <u>testing</u> commenced in <u>October 2014</u>
- In December 2014 we availed water for filling of swimming pools & construction <u>BUT NOT for drinking</u> had a <u>demand</u> of approximately 500kl/day, <u>peaking at 900kl/day</u>
- By January 2014 we found the appropriate treatment method to <u>meets</u> <u>SANS 241:2014 Drinking Water Quality Standards</u>.
- The Sewer Plant has to be properly operated to enable recycling to succeed



LABORATORY TEST SUMMARY				
	Potable Water	<b>Recycled Water</b>	SANS 241;2011	
DETERIVIINANDS	Avg Values	Avg Values	Limits - potable water	
MICROBIOLOGICAL (HEALTH)				
% Compliance	100	100	95	
CHEMICAL HEALTH				
% Compliance	100	100	95	
PHYSICAL, ORGANOLEPTIC (Non-Health)				
% Compliance	98	97	95	
OPERATIONAL TESTS				
% Compliance	97	96	95	

### Test Results have been independently verified by Talbot Laboratories

# **Recycled Water – Frasers WWTW**

## Lab Results Summary



		Potable Water	Recycled Water	SANS 241;2011
DETERMINANTS	unit	Average values	average values	Limits - potable water
MICROBIOLOGICAL (HEALTH)				
Cytopathogenic Viruses	counts/10	0	0	0
Cryptosporidium/Giardia	counts/10L	0	0	0
E Coli	counts/100 ml	0	0	0
% Compliance	counts/ 100 mi	100	100	95
Chemical Health		100	100	
Ammonia		<15	<15	15
Arsenic		<1,5	<1,5	< 10
Bromodichloromethane	μς/Ι	30	30	< 100
Bromoform	μς/Ι	<10	< 10	< 100
Cadmium	μς/Ι	<10	<10	< 100
Copper	μg/1 mg/l	<10	0.01	< 100
Cupper	111g/1	<20	< 20	< 70
Chromium	μg/1	<20	< 20	<70
Eluorido	μg/1	< 200	550	<1500
Sulphata	μg/1 mg/l	< 200		< 500
Suphate	mg/i	< 20	41.5	< 500
Lead	μg/1	<0.2	0.14	<10
Iron	mg/l	< 0.3	0.14	<2
Ivianganese	mg/l	<0,1	0.03	0.5
	mg/l	< 0,1	0.07	<5
Nitrate	mg/I	< 1.0	0.43	<11
% Compliance		100	100	95
Physical ,Organoleptic				
(NON HEALTH)			07	05
% Compliance		98	97	95
OPERATIONAL TESTS				25
% Compliance		97	96	95

# **Recycled Water – Frasers WWTW Public Participation**



Prior to investing in a full recycled plant we needed our public to 1 accept the recycled water





Owing to the drought, the Hazelmere Dam level has been continuously reducing and the possibility of it running dr before any significant rainfall remains a possibility. The dam level is currently below 35%.

Semboorp Size Water realised the need for sustainable management of this scarce resource and to seek innovative solutions to the current crisis. In our effort to reduce the demand on the Hazelmere Dam we have introduced recycled or new water at our Frasers Waste Water Treatment blant, nitially the water was only deemed fit for the filling of pools, washing of cars and for use in the parden. We have concorrently been trialling treatment methods, c ascertain if the water could be converted to meet safe drinking water standards.

We are proud to report that since March the recycled water treatment process has achieved the goal of making the final effuent from the plant complaint with South African National Standards for Water Quality (SANS:2/1). This has also been verified by a reputable and accredited independent laboratory Talbot Laboratories (a division of Talbot & Talbot (Pty) Etd).

The recycled water has been consumed by our senior management, including our Managing Director (clease refer to North Coast Courter Article - antitled "Recycled Water is Safe to Drink" 27 March 2015 edition). The table below shows the comparative laboratory test results between the recycled water and the potable water supply. Below is the test results of the potable water quality and recycled water quality to the required standard.

LABORATORY TEST SUMMARY				
	Potable Water	Recycled Water	SANS 241:2011 Limits - potable	
DETERMINONTS	Avg Values	Avg Values		
MICEOBIOLOGICAL (HEALTH)			water	
% Compliance	100%	100%	95%	
CHEMICAL HEACH I				
% Compliance	100%	100%	95%	
PHYSICA , ORGANOLEPTIC (Non-Health)				
% Compliance	98%	9795	95%	
OPERATIONAL LESIS				
% Compliance	97%	96%	95%	

As can be seen from the above, the recycled water meets the regulated standards and there is almost no difference to the potable supply. As Semboorp Size Water is Blue Drop Accredited (Water Quality Compliance); a robust and stript testing regime for water quality was and is in place to chours that the water is safe to drink and conforming to the National Standards. Our sim is to augment the current supply from Hazelmere Dam with the recycled water so as to reduce the draw down our supply area has on the Dam.

Taking the above into consideration we ask that our consumers please participate in the survey regarding the usage of recycled water as a viable alternative to the normal potable supply, especially with regard to the current drought and the possibility of not having any potable supply.

Please visit youw sembcorp-sizewatericoliza or visit our offices to take the survey on or before 10 June 2015. (NRI You have to receive your potable waterisupply from Semboorp Siza Water to take this survey and your account number is needed for verification purposes!)

Please email info sizewater@sembeerp.com for any further information you may need regarding recycled water.

Should you not have access to the internet kindly complete the section below and drop off same at either our Ballito or Shakaskraal office.

RECYCLED WATER SURVEY - CLOSING 10 JUNE 2015						
Semboorp Siza Water Account No *	Email Address **	Viobile Number **	LAM in favour of Using Recycled Water	Fam NOT in favour of Using Recycled Wate		
Compulsory lease mark appropriate sa	** optional lection with an X					
Sembcorp		Office Hours : 032 946 72 After Hours : 032 946 31 Email: Info-sizawater@sembcorp.cc				
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# Recycled Water – Frasers WWTW Plant Commissioning



- **97%** of homes that participated in the survey voted in **FAVOURABLY**
- Commenced tender process in July 2015, much of the work was undertaken internally
- By November 2015 we began testing the facility & in December 2015 we began injecting the recycled water into our network









- By mid 2016 we aim to expand the plant to Produce 3 Ml/d and also finalise construction of associated distribution networks (including Ultrafiltration & Reverse Osmosis)
- In 2017 we will expand the plant to be at least 5 Mℓ/d
- In 2018 we will address implementing a similar system at our Shakaskraal and Sheffield WWTW
- Spreading the construction is owing to cash flow constraints and all of our Drought Mitigation has been financed by ourselves.
- To date we have received no reimbursement from DWS for any of our interventions



**Vital Partners. Essential Solutions.**