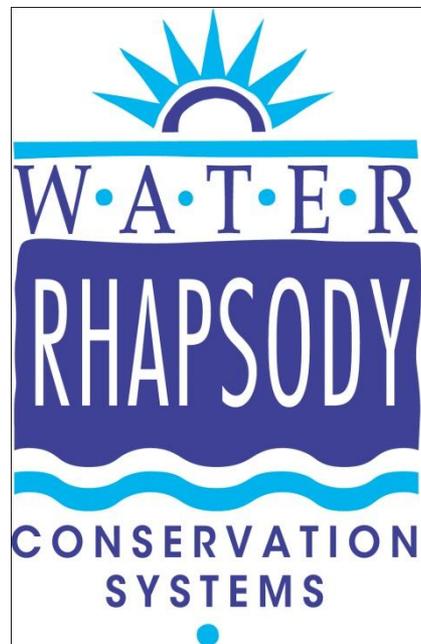


Water Rhapsody

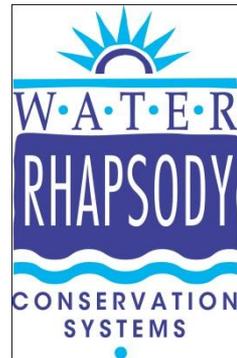
Conservation systems

Jeremy Westgarth-Taylor
founder and proprietor of Water Rhapsody



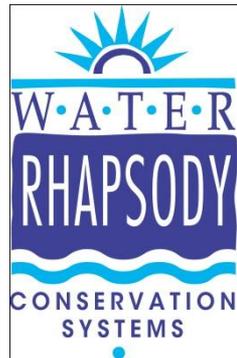
War over water – name a country that has been to an over the border war over water in the last 20 years?

1. Egypt
2. Central African Republic
3. South Africa



Who was the President that sent the troops into Lesotho.

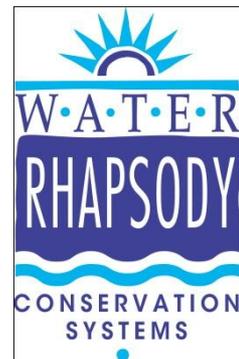
1. Nelson Mandela
2. Thabo Mbeki
3. F.W. de Klerk
4. Mangosuthu Buthelezi



South Africa: Water related problems

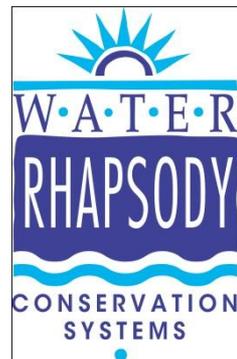
- Rivers Dammed to Extinction
- Corruption and nepotism rife in municipalities
- Road transport of water – pipelines sabotaged!
- Mine dumps: radio active outfall
- AMD water running into rivers and daily raw sewerage spills from ALL sewerage treatment works: see Green Drop
- Two thirds of river water polluted with:
- Water borne diseases: Fecal coli
- Municipalities cleaning upstream municipalities sewerage

Is there any way to get good quality water?



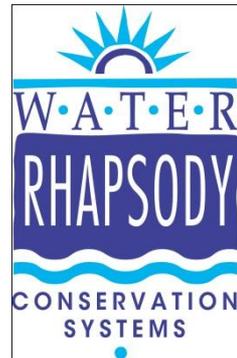
Current Environmental Disasters

- 98% of all SA river water extracted for human use.
- Over extraction of water has lead to estuarine destruction: mouths no longer open. This has led to a loss of fish in the sea.
- Groundwater polluted with nitrates.
- Polluted rivers: downstream to clean up water intended for potable purposes.
- Why bottle water if tap water is ok?



Human Disasters

- Why have people died from drinking municipal water?
- Why have so many municipalities simply given up trying to provide drinking quality water, and have resorted to a supply from Rand Water?
- How long can Rand Water do this?

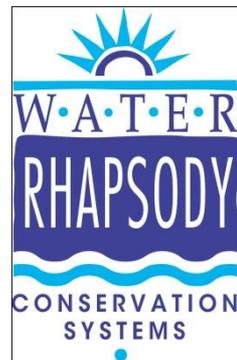


End of road for augmentation

- We have in South Africa no sustainable augmentation scheme to provide more water.
- Proposed are: desalination
- Extraction of fossil water.
- Further IBT's in Lesotho?

All unsustainable and expensive

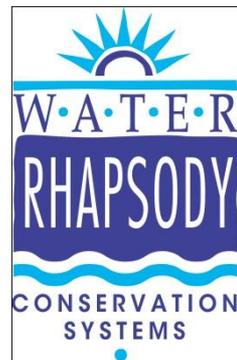
No further large scale augmentation left.



Cost of Desalination

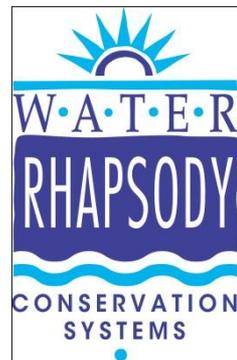
Why do municipalities abandon their prized desalination plants? Is it because:

1. The best practice desalination plants cost R12.00 per kilolitre to desalinate sea water?
2. There is not enough energy for desalination?
3. The plants cost huge sums in capital?
4. Municipalities claim that they lose money for the supply of water at present and desalination makes their losses worse?



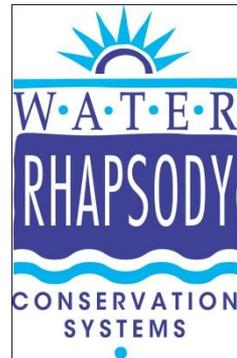
Additional problems

- Water needed to be pumped to high lying areas.
- Falling pressure in pipes from increased take off.
- Rustenburg, Brits to the west and Evander Nigel to the east – What is next – Christiana?



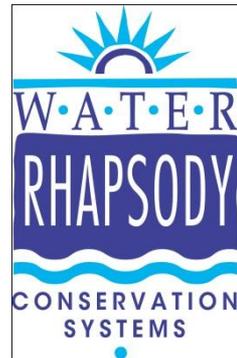
Black and Grey water

- All grey and black water travel down the same pipeline to the sewerage treatment works.
- Sewerage spills: compare a little grey water overspray onto roads with
- the volume of effluent from sewerage treatment works as soon as process cannot meet inflow into a plant.



Solution for Water Security

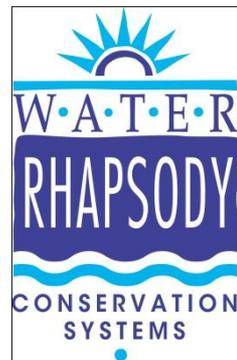
- A win-win solution for all that Municipalities should run with:
- Bank the water: Create a rainy season off-the-grid system.
- Harvest rain water to use in the ***Whole House***
- Irrigate with grey water ***Only***
- ***Return*** pool backwash to the pool
- Minimize toilet flushing water
- Here is how.



Reduce demand

First:

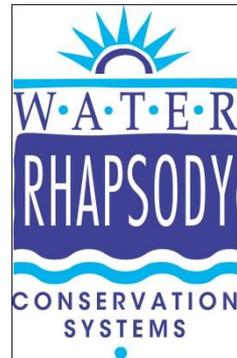
- Garden Rhapsody: Grey water Re-using System
- Water Rhapsody Multi Flush: Minimizes water required for flushing:
- Water Rhapsody Poolside Tank: Re-use of swimming pool backwash water returning pool backwash water back to the pool.
- Water Rhapsody Second Movement: Re-use of grey water for toilet flushing



Two systems to augment supply:

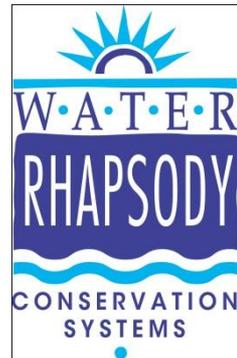
You take control

- Water Rhapsody Grand Opus:
- Harvests rainwater for general household use.
- Sounds silly, rainwater is pure, but in order to drink this water the system incorporates filtering and sterilizing.



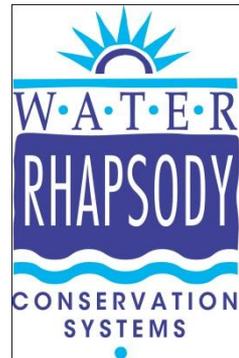
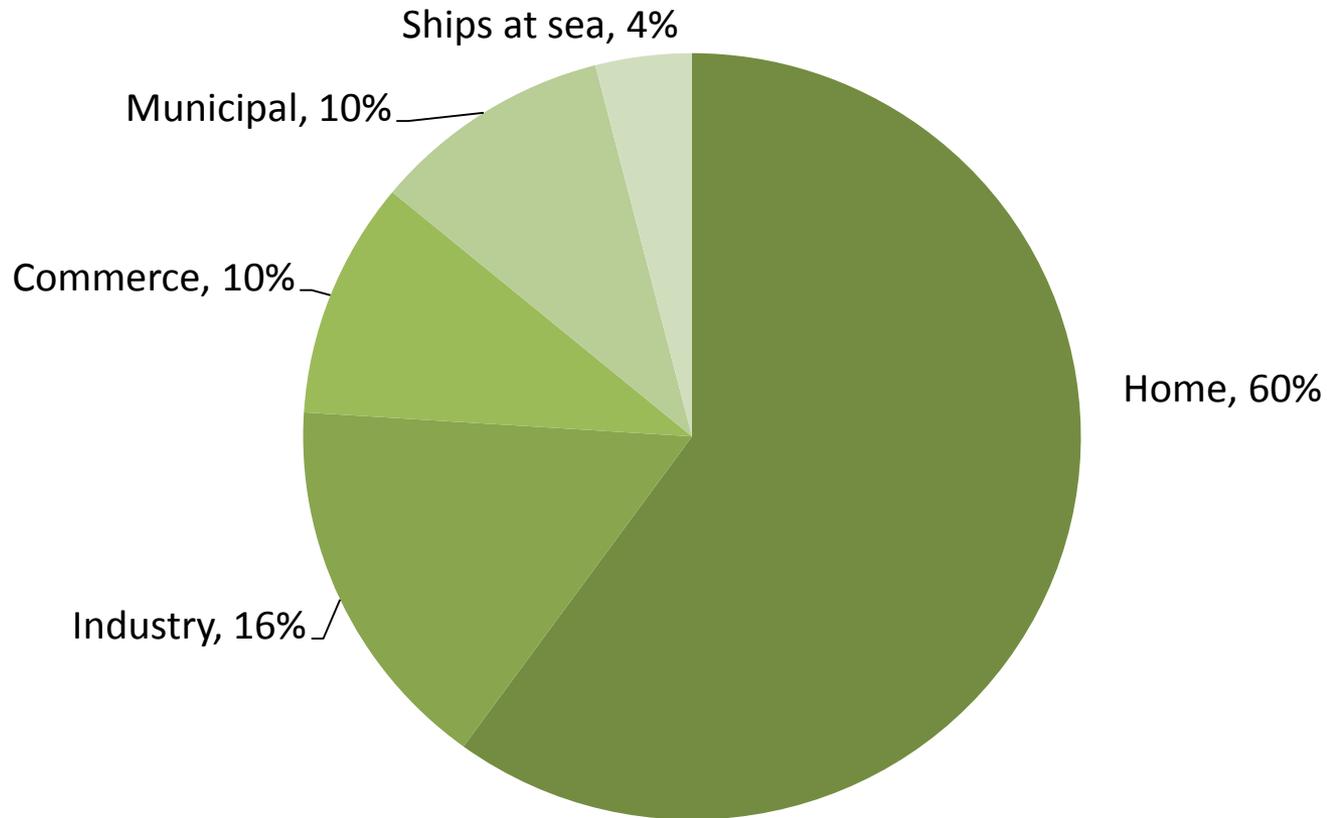
Instant results! The win win

- Water demand reduced by **50%** at worst
- Sewerage effluent reduced by **90%** at worst:
- Demand for water reduced to zero for the rainy season.
- One has a constant and reliable source of plentiful safe water for domestic, commercial and industrial use.
- Here is how it looks in pie form.



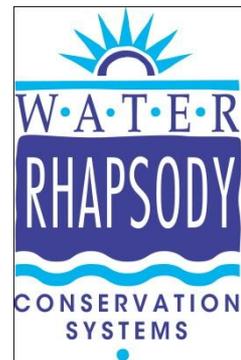
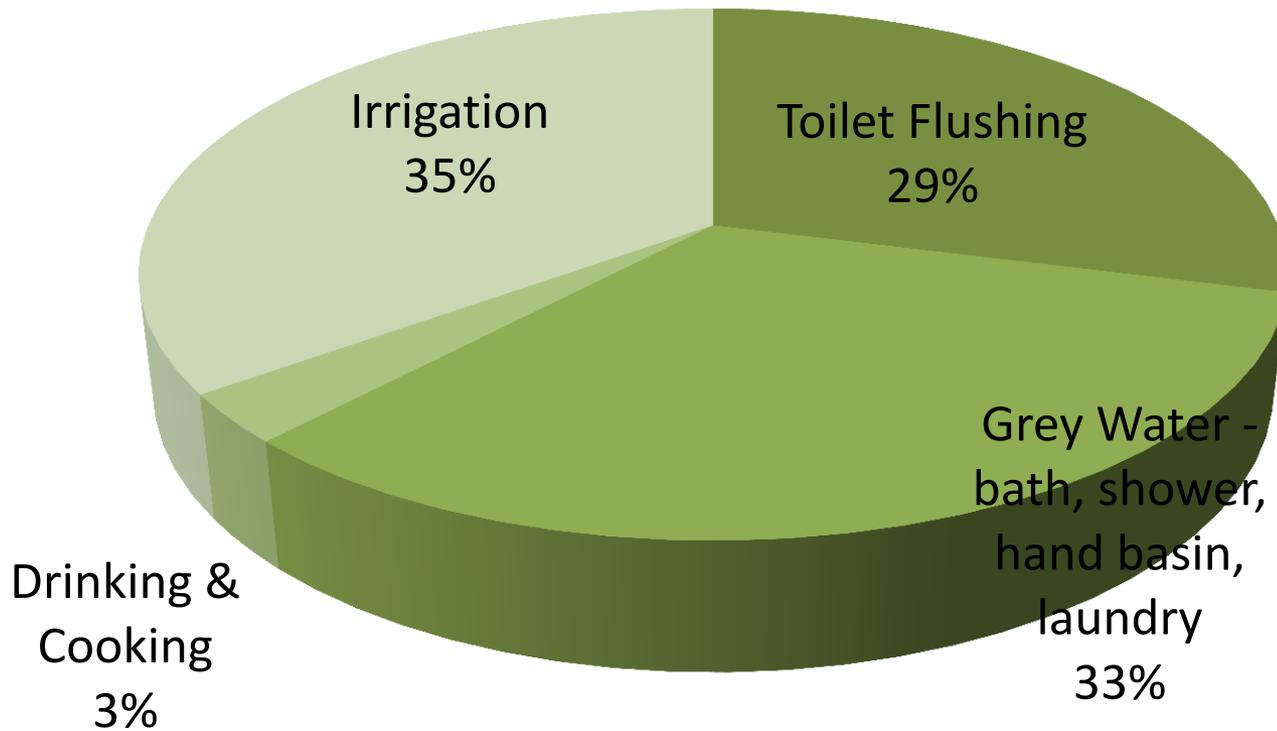
Where water goes in Cape Town City

(Unaccounted /non revenue water excluded)



Where water goes in the Home

Where water goes in the home - courtesy CTCC



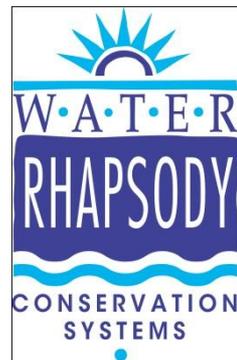
The ultimate spin-off

Elimination of unaccounted for water:

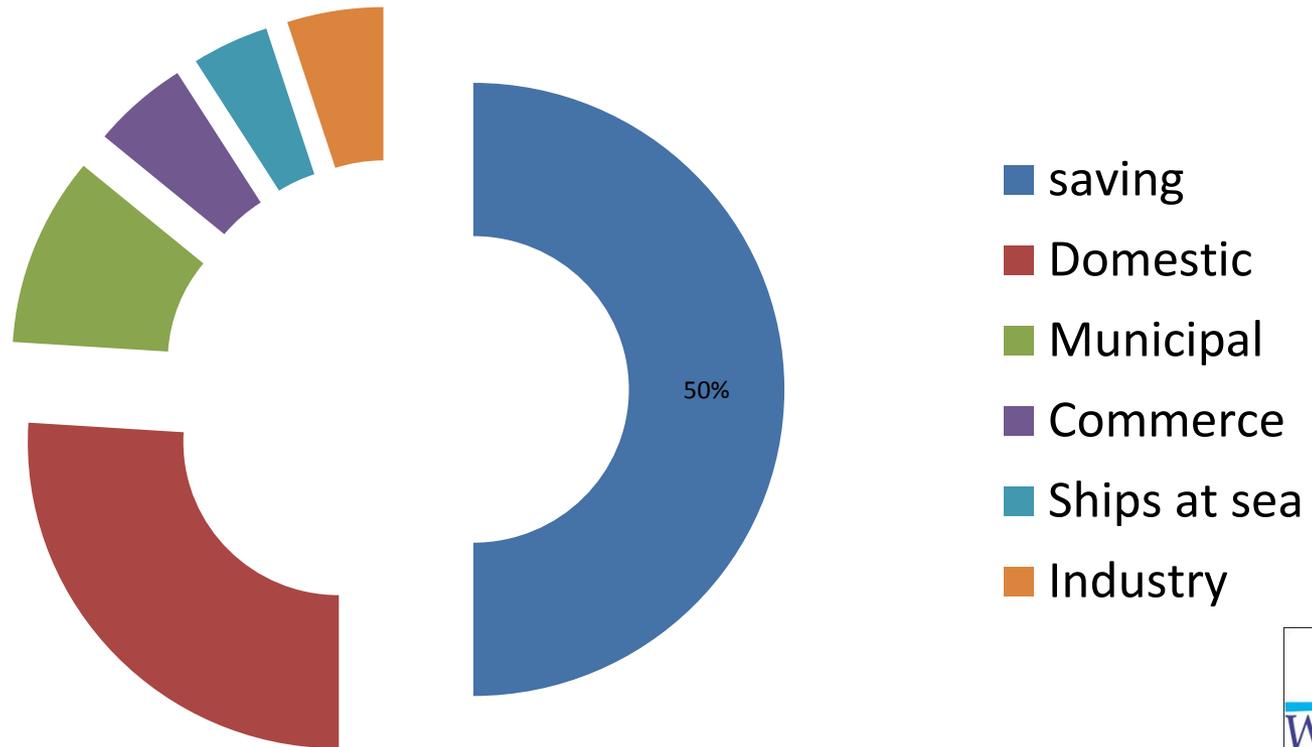
Gauteng loses 40% to non revenue water

Allow reduction of pressure:

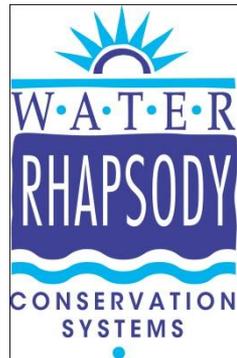
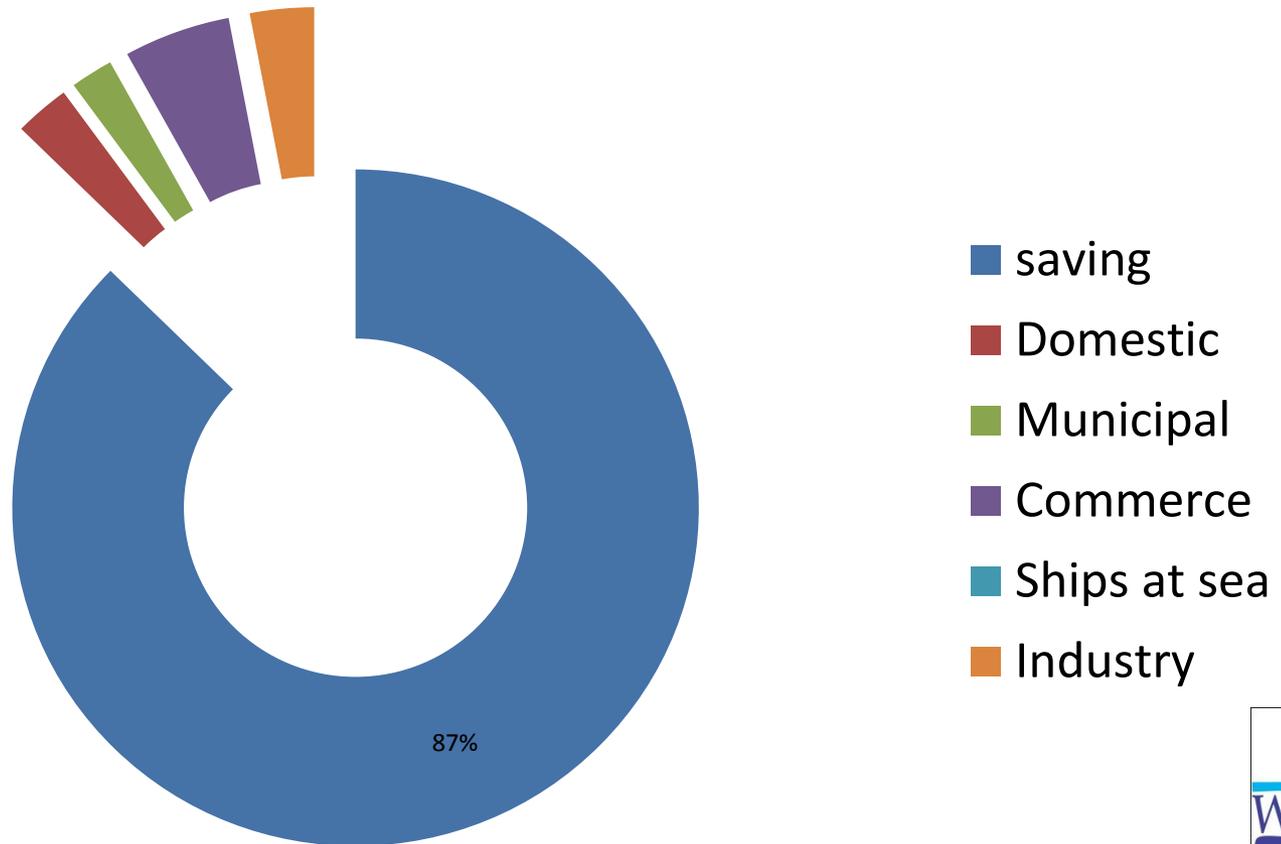
- On an exponential scale of 1.2 – reduction of the water pressure in supply pipelines one reduces leaks.
- Pressure bursts eliminated
- Obvious Benefits to municipality saving on repairs.
- Municipality needs do nothing else:
- Everyone would be forced to pressurize their own water supply and spin off:
- Natural spin off to enforce rain harvesting.



Hypothetical 50% water saving in Cape Town

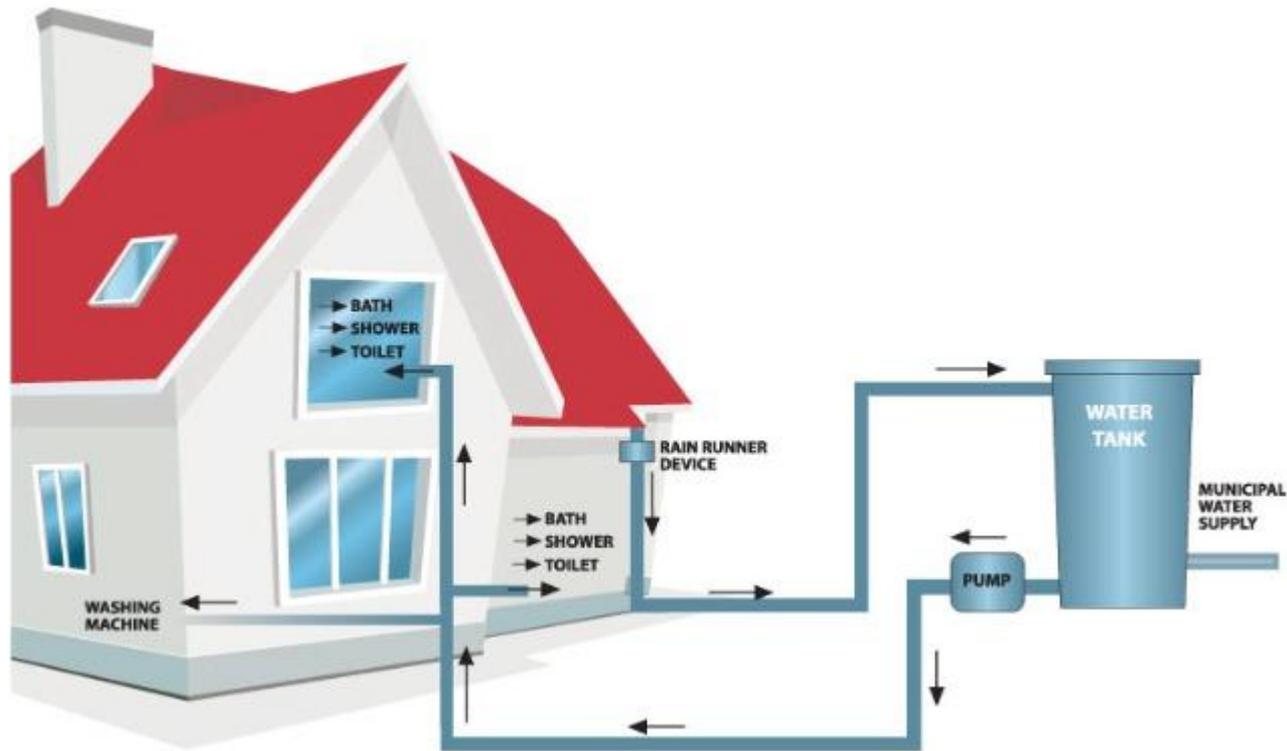


Sewerage saving



Water Rhapsody Grand Opus

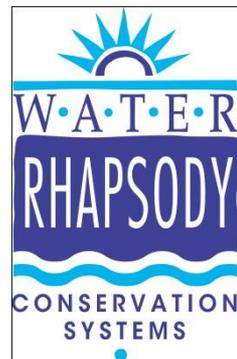
- Stored rainwater pumped to whole household

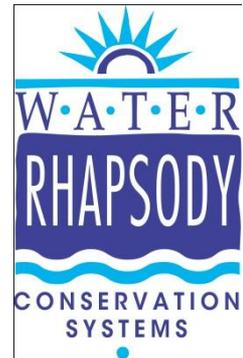


More spin off benefits not considered as a spin off from WDM

Not normally associated with WDM are the following **cause and effect**:

- **Remove the need for canalization.**
- **Introduce fish in the sea??** Kob steenbras leervis grunter stumpnose
- Save falling levels of aquifers thus:
- Extending the life of boreholes.
- Rising sewerage mains and cost of treatment works

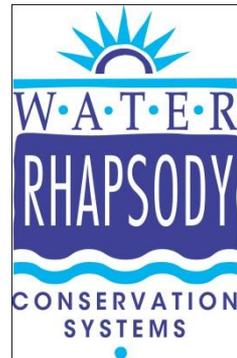




The Problem: Phosphates

Go to the source of the problem!

- This is an essential fertilizer.
- This is the bottom of the Blue green Algae blooms in so many dams.
- Most PO₄ comes from washing powders.
- By re-using grey water one effectively removes 50% of the phosphates reaching water bodies such as Hartebeespoort.
- All Water Rhapsody clients are advised not to use PO₄ rich washing powders.

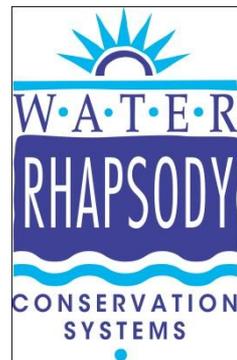


Final slide: Is Water Sustainability an allusion or reality?

- Supply management is not sustainable:
- Demand management of water is sustainable.
- Water Rhapsody have provided the means to use less water called for by Kader Asmal in the Western Cape Systems Analysis:

Ways should be found to augmenting supply

Ways must be found to use less water.



Reference by Kader Asmal



Professor Kader Asmal

Former Minister of Water Affairs and Forestry

11 February 2010

To Whom it may Concern:

Garden Rhapsody Grey Water Re-using System

It is very rare that a product, in this case, a new product gives so much satisfaction. We were one of the first to have this system installed. My officials at the Department of Water Affairs in Pretoria – I was the Minister at that time – warned me against this system as it would destroy my garden. As a matter of fact, the grass and the shrubs have flourished. During the drought about four years ago, when there were severe restrictions on garden water use, mine flourished because of the grey water. The service is excellent, even putting up with a smiling face with the idiocies of the owner, in this case me, who could not unravel the pipes. I have no hesitation in commending this system, its service and delivery, not only as a good example of water conservation and for beautifying the garden, but also as an excellent example of entrepreneurship.

Yours sincerely

Professor Kader Asmal

Former Minister of Water Affairs and Forestry

