

2023 10th Southern African Water Loss Summit
 Supported by:
 The International Water Association
 Water Loss Specialist Group

15 & 16 August 2023
 DBSA, Midrand

USING NIGHT FLOW RATIO TO ASSESS LEAKAGE AND DANGERS OF INTERMITTENT SUPPLY

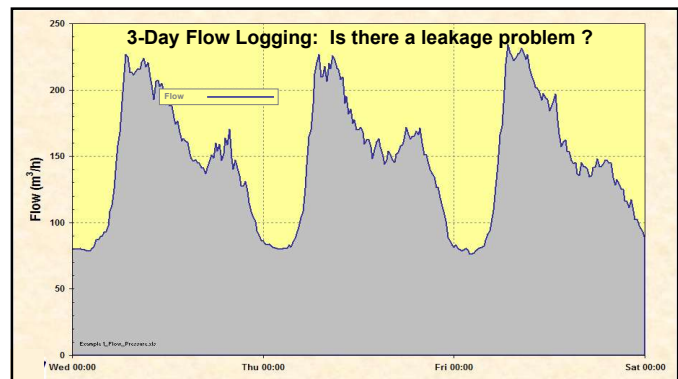
Presented by
 Ronnie McKenzie
 Previous Chairman
 IWA Water Loss
 Specialist Group

Participating and supporting organisations:

WRP 25 RAND WATER DBSA WATER RESEARCH COMMISSION



1



2

What is Leakage ?

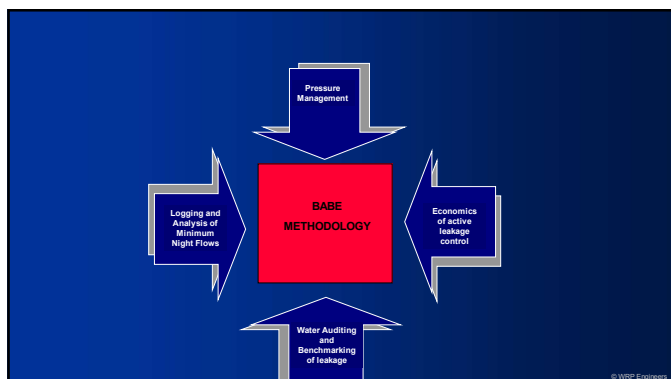
- 🔥 Large Leaks (bursts)
- 🔥 Small Leaks (background leakage)
- 🔥 Internal Leaks (household)

3

BABE: Definitions

- **BABE**
Burst and Background Leakage Estimate
- **Bursts**
Large leaks normally greater than 0.25 cubic meters per hour that are considered worthwhile to locate and repair
- **Background leakage**
The sum of all small leaks less than 0.25 cubic meters per hour that are not considered worthwhile to locate

4



5

BABE MODELS From WRC in South Africa

Sanflow

Benchleak

Presmac

Econoleak

Press any key to continue
 Version 2.0.2 - March 2018

© WRP Engineers

6



Background leakage

7



Connection Burst

8



Burst Leakage

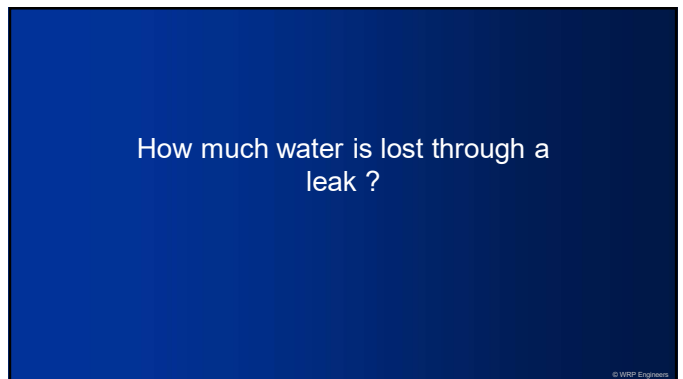
9



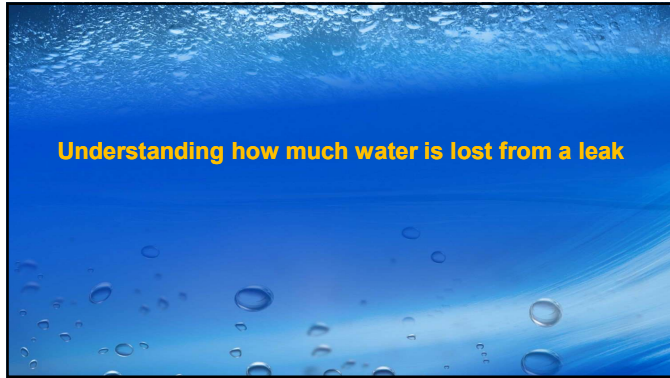
10



11



12



13



14



15



16



17



18



19



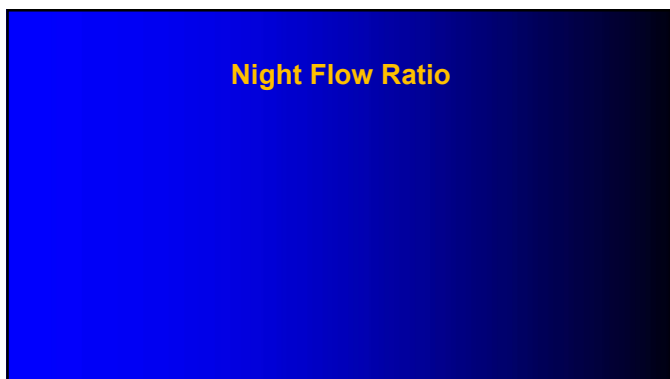
20



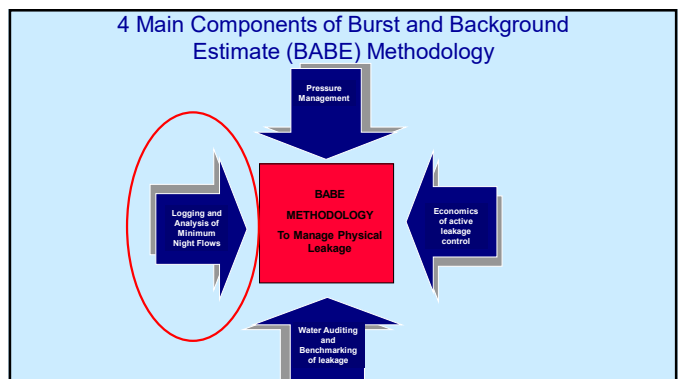
21



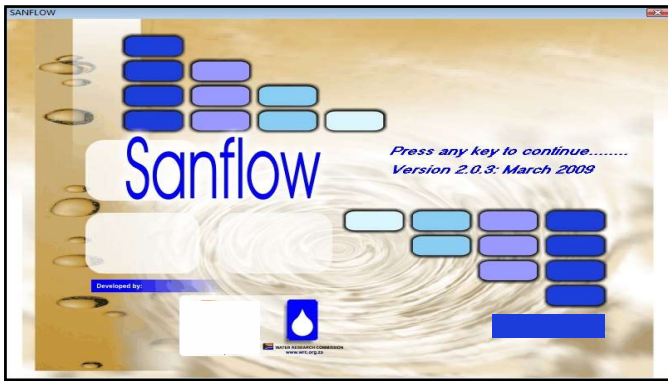
22



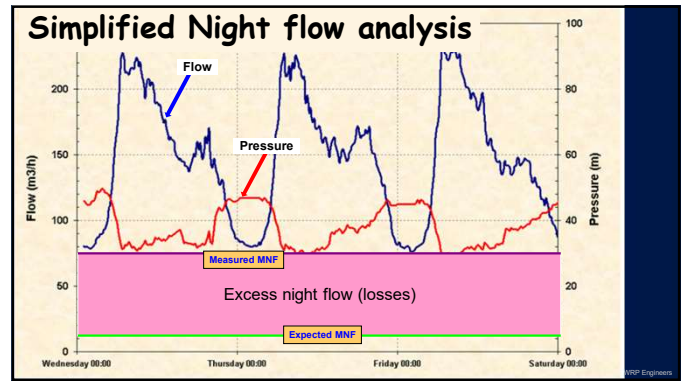
23



24



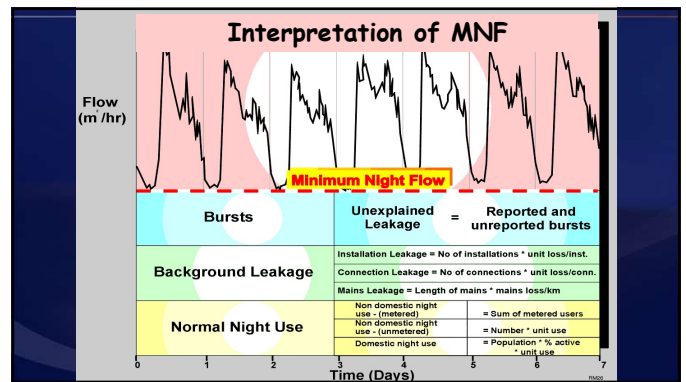
25



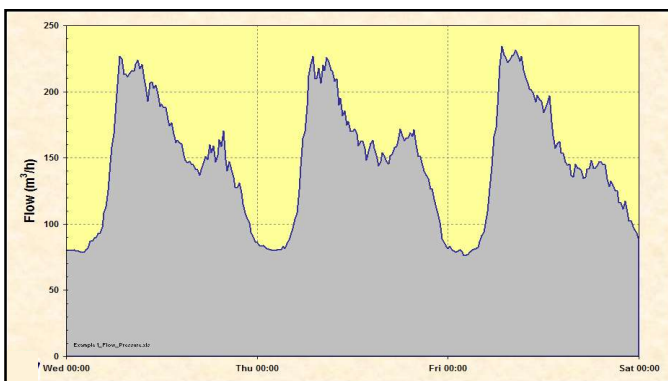
26



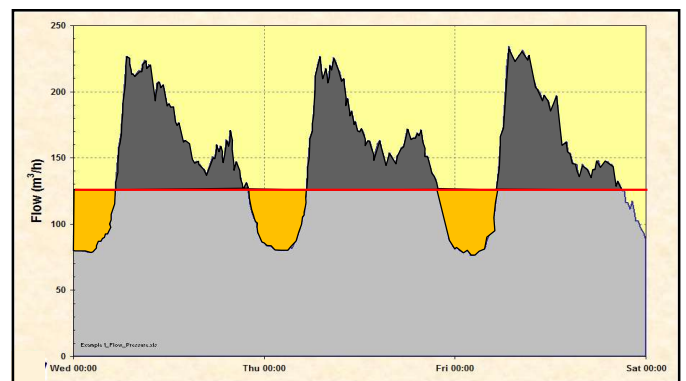
27



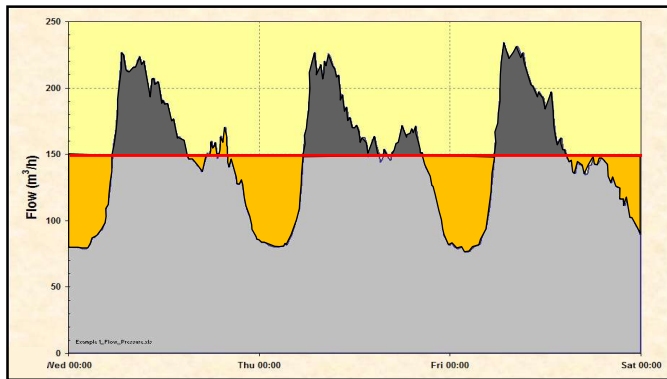
28



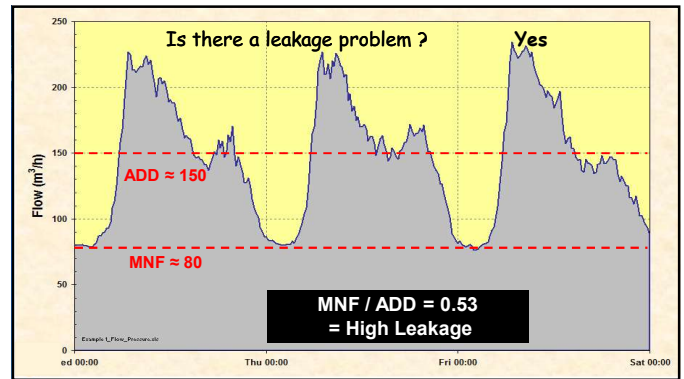
29



30



31



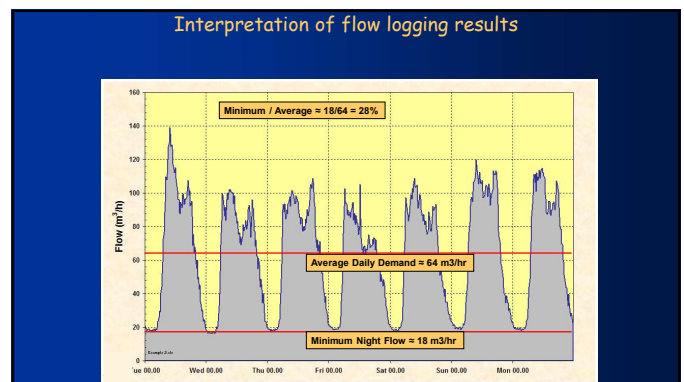
32

Recommendations

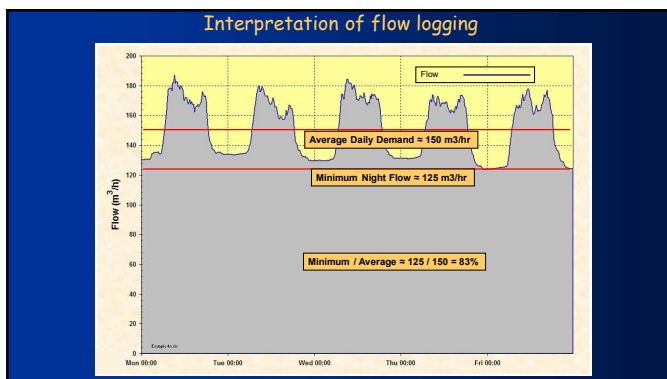
- Log flow into discrete areas and large consumers
- Use SANFLOW analysis or NFR to analyse nightflows
- Use results to prioritise target areas
- Continuous logging on selected areas/consumers is key to driving down leakage

© WSP Engineers

33



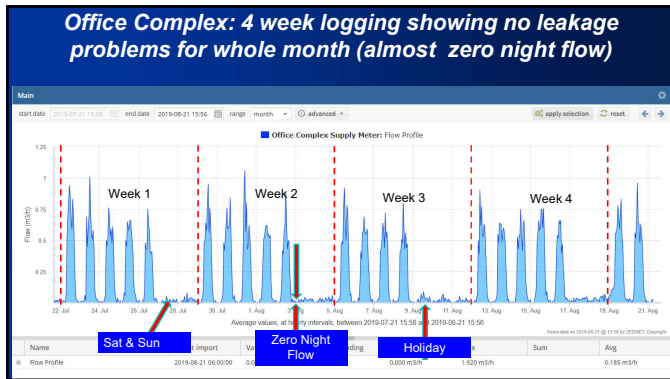
34



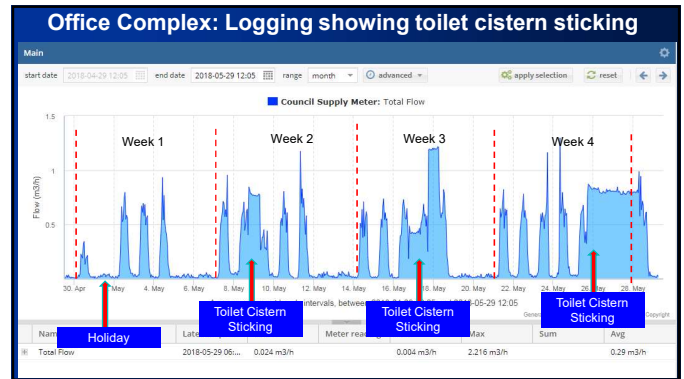
35



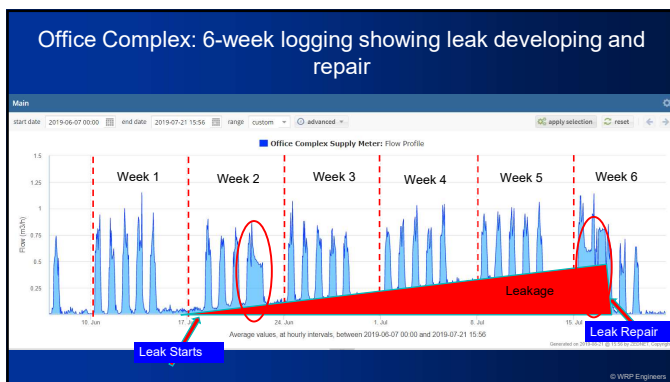
36



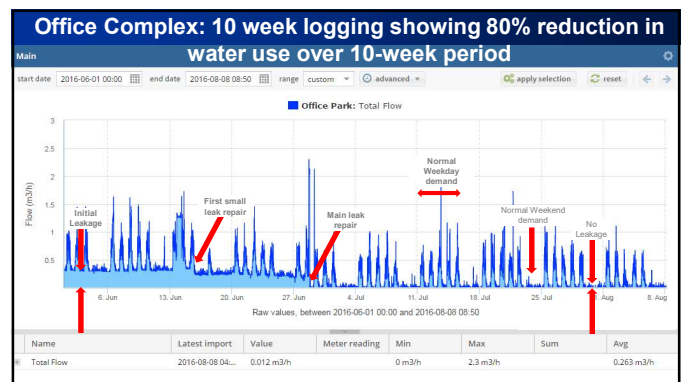
37



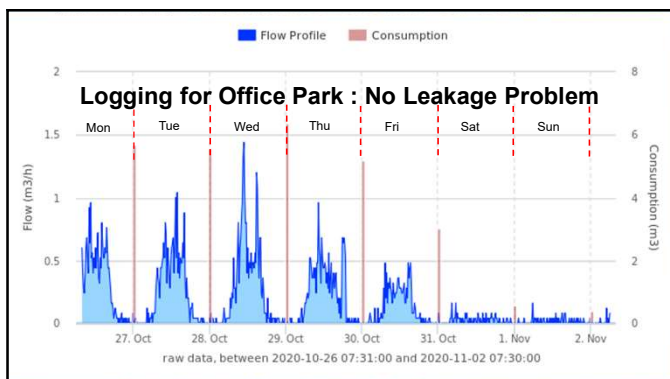
38



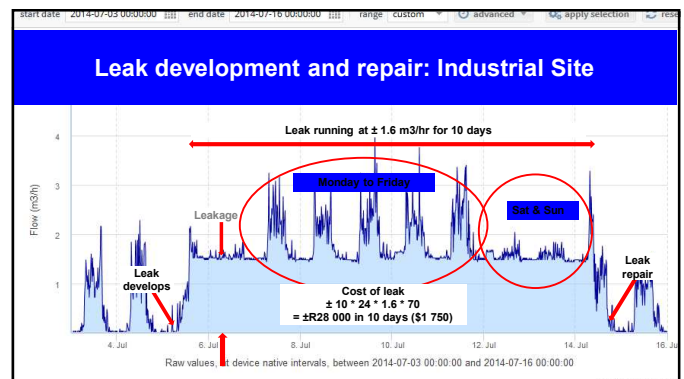
39



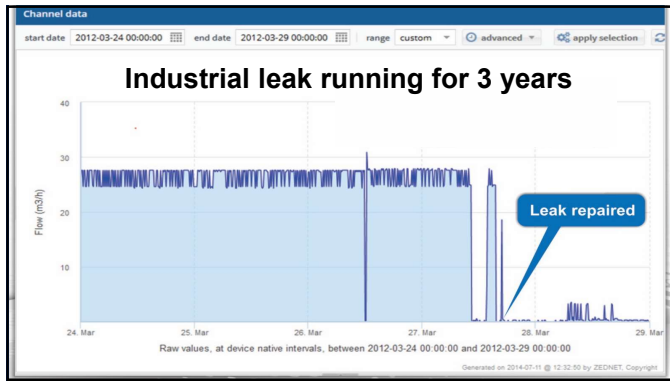
40



41



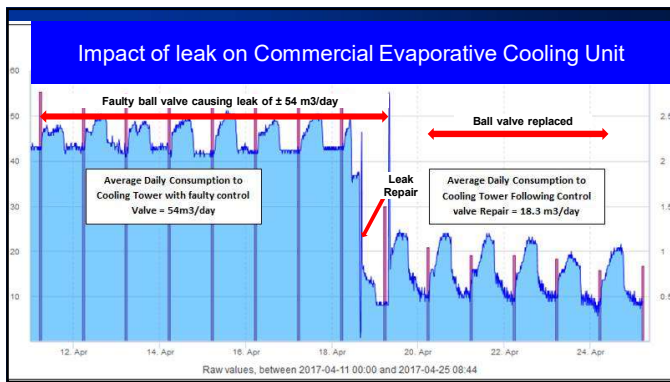
42



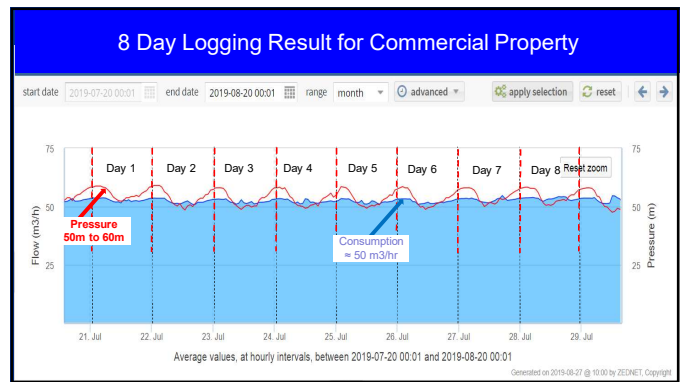
43



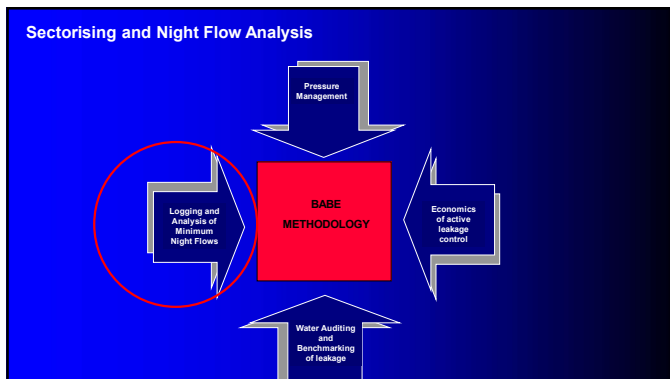
44



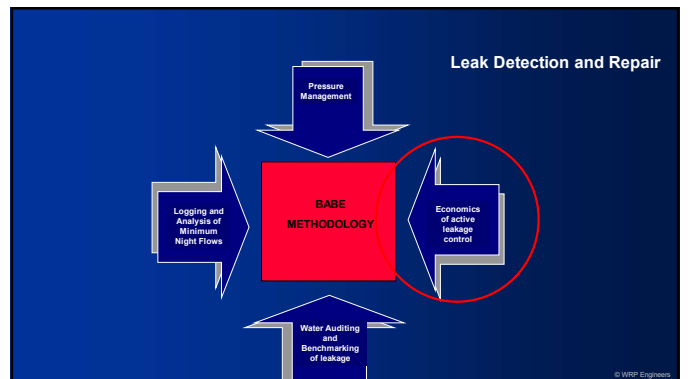
45



46



47



48

What about Leakage ? New Technology – High Tech

49

Leak Location by Satellite (300% increase in satellites by 2024)



50

What about Leakage ? New Technology – Low Tech

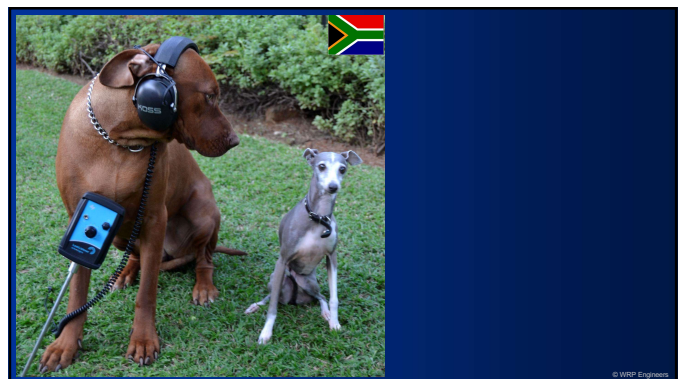
51



52



53



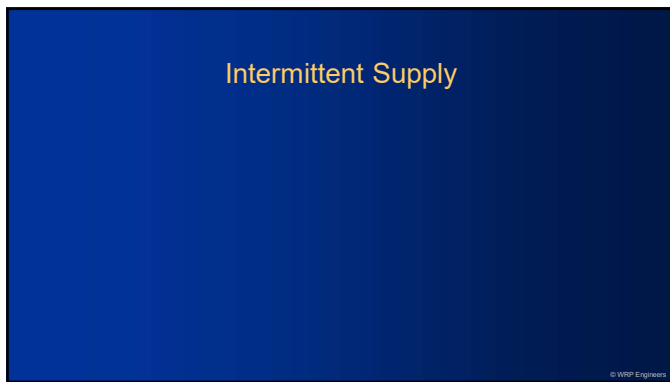
54



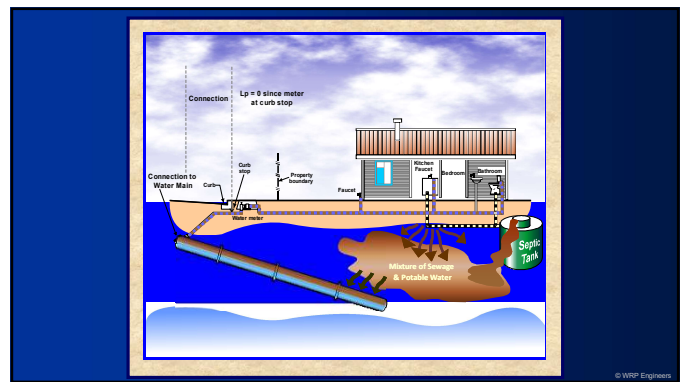
55



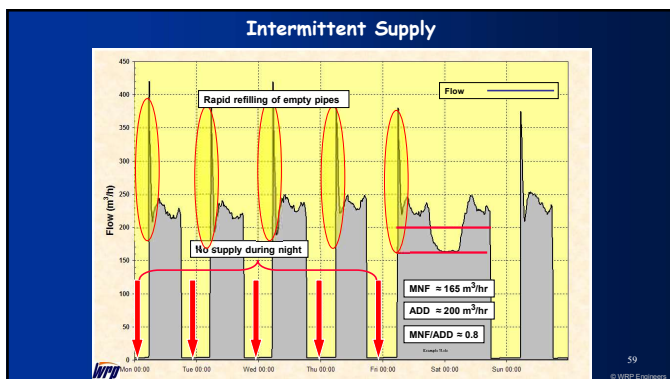
56



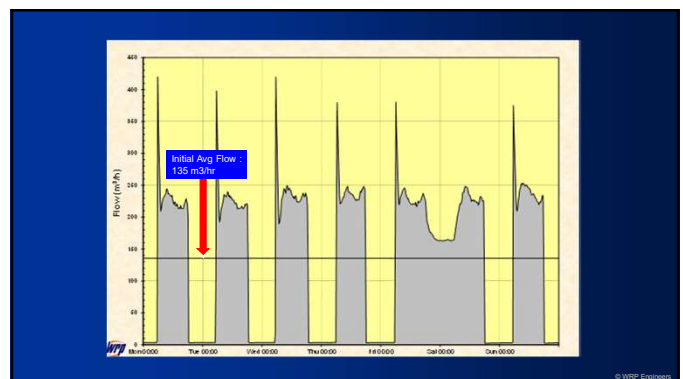
57



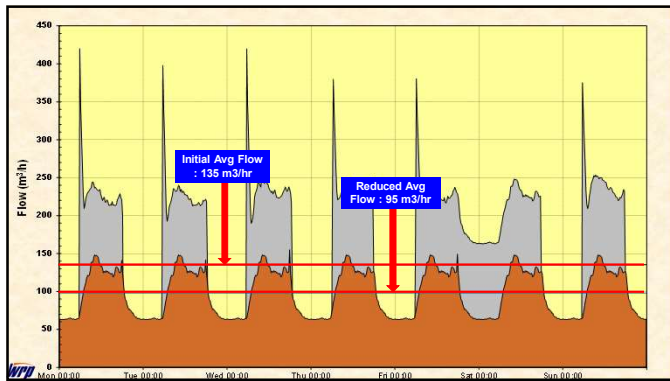
58



59



60



61

Comments from Bambos Charalambous (IWA: Bangalore 2016)

- Intermittent supply is not an appropriate response to drought or water shortage
- It takes 1 hour to switch to intermittent supply but 2 years to return to 24/7 (at great cost)

62

Recommendations

- Try everything else before introducing intermittent supply
- Intermittent supply is the measure of last resort
- Rather reduce water pressure but try to maintain 24/7
- Take action early on in a drought
- Take action now to reduce wastage

63

Thank You

mckenzie@global.co.za

ronniem@wrp.co.za

There's no life without water !

64