



Introduction

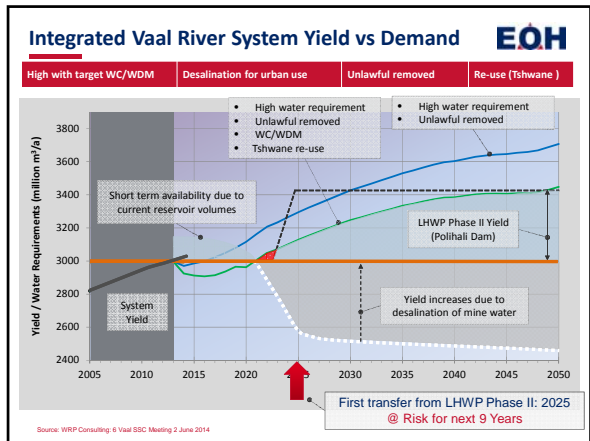
- Status of Current Drought
- Integrated Vaal River System
- El Niño (La Niña)
- Current Drought Restrictions
- Current Drought Relief Measures (Municipalities)
- Drought Mitigation Measures (DWS)
- Additional Drought Resilience Considerations for Local Government
- NRW Target Challenges
- Metro Bulk Demand Trends

Status of Current Drought

- South Africa: 8 of 9 Provinces Declared Disaster Areas (except Gauteng)
- 2015 Lowest Rainfall on record
- Lesotho, Malawi, Namibia, Swaziland and Zimbabwe : declared national emergencies,
- SADC seeking \$2.7bn to help 23 million people

A view taken on November 8, 2015 shows the dried up Mfolozi River in Lesotho, 159 km North of Durban in KwaZulu-Natal, as a severe drought affects South Africa. (AFP)

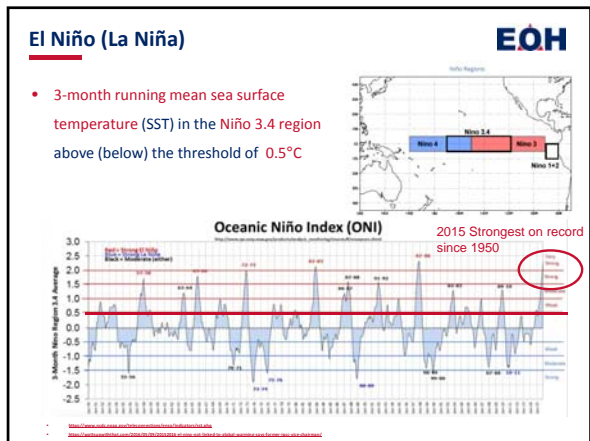
Source: WRP Consulting © Vaal SSC Meeting 2 June 2014

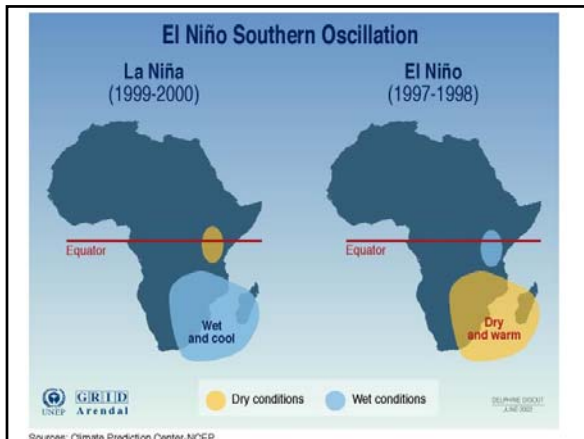


IVRS Strategic Interventions: 2014 Target

- Eradication of unlawful water use by 2015.
- Implementation of WC/WDM (Project 15%) – achieve target savings by 2017.
- Implement Phase 2 of LHWP by 2023.
- Mine water effluent treatment and use by 2018.
- Tshwane Water Augmentation Project (Re-use).
- Plan yield replacement scheme in Orange.
- Manage uncertainties: Vaal, Crocodile and Olifants.
- Implementation of Integrated Water Quality Management Plan.

Source: WRP Consulting © Vaal SSC Meeting 2 June 2014





El Niño (La Niña): Southern Africa

EOH

- ENSO Explains only 30 % of Rainfall Variability
- Does not always cause droughts across all of South Africa
- It's Predictable – up to 9 months

- **It's going to happen again**
- **Southern Africa will be effected**
- **We have to be prepared.**

<http://www.environment.gov.za/energyandclimate/qa/2009/09-how-does-el-nino-affect-south-africa>

Current Drought Restrictions

EOH

- Integrated Vaal River System: **15% Saving Needed**
- Umgeni Water: **15 % Saving Needed** (as of 15 Dec 2015)
 - EThekweni: Intermittent Supply **7 hours every night** (some areas)
- Cape Town: **Level 2 (20 % Saving)** Water Restrictions since 1 Jan 2016 (**10% tariff increase**)

<http://www.environment.gov.za/energyandclimate/qa/2015/11-11-2015>

<http://www.environment.gov.za/energyandclimate/qa/2016/01-10-2016>

Sources: WSP Consulting

Prepared for What?

EOH

- **More Droughts!**
- **Urbanisation!** – 80 % population in Urban Centres by 2035!
- For Intermittent Supply – **To be avoided at all cost!**
- **Limited CAPEX & Opex** (to maintain existing and develop new infrastructure)
- **Competing need** for water across Sectors

Figure 3: Total water withdrawals in 2014 and 2035 in the Current Path scenario

<http://www.environment.gov.za/energyandclimate/qa/2014/08-14-2014>

Sources: ESI version 7.13. Area of pie charts scaled to cover all water withdrawals

To Be more Drought Resilient

EOH

- Invest in BOTH **Water Use Efficiency (WSUD)** AND **Reduction of NRW** and address the **Unlawful Use** across all sectors
- YES, develop additional **W. Resources**, and **Preserve** those we have, but also:
 - Be prepared to avoid (or minimize) impact of intermittent supply
 - Quantify **Operational** Constraints Bulk Services Provider's + WSA's – **avoid "blanket" approach**
 - **Design** systems to be resilient against current challenges- not **Retrofit** (BM, PRV, AV, max Pres)
 - **Increase water tariffs** or else Revenue will drop. Address **"unlimited" Free Basic Water** and get rid of **Flat Rate Charge (Deemed)** – link to SIV?

<http://www.environment.gov.za/energyandclimate/qa/2015/11-11-2015>

Current Drought Relief Measures

EOH

- Water Restrictions + Public Awareness Campaigns
- Intermittent Supply
- Restrictor Washers (ex. Msunduzi, EThekweni)
- Tariff Increases (ex. CoCT)
- Pressure Management
- Emergency Measures:
 - Tankers
 - Bore Holes
 - Water Sachet Machines
 - Rain Water Tanks
 - Air Valves on Hydrants

<http://www.environment.gov.za/energyandclimate/qa/2015/11-11-2015>

<http://www.environment.gov.za/energyandclimate/qa/2016/01-10-2016>

DWS: Drought Mitigation Measures EOH

- Water conservation and water demand management (**War on Leaks**)
- **Surface water resource management** (e.g. Optimised operation of the IVRS, Establishing **operating rules for dams** to deal with droughts (and attenuate floods); improvement of the **early warning systems**;
- Managing and use of **groundwater** resources (drilling and equipping additional boreholes), storing excess overland running water underground
- **Re-use and desalination** of water (Mossel Bay, Sedgefield, Bitterfontein, NMB)
- Eradication of invading **alien plants**/catchment care (**WFW**)
- Eradication of **illegal water use** (Enforcement in the Vaal River System)
- **Development of surface water** resources (Hazelmere and Clainwilliam, Tzaneen)
- **Transfer Schemes** (LHWP Ph2, emergency transfer Tugela to Goedetrouw, Othangathi River transfer to Hazelmere)
- **Rainwater** harvesting (provision of tanks in selected areas)
- Engagement with **neighbouring countries**: shared water courses.)

Need to have Operating Rules in Place EOH

- Water Resources Reconciliation Study for own Resources
- Operating rules - restrictions and how to utilise own resources

Direct Supply Areas EOH

- Either Eliminate / Provide own storage (Permanent/Temporary)
- OR agree with bulk provider not to close such connections during intermittent supply

Restrictor Washers for Selected Areas EOH

- Need to determine low pressure areas when installing washers

Pressure Management EOH

- An hydraulic model is crucial for optimizing pressure management – helps identify bottlenecks in the system – to be upgraded

Pressure Management: Critical Point Controller EOH

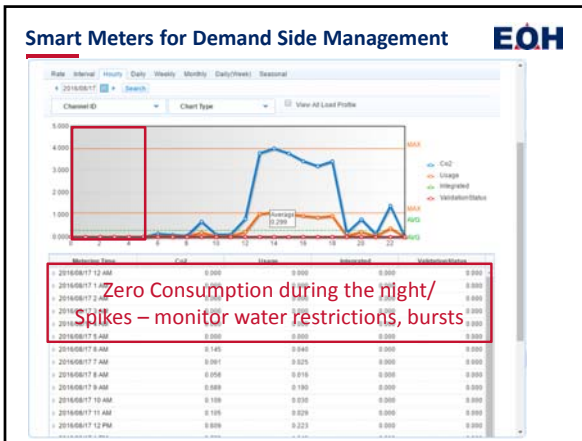
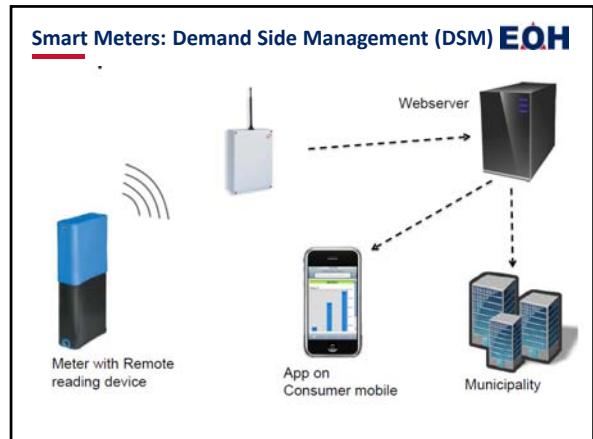
- PRVs can be retrofitted with **Intelligent (Smart) Controllers**

Reservoir Capacity Analysis / Water balance **EOH**

- Identify Reservoirs with inadequate Capacity (< 24 hours) and, coupled with
- Evaluate bulk supply constraints – Prioritise for Upgrading
- NB: Bulk meters for Water Balance, Telemetry so that MNF analysis can be done –

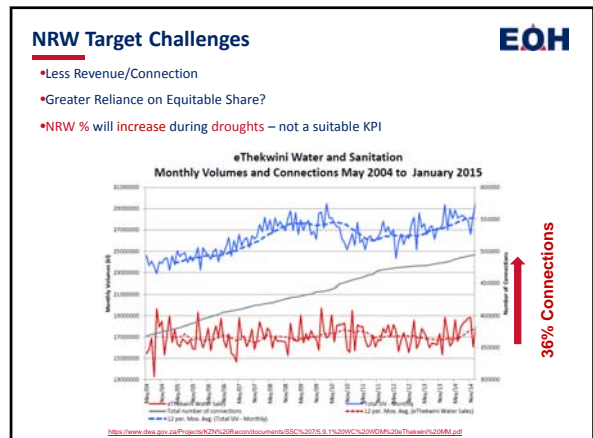
The Basics

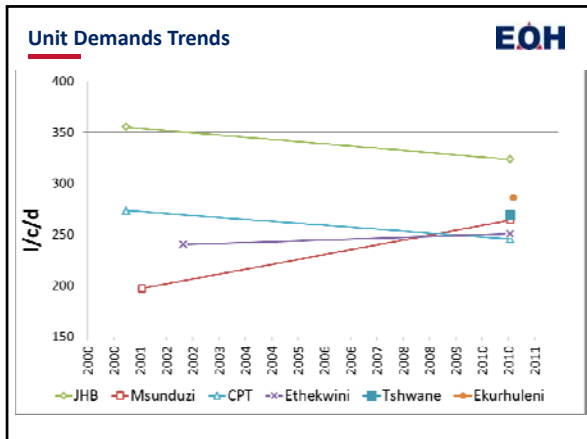
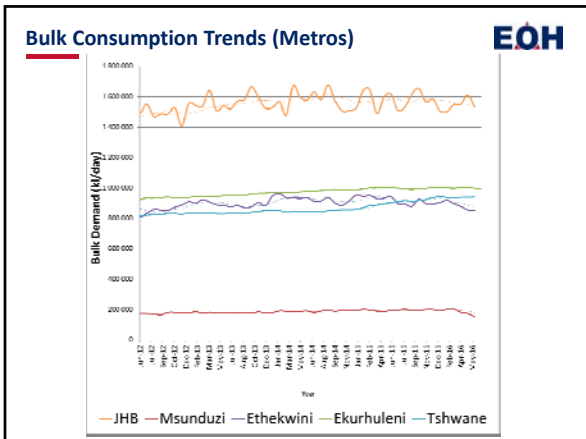
- Reservoir < 24h
- Reservoir > 24h



Smart Meters for Demand Side Management **EOH**

- Send/Receive data Remotely (RF)
- Managing Non-payment = Switched to Trickle Flow (Remotely)
- Wasteful Customers can be grouped – and switched off to trickle during the night
- Pre-payment transaction (using cellphone) - portion used to recover arrears on post paid account
- Requires a Vetting System for Indigents
- Cost Benefit Analysis Required
- Benefits:**
 - Improves Public Awareness – customer can log onto web portal or App
 - Reduced Metering Errors – improves Customers Confidence
 - Identify Leakage during the night – SMS Customer (DMS)
 - Improves Revenue, and Reduces Arrears
 - Data can be used to establish “live demand scenario”
 - Compliance with Water Restrictions Monitored





Contact

EOH

Thank You
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