

Current Status of Water Availability and Demand in Vaal River System


Presented by: Kobie Mare, Rand Water
19 August 2014

1

Dam level vs Demand in Vaal River System (VRS)

- 🔥 RW Demand vs License
- 🔥 VRS Storage Capacity and Yield
- 🔥 VRS Demand vs Yield
- 🔥 River Flow (Rainfall) vs Yield
- 🔥 Resultant Dam Levels – Dec 2013 & Jan 2014
- 🔥 Recent vs Historical drought (1991 to 1995)
- 🔥 Forecast Scenario
- 🔥 Conclusion

2




RW Demand vs License

3

RW Demand vs License

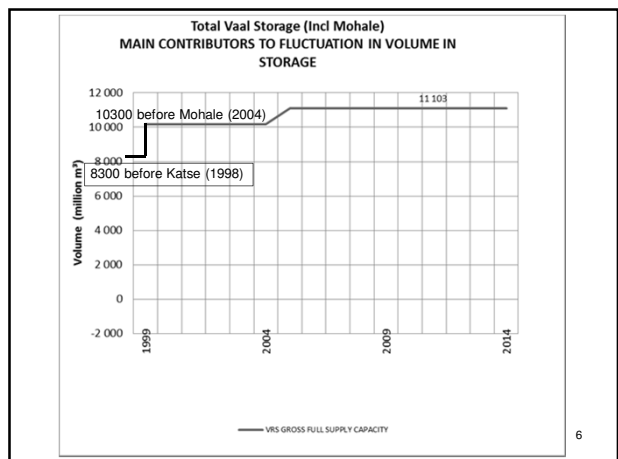
- 🔥 DWA has capped Rand Water's abstraction license to 1600 Mm³/a until 2020 (now extended to 2023)
- 🔥 RW actual abstraction in 2014 was already 1652 Mm³/a and growing at > 2% pa
- 🔥 Unsustainable if water use efficiency is not improved across the whole water sector, including sanitation and end-user plumbing
- 🔥 Conclusion: There is a need for Water Use Efficiency Improvement in the water sector in Rand Water's area of Service

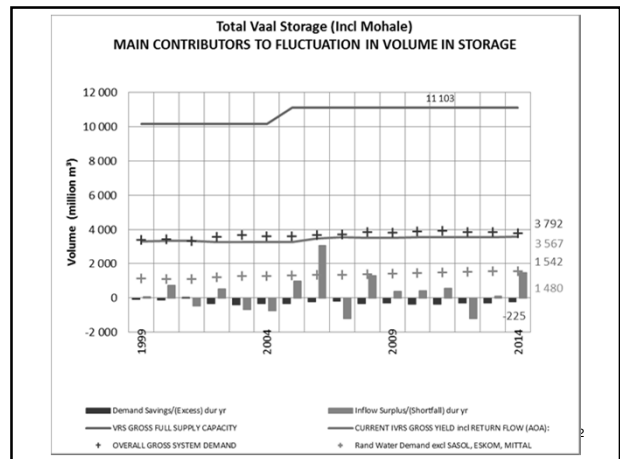
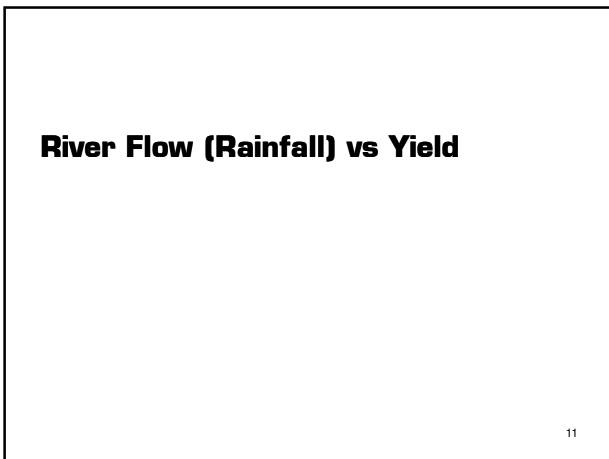
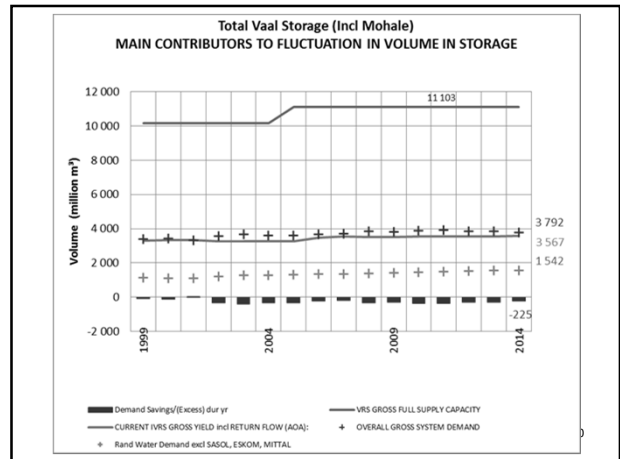
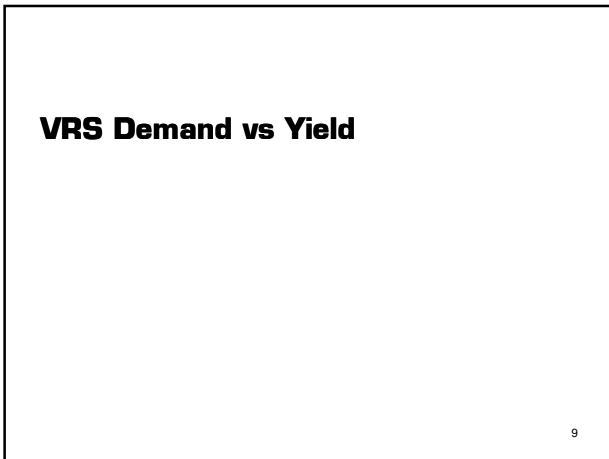
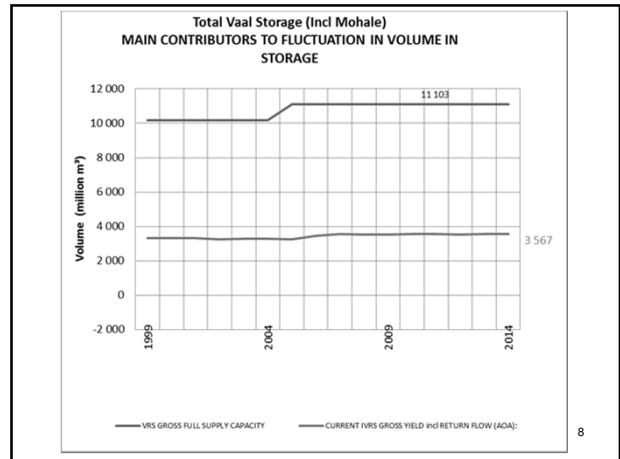
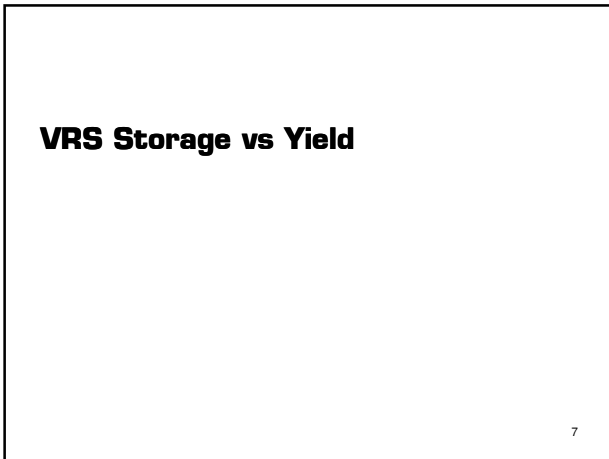
4



VRS Storage

5

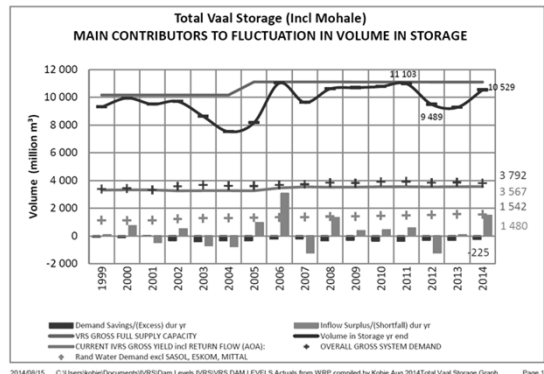




Resultant Dam Levels at May each year

13

DAM LEVEL vs DEMAND STATUS IN VAAL RIVER SYSTEM



2014/08/15 C:\Users\kobie\Documents\PRSD\Dam Levels IVRS\VRS DAM LEVELS Actuals from WRP compiled by Kobie Aug 2014\Total Vaal Storage Graph Page 1

Contributors to current water balance

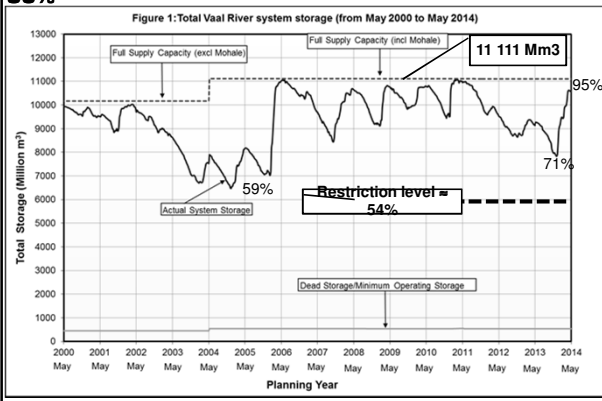
- Demand for water was consistently 6% above the long-term yield of the system
- Most of the excess was in the Rand Water supply system which includes Municipalities, Mines and Large Raw Water Users.
- Water demand management in the whole supply chain was not effective

15

Resultant Dam Levels – Dec 2013 & Jan 2014

16

May 2014: Good rains from Jan 2014, dams now at 95%



What could have happened in VRS?

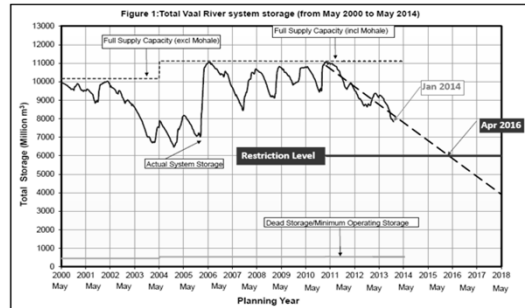
18

Recent vs Historical drought (1991 to 1995)

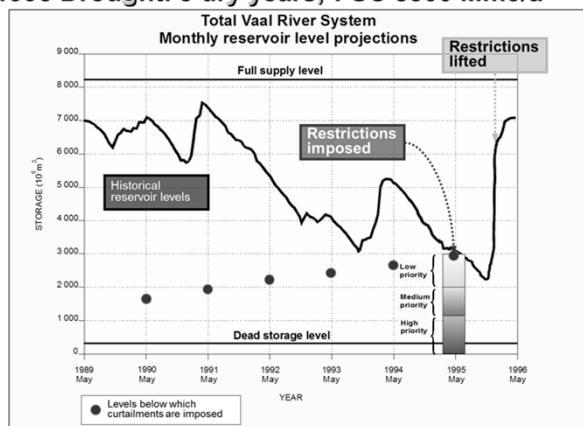
19

January 2014: 3 dry years, dams at 71%, close to restrictions at 54%; FSC 11 100 Mm³/a (with Katse & Mohale)

Source of historic data:WRP



1995 Drought: 5 dry years; FSC 8300 Mm³/a



Comparison of recent situation with 1991 to 1995 drought

- ▶ **The recent drought lasted 3 years**
 - Dam levels dropped to 71%
 - Restrictions would have been required at 54%
 - Restriction levels would have been reached after 5 years, despite current larger storage capacity
- ▶ **The previous serious drought lasted 5 years**
 - Dam levels dropped to 28%
 - Severe restrictions were applied at 38%
 - Demand reduced significantly
 - Restrictions lasted a year

22

Comparison of recent situation with 1991 to 1995 drought - Conclusion:

- ▶ **2 additional dry years could have caused a record drought**
 - Resulting in dangerously low dam levels
 - Necessitating restrictions
 - Impacting on economic and social welfare in the region
- ▶ **The danger period in RW AoS has now stretched to 2023 due to delays in the implementation of the Lesotho Phase 2 scheme**

23

Security of supply in IVRS

- ▶ **The fluctuating rainfall makes it very unpredictable and increases the risk. History showed that extreme droughts do occur**
- ▶ **We cannot change the rainfall in the short-term, therefore we have to improve water use efficiencies to reduce our risks**
- ▶ **The excessive demand coupled with the fluctuating rainfall increases the risk of water shortages**

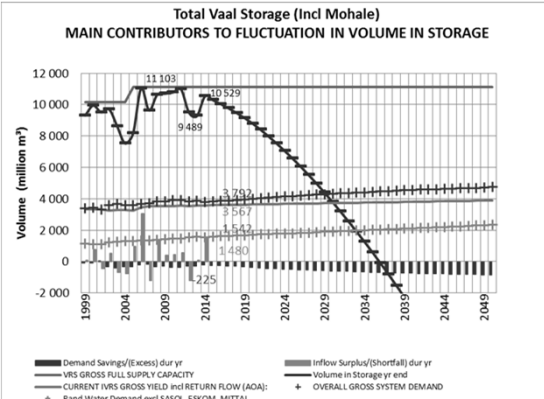
24

FORECAST

- ◆ The next slide shows this scenario:
 - Normal (long-term average) rainfall
 - No additional dams
 - Non-Rand Water demand grows as planned
 - No effective water demand reduction, i.e. current growth in Rand Water demand continues

25

FORECASTED DAM LEVEL VS DEMAND STATUS IN VAAL RIVER SYSTEM WITH NORMAL RAIN; WITHOUT WDM or NEW DAMS



Result

- ◆ Even without a drought, the system will run dry
- ◆ With a drought, even extra dams will only reduce the risk, but not remove it
- ◆ This clearly shows that we are creating our own drought by demanding more than the system yield!

27

Conclusion

- ◆ This presentation emphasises the need for demand reduction in the VRS to ensure sustainability of the region
- ◆ If this is done over the whole VRS, there would be an improved probability of balancing supply and demand for water



28

- Thank You -

29