Crocodile West Water Supply System

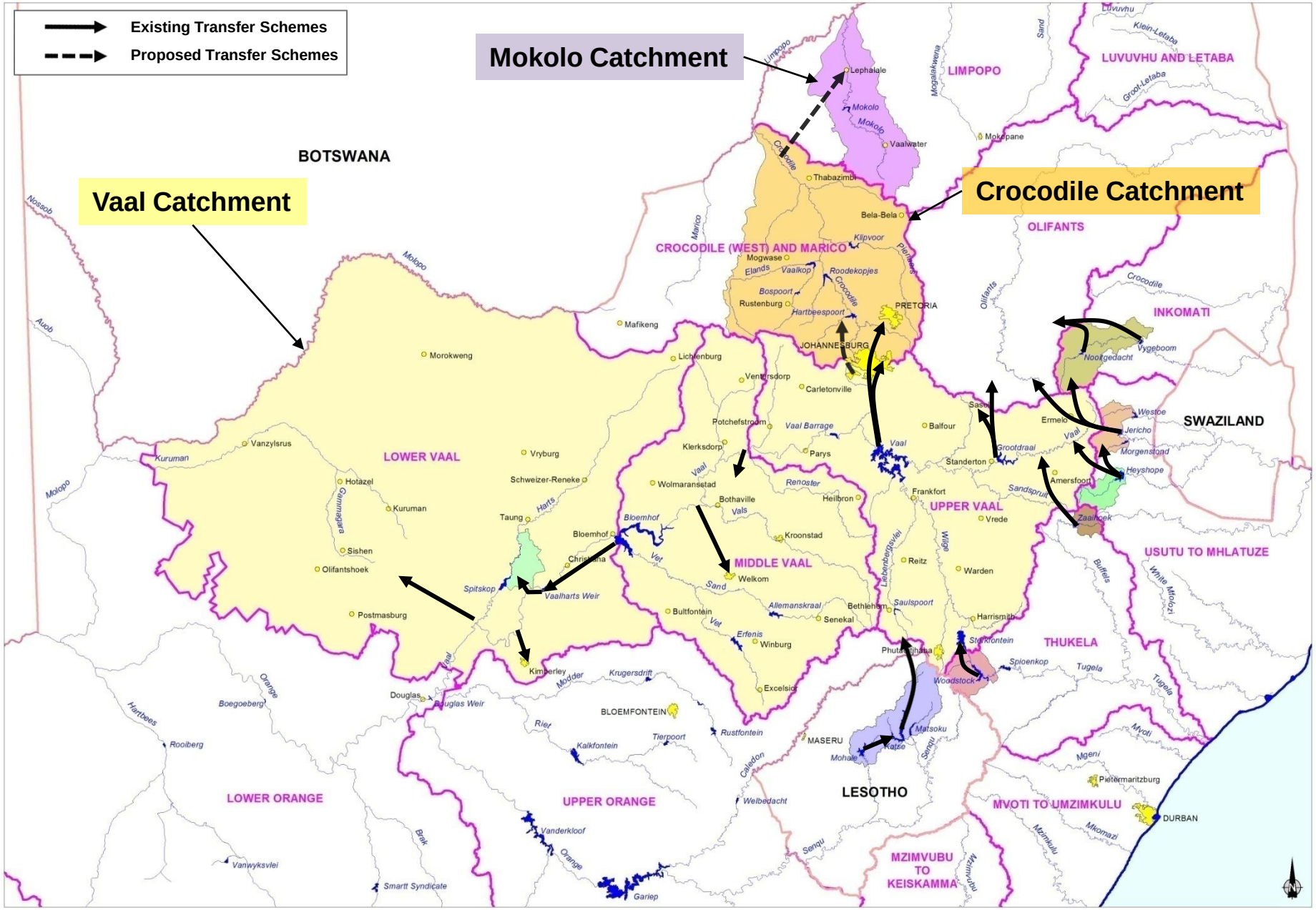
Background to the Reconciliation Strategy

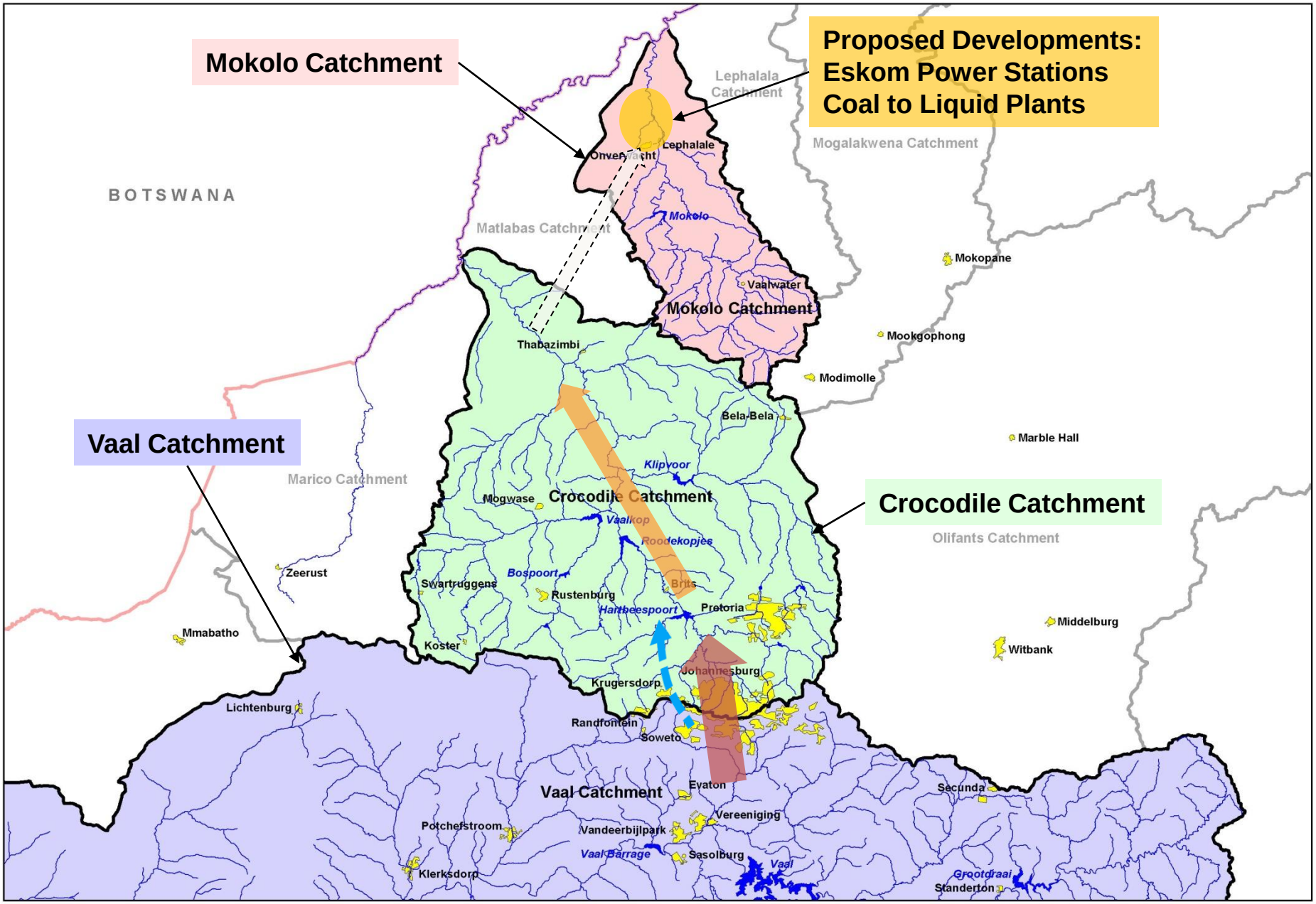
Tendani Nditwani

Acknowledgements

- Tendani Nditwani – DWA Project Manager
- Other directorates
- Regional Offices
- Teams of experts that did the bulk of the work
- Study Steering Committee members
- DWA Management

Context of the Crocodile West System




Mokolo Catchment
Proposed Developments:
Eskom Power Stations
Coal to Liquid Plants
Vaal Catchment
Crocodile Catchment
BOTSWANA
Lephalala Catchment
Mogalakwena Catchment
Matlabas Catchment
Marico Catchment
Olifants Catchment
Lephalale
Mokolo
Vaalwater
Mokopane
Mookgophong
Modimolle
Thabazimbi
Bela-Bela
Marble Hall
Klipvoor
Mogwase
Crocodile Catchment
Vaalkop
Roodekopjes
Bospoort
Brits
Rustenburg
Hartbeespoort
Pretoria
Zeerust
Swartruggens
Mmabatho
Koster
Middelburg
Witbank
Johannesburg
Krugersdorp
Lichtenburg
Randfontein
Soweto
Vaal Catchment
Evaton
Secunda
Vereeniging
Potchefstroom
Vandeerbijlpark
Vaal Barrage
Sasolburg
Vaal
Klerksdorp
Grootdraai
Standerton

Key Characteristics of Crocodile West Water Supply System

- About 5.5 million people, with over 20% of National GDP
- Includes urban and industrial areas of northern Johannesburg and Pretoria
- Large mining developments north of the Magaliesberg
- Irrigation downstream of Hartbeespoort Dam
- Linked to large planned developments on the coalfields in the Lephalale area
- Most of the water used in the catchment is supplied from the Vaal River System via Rand Water
- Urban return flows important resource

Background to the study

- Following on NWRS, Internal Strategic Perspectives (ISPs) were developed
- Crocodile West Marico ISP identified need for:
  - Crocodile West Reconciliation Strategy
  - Reserve Determination Study
  - Water Availability Assessment Study

NWRS = National Water Resource Strategy

Stakeholder engagement

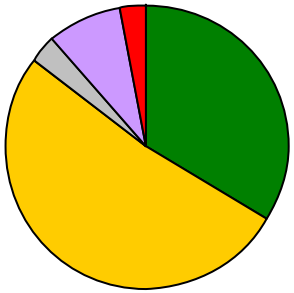
- Study teams have engaged with many stakeholders at different forums and through various avenues to receive inputs, concerns and issues regarding the studies
- Study Steering Committee of key stakeholders
- Reports available on DWA web site

CURRENT RECONCILIATION STRATEGY

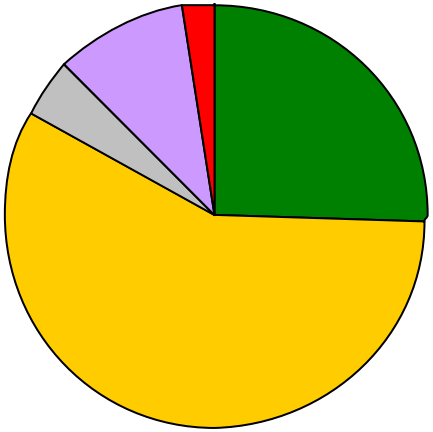
Objectives of the study

- Analysis of water demand profile and future water requirements
- Identification of interventions that will reconcile water requirements with available water up to 2030
- Integration of augmentation and bulk supply options to achieve optimised overall benefits
- Strategy should be flexible to accommodate future changes in actual water use
- Stakeholder engagement to build partnerships and promote co-operation

Total Crocodile water requirements



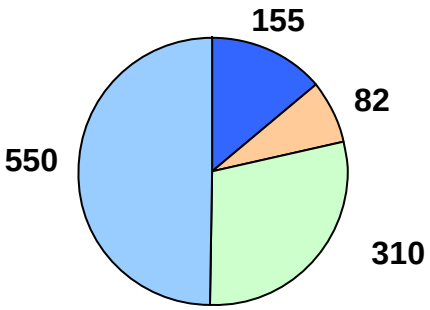
2005
1 100 million m^3



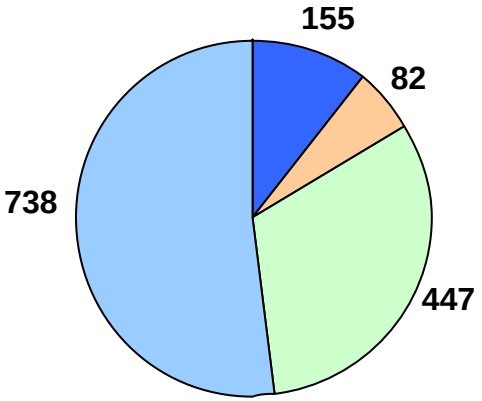
2030 medium WC/WDM efficiency
1 400 million m^3

- Irrigation
- Urban
- Rural and stock water
- Mining
- Power generation

Water resources



2005
1 097 million m^3



2030 medium WC/WDM efficiency
1 422 million m^3

- Surface water
- Ground water
- Return flows
- Transfers in

Perspective on water quality (1)

- Strategy mostly focused on water quantity
- Water quality being dealt with in detail in other studies
- Water quality in streams and impoundments downstream of the major urban areas is poor as a result of the return flows and urban wash-off
- This has serious environmental impacts and can also limit the potential for re-use

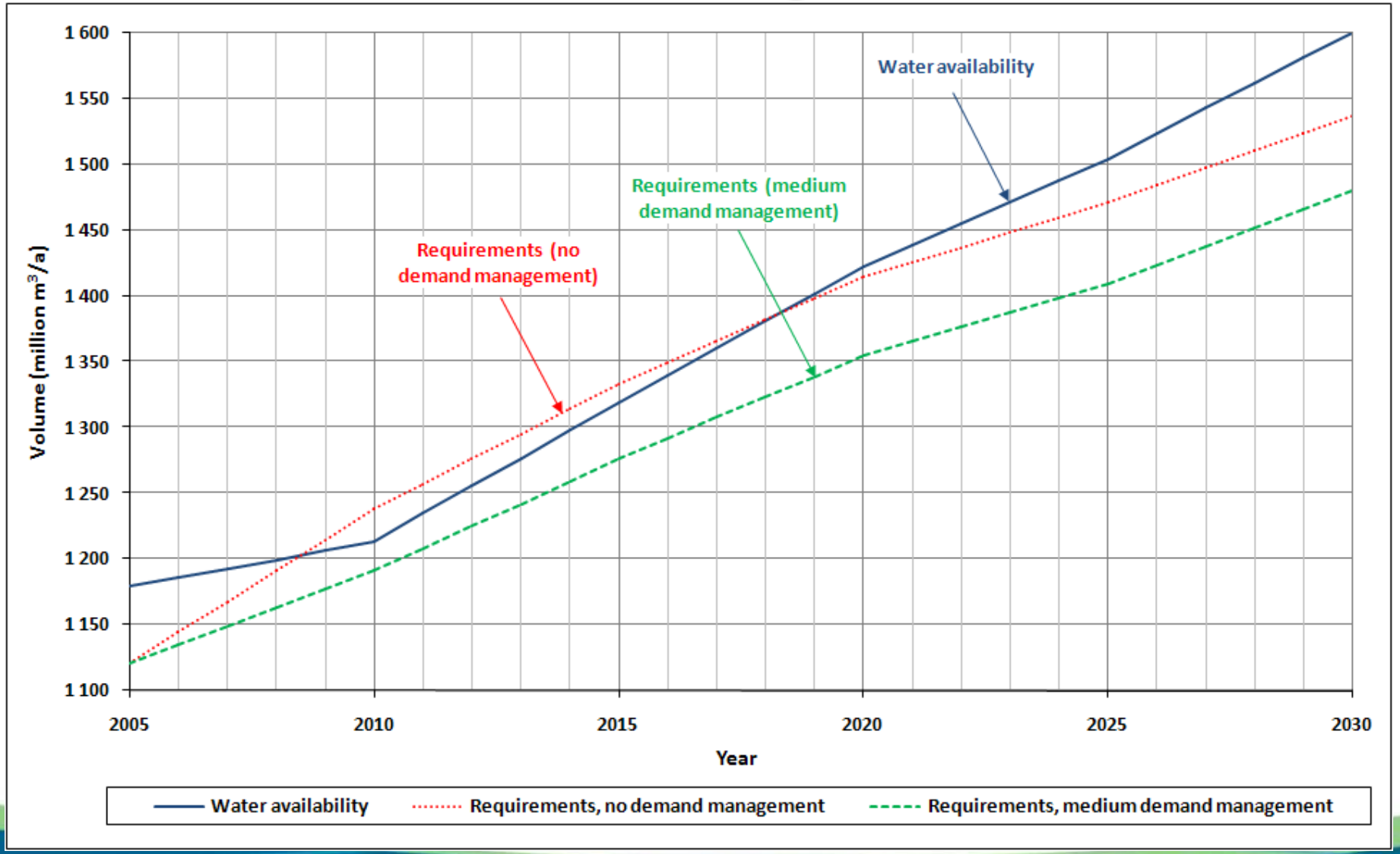
Perspective on water quality (2)

- The poor quality of water at Hartbeespoort Dam is of major concern
- Irrigation return flows and runoff from highly fertilized rain-fed cultivation also impact on downstream water quality
- As a result of the above impacts, Hartbeespoort and Roodeplaat Dams are highly eutrophic

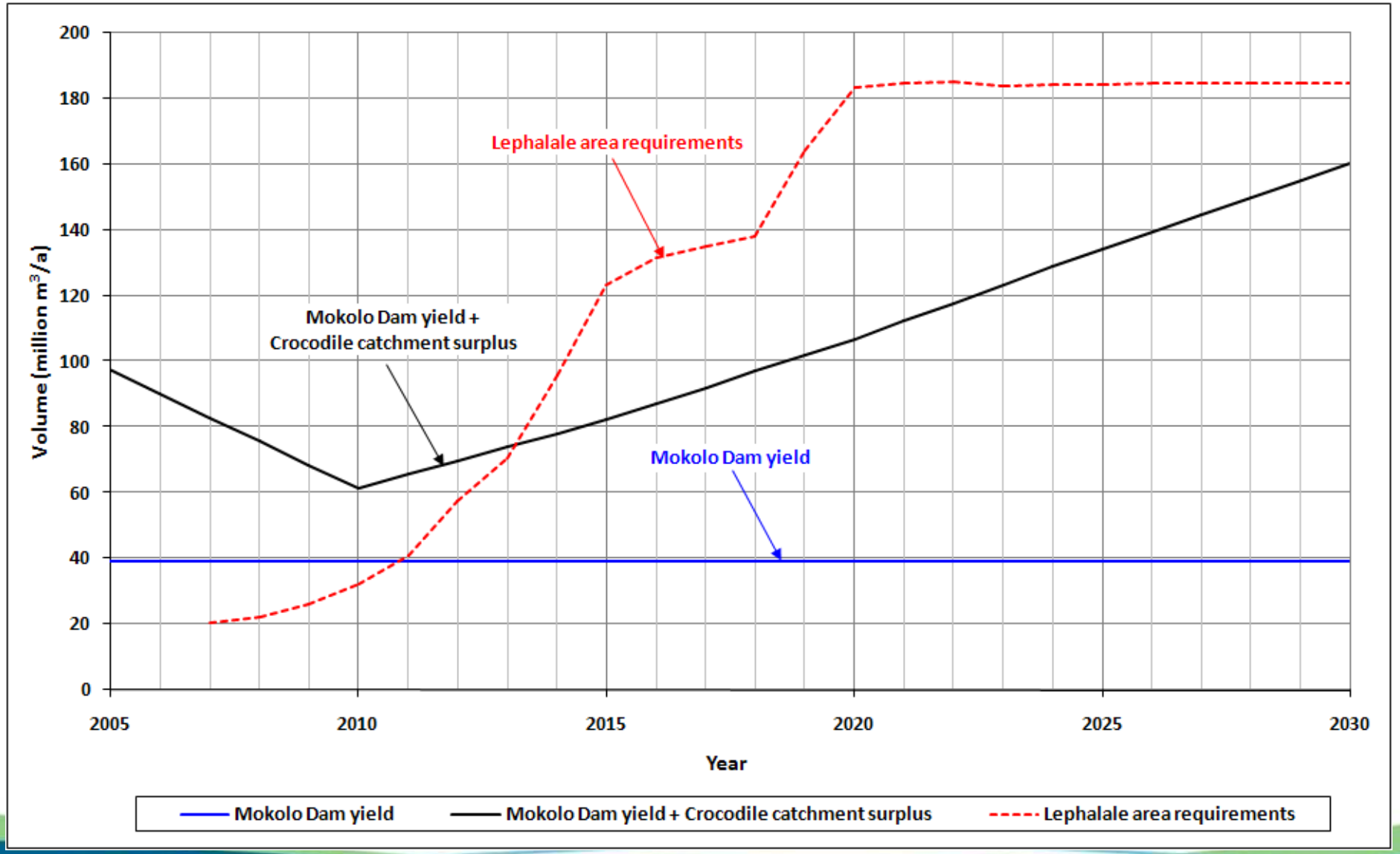
Water balances

- Water balances were determined for
  - Crocodile West River catchment
  - Mokolo Dam yield + Crocodile West balance

Crocodile water balance: High population, medium water demand management



Crocodile-Mokolo water balance



Key factors influencing the Strategy

- Growth in water requirements
- Natural water resources already fully developed
- Strong dependence on transfers from the Vaal River system
- Already large and projected increasing volumes of return flows
- Implementation of the Reserve
- Water quality
- Linkages to neighbouring catchments

Recommendations (1)

- Rand Water service area
  - Continued supply from the Vaal River system
- Northern Gauteng
  - Increasing treated effluent from metropolitan area will be future source of water for mining and urban requirements north of the Rand Water service area
- Waterberg area
  - Optimal utilisation of local resources to be continued
  - Surplus effluent will be transferred to Lephalale area

Recommendations (2)

- Any shortfall will be made up by pumping of treated effluent from wastewater treatment plants in the Vaal River
- Implement Water Conservation and Water Demand Management measures to reduce losses and thus also urban demand
- Implement measures to manage the water quality
- Constitute a Strategy Steering Committee

Approval process

- Study Steering Committee
- Public meetings
- Top Management of DWA
- Minister
- Cabinet

Summary

- We have solutions
- Implementation will be crucial – programmes very tight
- Programme has flexibility
  - Do not commit large capital before absolutely necessary
  - Flexible enough to cover for Reserve implementation
  - Flexible enough to cover for impact of climate change
  - Monitor and adjust