

 **water & sanitation**
Department
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

**CONTINUATION OF THE ALL TOWN
RECONCILIATION STRATEGIES IN THE
MPUMALANGA PROVINCE**

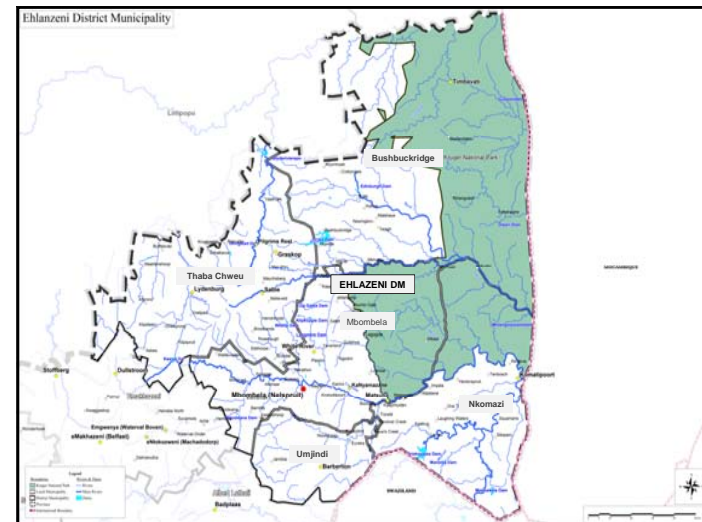
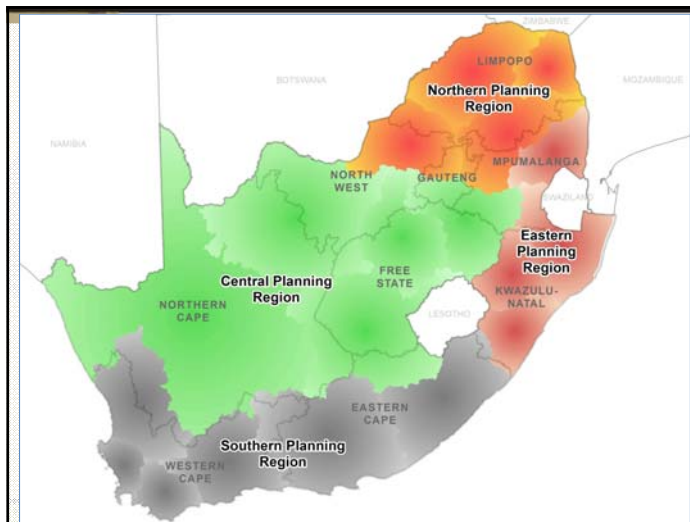
**Strategies Steering Committee Workshop
No. 2**

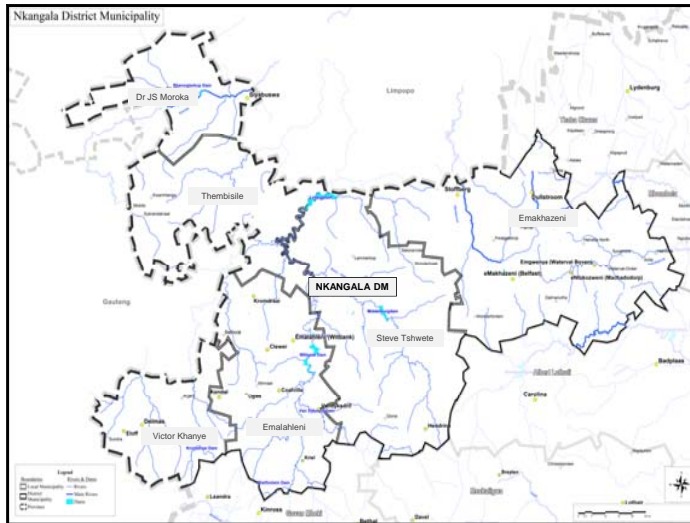
DWS: National Water Resource Planning
Friday, 21 August 2015
Umbali Event Venue, Mbombela

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**Updating Priority Strategies
Methodology**

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Prioritisation of Reconciliation Strategies

- **Step 1:** Identification of Category 4 strategies (towns currently in a water balance deficit)
- **Step 2:** Eliminate towns where solutions are in an advance stage of planning or implementation (RBIG projects)
- **Step 3:** Add towns where RBIG or other processes are in an early stage of planning and can still be influenced by strategy recommendations
- **Step 4:** Add any other hot spot areas identified on a national, provincial or local strategic level
- **Step 5:** Final selection was confirmed at Strategy Steering Committee Workshop 1

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Updating Priority Reconciliation Strategies

- Detailed assessment of strategies according to the following themes:
 - Demographics (Census 2011) & Economic Drivers, migration etc
 - Water requirements (**importance of metering**)
 - WC/WDM
 - Infrastructure (RBIG Projects)
 - Water resources
 - Surface water (DWS Studies)
 - Groundwater (desktop investigations)
 - Water quality
- Linkages with Recon Strategies for Large Systems



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Theoretical Water Requirements

- Population allocated to each Level of Service (LOS) category (Census 2011)

Category	Dwelling Type		Average Water Consumption (l/capita/day)
1	Flats		226
2	Clusters		255
3	Single Residential	Low Income	101
4		Medium Income	189
5		High Income	304
6		Very High Income	442
7	Informal	Below RDP Level	12
8		RDP Level	40
9		Above RDP Level	80

- Assumed Losses: Water Treatment =10%, Distribution = 10% (DWS Guidelines)
- Indirect usage for established towns

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Water Requirement Projections

- Water Requirement projections derived
 - Unit consumptions calibrated according to actual use (theoretical values used where no info available)
 - Projected population per town (High Scenario)
 - Estimated timing and extent of upgrading of water services (selected scenario)

Water Requirement Projections

Scenario 1 (Established Town - mostly formal):

- LOS assumed to be at a minimum of Residential Low Income by 2025
- 5% increase in Residential Medium Income 2011 to 2025 and a further 6% increase by 2035 (total of 11%)
- 2.5% increase in Residential High Income from 2011 to 2025 and a further 3.3% increase by 2035 (total of 5.8%)

Category	Dwelling Type
1	Flats
2	Clusters
3	Low Income
4	Single Medium Income
5	Residential High Income
6	Very High Income
7	Below RDP Level
8	RDP Level
9	Above RDP Level

Water Requirement Projections

Scenario 2 (Town/Village - formal and informal LOS):

- LOS assumed to be at a minimum of Above RDP Level by 2025
- 5% increase in Residential Low Income 2011 to 2025 and a further 6% increase by 2035 (total of 11%)
- 2.5% increase in Residential Medium Income from 2011 to 2025 and a further 2.3% increase by 2035 (total of 4.8%)

Category	Dwelling Type
1	Flats
2	Clusters
3	Low Income
4	Single Medium Income
5	Residential High Income
6	Very High Income
7	Below RDP Level
8	RDP Level
9	Above RDP Level

Water Requirement Projections

Scenario 3 (Village - mostly informal):

- LOS assumed to be at a minimum of RDP Level by 2025.
- 5% increase in Above RDP Level by 2011 to 2025 and a further 6.7% increase by 2035 (total of 11.7%)
- 2.5% increase in Residential Low Income from 2011 to 2025 and a further 3% increase by 2035 (total of 5.5%)

Category	Dwelling Type
1	Flats
2	Clusters
3	Low Income
4	Single Medium Income
5	Residential High Income
6	Very High Income
7	Below RDP Level
8	RDP Level
9	Above RDP Level

Updating Priority Reconciliation Strategies cont.

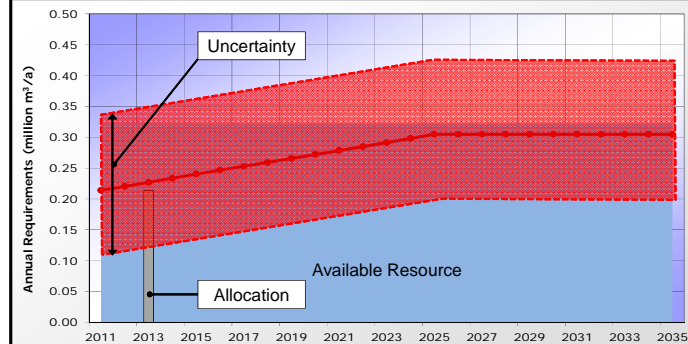
- Compile water balance diagrams (up to 2035)
- Identify potential development scenarios (management and infrastructure) for reconciliation of water requirements and water resources

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Importance of Metering



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Updated Strategies

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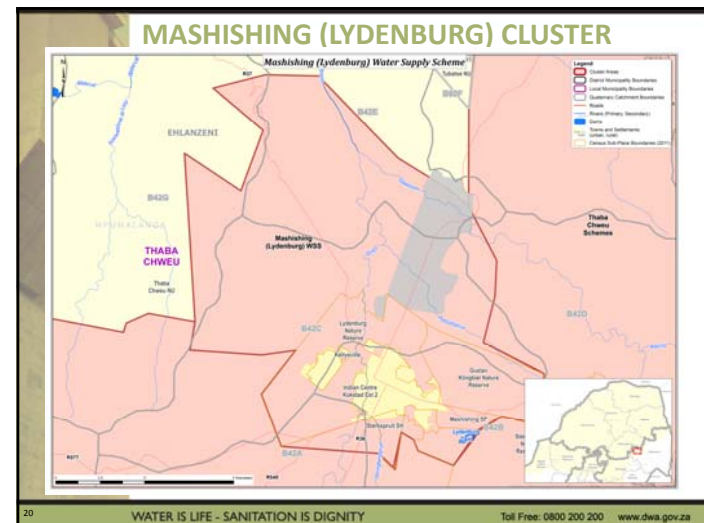
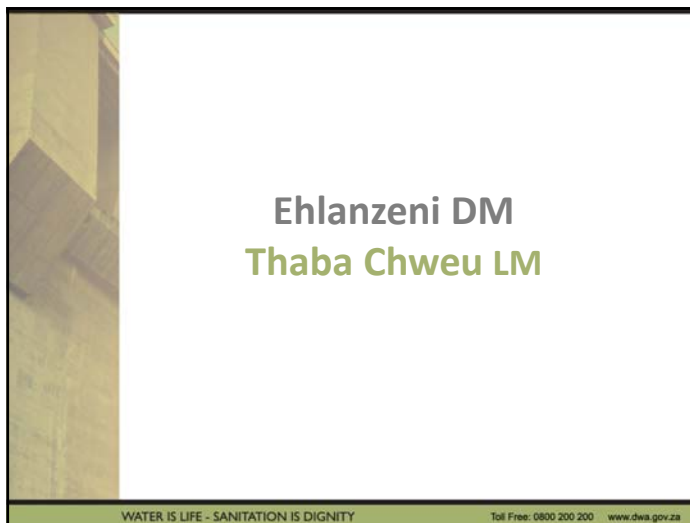
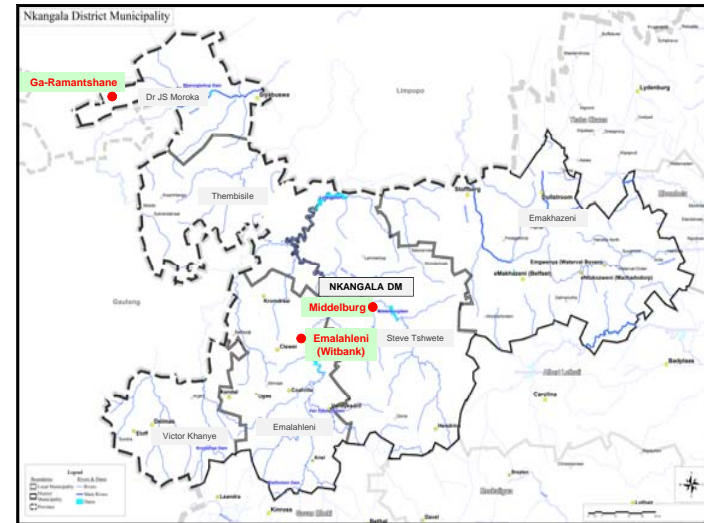
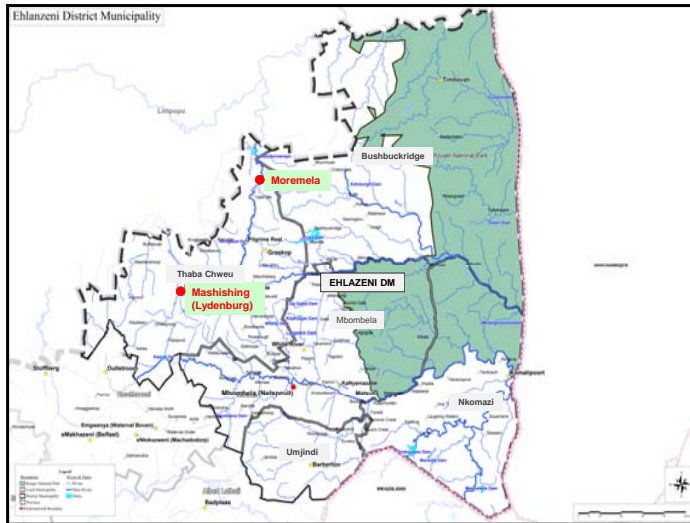
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Prioritised Strategies Updated (Northern Region)

District Municipality	Local Municipality	Strategy
Ehlanzeni	Thaba Chweu	Mashishing (Lydenburg) Cluster
		Moremela Cluster
Nkangala	Steve Tshwete	Middelburg Cluster
	Dr J.S Moroka	Ga-Ramantshane Cluster
	Emalahleni	Emalahleni and Springvalley Cluster

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MASHISHING (LYDENBURG) CLUSTER

- Demographics (high growth): 42 321 (2011) – 51 372 (2035)

Category	Dwelling Type	% Population per Category
1	Flats	3.8%
2	Clusters	2.7%
3	Low Income	42.7%
4	Medium Income	11.3%
5	High Income	9.8%
6	Very High Income	5.2%
7	Below RDP Level	4.1%
8	RDP Level	1.6%
9	Above RDP Level	18.9%

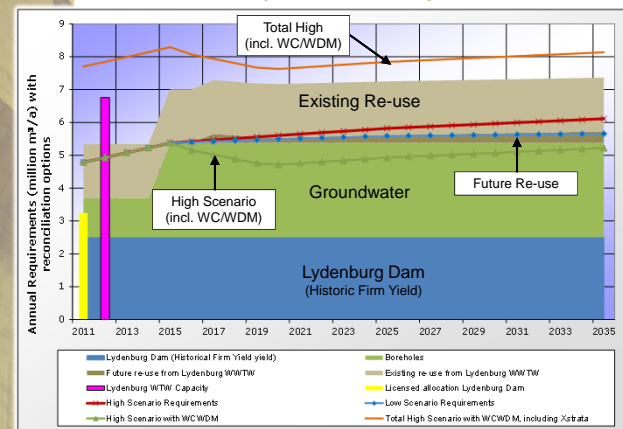
- Water sourced from Lydenburg Dam and some groundwater.
- Water Requirement projection (high growth)
 - 2011 Theoretical: 4.676 million m³/a (12.80 MI/d, 302 l/c/d)
 - 2011 4.788 million m³/a (13.11 MI/d, 310 l/c/d)
 - 2035: 6.112 million m³/a (16.74 MI/d, 326 l/c/d)

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MASHISHING (LYDENBURG) CLUSTER



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CONCLUSIONS AND RECOMMENDATIONS

- Projected requirements exceed available resources from 2011 (shortfall of 2.366 million m³/a (6.5 MI/d)) and 3.691 million m³/a (10.1 MI/d) by 2035). The following reconciliation measures are required:
 - WSA to implement WC/WDM;
 - Development of additional groundwater resources: to 2.875 million m³/a to be confirmed by DWS groundwater feasibility study;
 - Increasing re-use of treated effluent from the Lydenburg WWTW.
- Long terms stochastic yield analysis required for Lydenburg Dam

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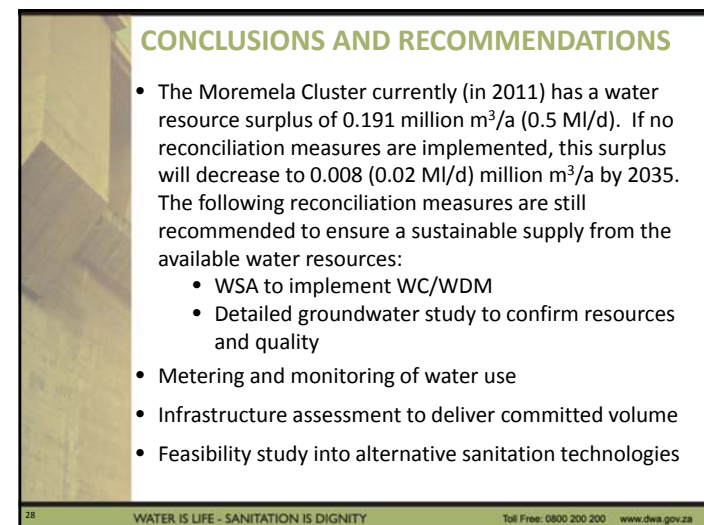
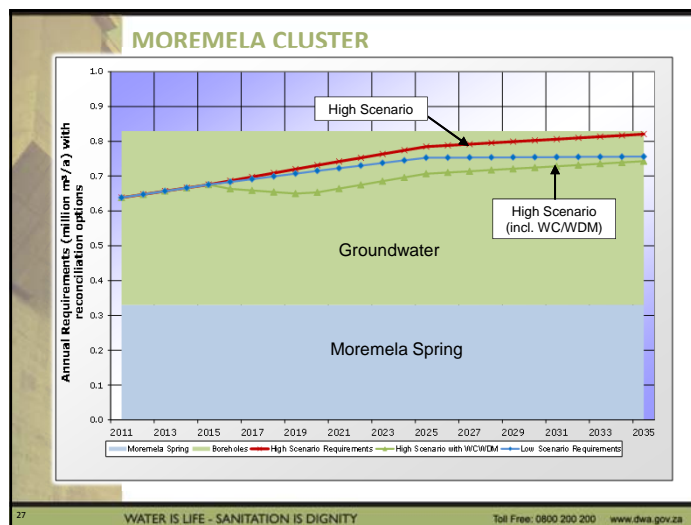
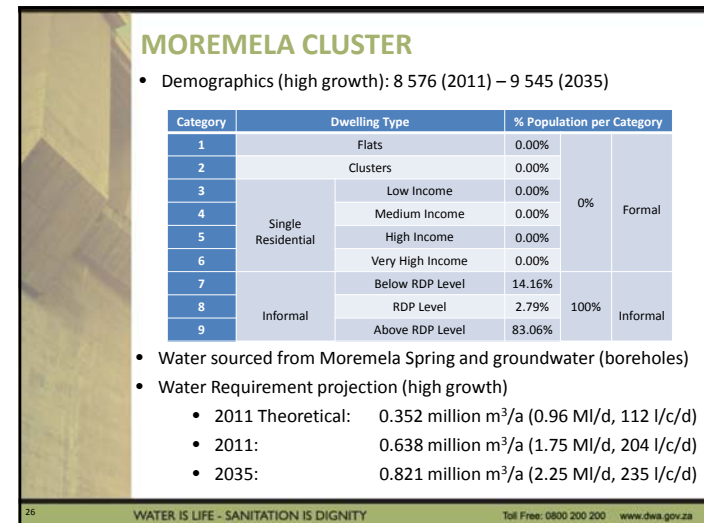
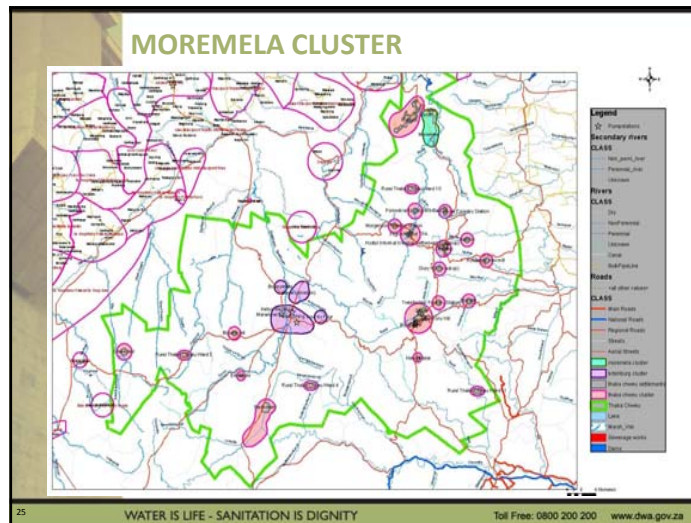
CONCLUSIONS AND RECOMMENDATIONS

- Should Olifants Catchment groundwater feasibility study and Lydenburg Dam yield analysis show insufficient yield to address Mashishing Cluster's deficit, further surface water augmentation should be investigated.
- Investigate infrastructure capabilities to deliver water requirements
- Water use entitlements must be investigated and be brought in line with projected water use (with WC / WDM)
- The All-towns study and the overarching DWS Continuation of the Olifants River Water Supply System Recon Strategy should inform each other.

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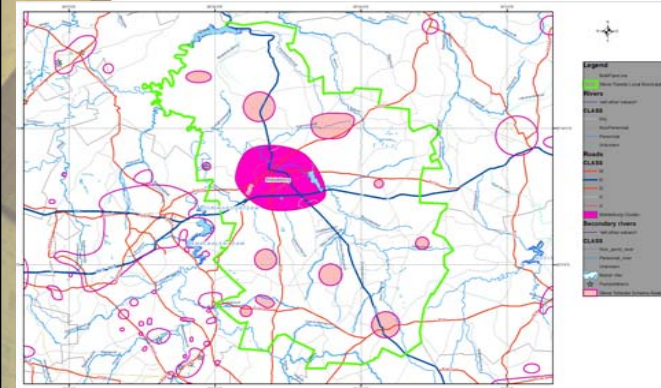


NKANGALA DM STEVE TSHWETE LM

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MIDDELBURG CLUSTER



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MIDDELBURG CLUSTER

- Demographics (high growth): 164 326 (2011) – 2212 137 (2035)

Category	Dwelling Type	% Population per Category		
1	Flats	6.6%		
2	Clusters	3.7%		
3	Low Income	44.8%	83.0%	Formal
4	Medium Income	10.6%		
5	High Income	10.4%		
6	Very High Income	6.9%		
7	Below RDP Level	4.2%		
8	RDP Level	4.0%	17.0%	Informal
9	Above RDP Level	8.8%		

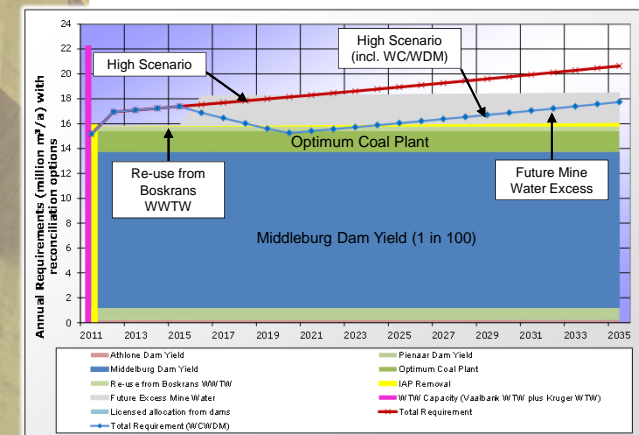
- Water sourced from Middelburg Dam, Athlone Dam and Pienaar Dam.
- Water Requirement projection (high growth)

2011:	16.696 million m ³ /a (45.71 Ml/d, 278 l/c/d)
2035:	23.205 million m ³ /a (63.53 Ml/d, 287 l/c/d)

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MIDDELBURG CLUSTER



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CONCLUSIONS AND RECOMMENDATIONS

- Projected water requirements exceed available resources from 2012 (shortfall of 4.84 million m³/a (13.251 Ml/d) by 2035). The following reconciliation measures are required:
 - WSA to implement WC/WDM
 - Development of additional supply of 2.374 million m³/a excess mine water from Arnot Exxaro from July 2016 onwards.
 - Feasibility into increasing supply of treated effluent from Boskrans WWTW
 - Removal of Alien Invasive Plants
- Undertake high confidence dam yield assessments for Athlone and Pienaar Dams.

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CONCLUSIONS AND RECOMMENDATIONS

- Incorporate DWS Olifants River Catchment groundwater feasibility study into water balance
- Infrastructure assessment to deliver committed volume
- Water allocations should be aligned with the projected water requirements with WC/WDM measures included
- DWS Continuation of the Olifants River Water Supply System Reconciliation Strategy and this All Towns Strategy should inform each other.

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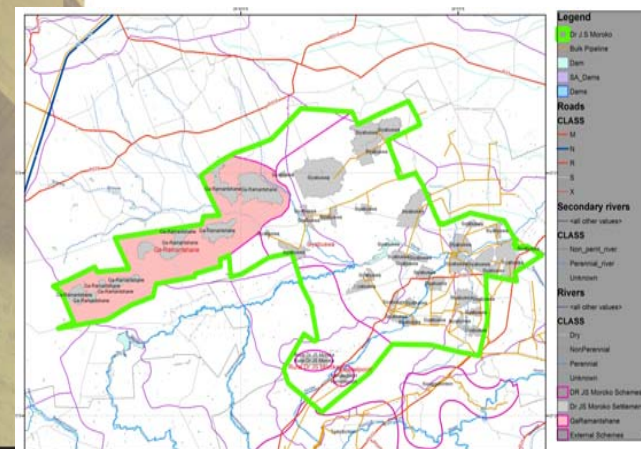
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DR JS MOROKA LM

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GA-RAMANTSHANE CLUSTER



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GA-RAMANTSHANE CLUSTER

- Demographics (high growth): 53 846 (2011) – 60 230 (2035)

Category	Dwelling Type	% Population per Category		
1	Flats	0.00%	0%	Formal
2	Clusters	0.00%		
3	Low Income	0.0%		
4	Medium Income	0.00%		
5	High Income	0.00%		
6	Very High Income	0.00%	100%	Informal
7	Below RDP Level	55.29%		
8	RDP Level	12.05%		
9	Above RDP Level	32.66%		

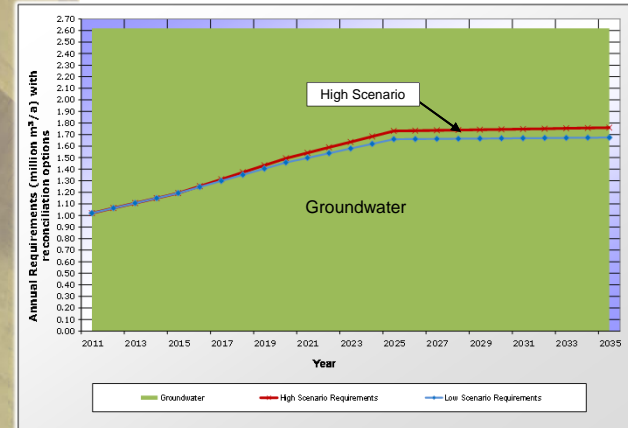
- Water sourced from groundwater only
- Water Requirement projection (high growth)
 - 2011 Theoretical: 1.154 million m³/a (3.15 MI/d, 58.7 l/c/d)
 - 2011: 1.020 million m³/a (2.79 MI/d, 52.0 l/c/d)
 - 2035: 1.759 million m³/a (4.82 MI/d, 80 l/c/d)

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GA-RAMANTSHANE CLUSTER



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CONCLUSIONS AND RECOMMENDATIONS

- Projected water requirements does not exceed available resources from throughout study period. The following reconciliation measures are required:
 - WSA to implement WC/WDM although limited potential to reduce total demand.
 - Detailed groundwater study to confirm water resources and identify quality issues.
- Metering and monitoring of water use
- Assessment of Infrastructure Capabilities to supply committed volumes
- Water allocations should be aligned with the projected water requirements.

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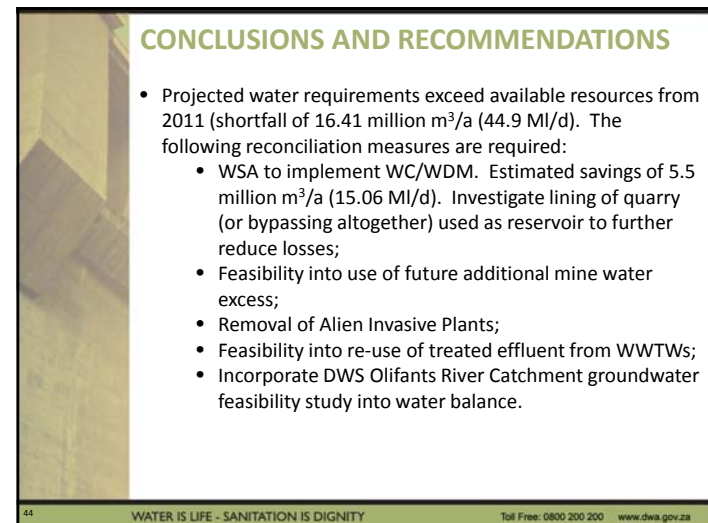
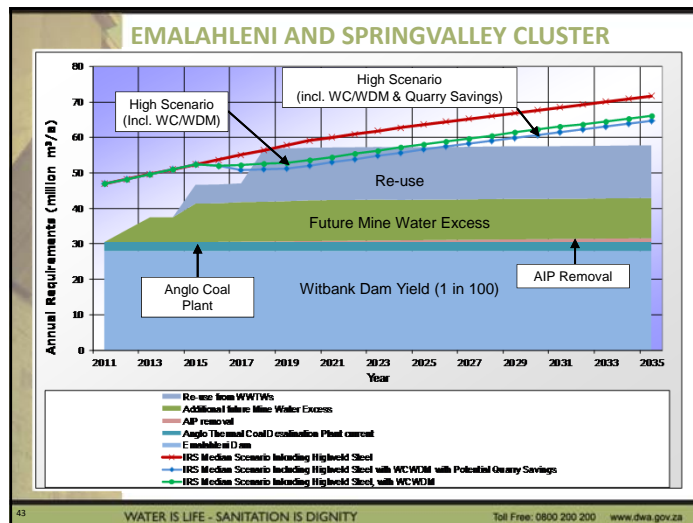
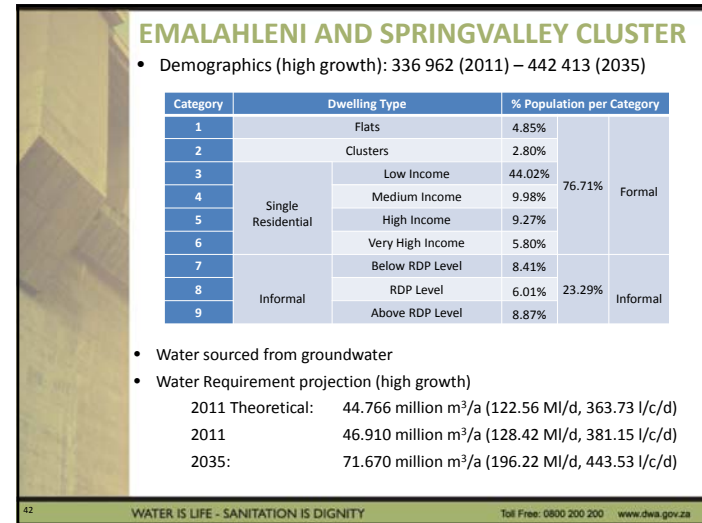
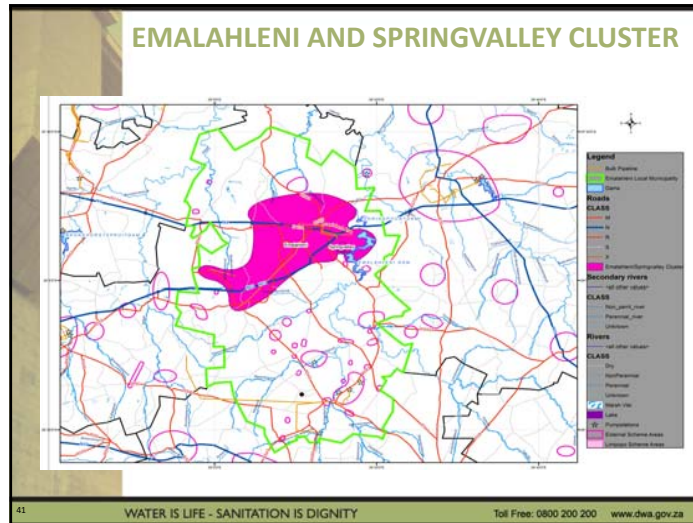
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CONCLUSIONS AND RECOMMENDATIONS

- Incorporate DWS Olifants River Catchment groundwater feasibility study into water balance
- Undertake feasibility into infrastructure as detailed in the IRS report.
- Should interventions not fully address the deficit in supply, other options could be considered such as transfers from the Vaal River System as a costly last resort.
- DWS Continuation of the Olifants River Water Supply System Reconciliation Strategy and this All Towns Strategy should inform each other.

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Remainder of the Study Programme – Phase 1

- SSC to submit comments by **15 September 2015** to:
 - Northern Planning Region Deputy Study Leader:
Ms Monja Esterhuizen (monjae@uwp.co.za)

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Thank You

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