

7TH REGIONAL
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LEAKAGE SUMMIT

2017

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NATIONAL WATER BALANCE STATUS QUO

Presented by:
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Chief Engineer: Water Services
Macro Planning

Participating and supporting organisations:

CONTENTS

- Data overview
- National water balance estimate
- Key performance Indicators
- Strategic overview

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STATE OF NRW / WATER LOSSES IN SA

Development of a simple and pragmatic approach to benchmark real losses in potable water distribution systems in South Africa

BY
BORRIS MCKENZIE & ADRIAN LAMBERT

BENCHLEAK
USER GUIDE

Benchmarking of Leakage from Water Reticulation Systems in South Africa

R McKenzie and C Seago

An Assessment of Non-Revenue Water in South Africa

11 Seago & R McKenzie

The State of Non-Revenue Water in South Africa (2012)

8 McKenzie, 26 Ugojika & 88 Wepstein

(2009/10 data)

2013

Metropolitan Municipality Non-Revenue/Water Loss Assessment

(2011/12 data)

2013

Secondary City Non-Revenue/Water Loss Assessment

(2011/12 data)

2014

National Municipal Non-Revenue/Water Loss Assessment

(2011/12 data)

A 2011/12 Assessment of Non-Revenue Water & Water Losses in South Africa

(2011/12 data)

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STATE OF NRW / WATER LOSSES IN SA

2014

NO DROP
REPORT

(2012/13 data)

2015

NO DROP
REPORT

(2012/13 data)

2015

BENCHMARKING OF WATER LOSS, WATER USE EFFICIENCY AND NON-REVENUE WATER IN SOUTH AFRICAN MUNICIPALITIES (2004/05 to 2012/13)

(2012/13 data)

Draft Status Report of Water Losses in the Eight Large Water Supply Systems

(2014/15 data)

8 Large Systems

Draft Status Report of Water Losses in the Eight Large Water Supply Systems

(2015/16 data)

8 Large Systems

Draft Status Report of Water Losses in the Eight Large Water Supply Systems

(Dec 2016 data)

8 Large Systems

2017

Non-revenue Water, Water Loss and Efficiency Assessment of Non-delegated and Secondary City Municipalities

(2015/16 data)

Non-delegated

2017

Non-revenue Water, Water Loss and Efficiency Assessment of Non-delegated and Secondary City Municipalities

(2015/16 data)

National

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Municipal Categories

Category	May 2011	Aug 2016	Short description	Long Description
A	8	8	Metros	Metropolitan municipalities
B1	19	19	Major cities	Secondary cities, local municipalities with the largest budgets
B2	27	25	Minor cities	Municipalities with a large town as core
B3	110	100	Rural dense	Municipalities with relatively small population and significant proportion of urban population but with no large town as core
B4	70	61	Rural scattered	Municipalities which are mainly rural with, at most, one or two small towns in their area
Total	234	213		

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Summary of data submission

Category	State of NRW in SA (2009/10)	DWS (2011/12)	3% No Drop (2012/13)	2015/16
A	8	8	8	8
B1	18	17	15	15
B2	26	21	15	15
B3	55	56	49	43
B4	25	20	14	26
Total	132	122	101	107
Size (%)	56%	52%	43%	50%

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Reports and data overview

- We have data from Jun 2005 to Jun 2016 – 11 years
 - Able to determine trends
 - **Approximately 50% of municipalities still do not prepare or submit water balance information**
 - Metros and several other municipalities are actively improving and monitoring their water balances
- Data is mainly obtained through DWS regional offices
 - WC, KZN, GP, NC active submission and monitoring programmes.
 - **FS, LP, MP, EC, NW data very poor**

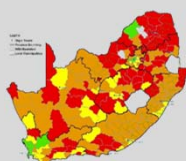
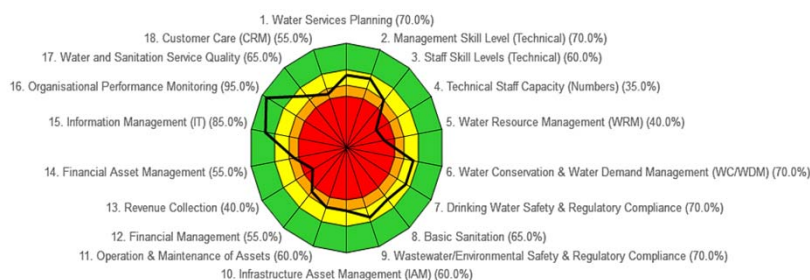
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- Municipal Strategic Self Assessment (MuSSA) indicates **“business health / vulnerability”** for each business attribute for a WSA
- MuSSA generates a “rolled-up” overall **Vulnerability Index** for each WSA

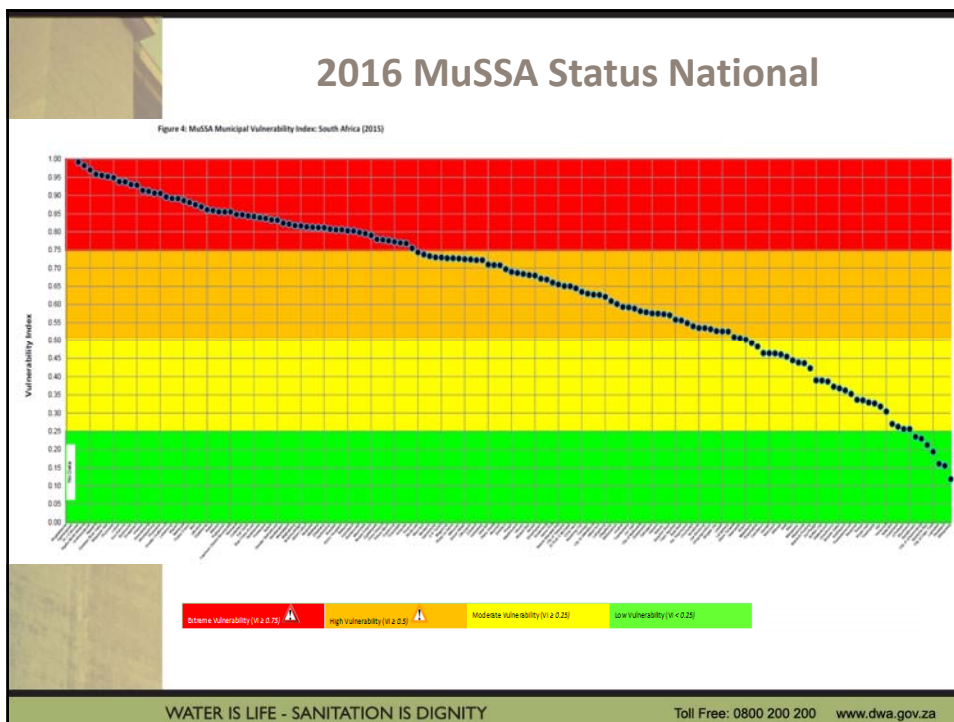
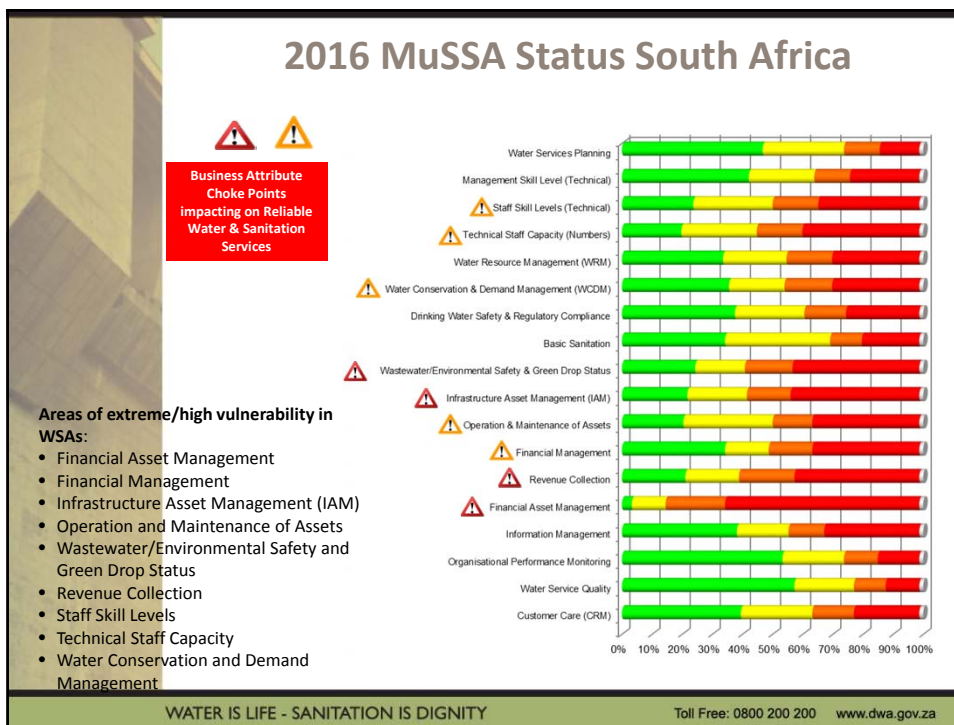
Municipal Strategic Self-Assessment of Water Services (MuSSA) (2016)

— Score ■ 0 - 50% (Extreme Vulnerability) ■ 50 - 60% (High Vulnerability) ■ 60 - 75% (Moderate Vulnerability) ■ 75 - 100% (Low Vulnerability)



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National Water Balance

- Is based on an extrapolated dataset
- %NRW is often criticized for being too low
- NRW often confused with non-payment
 - The IWA water balance is a **volumetric balance** and includes all billed consumption, **irrespective of payment.**
- Results highly influenced by category B3 and B4 municipalities – **the big unknown!!**

Extrapolated National Water Balance

- WRC / DWS 2009/10 total extrapolation
 - Sample: NRW = 36.8% and I/c/d = 235
 - Extrapolated: NRW = 36.8% and I/c/d = 235
- DWS 2011/12 category extrapolation
 - Sample: NRW = 39.9% and I/c/d = 257
 - Extrapolated: NRW = 40.7% and I/c/d = 233
 - Influenced by Category B3 and B4 municipalities
- DWS 2015/16 estimate per municipality - no extrapolation required

Estimated Water Balance Criteria

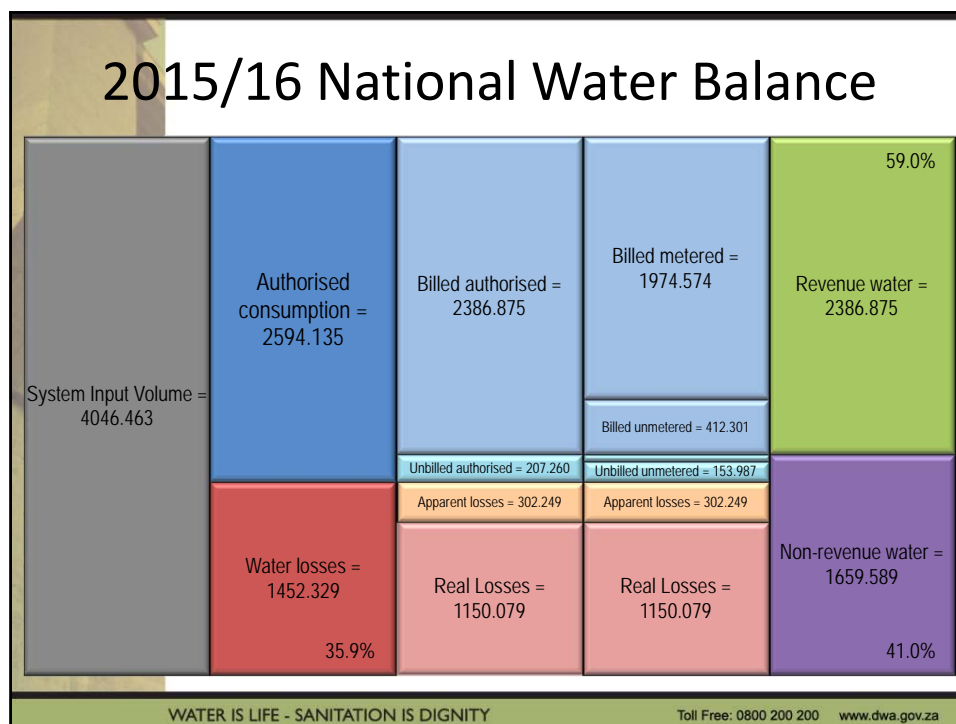
Municipal category	Average l/c/d consumption above RDP	Average l/c/d consumption below RDP	Red Book design figure (Table 9.11)	Billing efficiency
A Metro	300	55	Very high development level = 260 to 480 l/c/d Yard connections = 55 l/c/d (typical)	90%
B1	250	55	High development level = 130 to 280 l/c/d Yard connections = 55 l/c/d (typical)	70%
B2	200	55	High development level = 130 to 280 l/c/d Yard connections = 55 l/c/d (typical)	50%
B3	150	55	Moderate to high development level = 80 to 145 l/c/d Yard connections = 55 l/c/d (typical)	30%
B4 Rural	100	25	Yard connections = 50 to 100 l/c/d Standpipe = 10 to 50	10%

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Equitable Share (FBW) Allocation per Category

Category	Number of households	Number of indigent households (< R 2300pm)	% Indigent	Free basic water allocation (m ³ /annum)	System Input volume (m ³ /annum)	% billed consumption
A Metro	6 560 289	3 287 219	50%	236 679 789	2 204 322 416	11%
B1	2 301 265	1 263 093	55%	90 942 678	714 128 992	13%
B2	1 235 172	726 120	59%	52 280 637	278 917 501	19%
B3	1 988 542	1 268 049	64%	91 299 461	428 026 024	21%
B4 Rural	3 132 593	2 342 651	75%	168 670 823	421 068 293	40%
Total	15 217 861	8 887 132	58%	639 873 388	4 046 463 225	16%

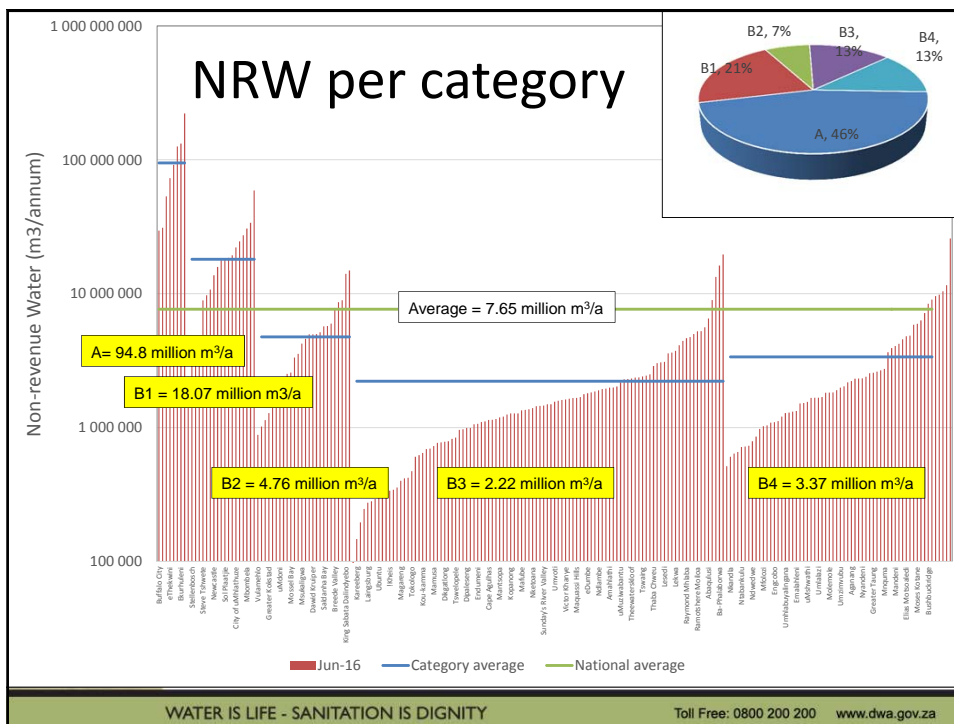
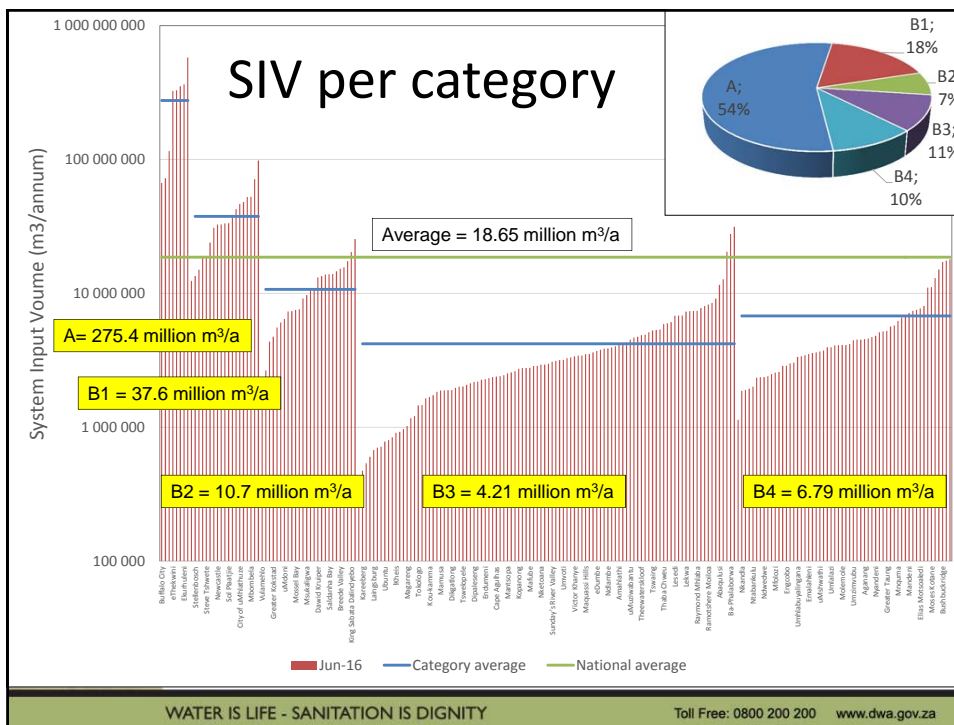
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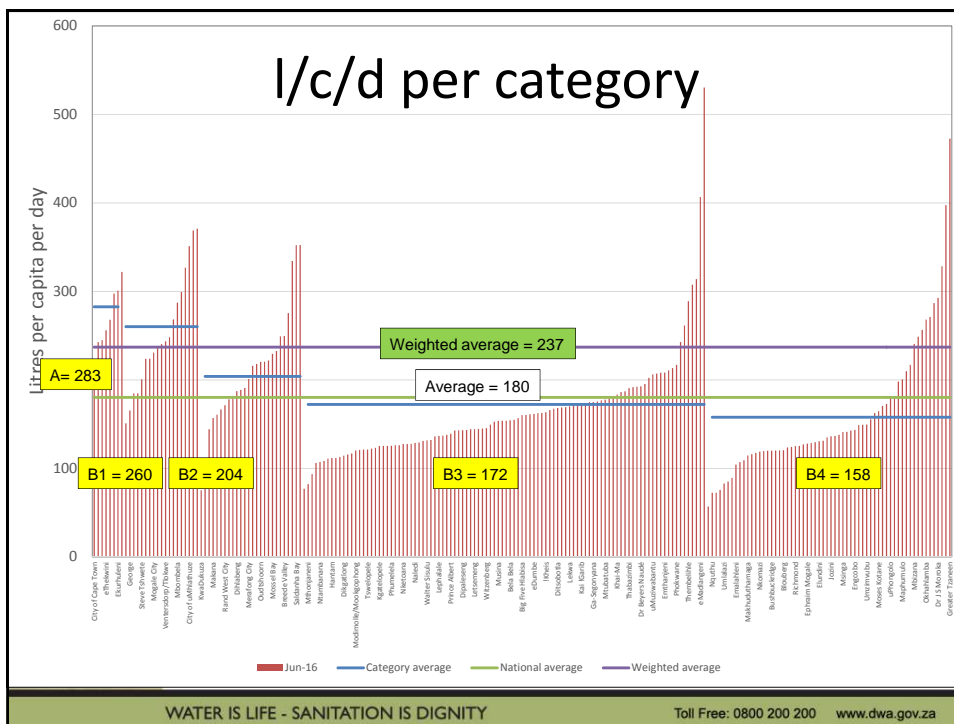
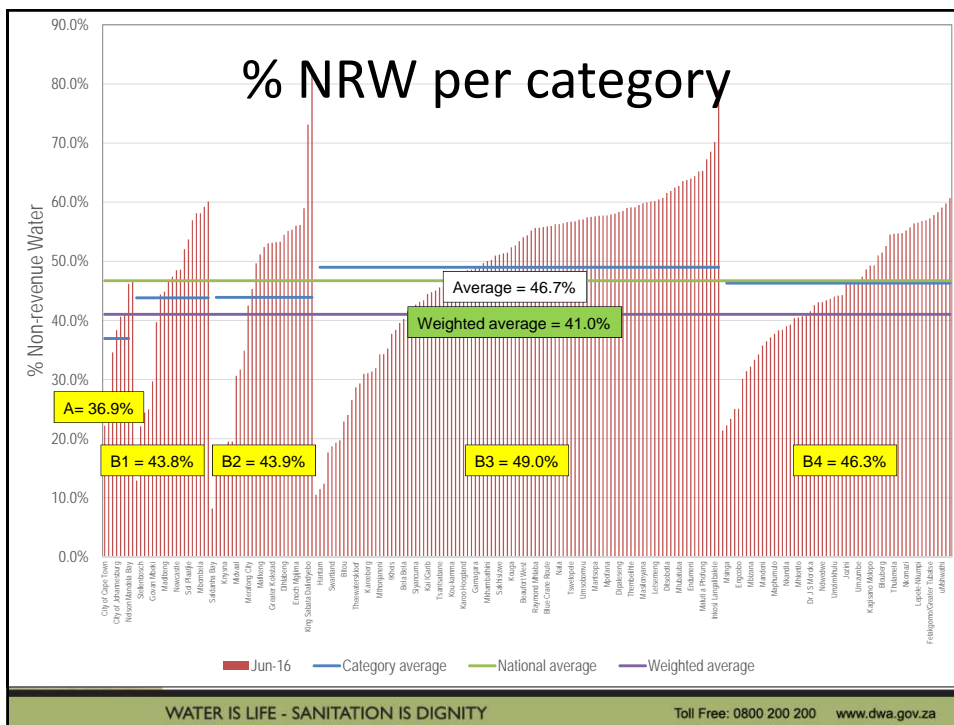


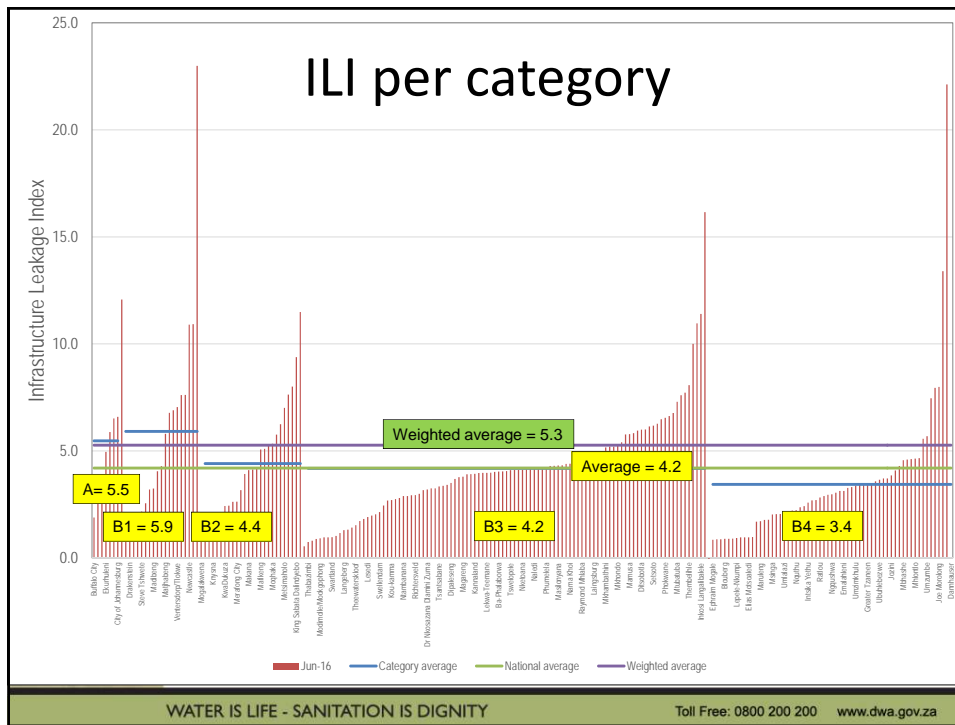
2015/16 Water Balance per Province

Province	Population served	SIV (m³/annum)	NRW (m³/annum)	% NRW	% WL	l/c/d	ILI
EC	4 477 918	332 151 376	158 647 165	47.8%	45.0%	200	4.8
FS	2 723 028	207 835 805	106 908 574	51.4%	46.6%	209	4.8
GT	12 978 281	1 473 100 700	528 839 540	35.9%	27.4%	305	5.8
LIM	4 225 967	281 235 907	155 016 679	55.1%	55.1%	182	1.3
KZN	8 491 508	697 751 184	327 444 107	46.9%	43.0%	225	6.2
NW	3 039 995	206 496 825	105 577 898	51.1%	51.1%	186	4.7
NC	1 085 944	94 205 305	45 418 308	48.2%	45.5%	238	7.1
WC	6 108 993	482 695 411	102 720 237	21.3%	16.7%	201	2.4
MP	3 622 506	270 990 713	129 852 490	47.9%	43.9%	205	4.3
National	46 754 140	4 046 463 225	1 659 588 711	41.0%	35.9%	233	5.3

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KPI trend

Category	State of NRW in SA (2009/10)				3% No Drop (2012/13)				2015/16 Nat Benchmark			
	No	% NRW	ILI	l/c/d	No	% NRW	ILI	l/c/d	No	% NRW	ILI	l/c/d
A	8	34.3%	8.2	291	8	32.3%	5.4	280	8	34.4%	5.3	283
B1	18	41.3%	7.4	241	15	41.5%	6.5	261	19	48.1%	5.9	260
B2	26	30.5%	5.7	230	15	26.2%	4.8	321	25	44.3%	4.4	204
B3	55	37.0%	4.7	164	49	37.1%	4.2	217	100	52.7%	4.2	172
B4	25	72.5%	7.8	65	14	49.5%	4.0	90	61	49.6%	3.4	158
Total	132	36.8%	6.8	235	101	34.6%	6.2	252	213	41.0%	5.3	233

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Strategic overview (1)

- National water balance number of datasets has reduced ($\pm 50\%$) but the data quality for some municipalities is improving
- Free basic water has a significant impact on the NRW, especially in the category B3 and B4 municipalities
- Improved analysis has not significantly changed key performance indicators over the past 5 to 10 years
- Focus should be on Cat A and B1 municipalities

Strategic overview (2)

- Gauteng is the largest water user in the country, and with KZN and Western Cape, account for 66% of the total demand.
- Gauteng and KZN account for 52% of the NRW by volume.
- Limpopo has the highest percentage NRW and water losses but the lowest I/c/d and ILI.
- Northern Cape has the highest ILI
- National NRW = 41%; WL = 35.9%; I/c/d = 233; ILI = 5.3



THANK YOU

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