water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

2030 NDP
NATIONAL DEVELOPMENT PLAN
Our Future - make it work

2022 WESTERN CAPE GREEN DROP REPORT "UNPACKED"

WESTERN CAPE WATER CARE FORUM

N. Davis-Wolmarans
9 June 2022



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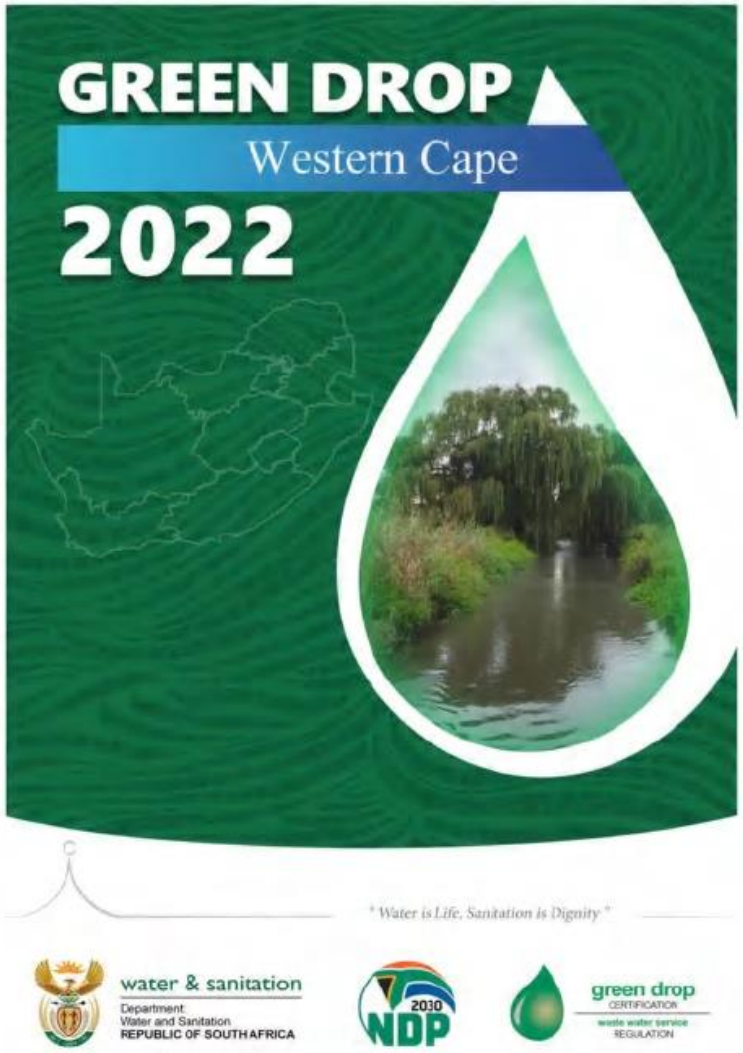


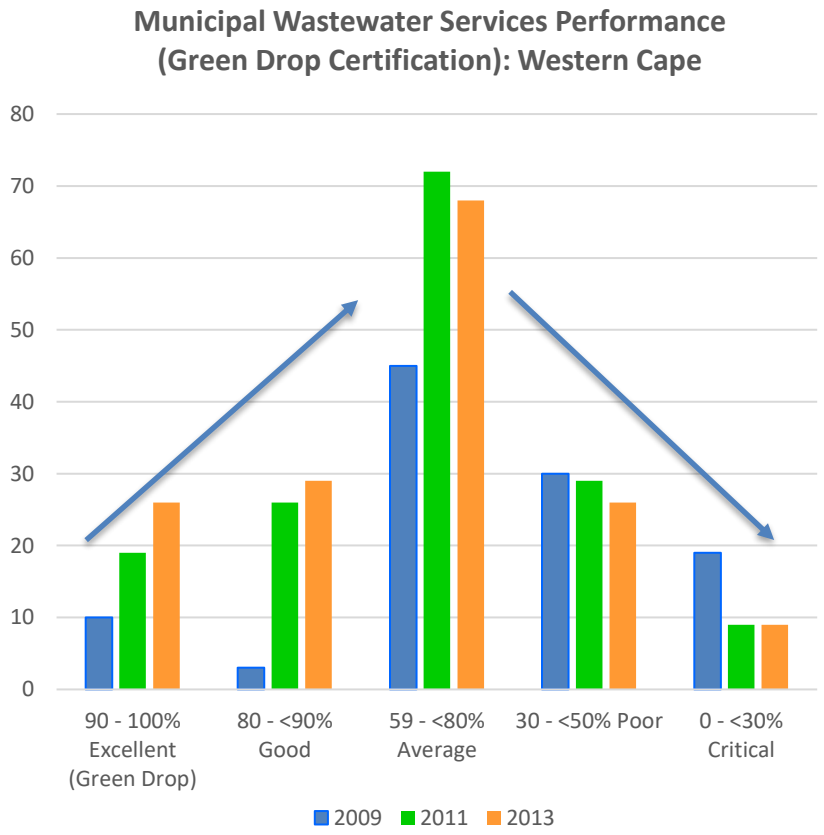
National Green Drop Report 2022 released by Minister Mchunu on 1 April 2022

All WSA WWTWs in the country assessed against set GD criteria

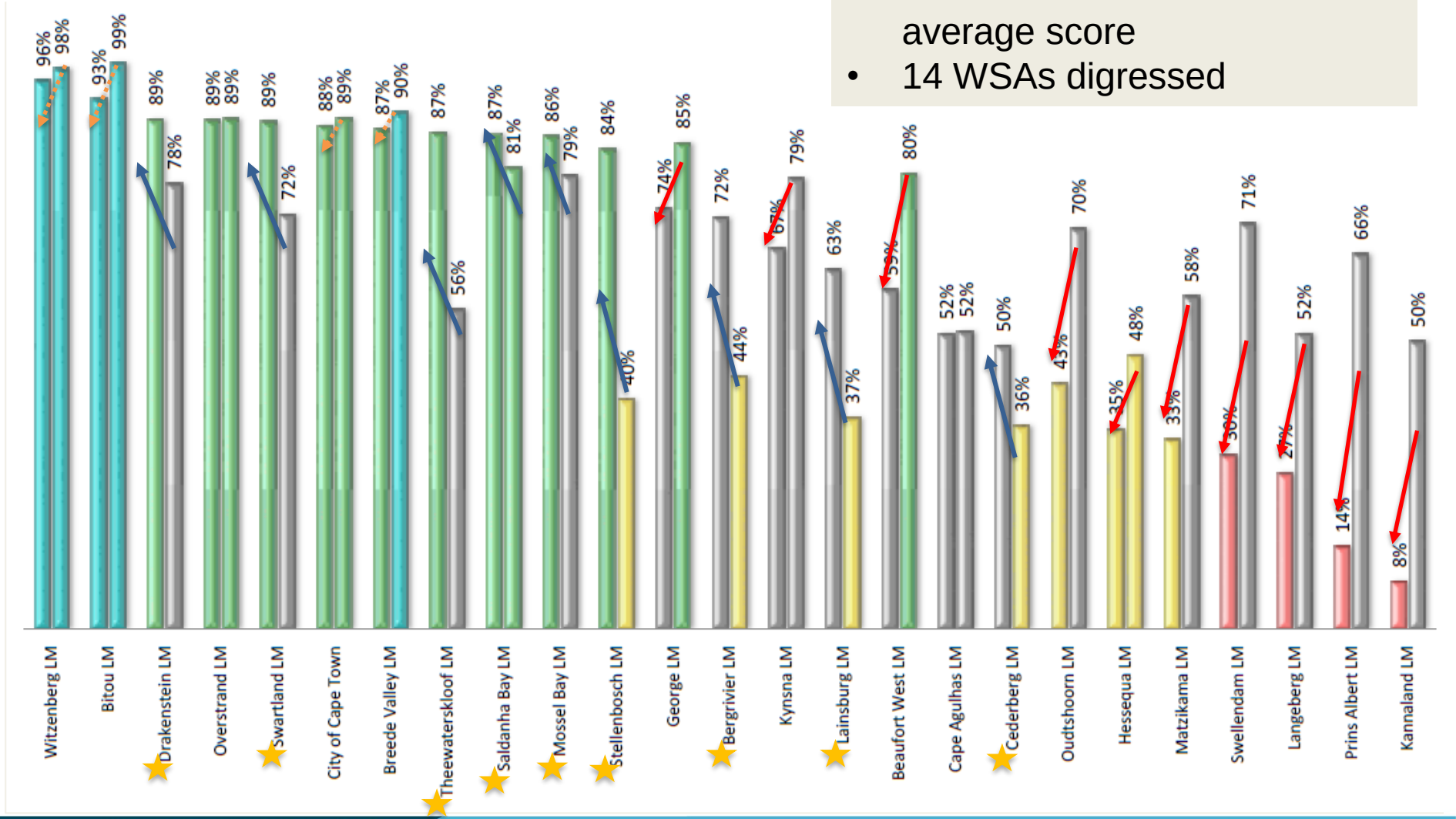
Provides the water sector and its stakeholders with ongoing, current , accurate, verified and relevant information on the status of wastewater services in SA

NB: tool to highlight challenge areas and allows focused and strategic approaches for
corrective action plans and consequent continuous improvement.

- The last Green Drop report was released in 2013 and the Blue Drop report in 2014
- The Blue Drop and Green Drop Programmes were **revitalized and relaunched** in June ’21
- At various water sector engagements, municipal officials responsible for water quality management called for the return of these programmes
- The example of previous Green Drop performance on the W Cape Graph serves as proof of the upward curve facilitated by means of incentive-based regulation



- 9 of 25 WSAs improving from 2013 GD
- 2 of 25 WSAs maintained average score
- 14 WSAs digressed



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Left bar = 2022 score
Right bar 2013 score

2030 NDP
NATIONAL DEVELOPMENT PLAN
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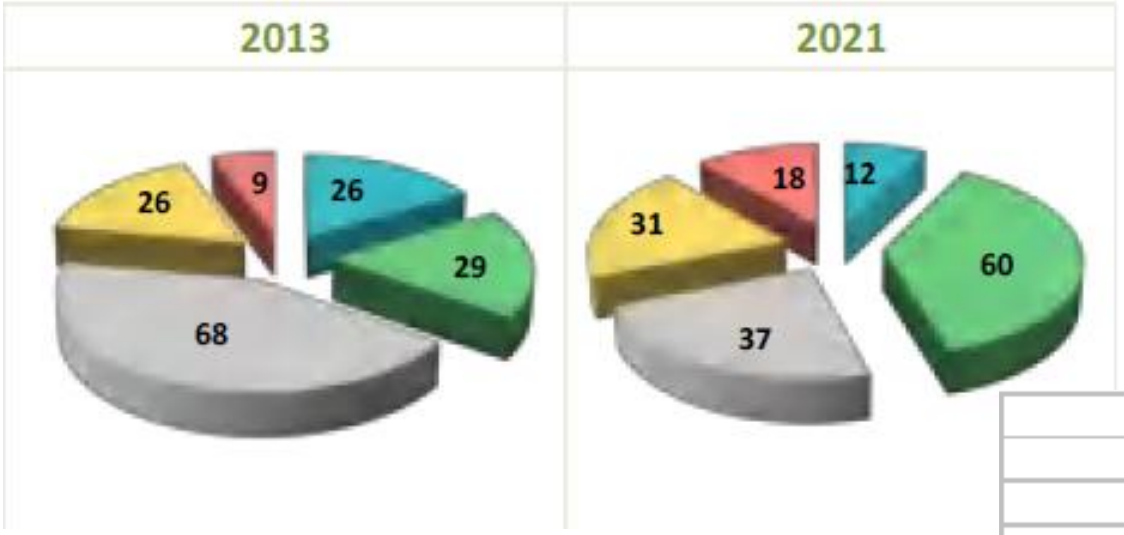
WESTERN CAPE 2022 PERFORMANCE



GREEN DROP COMPARATIVE ANALYSIS					
Performance Category	2009	2011	2013	2021	Performance trend 2013 and 2021
Incentive-based indicators					
Municipalities assessed (#)	20 (100 %)	27 (100%)	25 (100%)	25 (100%)	→
Wastewater systems assessed (#)	107	155	158	158	→
Average Green Drop score	47%	65%	69%	66%	↓
Green Drop scores ≥50% (#)	46/107 (44%)	117/155 (75%)	123/158 (78%)	109/158 (69%)	↓
Green Drop scores <50% (#)	61/107 (56%)	38/155 (25%)	35/158 (22%)	49/158 (31%)	↓
Green Drop Certifications (#)	10	19	26	12	↓
Technical Site Inspection Score (%)	NA	65%	74%	69%	↓

NA = Not Applied *NI = No Information* *↑= improvement, ↓= regress, →= no change*

14 drops, dropped

blue drop
CERTIFICATION
drinking water quality
REGULATION

green drop
CERTIFICATION
waste water service
REGULATION

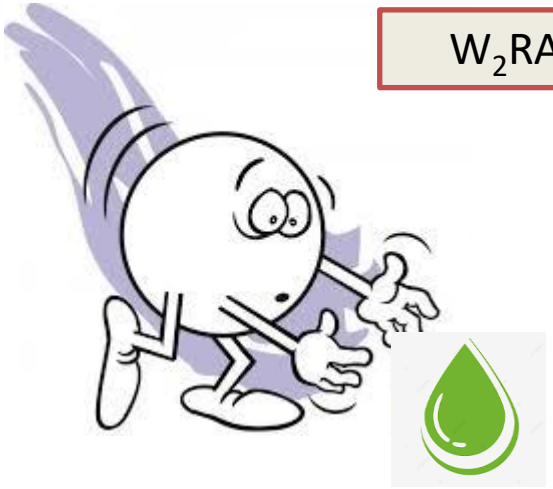
Process controllers

Water Safety Plans

W_2RAPs

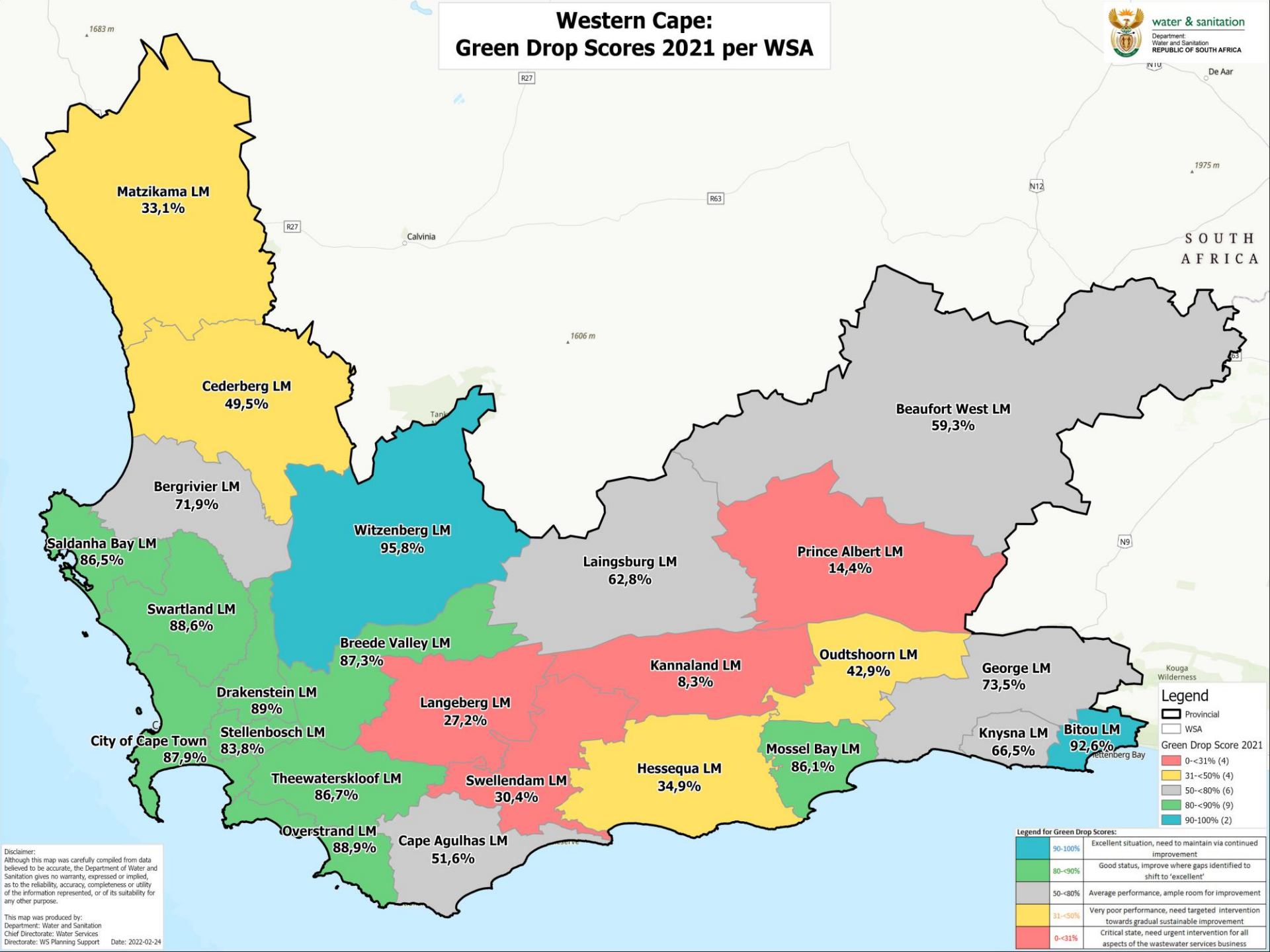
IRIS
INTEGRATED REGULATORY INFORMATION SYSTEM

Process audits



O&M budgets

Western Cape:
Green Drop Scores 2021 per WSA

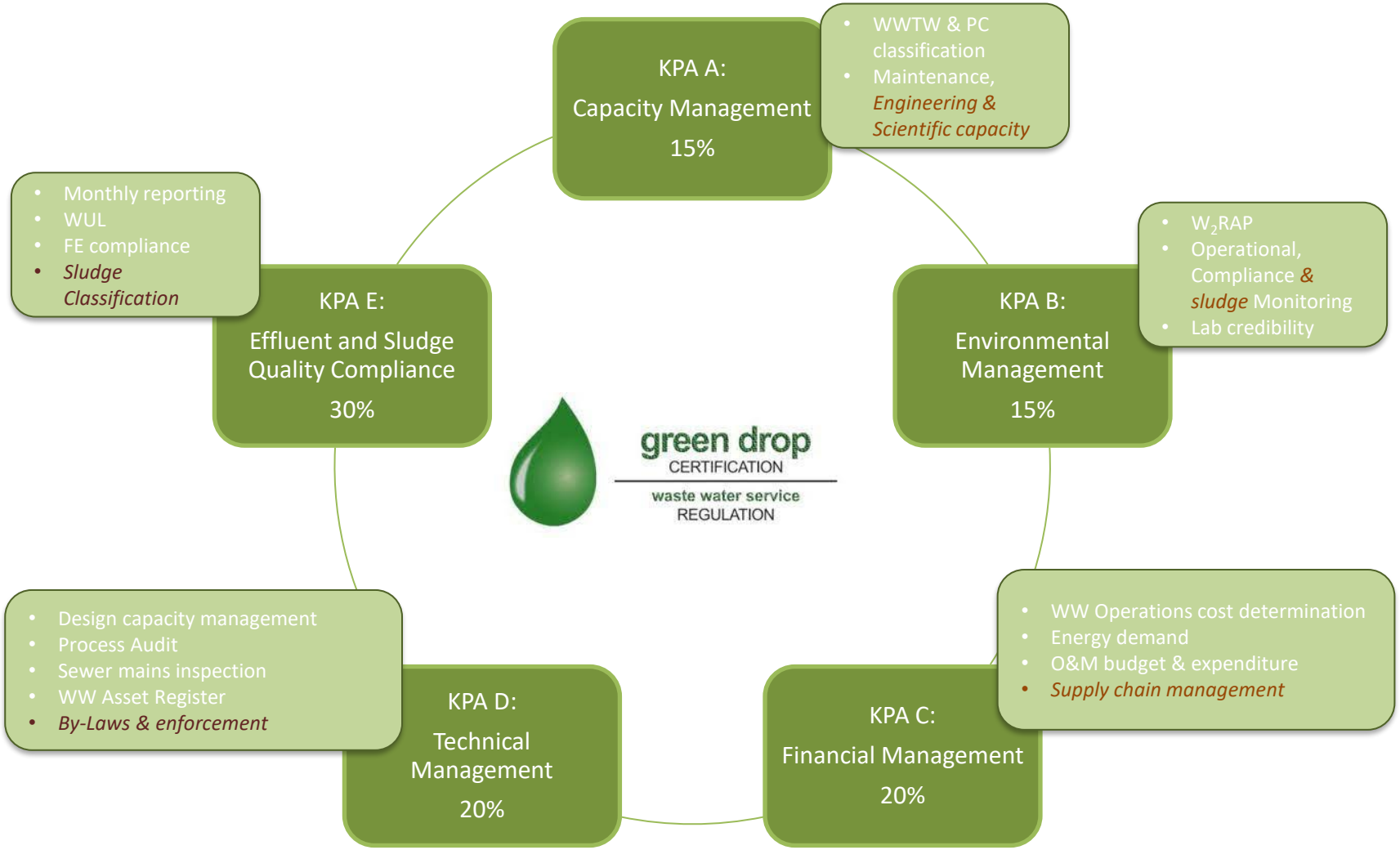


Legend for Green Drop Scores:

	90-100%	Excellent situation, need to maintain via continued improvement
	80-<90%	Good status, improve where gaps identified to shift to 'excellent'
	50-<80%	Average performance, ample room for improvement
	31-<50%	Very poor performance, need targeted intervention towards gradual sustainable improvement
	0-<31%	Critical state, need urgent intervention for all aspects of the wastewater services business

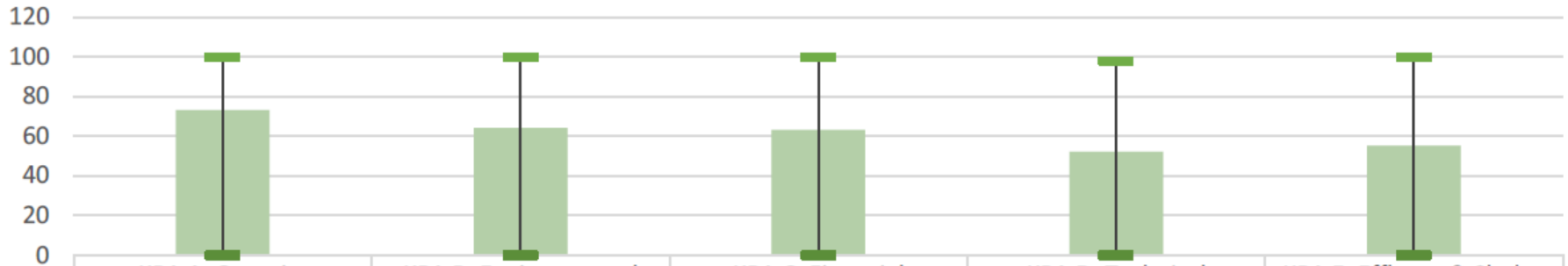
This map was produced by:
Department: Water and Sanitation
Chief Directorate: Water Services
Directorate: WS Planning Support
Date: 2022-02-24

2021 GREEN DROP REQUIREMENTS



CHALLENGE AREAS

KPA #	Key Performance Area	*Weight*	Minimum GD Score (%)	Maximum GD Score (%)	Mean GD Score (%)	# Systems <31%	# Systems ≥80%
A	Capacity Management	*15%*	0%	100%	**73%**	12 (8%)	94 (59%)
B	Environmental Management	*15%*	0%	100%	**64%**	14 (9%)	70 (44%)
C	Financial Management	*20%*	0%	100%	**63%**	42 (27%)	85 (54%)
D	Technical Management	*20%*	0%	98%	**52%**	48 (30%)	51 (32%)
E	Effluent and Sludge Compliance	*30%*	0%	100%	**55%**	31 (20%)	30 (19%)



	KPA A: Capacity Management	KPA B: Environmental Management	KPA C: Financial Management	KPA D: Technical Management	KPA E: Effluent & Sludge Compliance
Mean	73	64	63	52	55
Max	100	100	100	98	100
Min	0	0	0	0	0

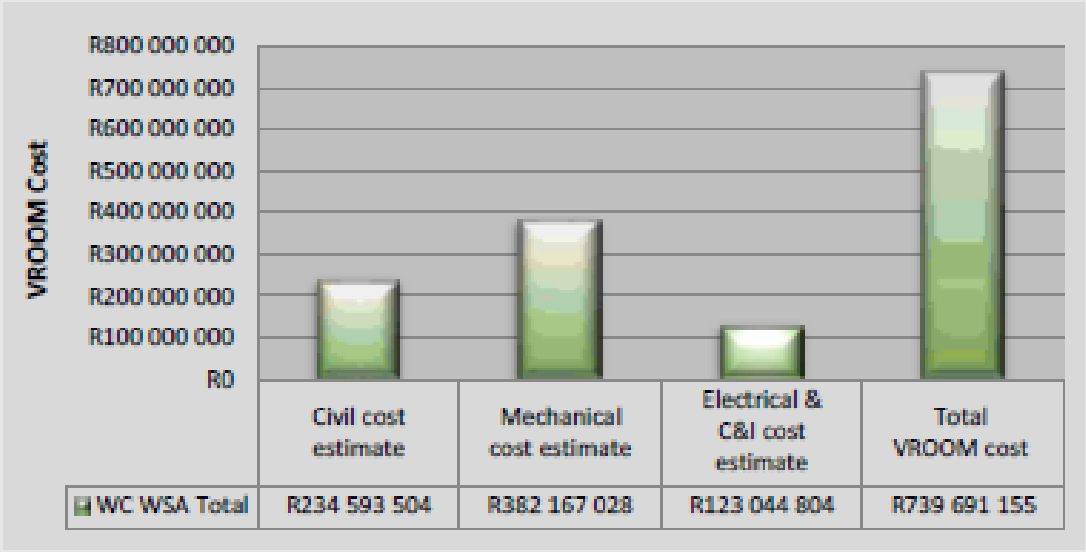
FINANCIAL MANAGEMENT

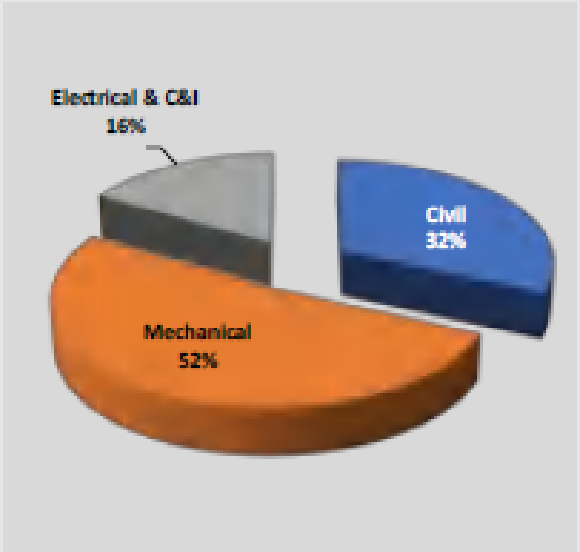
- Insufficient financial resourced often cited as a root cause of dysfunctional or non-compliant ww systems
- Knowledge and monitoring of financial spending is a critical part of wastewater management
  - Cost of treatment (R/m^3)
  - O&M budget and expenditure
  - Asset figures
  - Capital funding
- Challenges:
  - evidence presented in different formats, levels of detail, or absent
  - Generic or non-ringfenced budgets
  - Contract lump sums for Service Providers presented as budgets
  - Some cost drivers e.g. electricity not included

WSA	Capital budget available	O&M budget (2020/21)	O&M expended (2020/21)	% Expended	Total Current Asset Value
City of Cape Town	R12,471,000,000	R1,457,609,560	R1,519,030,180	104%	R3,558,167,000
Langeberg	NI	R6,138,780	NI	NI	NI
Laingsburg	R3,410,180	R1,619,380	R1,438,390	89%	R3,378,580
Kannaland	R8,400,000	R6,549,080	NI	NI	R73,821,020
Prince Albert	NI	NI	NI	NI	R3,498,920
Beaufort West	R42,696,730	R7,017,760	R5,182,360	74%	R20,382,420
Drakenstein	R12,052,010	R190,294,000	R179,675,000	94%	R894,133,000
Bergrivier	R44,300,000	R20,800,000	R20,800,000	100%	R91,380,000
Cederberg	R20,275,000	R2,016,000	R478,000	24%	R38,478,000
Matzikama	R26,382,825	NI	NI	NI	NI
Stellenbosch	R1,147,000,000	R30,133,000	R23,155,000	77%	R942,663,000
Witzenberg	R9,760,000	R29,166,000	R26,858,000	92%	R114,669,400
Breede Valley	R28,200,000	R123,000,000	R119,000,000	97%	R422,946,000
Theewaterskloof	R59,028,000	R13,035,000	R12,882,000	99%	NI
Swellendam	NI	NI	NI	NI	NI
Cape Agulhas	R55,924,000	R19,559,000	R18,360,000	94%	NI
Hessequa	R39,170,300	NI	NI	NI	NI
Mossel Bay	R134,318,000	R16,230,330	R14,816,130	91%	NI
George	R270,600,000	NI	R99,423,380	NI	R150,567,342
Knysna	R1,674,000	NI	NI	NI	R180,434,920
Bitou	R7,700,000	R42,042,170	R16,620,200	40%	R117,081,000
Oudtshoorn	R11,293,000	R14,285,590	R12,597,850	88%	R29,954,480
Swartland	R64,576,000	R55,489,300	R50,615,520	91%	R329,107,000
Overstrand	R35,132,000	R95,106,980	R97,700,390	103%	R692,434,000
Saldanha	R24,758,280	R68,080,720	R55,111,950	81%	R713,722,000
Totals	**R14,517,650,325**	**R2,198,172,650**	**R2,273,744,350**	**103%**	**R8,376,818,082**

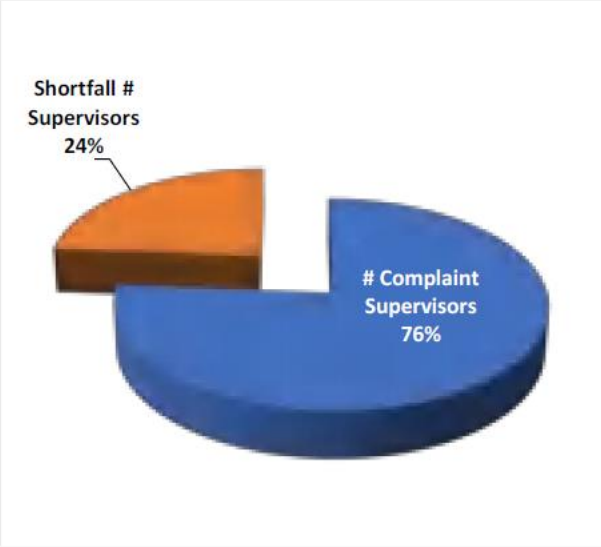
VROOM

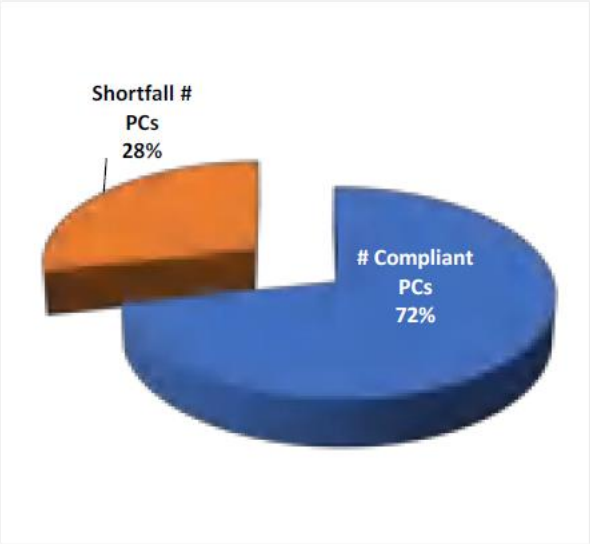
- Very Rough Order of Estimates (VROOM)
  - Estimate of capital requirement to restore functionality of wastewater infrastructure
  - Determined for those WWTW that were physically inspected
  - Intended to be used to prioritize grant funding with support from National Treasury





PROCESS CONTROLLER COMPLIANCE





- 11 of 25 WSAs comply fully with ***supervisor requirement*** (44%)
  - Highest shortfall – Swellendam, Hessequa, Langeberg, Matzikama and George
- Only 4 WSAs comply fully with the ***process controller requirements*** at their respective WWTWs i.e Witzenberg Overstrand, Laingsburg and Prince Albert (16%)
- 63% of PCs underwent training over past 2 years

OPERATIONAL & COMPLIANCE MONITORING

- *If you don't measure it, you can't manage it*

- The primary objective of a WWTW is to produce final effluent and biosolids to an acceptable standard – the only way to measure is to monitor
  - Operational monitoring = process monitoring (technology and influent dependent)
  - Compliance monitoring – final effluent monitoring (in accordance with Authorisation/license)
    - 22 of 158 WWTWs not authorised (14%) / 10 WWTWs with permits/exemptions

- Only **44%** of WW systems had satisfactory operational monitoring programmes

Links closely to process controller competence

NOTE: GA 2006 vs 2013

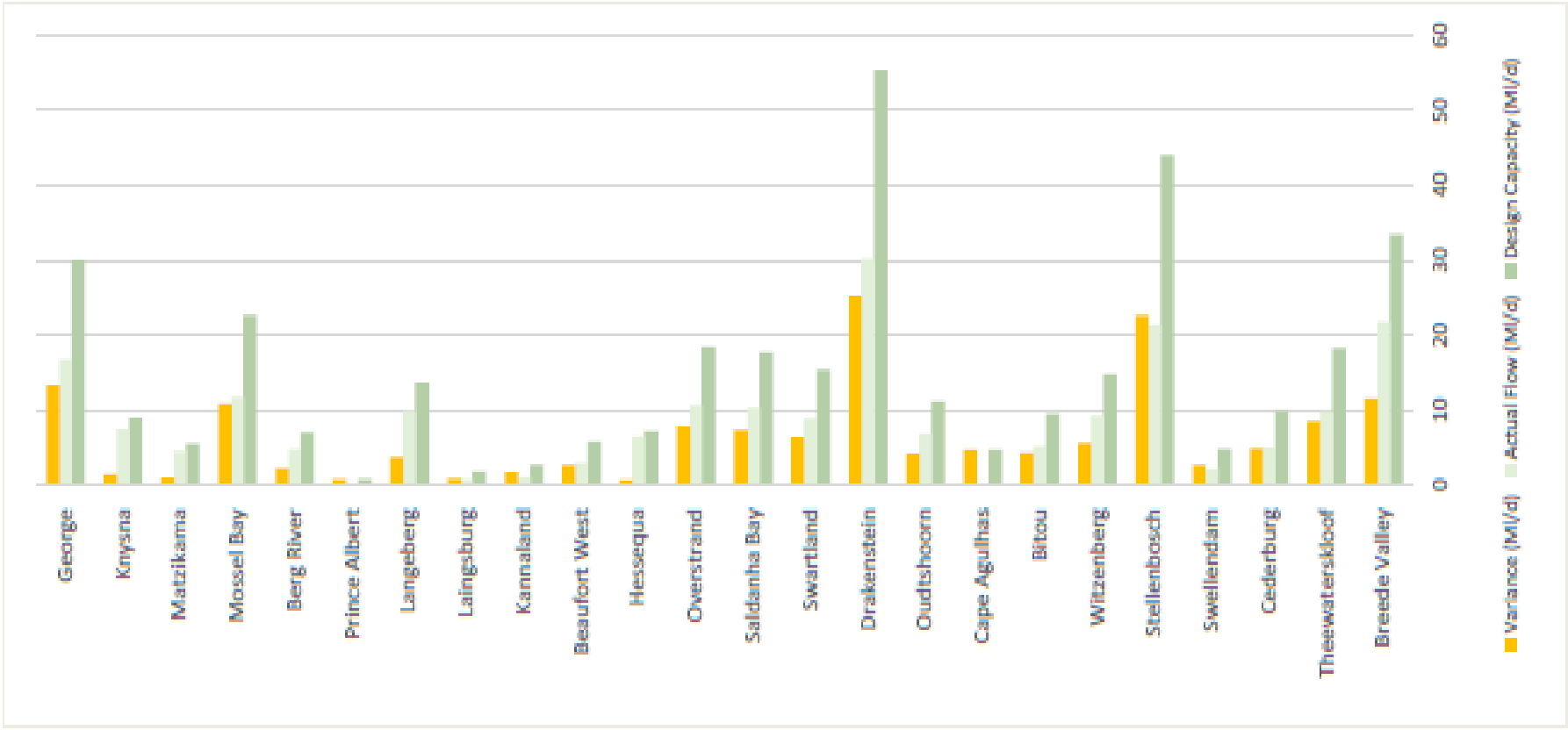
TABLE 3.2: Monitoring requirements for domestic wastewater discharges

DISCHARGE VOLUME ON ANY GIVEN DAY	MONITORING REQUIREMENTS
10 to 100 cubic metres	pH Electrical Conductivity (mS/m) Faecal Coliforms (per 100 ml)
100 to 1000 cubic metres	pH Electrical Conductivity (mS/m) Faecal Coliforms (per 100 ml) Chemical Oxygen Demand (mg/l) Ammonia as Nitrogen (mg/l) Suspended Solids (mg/l)
1 000 to 2 000 cubic metres	pH

TABLE 2.2: Monitoring requirements for domestic wastewater discharges

DISCHARGE VOLUME ON ANY GIVEN DAY	MINIMUM MONITORING REQUIREMENTS
10 to 100 cubic metres	pH Electrical Conductivity (mS/m) Faecal Coliforms (per 100 ml)
100 to 1 000 cubic metres	pH Electrical Conductivity (mS/m) Faecal Coliforms (per 100 ml) Chemical Oxygen demand (mg/l) Ammonia as Nitrogen (mg/l) Suspended Solids (mg/l) Phosphate (mg/l)
1 000 to 2 000 cubic metres	pH Electrical Conductivity (mS/m) Faecal Coliforms (per 100 ml) Chemical Oxygen demand (mg/l) Ammonia as Nitrogen (mg/l) Nitrate/Nitrite as Nitrogen (mg/l) Free Chlorine (mg/l) Suspended Solids (mg/l) Ortho-Phosphate as Phosphorous (mg/l)

TREATMENT CAPACITY



TREATMENT CAPACITY

17 systems with known design capacities are hydraulically overloaded

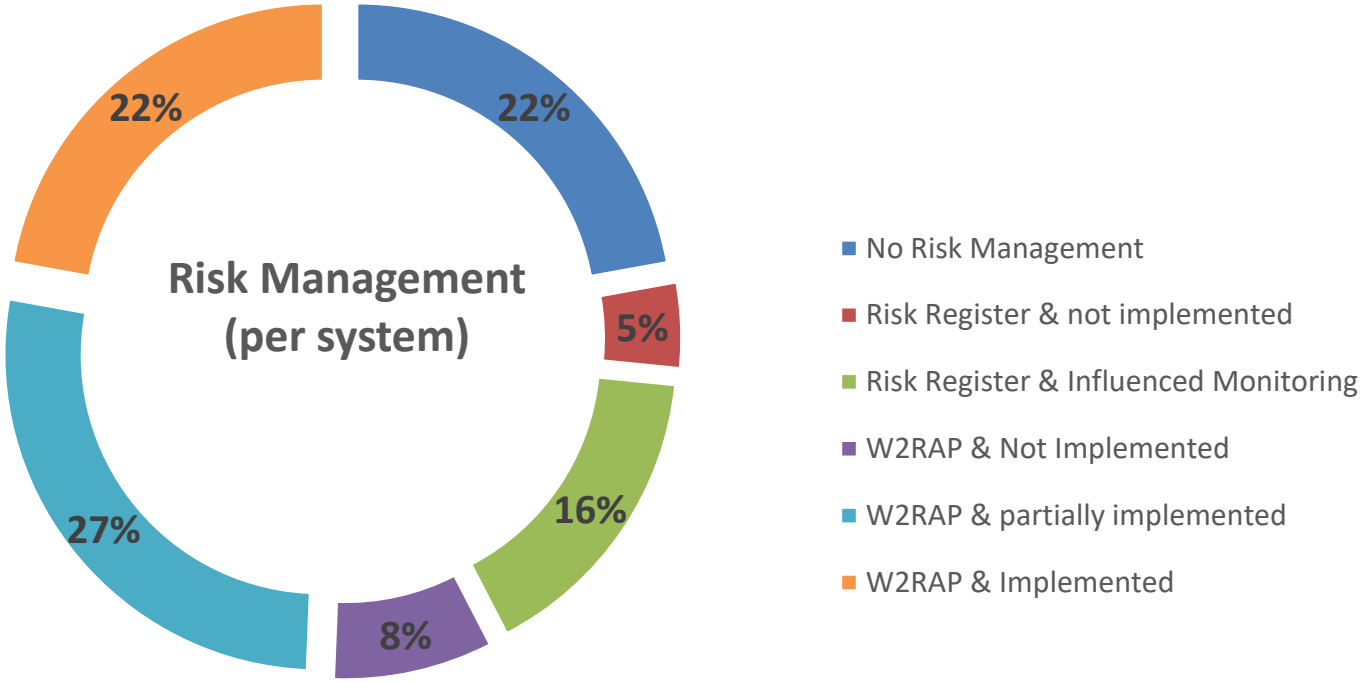
- *18 systems not monitoring inflow/did not submit information*

- City of Cape Town: 3/26 (Zandvliet, Gordon's Bay, Klipheuwel)
- Breede Valley: 2/4 (Rawsonville, Touwsrivier)
- Theewaterskloof: 1/8 (Riviersonderend)
- Stellenbosch 1/5 (Pniel)
- Oudtshoorn 1/3 (De Rust
- Swartland: 1/7 (Koringberg)
- Hessequa 2/10 (Melkhoutfontein, Riversdale, Slangrivier)
- Langeberg: 1/5 (Robertson)
- Mossel Bay: 1/7 (Grootbrak)
- Matzikama: 1/6 (Knysna)

FINAL EFFLUENT COMPLIANCE

WSA Name	Effluent Compliance									Enforce-ment Measures*
	Authorisation Status	Microbiological Compliance (%)			Chemical Compliance (%)			Physical Compliance (%)		
		Ave. (%)	# WWTWs >90%	# WWTWs <30%	Ave. (%)	# WWTWs >90%	# WWTWs <30%	Ave. (%)	# WWTWs >90%	# WWTWs <30%	
City of Cape Town	23 WULs; 3 GAs	84%	17	2	69%	8	2	76%	8	0	0
Breede Valley	2 WUL; 1 GA; 1 Permit	96%	4	0	70%	0	0	85%	2	0	0
Theewaterskloof	4 WULs; 2 GAs; 2 Permits	40%	0	2	43%	0	3	72%	1	0	0
Cederburg	2 WULs; 5 GAs	42%	1	3	21%	0	5	64%	3	2	0
Swellendam	1 WUL; 3 Unknown	75%	3	1	80%	2	0	99%	4	0	0
Stellenbosch	2 WULs; 3 GAs	43%	1	2	54%	0	0	66%	0	0	0
Witzenberg	2 GAs; 2 Permits	98%	4	0	82%	3	0	91%	2	0	0
Bitou	2 WULs; 3 GAs	100%	2	0	100%	2	0	100%	2	0	0
Cape Agulhas	1 Exempted; 1 Not authorised; 2 Unknown	77%	2	0	69%	1	0	65%	1	0	0
Oudtshoorn	1 Exempted; 1 GA; 1 Unknown	49%	1	1	33%	1	2	33%	1	2	0
Drakenstein	3 WULs; 3 GAs	76%	2	0	89%	4	0	90%	5	0	0
Swartland	1 WUL; 5 GAs; 1 Permit	53%	2	3	54%	3	3	65%	4	2	0
Saldanha Bay	2 WULs; 4 GAs; 1 Not authorised	74%	2	0	69%	1	0	74%	2	0	0
Overstrand	1 WUL; 5 GAs	85%	2	0	74%	1	0	76%	2	1	0
Hessequa	5 GAs; 4 Not authorised; 1 Unknown	49%	4	5	53%	4	4	60%	5	3	0
Beaufort West	4 GAs	73%	3	1	71%	2	1	64%	2	1	0
Kannaland	4 Not authorised	0%	0	4	0%	0	4	0%	0	4	1
Laingsburg	2 GAs	50%	1	1	70%	1	0	44%	0	0	0
Langeberg	4 GAs; 1 Not authorised	60%	1	1	83%	1	0	89%	4	0	0
Prince Albert	3 GAs	22%	0	2	43%	1	2	52%	0	0	0
Bergrivier	1 WUL; 4 Not authorised	51%	1	1	43%	0	2	72%	2	0	0
Mossel Bay	2 WULs; 5 GAs	84%	2	0	75%	3	0	92%	6	0	0
Matzikama	5 WULs; 8 GAs	65%	6	3	16%	0	10	50%	0	3	0
Knysna	2 Exempted; 1 WUL; 3 GAs	71%	2	0	86%	3	0	87%	4	0	1
George	2 WULs; 4 GAs	84%	5	1	94%	5	0	98%	6	0	0
Totals		**64%**	**68**	**33**	**62%**	**46**	**38**	**70%**	**66**	**18**	**2**

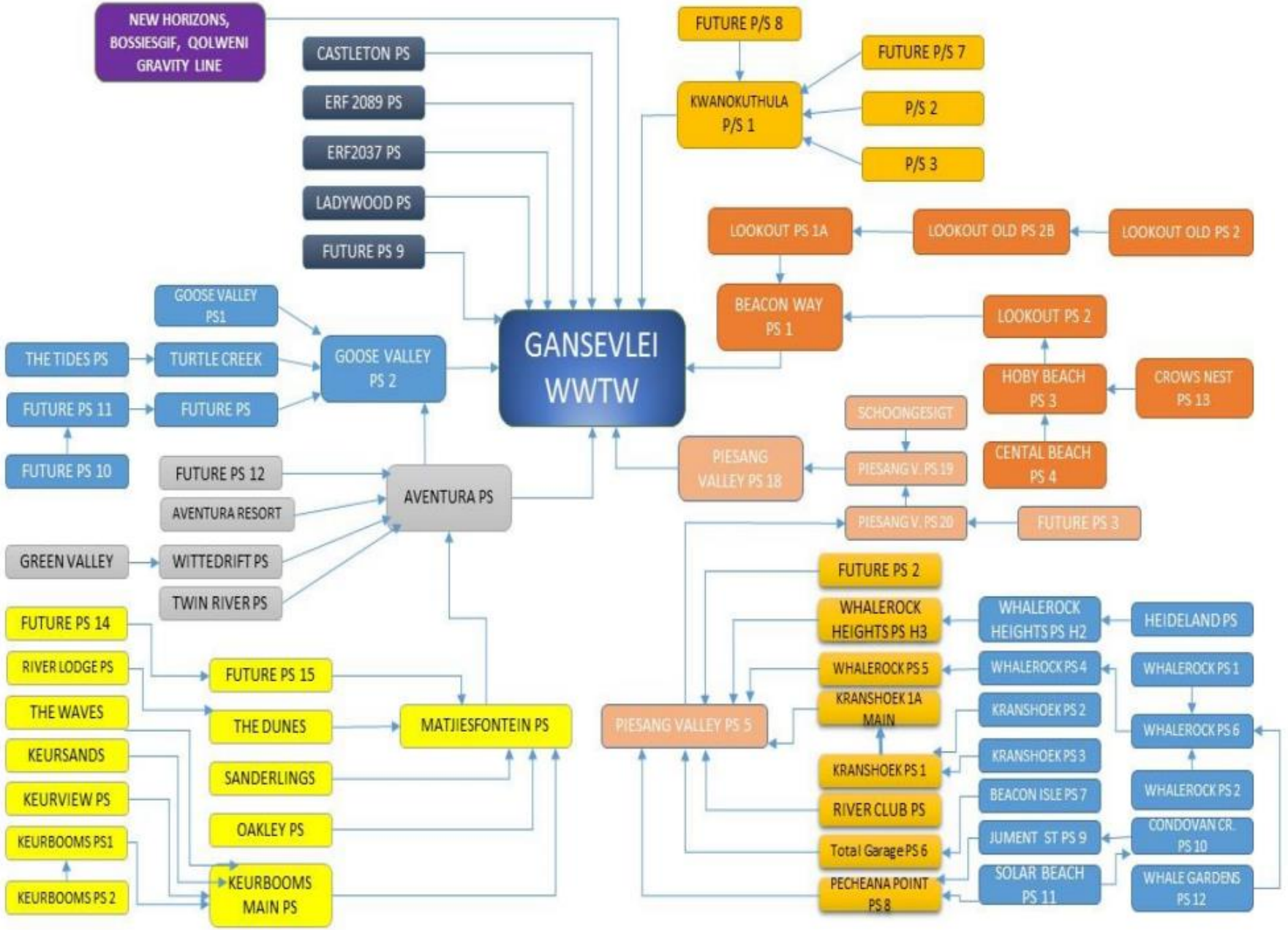
WASTEWATER RISK ABATEMENT

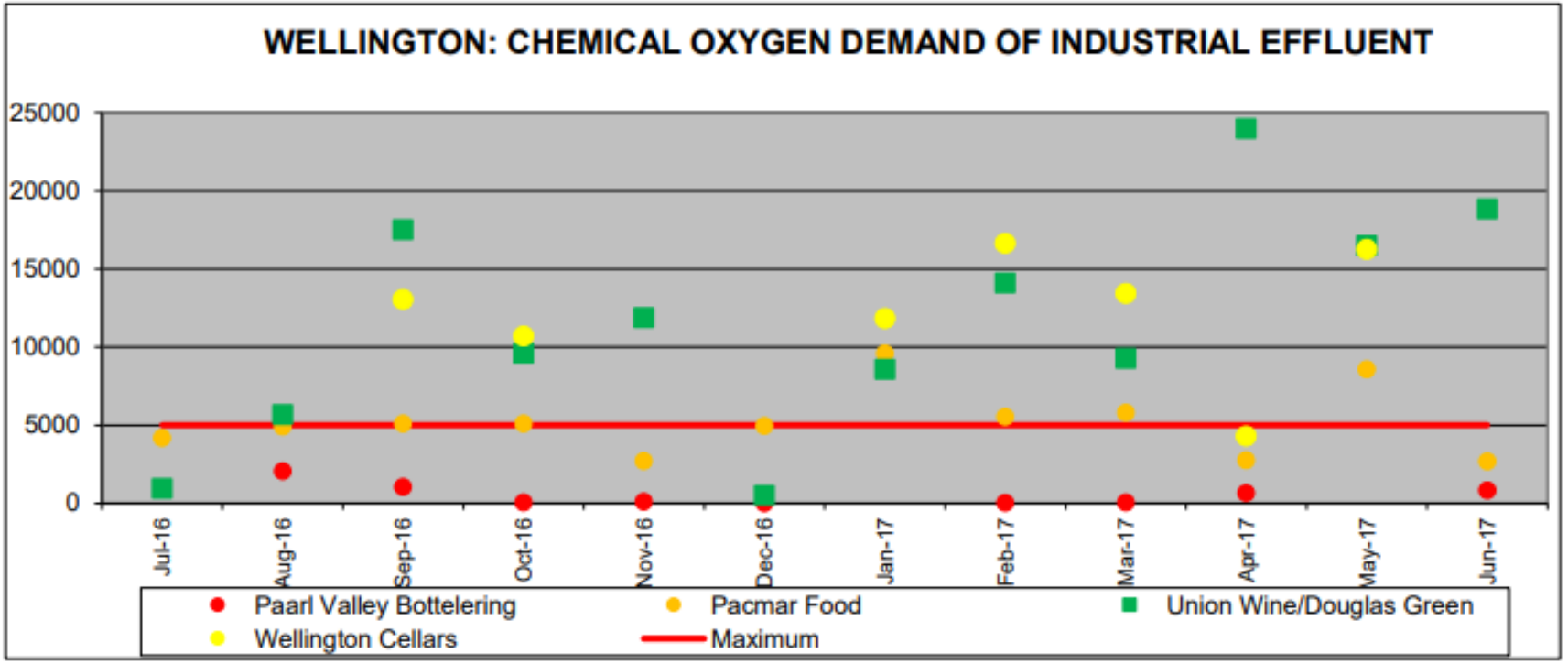


GD requirement:

- A practical and site specific W2RAP is in place which
  - (i) describes the system
  - (ii) identifies and prioritizes risks,
  - (iii) includes measures to mitigate inefficiencies/inadequacies that result in non-compliance
- Implementation evidence and proof of management commitment

GANSEVLEI WWTW COLLECTION SYSTEMS




WELLINGTON: CHEMICAL OXYGEN DEMAND OF INDUSTRIAL EFFLUENT
25000
20000
15000
10000
5000
0
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-17
Jun-17
Paarl Valley Bottelering
Pacmar Food
Union Wine/Douglas Green
Wellington Cellars
Maximum

RESIDUAL RISKS

Annexure B1: Assessment of Risk with Action Points and Responsibilities for Improvement and Upgrading of Hermanus SeA1:M21wer Pump Stations								Mitigated Risks		
Existing Risks	Likelihood	Consequence	Risk rating (L x C)	Recommendations	Responsibility	Timeframe for implementation of mitigation measures	Current Mitigation Measures	Likelihood	Consequence	Risk rating (L x C)
1) De Mond Camp Sewer Pump Station										
Power (Electricity) failure at pump station	0,2	70	14	Make use of roaming generators and suction tankers. Monitor early warning system.	Veolia team Mr G leRoux	On-going	Roaming generators and suction tankers available.	0,1	70	7
Pump failure at pump station	0,2	70	14	Use maintenance teams to do repair work and use suction tankers to control sump level of pump station. Ensure duty and standby pump operations. Monitor early warning system.	Veolia team Mr G leRoux	On-going	Veolia maintenance teams available to do repair work. Pumps on duty standby. Suction tankers available.	0,1	70	7
Motor Control Centre (MCC) failure at pump station	0,2	70	14	Use maintenance teams to do repair work and use suction tankers to control sump level of pump station.	Veolia team Mr G leRoux	On-going	Veolia maintenance teams available to do repair work. Suction tankers available.	0,1	70	7
Insufficient sump and / or pump capacity at pump station	0,1	70	7	Forward master planning.	Mr H Bilgnaut Mr P Robinson	Bi-annually	Master plan up to date. Sump and pump capacity sufficient	0,1	70	7
Pump station rising main failure	0,1	70	7	Use maintenance teams to do repair work and use suction tankers to control sump level of pump station. Monitor early warning system.	Veolia team Mr G leRoux	On-going	Veolia maintenance teams available to do repair work. Suction tankers available.	0,1	70	7
Pump station vandalism	0,2	70	14	Use maintenance teams to do repair work and use suction tankers to control sump level of pump station. Investigate security measures and daily inspections. Monitor early warning system.	Veolia team Mr G leRoux	On-going	Veolia maintenance teams available to do repair work. Suction tankers available. Daily inspections done. Installation of early warning system.	0,1	70	7
2) Scout Camp Sewer Pump Station										
Power (Electricity) failure at pump station	0,2	70	14	Make use of on site generator and / or suction tankers. Monitor early warning system.	Veolia team Mr G leRoux	On-going	Permanent existing generator and suction tankers available.	0,1	70	
Pump failure at pump station	0,2	70	14	Use maintenance teams to do repair work and use suction tankers to control sump level of pump station. Ensure duty and standby pump operations. Monitor early warning system.	Veolia team Mr G leRoux	On-going	Veolia maintenance teams available to do repair work. Pumps on duty standby. Suction tankers available.	0,1	70	7
Motor Control Centre (MCC) failure at pump station	0,2	70	14	Use maintenance teams to do repair work and use suction tankers to control sump level of pump station.	Veolia team Mr G leRoux	On-going	Veolia maintenance teams available to do repair work. Suction tankers available.	0,1	70	7
Insufficient sump and / or pump capacity at pump station	0,1	70	7	Forward master planning.	Mr H Bilgnaut Mr P Robinson	Bi-annually	Master plan up to date. Sump and pump capacity sufficient	0,1	70	7
Pump station rising main failure	0,1	70	7	Use maintenance teams to do repair work and use suction tankers to control sump level of pump station. Monitor early warning system.	Veolia team Mr G leRoux	On-going	Veolia maintenance teams available to do repair work. Suction tankers available.	0,1	70	7
Pump station vandalism	0,2	70	14	Use maintenance teams to do repair work and use suction tankers to control sump level of pump station. Investigate security measures and daily inspections. Monitor early warning system.	Veolia team Mr G leRoux	On-going	Veolia maintenance teams available to do repair work. Suction tankers available. Daily inspections done. Daily monitor of early warning system.	0,1	70	7
3) Piet se Bos Sewer Pump Station										
Power (Electricity) failure at pump station	0,2	70	14	Make use of roaming generators and suction tankers. Monitor early warning system.	Veolia team Mr G leRoux	On-going	Roaming generators and suction tankers available.	0,1	70	7
Pump failure at pump station	0,2	70	14	Use maintenance teams to do repair work and use suction tankers to control sump level of pump station. Ensure duty and standby pump operations. Monitor early warning system.	Veolia team Mr G leRoux	On-going	Veolia maintenance teams available to do repair work. Pumps on duty standby. Suction tankers available.	0,1	70	7
Motor Control Centre (MCC) failure at pump station	0,2	70	14	Use maintenance teams to do repair work and use suction tankers to control sump level of pump station.	Veolia team Mr G leRoux	On-going	Veolia maintenance teams available to do repair work. Suction tankers available.	0,1	70	7
Insufficient sump and / or pump capacity at pump station	0,1	70	7	Forward master planning.	Mr H Bilgnaut Mr P Robinson	Bi-annually	Master plan up to date. Sump and pump capacity sufficient	0,1	70	7
Pump station rising main failure	0,1	70	7	Use maintenance teams to do repair work and use suction tankers to control sump level of pump station. Monitor early warning system.	Veolia team Mr G leRoux	On-going	Veolia maintenance teams available to do repair work. Suction tankers available.	0,1	70	7
Pump station vandalism	0,1	70	7	Use maintenance teams to do repair work and use suction tankers to control sump level of pump station. Investigate security measures and daily inspections. Monitor early warning system.	Veolia team Mr G leRoux	On-going	Veolia maintenance teams available to do repair work. Suction tankers available. Daily inspections done. Installation of early warning system.	0,1	70	7
4) Grotto Sewer Pump Station										
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Veolia team	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

W_2RAP IMPLEMENTATION & REPORTING

- Everyone manages risk – focus on formalizing coherent reporting

- W_2RAP is a process and not a document
  - Good baseline document required
  - Internalize reviews

- Make W_2RAP part of your operations/business
  - Monitoring & reporting tool
  - Highlight - escalate high risks

PROPOSALS FOR IMPROVEMENT

- 54 of 158 WW systems are pond systems (44%)
- 3 pond systems achieved Green Drop status in 2022
  - Philadelphia (City of Cape Town)
  - Herbertsdale (Mossel Bay)
  - Hermon (Drakenstein)
- Of the 18 WW systems identified as critical and where regulatory surveillance has been prioritized

12 are pond systems

- **First proposal:** share practices (record-keeping, monitoring, templates etc)

THANK YOU