water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

WATER RESEARCH COMMISSION RDI SYMPOSIUM

WASTEWATER SERVICES REGULATION IN SOUTH AFRICA

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WASTEWATER QUALITY REGULATION
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Presentation Content

- Regulatory Approaches
- SA's Water Sector
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- GD Implementation/10 year plan
- Risk Based Regulation
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Regulation Approaches

- Compliances Monitoring (Norms & Standards)
- Punitive Regulation (Enforcement)
- Risk-based Targeted Regulation
- Incentive-based Regulation (e.g. Green Drop Certification)

South African Water Sector

- Regulate 152 Water Services Authorities (WSA or municipalities) in the 9 provinces of South Africa, regulated by the Department of Water and Sanitation to ensure acceptable Wastewater services.
- 831 Wastewater Treatment Works (WWTW) owned by the municipal sector;
- Includes 121 WWTW ‘s DPW and Four WWTW’s in Private Systems;
- These authorities are assisted in some places by Water Boards and water companies in the task of assuring safe effluent discharge in our water resources and effective wastewater management (Sludge Management)
- There are private entities and National Departments providing water services
- Total receiving flow of 5000 Ml/d or 1825000 Ml/d

Objective of the Green Drop Programme

The Green Drop regulation programme seeks **to identify and develop the core competencies** required for the sector that, if strengthened, will **gradually and sustainably improve the level of wastewater management** in South Africa.

It is a **form of regulation** that holds the intent to synergise the current goodwill exhibited by Water Services Institutions and existing government support programmes, to give the **focus, commitment, planning and resources** needed to achieve excellence in wastewater management.

- The Green Water Services Audit and the PAT are the tools whereby incentive- and risk-based regulation is conducted in South Africa.

- The Green Drop process measures and compares the results of the performance of WSIs, and subsequently rewards (or penalises) the institution upon evidence of their excellence (or failures) according to the minimum standards or requirements that has been defined.

GD Implementation

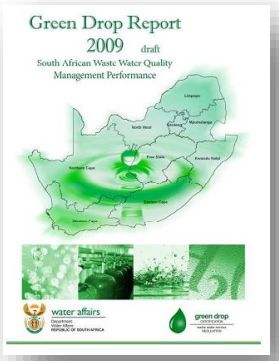
The process seeks to amalgamate legal requirements & best practices within the domain of Water Quality Management (WQ) towards sustainable improvement

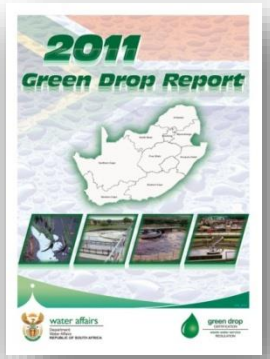
- Green Drop audits and certification takes place every 2nd year, using the full set of GWSA criteria to assess performance of the wastewater system.

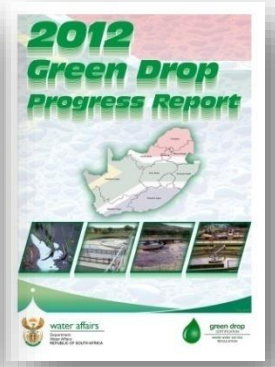
  Output = Green Drop Report

- Progress assessments takes place during the Green Drop 'gap' year, using the PAT to assess the cumulative risk status of treatment systems.

  Output = Green Drop Progress Report

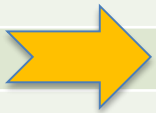






Green Drop 10 Year Plan

GD#	Description	Weighted Scores (%)				
		2015	2017	2019	2021	2023
1	Wastewater Risk Abatement Planning	20	20	25	30	30
2	Technical Skills	10	10	10	5	5
3	Operation, Maintenance, [illegible]ng	10	10	5	5	5
4	Effluent Compliance	30	30	30	35	35
5	Solids/Sludge Handling	5	5	5	0	0
6	Management Accountability & Local Regulation	10	10	10	10	10
7	Asset Management	15	15	15	15	15
Bonus		*17%max*	*17%max*	*17%max*	*17%max*	*17%max*
Penalty		✓	✓	✓	✓	✓
Qualifiers		YES	YES	YES	YES	YES
TOTAL		**100**	**100**	**100**	**100**	**100**



Risk Based Regulation

CRR #	RISK INDICATOR	DESCRIPTION and UNIT			VALUE
A	**DESIGN CAPACITY** *If NI, then calculate or estimate (Class, flow, etc)*	**Hydraulic Design Capacity [Ml/day]**			= I2
B	**OPERATIONAL FLOW** *If ADWF = 0 [NI] and/or Design Capacity = 0 [NI], then CELL H114 = 151% (max weight)*	**ADWF / Hydraulic Design Capacity (Ml/day) x 100 [%]**			= C64
C	**EFFLUENT FAILURE** *[No monitoring or no info; Waived NMR = as per Authorisation]*	**% Microbiological compliance**	% E.coli OR Faecal Coliform	?	=AVE
		% Physical compliance	% pH	?	=AVE
			% Electrical Conductivity	?	
			% Suspended Solids	?	
		% Chemical compliance	% COD	?	=AVE
			% Ammonia	?	
			% Nitrates	?	
			% Orthophosphate	?	
		Overall Compliance			=F,G,H 40-42
D	**TECHNICAL SKILLS** *[Compliance with R2834]*	Supervisor + Process Controllers + Maintenance (1)			= G16
		Supervisor + Maintenance & No Process Control (2)			
		Process Control + Maintenance & No Supervisor (2)			= G18
		Process Control + Supervisor & No Maintenance (2)			
		Supervisor & No Maintenance & No PC's (3)			= G20
		Process Controllers & No Maintenance & No Sup (3)			
		Maintenance & No PC's & No Supervisor (3)			
		No Supervisor & No Maintenance & No PCs (4)			
				Spec WF (1-4)	?
				(CRR)	13
				MaxCRR	17

WHY RISK ABATEMENT PLANNING?

- > 950 publically owned treatment facilities
- Convey, treat ± 6,550,000 kl and 357,500 kl of sludge per day
- Equipment market revenues of $66.5 million in 2014
- Further growth: expanding population, housing, industrial activity, and upgrade of infrastructure surpassing its 20 year life cycle
- Technology development for wastewater and its by-products for its potential commercial value

(Frost & Sullivan, 2014, DWS GWSA 2013).

- It has become increasingly important to establish a balance between **desires, wants and needs** in order to achieve agreed performance.
- Such a balance requires the use of **risk-based decision making** to allow managers to make trade-offs between different priorities and scenarios.

Risk as a metric

- ✓ allows the Regulator to regulate in domains that represent the highest risk to non-compliance of norms and standards
- ✓ allows the WSI to identify and prioritise the critical risk areas within its wastewater system and to take corrective measures to abate these

green drop CERTIFICATION
waste water service REGULATION

GWSA 2014 = watershed:
the Regulator will no longer ask only '*show us the plan*', but will ask '*show us how the implementation of the plan succeeded in addressing the health-based and environmental targets*'

GD Comparative Analysis

GREEN DROP COMPARATIVE ANALYSIS				
Performance Category	**2009**	**2010/11**	**2012/13**	**Performance trend**
Number of municipalities assessed	98	156 (100%)	152 (100%)	→
Number of wastewater systems assessed	444	821	824	↑
Average Green Drop score	37%	45%	46.4%	↑
Number of Green Drop scores ≥50%	216 (49%)	361 (44%)	415 (50.4%)	↑
Number of Green Drop scores<50%	228 (51%)	460 (56%)	409 (49.6%)	↑
Number of Green Drop awards	33	40	60	↑
Average Site Inspection Score	N/A	51.4%	57.0%	↑
NATIONAL GREEN DROP SCORE	N/A	71%	**73.8%**	↑

GD Performance

Province	Number of Wastewater Systems with <30% score	Number of 2013 Green Drop Certificates
Eastern Cape	34	1
Free State	46	1
Gauteng	0	8
Kwa-Zulu Natal	32	19
Limpopo	22	1
Mpumalanga	41	2
Northern Cape	33	1
North West	21	1
Western Cape	9	26
National Total	248	60

Lessons Learned

- Incentive-based regulation is successful, and approach must be retained
- DWS is targeting the right issues which is focussing the attention of the sector
- Documents are good but performance is better – focus must be on implementation. Particularly evident in risk planning vs. risk management
- Streamlining is required between BD and GD
- GD criteria has previously not incentivised green technologies (ponds, wetlands, etc) or small/rural municipalities – differentiated approach required
- Implementation of new criteria lead to "sector shock" and these must be introduced gradually.
- A longer term plan and timeframes are required by WSIs to plan and prepare adequately for GD audits

THANK YOU