OVERVIEW OF CURRENT GREEN DROP REQUIREMENTS

Services Master Class # 2 17th – 18th April

Gauteng, SALGA, IMESA, MILE
Introduction

- The Departments Water Services Regulation unit introduced **alternative regulation approaches** with the primary objective of improving the quality of water services.
- **Conventional regulation** has not been aborted and still forms part of the adopted **Enforcement Protocol**.
- The world-renowned **Green Drop Certification** programme forms part of the **incentive-based regulation** approach.
- This programme enjoyed some success and certainly triggered a major **paradigm shift** within the wastewater service domain.
Benefit of Incentive Base Regulation

• Regulatory requirements may include both legislated norms and standards and best practice;
• Publication of results ensures enhanced levels of accountability at both departmental and municipal level;
• Public have access to credible information and do not have to rely on sensationalist reporting;
• Assessments preceding reporting are conducted on a consultative audit basis which feeds areas of improvement back to the municipality
Benefit of Risk Based Regulation

- Municipalities will be allowed to formulate tangible targets for wastewater services management improvement, through reduction of identified risks;
- Intervention priorities are informed according to the determined risk ratings –
- The risk matrix can inform all spheres of government since priorities can be established on municipal, provincial and national levels.
This graph depicts the overall wastewater performance in terms of the number of systems scoring per performance category.

In SA only 7% (60) of the works are classified as Macro in size but it is responsible for 4000Ml/day effluent discharge (76% of total daily discharge).
GD 2011 National overview

The chart shows the water quality distribution across different provinces in South Africa. The provinces are categorized into two groups: 90 - 100% Excellent situation and 80 - 90% Good Situation.

- **Eastern Cape**: Excellent situation
- **Free State**: Excellent situation
- **Gauteng**: Excellent situation
- **Kwa-Zulu Natal**: Excellent situation
- **Limpopo**: Excellent situation
- **Mpumalanga**: Excellent situation
- **North West**: Excellent situation
- **Northern Cape**: Excellent situation
- **Western Cape**: Excellent situation

The chart indicates that all provinces fall within the excellent or good categories, with Western Cape showing the highest percentage in the excellent category.
National Risk Profile: CRR as % of CRRmax

<table>
<thead>
<tr>
<th>WWTWs</th>
<th>Oct-08</th>
<th>May-11</th>
<th>Oct-08</th>
<th>May-11</th>
<th>Oct-08</th>
<th>May-11</th>
<th>Oct-08</th>
<th>May-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 50</td>
<td>196</td>
<td>138</td>
<td>259</td>
<td>262</td>
<td>264</td>
<td>284</td>
<td>259</td>
<td>262</td>
</tr>
</tbody>
</table>

% Deviation = CRR/CRR(max)

TREND

- 90 – 100% Critical risk WWTPs
- 70 - <90% High Risk WWTPs
- 50 < 70% Medium risk WWTPs
- <50% Low Risk WWTPs
### Criteria for Green Drop
For a Green Drop Certification - Comply with 90% of weighted criteria

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Allocated Weight (%)</th>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>YEAR 3+</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Process Controllers</td>
<td></td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>2. Wastewater Quality Monitoring Programme</td>
<td></td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>3. Wastewater Quality Sample Analysis</td>
<td></td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>4. Submission of Wastewater Quality Results</td>
<td></td>
<td>10</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>5. Wastewater Quality Compliance</td>
<td></td>
<td>35</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>6. Management of Wastewater Quality Failures</td>
<td></td>
<td>20</td>
<td>10</td>
<td>10</td>
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<tr>
<td>7. Stormwater Management</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>8. Bylaws</td>
<td></td>
<td>0</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>9. Wastewater Treatment Works Capacity</td>
<td></td>
<td>10</td>
<td>10</td>
<td>10</td>
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<tr>
<td>10. Publication of WW Quality Performance</td>
<td></td>
<td>0</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>11. Wastewater Asset Management</td>
<td></td>
<td>0</td>
<td>10</td>
<td>10</td>
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<td></td>
<td></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
## GREEN DROP REQUIREMENTS 2010/11
### South African Municipal Wastewater Services Incentive-based Regulation

<table>
<thead>
<tr>
<th>[Criteria]</th>
<th>Weight (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Operations (Process Control), Maintenance &amp; Management Skill</td>
<td>10</td>
</tr>
<tr>
<td>2 Wastewater Monitoring Programme</td>
<td>10</td>
</tr>
<tr>
<td>3 Wastewater Sample Analysis (credibility)</td>
<td>5</td>
</tr>
<tr>
<td>4 Submission of Wastewater Quality Results</td>
<td>5</td>
</tr>
<tr>
<td>5 Effluent Quality Compliance</td>
<td>30</td>
</tr>
<tr>
<td>6 Wastewater Failure-Response Management</td>
<td>10</td>
</tr>
<tr>
<td>7 Storm water and Water Demand Management</td>
<td>0</td>
</tr>
<tr>
<td>8 Bylaws</td>
<td>5</td>
</tr>
<tr>
<td>9 Wastewater Treatment Facility Capacity</td>
<td>10</td>
</tr>
<tr>
<td>10 Publication of Wastewater Management Performance</td>
<td>0</td>
</tr>
<tr>
<td>11 Wastewater Asset Management</td>
<td>15</td>
</tr>
</tbody>
</table>

## GREEN DROP REQUIREMENTS 2010/11
### South African Municipal Wastewater Services Incentive-based Regulation

<table>
<thead>
<tr>
<th>[Key Performance Indicator]</th>
<th>Weight (%) – Yr4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Wastewater Quality, Process Management and Control</td>
<td>15</td>
</tr>
<tr>
<td>2 Wastewater Compliance</td>
<td>35</td>
</tr>
<tr>
<td>3 Wastewater Risk Abatement</td>
<td>25</td>
</tr>
<tr>
<td>4 Management, Accountability and Local Regulation</td>
<td>10</td>
</tr>
<tr>
<td>5 Wastewater Asset Management</td>
<td>15</td>
</tr>
</tbody>
</table>
Green Drop 2012
KEY PERFORMANCE AREAS

- Process Management & Control: 15%
- Wastewater Quality Compliance: 35%
- Asset Management: 15%
- Risk Abatement & Management: 15%
- Management Accountability: 10%
- Local Regulation: 10%
Requirement 1
Operations (Process Control), Maintenance and Management Skill

10 %

- To ensure compliance with Regulation 2834;

- Place renewed focus on Operational and Maintenance skills Requirements

- To ensure that adequately skilled staff is employed to take charge of process controlling and operations.
## Requirement 1
### Operations (Process Control), Maintenance and Management Skill

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.) A copy (certified) of Registration Certificate of Works displaying Classification ito (Regulation 2834) (20%)</td>
<td>- Copy of the WWTW registration certificate must be uploaded on the GDS</td>
</tr>
</tbody>
</table>
| 2.) Copies (certified) of Registration Certificates of Process Controllers and Supervisors (Regulation 2834) (40%) | - Copies of the classification certificates of all process controllers/operators and supervisors/superintendents must be uploaded on the GDS  
- WSI must indicate shift patterns  
- Proof of qualifications and experience of shift workers performing process controlling tasks  
- Must comply with Reg 2834  
- WSI must indicate process controllers and/or supervisors that are ‘shared’ across different plants/sites |
| 3.) Proof of Maintenance Team used for general maintenance work at the plant (both mechanical and electrical) (10%) | - Information on in-house staff or external contractor/s  
- Contract or Logbook with maintenance entries will serve as proof  
- Provide additional proof of competency of team (e.g. Qualification & Experience & Trade-test) |
4.) Proof of a 'sitespecific' Operation & Maintenance Manual (30%)

- Copy of front page and index to be provided to DWA, but sufficient content must be proven
- O&M manual to contain: structural, mechanical, electrical detail of plant, design specifications of plant, reference to drawings, operational schedules, maintenance schedules, process detail and control, instrumentation specification/type, fault finding, monitoring, pump curves, supportive appendices

**BONUS: (40%)**

- Proof of Process Controllers being subjected to relevant training the past 12 months
Requirement 2

Wastewater Monitoring Programme 10%

• To ensure that adequate monitoring is taking place as a 1st step towards effective wastewater management.

• To promote management & planning based upon measurement /monitoring.
### Requirement 2
**Wastewater Monitoring Programme**

| 1.) Details of sampling sites; determinants and frequencies of **Operational Monitoring (40%)** | ▪ Proof of Operational Monitoring sites, determinands and frequency  
▪ Samples must include: inflow, outflow, process flows, industrial effluent, sludge;  
▪ Determinands: as per license/permit; Frequency : as per license/permit or as per best practice |
| --- | --- |
| 2.) Details of sampling sites; determinants and frequencies of **Compliance Monitoring (60%)** | ▪ Proof of Compliance Monitoring sites, determinants and frequency  
▪ As per specification in license/GA/permit/registration (including Catchment Monitoring, i.e. up/downstream samples)  
▪ Note: for zero-effluent treatment systems - still need to monitor for impact on catchment / environment (for both lined and unlined systems)  
▪ NB: Applicable to oxidation ponds as well |
Requirement 3
Wastewater Sample Analysis (credibility) 5 %

• To ensure enhanced credibility of analyses.

• To place renewed focus on the role of credibility laboratories.

• To improve the integrity of results (that forms the foundation of so many decisions made in the wastewater sector).

• To serve as basis for the procurement of credible laboratory services.
## Requirement 3
### Wastewater Sample Analysis (credibility)

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.) Provide proof and the name of the Laboratory used (10%)</td>
<td>▪ Name lab for operational analysis (in-house or on-site) and lab for compliance analysis/checks (in-house or external)</td>
</tr>
<tr>
<td>2.) Certificate of Accreditation for applicable methods, Or Z-scores results following participation a recognised Proficiency Testing Scheme (.2 . z-score . 2 are unacceptable) Or Proof of Intra- and Inter-laboratory proficiency (quality assurance as prescribed in Standard Methods) (60%)</td>
<td>▪ Check if Laboratory is accredited to perform the specific methods, check acceptability of Z-scores for the water quality determinands</td>
</tr>
<tr>
<td>3.) Explain how monitoring results are used to amend/improve process controlling (30%)</td>
<td>▪ Practical example [The assessor will select at random analytical parameter/s from the presented analytical results to present an audit question]</td>
</tr>
<tr>
<td>BONUS: Monitoring at an acceptable frequency and for the required determinands (+25%)</td>
<td>▪ Proof to be provided that WSI maintains a 100% monitoring trend at an acceptable minimum frequency against a full set of required process determinands</td>
</tr>
<tr>
<td></td>
<td>▪ Best practice indicators: low-end techn/small size = 1x-2x/month, medium size = 1x-2x/week, high techn/macro size = 1x/day or hourly</td>
</tr>
</tbody>
</table>
Requirement 4
Submission of Wastewater Quality Results 5%

- Ensuring that the necessary information/data is submitted to the Department to allow for regulatory performance monitoring to be conducted.

- Essential as per the Section 62 of the Water Services Act (Act 108 of 1997)
## Requirement 4
Submission of Wastewater Quality Results

| Proof of **data submission** to DWA (12 months) (100%) | ▪ 12 months of data submitted to DWA on the GDS  
▪ WSA must ensure that 12 months' sets of results are submitted and recorded on the GDS prior to the assessment. Note: **All compliance results' data required**  
▪ Green Drop System (GDS) is operational and is accessible @ [www.dwa.gov.za/greendrop].  
▪ Proof is required should hardcopy submissions have been made to DWA Regional Offices. |

[Image: water affairs logo]
Requirement 5
Effluent Quality Compliance 30%

• To give emphasis to the need for improved Effluent Quality Compliance.

• To ensure that a wastewater treatment facility complies with the limits set in the License/Authorization.

• The most important requirements and weighted accordingly.
## Requirement 5
### Effluent Quality Compliance

1.) Copy of **effluent quality** limits or standards used to calculate compliance (e.g. effluent limits or standards as per license, GA or permit)  
(20%)

- Copy of applicable Authorisation, containing the specified effluent quality limits or standards for discharge to a water body or for irrigation or for other applications

2.) Effluent Quality CATEGORIES:  
- 90% microbiological compliance;  
- 90% chemical compliance;  
- 90% organoleptic physical compliance  
(80%)

- 90% compliance against all three effluent quality categories (if not authorised – 8x General Limits apply)  
- Note: 90th percentile compliance considered in case of large datasets to be assessed as performance measure

**BONUS**  
(+35%)

- A practical and acceptable Wastewater Management Rectification or Risk Abatement Plan (W2RAP) is in place to address inefficiencies/inefficiencies that result in non-compliance

**PENALTY**  
(-20%)

- No proof of valid authorisation or sufficient proof of application submitted to DWA
Requirement 6

Wastewater Quality Failure-Response Management 10%

• To get protocols in place for any incident which may directly or indirectly lead to the compromising of effective wastewater treatment and management.
### Requirement 6
#### Wastewater Quality Failure-Response Management

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Details</th>
</tr>
</thead>
</table>
| 1.) Proof of a documented **Wastewater Incident Management Protocol** (45%) | ▪ Protocol to specify alert levels, response times, required actions, roles & responsibilities and communication measures/vehicles  
▪ NB. Include Pump station failure |
| 2.) Provide **evidence of implementation** of Protocol (55%) | ▪ Wastewater Quality Failure Incident and Sewer Spillage Incident register |
Requirement 7
Storm Water and Water Demand Management

• To ensure that artificial loading on WWTWs are minimised.
• To minimise the influence of faecal contamination in stormwater and run-off.
## Requirement 7
### Storm Water and Water Demand Management

<table>
<thead>
<tr>
<th><strong>Proof of a Storm-water management plan</strong> detailing how storm-water will be prevented from entering sewer systems and how sewer spillages or sewerage from entering storm-water. Evidence of implementation required</th>
<th>▪ Copy of front page and contents pages + implementation proof</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water Demand Management Plan</strong> including a practical strategy to address artificial water demand due to leakages causing higher hydraulic loading of wastewater collection and treatment infrastructure. (Might include the need for a wastewater balance)</td>
<td>▪ Copy of Strategy or Implementation Plan + implementation proof</td>
</tr>
</tbody>
</table>
Requirement 8
Water Services Bylaws

• To promote local regulation with the purpose of preventing industrial, commercial and domestic practices from having a detrimental impact on the sewer collection and treatment operations.
## Requirement 8
### Water Services Bylaws

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Description</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.) <strong>Proof of the Bylaws</strong> providing for the regulation of industrial (trade) effluent (volumes &amp; quality) discharged into municipal system, package plants, decentralized systems, vacuum tank discharges and spillages into the environment.</td>
<td>Copy of front page, index and section referring to industrial/trade effluent</td>
<td>(40%)</td>
</tr>
<tr>
<td>2.) <strong>Evidence of Bylaws enforcement</strong> by Local Authority</td>
<td>Proof of application of Bylaw clause in practice, supported by written notice/s to offender</td>
<td>(60%)</td>
</tr>
</tbody>
</table>
Requirement 9
Wastewater Treatment Facility Capacity 10%

- To ensure that the treatment and collection capacity risks be mitigated.
- An essential component of Integrated Asset Management
## Requirement 9
### Wastewater Treatment Facility Capacity

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Details</th>
</tr>
</thead>
</table>
| 1.) Documented design capacity *(hydraulic and organic)* of the wastewater treatment facility and Documented daily receiving flows over the 12 months of assessed period (ideally ≤ than design capacity) *(30%)* | - Design capacity as Average Dry Weather Flow (ADWF) and COD load to the plant  
- Evidence of daily flows and subsequent calculated averages. Measurement method to be explained  
- Assessor may request proof of calibration certificates of inflow meters to verify accuracy of data |
| 2.) Medium to long term planning to ensure sufficient capacity for treatment system and to ensure effluent quality compliance *(40%)* | - Detailed Work-plan which stipulates type of work, associated budget and projected timeframe, as well as the planned output of this work |
| 3.) Medium to long term planning to ensure sufficient capacity for collecting system *(30%)* | - Detailed Work-plan which stipulates type of work, associated budget and projected timeframe, as well as the planned output of this work |
Requirement 10
Publication of Wastewater Management Performance

- Enhancing Accountability through enhance transparency.
Requirement 10
Publication of Wastewater Management Performance

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Publication of wastewater management performance against the</td>
<td>Name and date of publication, copy of information pertaining to audit</td>
</tr>
<tr>
<td>requirements of the site-specific License conditions or General Authorisations</td>
<td>question. Note: Level of detail must include compliance detail</td>
</tr>
<tr>
<td>(40%)</td>
<td></td>
</tr>
<tr>
<td>Publication in various communication mechanisms to reach wider audience,</td>
<td>Evidence/Copy of publication in each media form. Electronic (web) good</td>
</tr>
<tr>
<td>in particular information to the public (60%)</td>
<td>but not entirely sufficient. Web-based reporting (only) will equate to</td>
</tr>
<tr>
<td></td>
<td>40% of this sub-criteria score</td>
</tr>
</tbody>
</table>
Requirement 11

Wastewater Asset Management 15%

• To re-enforce the crucial importance of effective Asset Management
## Requirement 11
### Wastewater Asset Management

1.) Annual Audit report addressing: collection and treatment infrastructure and process control.  
(25%)
- Proof of Technical Audit/ Assessment/ Inspection Report and evidence/plan of implementation of findings during year following Audit Report

2.) Updated sanitation / wastewater Infrastructure Asset Register  
(35%)
- Proof of Asset Register, evidence to be submitted. Asset register to include movable equipment and immovable infrastructure / assets (Cover page plus Index)

3.) Operation and maintenance budget and comparative expenditure detail for:  
- wastewater treatment (in cents/m3), and  
- collection system (R/m3)  
(20%)
- 50% score to proof of budget, 50% score to proof of expenditure against budget.  
- Guide 1: low end technology = R0.50/Kl, medium to high end techno = R0.80-1.20/Kl  
- Guide 2: R 55 000/(Ml/day plant capacity)

4.) Maintenance records of pump stations  
(20%)
- Proof of maintenance work done on mechanical, electrical, civil per pump station
**HINTS & TIPS**

- **Management Commitment (Team), GDIP, Pursue Registration (Water Use) /Authorisation (NWA), Cross Pollination**

<table>
<thead>
<tr>
<th>No</th>
<th>Green Drop Criteria</th>
<th>Requirements</th>
<th>Assessor’s Comments</th>
<th>GDIP</th>
<th>Responsible Official</th>
<th>When</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Process Control, Maintenance and Management Skill</td>
<td>A copy (certified) of Registration Certificate of Works displaying Classification (R2834)</td>
<td>Information submitted to DWA in 2009 - no proof of submission provided. Need certified title deeds which should be available today and can then finalise the submission</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Copies (certified) of Registration Certificates of Process Controllers and Supervisors</td>
<td>1 operator works Monday to Friday on day shift only. Operator works for the Contractor. Consultant to give information on qualifications. Civil engineer appointed by contractor to oversee works. Outstanding - information to be provided on the classification of the operator and supervisor.</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Proof of Maintenance Team used for general maintenance work at the plant (both mechanical &amp; electrical)</td>
<td>Contract with service provider cover operations and maintenance. Qualifications of artisan to be provided by contractor. Contract between public works and contractor to be provided.</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Proof of a 'site-specific' Operation &amp; Maintenance Manual</td>
<td>Consultants to provide. KFD Wilkinson - Consulting Engineers</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td><strong>BONUS</strong>: Proof of Process Controller staff being subjected to relevant training the past 12 months</td>
<td>To be confirmed</td>
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</tr>
</tbody>
</table>
Ensure adequate Municipal/WSP representation during assessments. An internal Green Drop Committee was found to be best practice.
Preparations of Assessments (time & filing)
Monitor and Manage Effluent Quality compliance & Treatment efficacy throughout the year.
Provide proof of compliance with set requirements
Aim realistically; adopt a pragmatic and incremental approach to reach the Green Drop goals (W2RAP)
HINTS & TIPS

• Register your systems and PC’s (GDS) R 2834;

• Apply for a Grand Parenting (R 17);

• Display the Certificates at the WWTWs;

• Qualification & Experience & Trade-test (staff);

• Operation & Maintenance Manual
HINTS & TIPS

• Evidence of implementation By- Laws;

• Consult DWA: WSS for By- Laws Module

• Pre- Treatment from Industries.
HINTS & TIPS

• Daily Flows;

• Conduct Annual Audit per WWTW

• Medium and Long Term Plans

• Calibration Certificates
Involve PCs in the business (Operational Monitoring)
Thanks