AIR QUALITY MANAGEMENT, SYSTEMS AND TOOLS IN THE WESTERN CAPE

8th Annual Air Quality Governance Lekgotla

CTICC, Cape Town       J Leaner and S Benson
Outline

- Context: Sub-Directorate AQM
- Air Quality Management Planning
- Air Quality Management Regulatory Services
- Air Quality Monitoring and Information Management Services
- Success in Air Quality Management
- Way Forward
Air Quality Management Planning

- AQOF and AQMP Working Groups
- Health Risk Assessment
Air Quality Management Planning
AQOF and AQMP Working Groups

**AIR QUALITY MANAGEMENT AND CLIMATE CHANGE WORKING GROUP**
Area of work: Governance, management with respect to air quality, climate change, town and regional planning and transport planning

**AIR QUALITY AWARENESS RAISING WORKING GROUP**
Area of work: Information management on air quality and climate change

**COMPLIANCE MONITORING AND ENFORCEMENT WORKING GROUP**
Area of work: Technical/Control and legal

---

**Jimmy Knaggs**

<table>
<thead>
<tr>
<th>AQMP Status</th>
<th>CoCT</th>
<th>CWDM</th>
<th>EDM</th>
<th>IGTTs</th>
<th>AQWG</th>
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</table>

**Piet Fabricius**

- CoCT: "Sniffels" cat mascot for young learners
- CWDM: Interactive theatre: 15 500 learners
- EDM: Clean Fires Campaign: Oudtshoorn

**Johann Schoeman**

- Oudtshoorn
- St Helena Bay
- Gansbaai
- CoCT, EDM, CWDM, WCDM
AQOF and AQMP Working Groups

Outreach Programmes

Diesel vehicle emissions testing

Figure 64. Food prepared using painted wood, as a fuel source.

Figure 65. EDM engagements with communities in Oudtshoorn
Health Risk Assessment

**Aim:**
- To conduct comprehensive health risk assessment studies over a 10 year period within identified areas across the Western Cape.

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Epidemiological Studies</th>
<th>HRA</th>
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</thead>
<tbody>
<tr>
<td>City of Cape Town</td>
<td>Milnerton/Milnerton Ridge (Joe Slovo, Nyanga, Phillippi)</td>
<td>Bluedowns, Elsies River, Khayelitsha, Fisantekraal, Table View, Bothasig</td>
</tr>
<tr>
<td>Eden DM</td>
<td>Oudtshoorn, Mossel Bay</td>
<td>Knysna, George</td>
</tr>
<tr>
<td>West Coast DM</td>
<td>n/a</td>
<td>Moorreesberg, Piketberg, Velddrift, St Helena Bay, Saldanha Bay</td>
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<tr>
<td>Overberg DM</td>
<td>Grabouw</td>
<td>Gansbaai, Bredasdorp, Villiersdorp</td>
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<tr>
<td>Central Karoo DM</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Cape Winelands DM</td>
<td>Ashton</td>
<td>Stellenbosch, Ceres, Wellington, Paarl</td>
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</table>
Health Risk Assessment

**Outcome:**

- demonstrate a relationship between **exposure to air pollutants** and various **respiratory, cardiovascular and other symptoms** in test subjects thereby strengthening the case for investment in air quality management for improved health.
Air Quality Regulatory Services

- AELs
- Compliance and Enforcement:
  - Compliance Inspections
  - Complaints
  - EMI Covert Operations
Objectives:

- To shift from source-based air pollution control to a receiving environment approach
- To reflect the NEMA sustainable development principles

Status:

- Licensing: status
- SoPs
- Capacity building
## Atmospheric Emission Licensing

### AEL and PAEL: Status in the Western Cape (August 2013)

<table>
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<tr>
<th>Licensing Authority</th>
<th>AELs in process</th>
<th>2011</th>
<th></th>
<th>2012</th>
<th></th>
<th>2013</th>
<th></th>
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<td>AEL</td>
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<td>9</td>
<td>5</td>
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<td>11</td>
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</table>

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AEL Standard Operating Procedures

AEL Procedure Applicable to Basic Environmental Assessment Process

Atmospheric Emission Licensing Process
AEL capacity building

e.g. Overberg DM

- Atmospheric Emission Licensing
  - 2yr SLA with DEADP
  - ODM issued 1st PAEL: Feb 2013

- Capacity Building
  - ODM adopted the AEL function
  - Training on processing AELs

![Image of a group of people with a certificate]
Compliance and Enforcement

Objective:
- To ensure compliance of regulated facilities (inspection, compliance monitoring, testing, and records review)

Approach:
- Compliance Inspections
- Complaints
- EMI covert operations
Compliance and Enforcement

Compliance Inspections: animal matter; cement; lime works

Objectives:

- To determine compliance status with regulations, permit conditions, and additional program requirements;

- To gather evidence to support enforcement actions;

- To obtain information that supports the permitting process;

- To take appropriate enforcement actions for non-compliance;

- To provide guidance to regulated facilities to ensure that they understand the compliance requirements.
## Compliance and Enforcement

### Compliance Inspections: status

<table>
<thead>
<tr>
<th>Authority</th>
<th>Industry</th>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CWDM</td>
<td>Rainbow Farms</td>
<td>Completed - Jun 2013</td>
<td>Undergoing AEL Renewal process; address shortcomings of APPA certificate</td>
</tr>
<tr>
<td>WCDM</td>
<td>Oceana Brands; Pioneer Fishing</td>
<td>Completed - Sep 2013</td>
<td>In Progress</td>
</tr>
<tr>
<td>CoCT</td>
<td>Tydstroom, as part of Pioneer Foods</td>
<td>Planned - Oct 2013</td>
<td>Planned</td>
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<tr>
<td>WCDM</td>
<td>PPC De Hoek</td>
<td>Planned - Nov 2013</td>
<td>Planned</td>
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<tr>
<td>ODM</td>
<td>Bontebok Limeworks</td>
<td>Planned - Dec 2013</td>
<td>Planned</td>
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<tr>
<td>EDM</td>
<td>Klein Karoo International (Tannery &amp; Abattoir)</td>
<td>Planned - Feb 2014</td>
<td>In progress</td>
</tr>
</tbody>
</table>
Compliance and Enforcement

Complaints

Constitution – section 24
- Everyone has the right to an environment that is not harmful to their health or well-being.

Types of complaints
- odour – “offensive” – any smell which is considered to be malodorous or a nuisance to a reasonable person
- noise

Inter-Governmental Task Teams
- St Helena Bay – odour (fish meal plants)
- Gansbaai – odour (fish meal plants)
- Saldanha Bay – ore dust
- Oudtshoorn – odour (WWTWs / tannery / abattoir)
Compliance and Enforcement

**IGTT: Oudtshoorn**

**Co-operative Governance: investigate and address matter**
- District Municipality: DM (Johann Schoeman)
- Local Municipality: Oudtshoorn
- Provincial Government: DEADP, Health
- National Government: DWA, Health

**Process**
- IGTT Authorities Meetings: Action List
- IGTT Industry Meetings
- Public Participation Meetings / Open Days

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**PUBLIC INTERESTED AND AFFECTED PARTY**

You are hereby cordially invited to a site visit to the Klein Karoo International, Abattoir in Oudtshoorn on **Tuesday, 20 November 2012 at 10:00 (group 1) or 11:30 (group 2)**. The KKI Abattoir was identified as one of five possible sources contributing to the odour problem in Oudtshoorn. The reason for the site visit is for you to inspect the currently installed control equipment at the abattoir. The Eden District Municipality Air Quality Unit requested the abattoir to install a pipeline from their cooking pots that extract the H₂S- contained steam to the boiler where H₂S are burned off. This installation was completed about two weeks ago.

Please indicate your attendance to this site visit and also the preferred time slot (group 1 or group 2) that you wish to participate. It is very important that you attend this site visit and to familiarize yourself with the control measures implemented.

Please R.S.V.P. on or before **13 November 2012** by replying to this e-mail and please also copy The Manager of the Abattoir, Mr. Len Droomer at ldroomer@kleinkaroo.com
Abattoir: all steam releases are ducted and incinerated
Tannery: upgraded effluent ponds
Municipal WWTW: earmarked for upgrading
Compliance and Enforcement

IGTT: Oudtshoorn

decrease in $\text{H}_2\text{S}$ concentrations
Way Forward

- Ensure implementation of action items

**IGTT: Oudtshoorn**

<table>
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<tr>
<th>Action Item</th>
<th>Responsible person</th>
<th>Timeframe</th>
</tr>
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<tbody>
<tr>
<td>To investigate the commissioning of an analyzer (new monitoring station) in proximity of the WWTW</td>
<td>Heinrich Wingrove (DEAD&amp;P AQM)</td>
<td>Approximately by March 2014</td>
</tr>
<tr>
<td>Address a letter to local municipality, motivating the need of an action plan</td>
<td>Nobabalo Gaju (DWA)</td>
<td>30 September 2013</td>
</tr>
<tr>
<td>To submit feedback on IGTT to MEC with regards to progress made</td>
<td>Peter Harmse (DEAD&amp;P AQM)</td>
<td>30 September 2013</td>
</tr>
<tr>
<td>To address local government MEC on the urgency of the upgrade of the WWTW</td>
<td>Lungiswa Mgxwati (DWA)</td>
<td>30 September 2013</td>
</tr>
<tr>
<td>To schedule a compliance inspection at the KKI Tannery</td>
<td>Peter Harmse (DEAD&amp;P AQM)</td>
<td>31 October 2013</td>
</tr>
<tr>
<td>To find inputs from consultant regarding information on the WWTW</td>
<td>Robert den Drijver (Oudtshoorn Municipality)</td>
<td>30 September 2013</td>
</tr>
<tr>
<td>To determine if an action plan has been developed and approved by council</td>
<td>Johan Uys (Oudtshoorn Municipality)</td>
<td>30 September 2013</td>
</tr>
<tr>
<td>Epidemiological study</td>
<td>DEAD&amp;P</td>
<td>2015</td>
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</tbody>
</table>
Compliance and Enforcement

EMI covert operations

- Plan operation
- Set up near facility
- Make notes while doing assessment
- Record all observations
- Review notes
- Write report
- Determine way forward: action
Air Quality Monitoring & Information Services

- Ambient air quality monitoring
- Emissions inventory
- Data management
Ambient Air Quality Monitoring

Location of DEADP stations

- Current
- New 2013

Hout Bay – 2013

Hermanus – 2013
Continuous ambient air quality monitoring stations
# Ambient Air Quality Monitoring

## Location and air pollutants measured at DEADV stations

<table>
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<tr>
<th>Location</th>
<th>PM$_{10}$</th>
<th>O$_3$</th>
<th>NO$_2$</th>
<th>SO$_2$</th>
<th>CO</th>
<th>CO$_2$</th>
<th>H$_2$S</th>
<th>TRS</th>
<th>Benzene</th>
<th>Met</th>
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</table>

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Ambient Air Quality Monitoring

e.g. Malmesbury
Ambient Air Quality Monitoring

**SO₂ concentrations (24-hour) at Malmesbury**

![Graph showing SO₂ concentrations over time with various standards and guidelines.](image)

- **SO₂**
- UAT (ppb) (70% of standard)
- LAT (ppb) (50% of standard)
- WHO Guideline (ppb) (daily average)
### Ambient Air Quality Monitoring

#### Malmesbury: Exceedances

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Average</th>
<th>Conc.</th>
<th>Mar 13</th>
<th>Apr 13</th>
<th>May 13</th>
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<td>SO₂</td>
<td>10 min average</td>
<td>191 ppb</td>
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<td></td>
<td>1 hr average</td>
<td>134 ppb</td>
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<td>24 hr average</td>
<td>48 ppb</td>
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<td>NO₂</td>
<td>1 – hr average</td>
<td>106 ppb</td>
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<td>8 – hourly running average</td>
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<td>120μg/m³</td>
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Air Quality Monitoring

Portable monitors

- Knysna Municipality
  - Traffic Monitoring

- Beaufort West Municipality
  - Traffic Monitoring

- Oudtshoorn Municipality
  - H₂S Monitoring
Emissions Inventory

Model Ready data

Aim
- to support and inform all atmospheric dispersion modeling that is undertaken for regulatory purposes within the province.

Process
- Record location of various air emission sources in a region
- Define environmental priorities
- Identify activities responsible for air pollution
Emissions Inventory

Model Ready Data

- 26 air quality modeling domains proposed for Western Cape.

- Specific domains allows for emissions scenario modeling, for proposed NEM:AQA Listed Activities.

- Modeling tools (e.g. Calpuff and AERMOD) for use in air dispersion modeling.
Data Management

Reporting

- Monthly reports
- State of Air Quality Management Reports
- NAQO Reports
- NAEIS – National Atmospheric Emission Inventory System
Success in Air Quality Monitoring depends on

- **Communication**
- **Consistent power supply**
- **Equipment / infrastructure**
- **Security / safety of stations**
- **Municipal involvement**

Way forward
Way Forward

Capacity Building

**All levels of AQM**
- Internal to DEADP
- Municipalities (LM / DM)

Compliance/Enforcement
- AELs
- Inspections

Monitoring

**Infrastructure**
- Laboratory / work space
- Spare equipment
- Improve data management

Governance
- AQMPs / AQOs
  - Increase number
- HRA
  - Sound studies

Planning

Regulatory Services
Thank you

P Harmse, H Wingrove, B Parker, S Benson, L Mayana, K Hove
J Jefferson, F Zingitwa, P Rululu, S Le Roux, L Wildschut
B Hendricks, G Grosch
K Chetty (SAWS)
Contact Us

Joy Leaner (PhD)
Director: Pollution Management

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