National Norms and Standards for Air Quality Monitoring

11th Annual Air Quality Governance Lekgotla

Emnotweni Arena and Conference Centre, Nelspruit, Mpumalanga,

DEA-NACA Workshop, Wednesday 5 October 2016

Presenter: Patience Gwaze

Presentation Outline

- Project Approach and Progress

- Workshop Objectives

- Norms and Standards Scope

- Comments raised after 28 July workshop

- Way Forward

Workshop Objective

- Present the final National Ambient Air Quality Monitoring Norms & Standards as will be published

- Present the way forward

Nomenclature and Acronyms

- **National Norms and Standards for Air Quality Monitoring** = AQ Monitoring Standards

- **SAAQIS** – South African Air Quality Information System

- **NAAQMN** – National Ambient Air Quality Monitoring Network

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Project Approach and Progress

- First multi-stakeholder workshop **19 September 2013**
  - Standards scoped and authors volunteered to draft chapters
- Authorities and DEA-NACA Workshop **October 2013**
  - Comments received and in cooperated into draft
- Second technical workshop on **28 July 2016**
  - Detailed Standard scope discussed
  - Comments received in writing
  - Authors in cooperated comments
- Today presenting the revised draft scope
  - Thereafter document will be reviewed for publication
  - Other component supporting NAAQMN – **National Monitoring Strategy**

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Legislative Context

Section 7(1) "The Minister must …..by notice in the *Gazette*, establish a national framework, for achieving the objectives of this Act, which must include:

- **(d) national norms and standards for air quality monitoring;**
- (f) national norms and standards for air quality information management.

Section 7 (2) National norms and standards established in terms of subsection (1) must be aimed at ensuring: -

- public access to air quality information;
- the promotion of efficient and effective air quality management;
- effective air quality monitoring;
- regular reporting on air quality; and

AQ Standards Objectives – National Framework

- **Procedures** on ambient monitoring programme design, pollutants to monitor, considerations on siting of stations and monitoring station classifications;

- **Procedures** on the use of verified monitoring equipment, reference and equivalence monitoring methods in accordance with appropriate norms;

- **Procedures** on how ambient air quality data will be recorded, analysed, processed, reported and archived following best-practice principles;

- **Guidance** on monitoring station operation, maintenance and calibration following best- practice principles;

- **Quality control and quality assurance procedures** fit for ambient air quality monitoring and reporting;

- **Guidance** concerning air quality measurements by passive sampling;

- Systems for transferring data in SAAQIS; and

- **National Air Quality Index** for simplified reporting of daily air quality to the general public.

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AQ Monitoring Standards Outline – Lead Authors

1. Introduction
2. Governance in Ambient AQ Monitoring
3. Ambient Air Quality Monitoring Planning
4. Ambient Air Quality Monitoring Methods – **D Ngubane and G. Fourie**
5. Operation of a Monitoring Network – **B. Pillay**
6. Dust Monitoring – **M. Josipovic and O. Matshediso**
7. Alternative Air Quality Monitoring Methods – **M. Josipovic**
8. Guidance on Meteorological Monitoring – **G. Feig**
9. Air Quality Monitoring Data Reporting and Archiving – **S. Piketh**
10. Monitoring Network Performance Management – **N. Ntsasa & S. Phophi**

Chapter 1. Introduction

- Background
- Legislative Context
- Objectives of AQ Monitoring Standards
- AQ Monitoring Standards Audience
- AQ Monitoring Standards Scope and Structure
- AQ Monitoring Standards Development and Review Processes

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Chapter 2. Governance in Ambient AQ Monitoring

- Government's Roles and Responsibilities
  - Department of Environmental Affairs
  - **Provinces and Municipalities**
- Other Statutory Bodies in AQ Monitoring
  - South African Weather Service (SAWS)
  - South African National Accreditation System (SANAS)
  - National Metrology Institute of South Africa (NIMSA)
- Personnel Qualifications and Training Qualifications
- Training

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Chapter 3. Ambient Air Quality Monitoring Planning
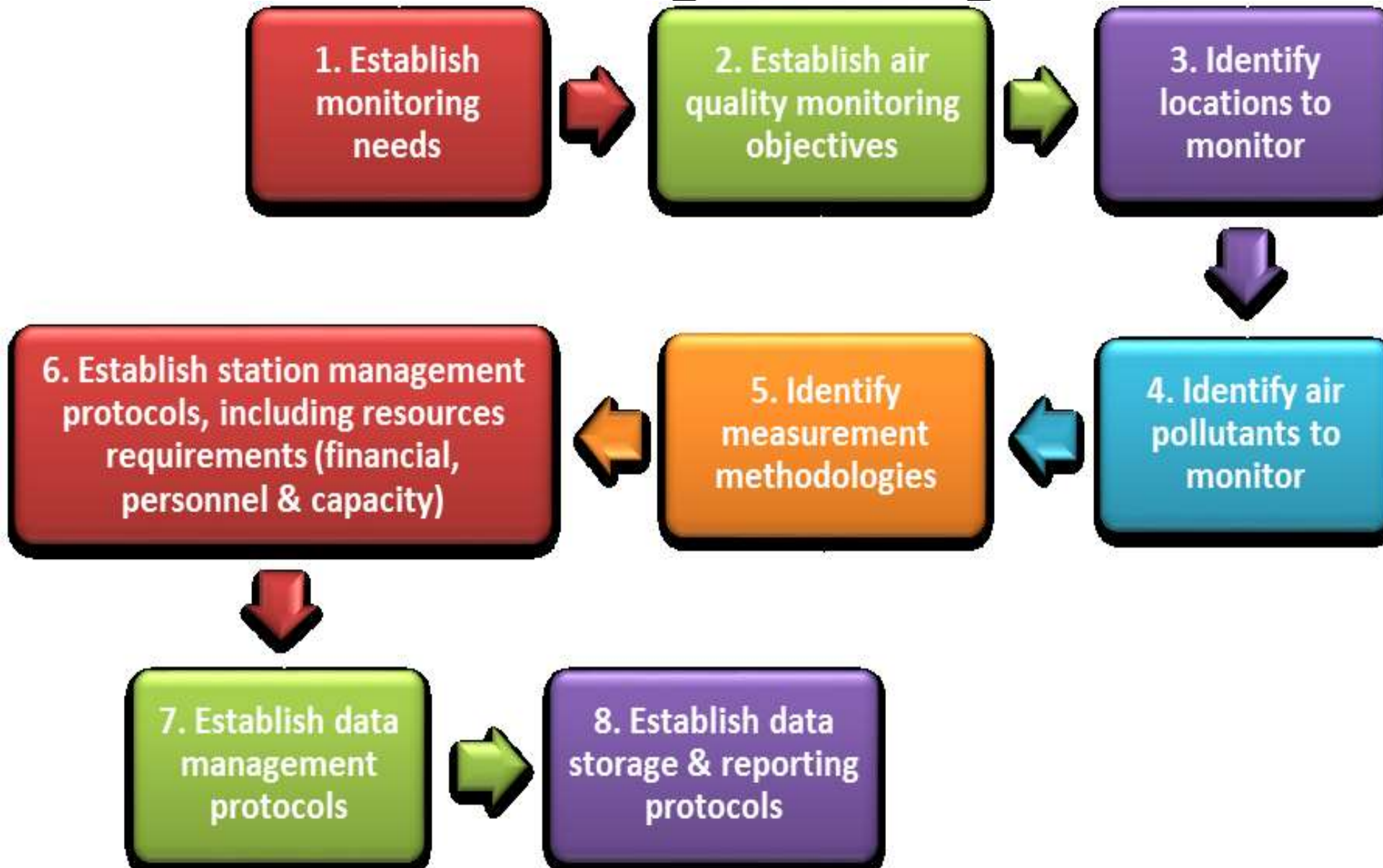
Chapter 3. Ambient Air Quality Monitoring Planning

- Step 1: Desktop Study to Establish Air Quality Monitoring Needs

- Step 2: Establish Air Quality Monitoring Objectives

- Step 3: Identify Locations to Monitor
  - Monitoring Network Design and Station Siting
  - **Monitoring Station Classification**
  - Monitoring Site Metadata

- Step 4: Identify Air Pollutants to Monitor

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Chapter 3. Ambient Air Quality Monitoring Planning……

- Step 5: Identify Measurement Methodologies
- Step 6: Establish a Station Operation and Management Protocols
- Step 7: Establish Data Management Protocols
- Step 8: Establish Data Storage and Reporting Protocols
- **Asset Registry and Management**
- **Procurement Checklist**
- **Monitoring Shelter**
- **Probe Placement and Sampling Line**
- **Ambient Monitoring for Compliance with AEL Conditions**

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Chapter 4. Ambient Air Quality Monitoring Methods

- Provides a summary of the measurement principles of the different instruments
  - Measurement Procedures for the Determination of Particulate Matter Concentrations
  - Measurement Procedures for the Determination of Gases Concentrations
    - SO_2, NO_x, CO, O_3, Benzene & Pb,

Chapter 5. Operation of a Monitoring Network

- Operational Documentation
  - Quality Manual, Administration Manual
  - Standard Operating Procedures Manuals
- Calibrations
  - Standards and Traceability
  - Zero and Span checks, Multipoint Calibrations
- Frequency of Maintenance and Calibration Activities
  - Daily Checks, Routine Station Visits
  - Non-Routine Station Visits
- Performance Acceptance Criteria
- System Audits

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Chapter 6: Dust Monitoring

- Dust Monitoring Principle
  - Based on the National Dust Control Regulations
  - ASTM D1739: 1970
- Dust Monitoring Data Evaluation
  - Recommendations for authorities
- *This chapter will be finalised noting the national discussions since the workshop in July*

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Chapter 7. Alternative Air Quality Monitoring Methods

- Measurement Program for Passive Sampling
  - Measurement Procedures for the Determination of Gases Concentrations – NO_2, O_3, SO_2, VOCs, H_2S, NH_3 etc.
  - Passive Sampling Quality Control and Quality Assurance Procedures
  - Passive Sampling Data Management and Reporting
- MiniVol Sampling
- **Use of Active Electronic instruments for screening**

Chapter 8. Guidance on Meteorological Monitoring

- Meteorological Instrumentation Siting Selection

- Meteorological Instrumentation Towers

- Meteorological Parameters Measurements
  - Wind Speed and Direction, Temp, Rel Hum, Pressure, Rainfall, Radiation

- Calibration and Maintenance of Meteorological Instruments

- Meteorological Data Validation and Verification

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Chapter 9. Data Management Protocols

- **Data Acquisition Systems**
  - Analogue Acquisition Signals
  - Digital Acquisition Signals
  - Station Connectivity and Data Transfer

- **Data Quality Requirements**
  - Monitoring Units

- **Data Quality Assurance Principles**
  - Documentation and Procedures
  - Data Adjustment
  - Applying Manual Check and Calibration Adjustments
  - Zero Span Changes Adjustments

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Chapter 9. Air Quality Monitoring Data Reporting and Archiving

- **Reporting of Ambient Air Quality Monitoring**
  - Reporting to SAAQIS
  - Monthly reporting, SoA,

- **Information for the Public on Air Quality**
  - Air Quality Index
  - Including the reporting air quality on several platforms,

- **Data Storage and Archiving Protocols**

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Chapter 10. Monitoring Network Performance Management

- Proficiency Testing Protocols
  - Summary of PT as prescribed by NMISA
- SANAS Accreditation Protocols
  - Preparing and maintaining SANAS accreditation as prescribed by SANAS

Appendix

- A   South Africa Air Quality Index
- *B   National Air Quality Indicator*

Way Forward

- Received **3 (of 5)** of revised Chapters from Lead Authors
- DEA will finalise the inputs
- Publish for public commenting early 2017

Thank you
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