AN ASSESSMENT OF THE NATIONAL AIR QUALITY MANAGEMENT PLANNING

STATUS QUO REPORT

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Compiled by
Zanokuhle Environmental Services (ZES)
P. O. Box 37945, Overport, 4067
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1. INTRODUCTION

1.1 Background

1.1.1 Air Quality Management Planning in South Africa
Section 15(1) of Chapter 3 of the National Environmental Management: Air Quality Act, (Act No. 39 of 2004) (hereinafter “the AQA”) requires each National governmental department or province responsible for preparing an Environmental Implementation Plan (EIP) and or Environmental Management Plan (EMP) to include an Air Quality Management Plan (AQMP) as part of that plan. In the Local government sphere, Section 15(2) of the AQA requires each municipality to include an AQMP in its Integrated Development Plan (IDP) as required in terms of Chapter 5 of the Municipal Systems Act.

Even though AQMPs are required by law within these various spheres of government, many authorities have still not developed an AQMP. The Department of Environmental Affairs (DEA) has through the development of the National Framework (NF) provided norms and standards for technical aspects of air quality management as well as the delineation of responsibilities for implementation of the AQA. Further to this, the DEA published the Manual for Air Quality Management Planning in South Africa in 2008. The intent of this manual was to harmonise the process of AQMP development. Since the manual was not an obligatory tool different approaches are being employed in the development of AQMPs around the country which has resulted in some existing AQMPs that fail to address air quality challenges adequately.

1.1.2 National review of the status of AQMP in South Africa

In order for the DEA to harmonise the Air Quality Management Planning regime and be able to assess and monitor its effectiveness, the status quo of AQMPs needed to be assessed. This report on the assessment of the current status of the development of AQMPs in South Africa forms part of a wider project being undertaken by the DEA. The project will, in addition to the assessment of the current status of air quality management planning in South Africa, have the following outcome: An Air Quality Planning Support Programme that provides guidance to the DEA on how to effectively and efficiently bring Air Quality Management Plan (AQMP) regime into full capacity in line with the National Framework.

The assessment presented includes a critical review of the completed AQMPs and a further understanding of the status quo through auditing current practices, level of capacity, current AQMP tools, who is involved, extent of political buy-in, the extent of support from DEA and what can be improved, how are interventions being designed, challenges and gaps identified, whether interventions identified are being implemented.

This report only presents the assessment of the current status of the development of AQMPs in South Africa which will then inform the development of the national support programme.
1.2 Structure of the document

The outline of the report encompasses the following:

**Section 1: Introduction** – Provides an introduction to the DEA project and the specific outcomes of the status quo report.

**Section 2: Air Quality Management Plans in South Africa** – Defines an AQMP and highlights the number of AQMPs completed to date.

**Section 3: Understanding the process of developing an AQMP** – This section highlights the stakeholder feedback on the different aspects of the AQMP stages.

**Section 4: Review of existing AQMPs in South Africa** – Provides a technical assessment of the existing AQMPs in South Africa as well as the principal constraints in the development of the AQMPs and intervention measures.

**Section 5: Conclusion**
2. AIR QUALITY MANAGEMENT PLANS IN SOUTH AFRICA

2.1 Introduction

A description of an AQMP is provided in the Manual for Air Quality Management Planning in South Africa as follows:

"An AQMP describes the current state of air quality in an area, how it has been changing over recent years, and what could be done to ensure clean air quality in a region. It provides goals and objectives for a region and prescribes short- and long-term policies and controls to improve air quality.

An AQMP sets a course of action that will attain air quality goals in a specified geographical area. It requires actions by government, business, industry, Non Governmental Organisations (NGO’s) and the population, as its success will depend on support from all these sectors.

The main purpose of the AQMP development process is to establish an effective and sound basis for planning and management of air quality in selected areas. This type of planning will ensure that significant sources of impacts are identified and controlled in a most cost-effective manner. The best air quality management tools and practices are used in order to assure the most adequate solutions. The ultimate goal is to assure that health effects and impact on building materials and the environment will be minimised in the future."

The AQMP manual describes the development of an AQMP as a six stage process outlined below:

1. Goal setting
2. Baseline air quality assessment
3. Air quality management system (AQMS) and gap and problem analysis
4. Intervention strategies
5. Action plans implementation
6. Evaluation and follow up

2.2 Collation of information and analysis

To gain an understanding of the status quo, the following tools were used to gather information on air quality management planning and assess the existing AQMPs in South Africa.

- The Evaluation Checklist in the Manual for Air Quality Management Planning was used to appraise the AQMPs completed to date.

- Two questionnaires were designed for two different stakeholder groups and distributed to governance participants and consultants working in the field of air quality management planning.
The governance stakeholder questionnaire was distributed via an automated website or electronically or by fax while the questionnaire to the consultants was sent via e-mail.

The governance questionnaire was distributed to 88 Air Quality Officers (AQOs) and 154 other governance stakeholders while, 10 consultants were contacted. Thirty three (33) governance stakeholders responded via the website, ten (10) responded via e-mail/fax/ hard copy and four (4) of the 10 consultants responded electronically.

A breakdown of the number of responses to the governance questionnaire is further detailed in Appendix A while Appendix B holds a copy of the questionnaire distributed.

- Stakeholder feedback was received through two stakeholder engagement workshops. The first was at the Air Quality Officers Forum in August 2011 while the second was at a project progress presentation at the annual air quality Lekgotla on 12 October 2011.

An analysis of the appraisals of the AQMPs and the feedback on the questionnaire and stakeholder engagement is presented in the sections that follow to give an indication of the air quality management planning status quo in South Africa.

2.3 Number of existing AQMPs and areas still requiring an AQMP

A list of existing AQMPs was developed by the project team through consultation with local and provincial government structures. The list of AQMPs extended to local, district and provincial departments and priority areas. No national department AQMPs were noted.

Twenty four (24) AQMPs have been completed in South Africa with six (6) AQMPs in progress. A total of thirty one (31) district municipalities, four provinces and one metropolitan have not yet embarked on the process. A summary of AQMPs completed and in progress is presented in Table 1 below and graphically presented in Figure 1.
**Table 1: AQMP development status**

<table>
<thead>
<tr>
<th>Governance structure</th>
<th>AQMPs completed</th>
<th>AQMPs in progress</th>
<th>AQMPs not started</th>
</tr>
</thead>
<tbody>
<tr>
<td>Priority Areas</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Provinces</td>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Districts</td>
<td>10</td>
<td>3</td>
<td>31</td>
</tr>
<tr>
<td>Metros</td>
<td>6</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Local Municipalities</td>
<td>2</td>
<td>0</td>
<td>224*</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>24</strong></td>
<td><strong>6</strong></td>
<td><strong>36</strong></td>
</tr>
</tbody>
</table>

* (2011 Demarcation Board)

**Figure 1: Graphical presentation of AQMP development status**

A list of the 24 AQMPs (including priority areas) completed to date is further presented in Table 2 below per province.
### Table 2: List of 24 AQMPs completed to date

<table>
<thead>
<tr>
<th>Province</th>
<th>AQMPs Completed</th>
<th>Districts/Municipalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free State Province</td>
<td>AQMP complete</td>
<td>Lejweleputswa DM</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL including provincial (2)</td>
<td></td>
</tr>
<tr>
<td>North West Province</td>
<td>AQMP complete</td>
<td>Bojanala Platinum DM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rustenburg LM</td>
</tr>
<tr>
<td></td>
<td>TOTAL including provincial (3)</td>
<td></td>
</tr>
<tr>
<td>Limpopo Province</td>
<td>AQMP complete</td>
<td>Capricorn DM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sekhukhune DM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Waterberg DM</td>
</tr>
<tr>
<td></td>
<td>TOTAL (3)</td>
<td></td>
</tr>
<tr>
<td>Western Cape Province</td>
<td>AQMP complete</td>
<td>City of Cape Town</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drakenstein LM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eden DM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>West Coast DM</td>
</tr>
<tr>
<td></td>
<td>TOTAL including provincial (5)</td>
<td></td>
</tr>
<tr>
<td>Eastern Cape Province</td>
<td>AQMP complete</td>
<td>Amathole DM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nelson Mandela Bay DM</td>
</tr>
<tr>
<td></td>
<td>TOTAL (2)</td>
<td></td>
</tr>
<tr>
<td>KwaZulu-Natal Province</td>
<td>AQMP complete</td>
<td>eThekwini Metropolitan Municipality</td>
</tr>
<tr>
<td></td>
<td>TOTAL (1)</td>
<td></td>
</tr>
<tr>
<td>Gauteng Province</td>
<td>AQMP complete</td>
<td>City of Johannesburg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>City of Tshwane DM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ekurhuleni DM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Metsweding DM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>West Rand DM</td>
</tr>
<tr>
<td></td>
<td>TOTAL including provincial (6)</td>
<td></td>
</tr>
<tr>
<td>Mpumalanga Province</td>
<td>AQMP complete</td>
<td>National Department Priority Areas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Highveld Priority Area</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vaal Triangle</td>
</tr>
<tr>
<td></td>
<td>TOTAL (0)</td>
<td></td>
</tr>
<tr>
<td>Northern Cape Province</td>
<td>AQMP complete</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL (0)</td>
<td></td>
</tr>
<tr>
<td>National Department Priority Areas</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total:** 24 AQMPs completed to date.
Further to the requirements of AQA for all municipalities to develop AQMPs, the National Framework has identified and prioritised areas of concern (at district and metropolitan municipality level) where the ambient air quality does not comply with the national ambient air quality standards. Air quality in these areas has been classified as poor or potentially poor.

A list of these municipalities in South Africa that need special attention is presented in Table 24 of the National Framework. According to the NF, such municipalities need to develop detailed AQMPs. Currently, 61% of the municipalities in Table 24 of the NF have developed AQMPs with 3% in progress.

Those municipalities in the Table 24 of the NF that have not yet undertaken an AQMP encompass those listed in Table 3 below. This is further graphically presented in Figure 2.

Table 3: Table 24 municipalities still to undertake an AQMP

<table>
<thead>
<tr>
<th>Limpopo Province</th>
<th>North West Province (AQMP complete)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mopani DM</td>
<td>Dr Kenneth Kaunda DM (formerly Southern DM)</td>
</tr>
<tr>
<td><strong>Gauteng Province (AQMP complete)</strong></td>
<td>Northern Cape Province</td>
</tr>
<tr>
<td>Sedibeng DM</td>
<td>John Taolo Gaetsewe (formerly Kgalagadi DM)</td>
</tr>
<tr>
<td><strong>Mpumalanga Province</strong></td>
<td>KwaZulu-Natal Province</td>
</tr>
<tr>
<td>Ehlanzeni DM</td>
<td>Ugu DM</td>
</tr>
<tr>
<td>Gert Sibande DM</td>
<td>uMgungundlovu DM</td>
</tr>
<tr>
<td>Nkangala DM</td>
<td>Uthukela DM</td>
</tr>
<tr>
<td></td>
<td>iLembe DM</td>
</tr>
<tr>
<td></td>
<td>Uthungulu DM</td>
</tr>
<tr>
<td></td>
<td>Amajuba DM</td>
</tr>
</tbody>
</table>

The following progress is noted in the table above (Table 24 of the NF).

1. The Limpopo province as recently as early November 2011 issued a terms of reference for a call for proposals to develop an AQMP for the province.
2. Dr Kenneth Kaunda DM is in the process of undertaking the AQMP.
3. The Sedibeng DM AQMP could be considered as part of the Vaal Triangle Priority Area AQMP and adopt the intervention strategies proposed by the AQMP.
Further to the above, the National Framework goes on to note the following:

“Provinces that only have one metropolitan or district municipality listed in Table 24 (page 47 of the NF) will not be required to develop highly detailed provincial AQMPs as the municipal AQMP for that metropolitan or district municipality will serve as the provincial plan.”

And

“Municipalities that are not listed in Table 24 (page 47 of the NF) will not be required to develop highly detailed municipal AQMPs as the provincial AQMP will provide the necessary overall guidance for the municipality’s air quality management provision of services.”

The above statements should be considered in the development of the National Support Programme when the development of a national response to air quality management planning is formulated.
3. UNDERSTANDING THE PROCESS OF DEVELOPING AN AQMP

3.1 Assessment of the development process of an AQMP and challenges

3.1.1 AQMP development process

The process of the development of an AQMP as prescribed in the Manual for Air Quality Management Planning is outlined in Section 2.1 above. Sixty percent (60%) of the questionnaire respondents had used the Manual for the development of their AQMP even though some had undertaken their work before the manual was published. Other government structures indicated that the manual was not used since consultants had taken the work.

Two of the four consultants that responded to the questionnaire, indicated that they used the Manual for Air Quality Management Planning with influence from additional sources noted in the box below.

<table>
<thead>
<tr>
<th>In some cases input from the following documents/ sources were also used to inform the development of AQMPs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK – Urban air quality management tool book part of the United nations Environmental Programme and United Nations Human Settlements Programme</td>
</tr>
<tr>
<td>National framework</td>
</tr>
<tr>
<td>Environmental Protection UK</td>
</tr>
<tr>
<td>US EPA and South Coast AQM District</td>
</tr>
<tr>
<td>Environment Canada</td>
</tr>
<tr>
<td>Specific requirements outlined by the Client</td>
</tr>
<tr>
<td>Reference to plans developed internationally</td>
</tr>
</tbody>
</table>

The governance responses on a similar question, noted that the manual was used in addition to sources highlighted below.

- Provincial or district AQMPs already in place
- Applicable legislation
- International best practice
- Existing emission inventory
- AQMP developments by other municipalities

3.1.2 The Manual for Air Quality Management Planning

The question raised on the suitability of the Manual for Air Quality Management Planning highlighted the following common aspects:

1. Most useful parts of the Manual:
   a. It was useful all round and contains helpful background information.
   b. The public participation aspect.
c. The 6-step process.

d. Used as a minimum requirements list.

e. Monitoring, evaluation and review section.

f. It was further noted that the document was clear and concise.

2. Parts of the Manual that could be improved:

   a. Source ranking indicators could be included.

   b. Include further guidance on how to set standards.

   c. Sections on intervention strategy and baseline assessment could be expanded.

   d. Document could be less technical and emphasis placed on basic planning principles.

   e. Further guidance on internal review process.

   f. The document should be more practical and procedural to assist with consistency across the country.

Alternatives to the 6-step process in the Manual for Air Quality Management Planning were proposed in responses from governance stakeholders and consultants and the following was generally the process that was communicated:

1. Undertake a Baseline assessment. Present findings to the governance structure, stakeholders and the public.

2. Identify the gaps and prioritise.

3. Develop a vision, mission, goals and objectives.

4. Develop an implementation plan with responsibilities, timeframes and indicators.

5. Define mechanism, stakeholders and timeframes for monitoring, evaluation and review.

The difference between the above and the 6-step process in the Manual is that the baseline assessment and identification of gaps is proposed before the development of the vision, mission and goals of the AQMP.

Further to the above, the call for a simplistic approach to the development of an AQMP was reiterated through the responses to the questionnaires as well as at the two stakeholder engagements. The idea would be to encompass a simple procedure for local authorities to develop an AQMP where no critical air quality issues were evident. This may or may not include a distinguishing between a basic AQMP and a plan of action.

### 3.1.3 Time taken to undertake an AQMP

The time **taken to undertake an AQMP** was noted as an average of 17 months from inception of the project to the delivery of a final documented AQMP. The longest time taken to develop an AQMP was noted as 36 months in the questionnaire responses received.

The **baseline assessment** part of the AQMP was noted as taking an average of nine (9) months with the longest time being 24 months.
The time required to actually have the request for the development of the AQMP approved and advertised on a tender for an external consultant to undertake the project averaged **10 months** with the longest approval period spanning a period of two years.

In most cases the timeframes were prescribed in the project terms of reference for external consultants while in others, the consultants proposed project timelines. It was highlighted that the time required undertaking an AQMP was dependent on the spatial extent of the area under review, the related air quality issues, availability of data and complexity of stakeholder engagement.

Further to this, challenges on prescribed timeframes are also compromised by report iterations, governmental internal management finalisation processes.

### 3.1.4 Level of stakeholder engagement in the AQMP process and its importance in the IDP

The questionnaire responses from the governance stakeholder group noted that, of the institutions that had developed an AQMP, 71% had set up a technical committee to oversee the process – input was mainly in relation to technical aspects, evaluation of performance of consultants and assistance with public participation engagement. On the other hand, 57% established an Air Quality Stakeholder group which seemed to have very similar input to the technical committee.

The Manual for Air Quality Management Planning highlights the need for both a Technical Committee and an Air Quality Stakeholder Group and further describes the areas of responsibility for each. The AQMPs did not indicate fully the involvement of these groups and as a result, the effectiveness of each is not clearly understood.

However, officials felt that the Stakeholder Group assisted in determining key consultation issues, identifying potential trade-offs/compromises with conflicting views on the AQMP and acted as sounding boards for the project team.

The stakeholder questionnaire responses revealed that these Air Quality Stakeholder Groups would comprise the stakeholders such as the Department of Environmental Affairs, Human Settlements, Health, Transport, Provincial Departments, District and Local municipalities, NGOs/Community Based Organisations (CBOs) and Industry. An indication of the percentage of the numbers indicating the involvement of these stakeholders is noted in the Table 4 below.

From the information provided in the table, it is evident that there is strong participation by the local municipalities and industry within these groups. Further to this, the DEA and provincial departments’ participation is also highly rated at 82%.
Table 4: Stakeholder distribution (Questionnaire responses received)

<table>
<thead>
<tr>
<th>Stakeholder Group</th>
<th>Percentage response</th>
<th>(Number)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Environmental Affairs</td>
<td>85.7%</td>
<td>(n = 12)</td>
</tr>
<tr>
<td>Department of Housing</td>
<td>78.6%</td>
<td>(n = 11)</td>
</tr>
<tr>
<td>Department of Health</td>
<td>78.6%</td>
<td>(n = 11)</td>
</tr>
<tr>
<td>Department of Transport</td>
<td>71.4%</td>
<td>(n = 10)</td>
</tr>
<tr>
<td>Provincial Departments (please state)</td>
<td>100.0%</td>
<td>(n = 14)</td>
</tr>
<tr>
<td>District/local municipalities Departments (please state)</td>
<td>92.9%</td>
<td>(n = 13)</td>
</tr>
<tr>
<td>Other (please state)</td>
<td>57.1%</td>
<td>(n = 8)</td>
</tr>
</tbody>
</table>

The level of public participation in the process of developing an AQMP presented generally an average of two to three public participation interactions taking place during the development of an AQMP. This was usually but not always at the following milestones in the development of the plan:

- Inception of the development of the plan
- Presentation of the baseline assessment
- Presentation of the draft AQMP for comment

The AQMPs again did not provide detail on the processes undertaken to engage the public or any proof of this public engagement. However, a vast majority had noted that public participation meetings were held during the development of the AQMP. The extent of this multi-stakeholder involvement in the process could not be determined through the lack of detailed information provided in this area.

Although 67% of authorities had included their AQMP into the IDP/EMP/EIP, further responses highlighted a need for clarity on the process to be undertaken for inclusion of these plans within these documents.

In this respect to the development of an AQMP regime, a call was made for cognisance to be taken of the delineation between the AQMP and other documents such as the IDP and EMP that also speak to air quality management planning issues.

3.1.5 Level of skills transfer

Almost 80% of the respondents on the governance questionnaire indicated that their AQMP had been undertaken by external consultants. On the question raised regarding the level of skills transfer by consultants on the projects, the following was noted.

The transfer of skills from consultants to government officials involved in the development of an AQMP remains an informal arrangement as the terms of reference on these projects encompasses a component of capacity building/skills
transfer but does not stipulate any specific goals. As a result, the extent of this skills transfer remains at the discretion of the consultant.

The transfer of skills was noted as being very variable but mainly not enough skills transfer. Where there was a certain degree of capacity building within projects, the transfer of skills was generally reported as being in one or more of the following ways:

1. Officials are involved in the review of the reports generated during the development of the plan.
2. Active involvement of officials in the public participation process and/ or other stakeholder meetings and interactions.
3. Short presentations throughout the development process on issues relating to air quality management. For example, discussions on aspects such as modeling, monitoring or air quality legislation.
4. Shadowing consultants on tasks which would entail accompanying technical or management staff of the consultant team on specific project tasks.

No measureable level of skills transfer could be reported since no criteria for building capacity had been set.

3.2 Capacity within government structures

The roles and responsibilities of the different spheres of government pertaining to air quality management are summarised in the National Framework and encompass amongst other responsibilities the appointment of an AQO at the national, provincial and local government level. The framework also summarises the air quality management functions for which the different levels of government are responsible but is silent on the extent of human and financial resources required or any indication of how the structures could achieve these deliverables.

The feedback on the stakeholder questionnaire provides an indication of the various levels of capacity within the different spheres of government. But generally the capacity within provincial and local government to undertake the air quality management function is variable and presents generally with a lack of human and capital resources to sustain the function effectively.

However on assessing this aspect of air quality management, one must bear in mind that a benchmark has not been presented in terms of what exactly is expected to be in place within a governance structure in terms of the actual basic air quality management requirements. This is reiterated in the request by stakeholders for a better understanding of the AQMP process requirements within different municipalities with varying degrees of air pollution challenges. The current capacity requirement is presented without a measureable benchmark for this aspect.

Fifty six percent (56%) of the governance officials had attended some training in air quality management which encompassed a wide range of topics and service providers with no real consistent training requirements in place. It is
difficult to assess the level of competence of officials without a benchmark of training needs. As a result, training undertaken may or may not be adequate for the purpose. This in essence does not provide a measurable means on which to base assumptions of the skills in place at the various governance structures. However, the training is presented as being segmented and targeted to specific needs that are not immediately clear in terms of established training or capacity building plans in place.

The various training that had been received by officials as noted in the questionnaire responses (excluding professional training/qualifications) were as follows:

- Introductory training to air quality management planning
- Introductory course to air quality modeling
- Demonstration sessions on emission modeling
- Air quality management course
- Training on air dispersion modeling, Atmospheric Emission Licence (AEL’s), cement plants and clay brick manufacturing
- Training received as Environmental Management Inspector (EMI) (but not yet appointed)
- Training through the DEA and USEPA on all major aspects of an AQMP

The National Framework summarises the roles and responsibilities of the different spheres of government with respect to air quality management and encompasses the appointment of an AQO as well as outlining various reporting and regulatory responsibilities.

However, in the feedback from the stakeholder questionnaires and during the review of the AQMPs a reflection of the human and budgetary resource capacity is given as far inferior to the expectation of the delivery of the air quality management service.

The situation is presented as follows in various instances:

- The provincial responsibilities span all integrated pollution activities and there are no dedicated resources specifically for air quality management. Since the responsibilities for air quality management came through an act of parliament, (AQA) the resources (financial and human) are committed more towards integrated pollution control as there is no allocation in terms of a budget.
- In almost all cases the air quality management function is assigned to Environmental Health Practitioners (EHP) without the necessary air quality specific training or the financial resources to carry out the function.
- The time allocated to the function varies between one hour per week to 25 hours per week. Even where human and financial resources are in place and may not be fully adequate, only up to 60% of the staff time is allocated to the air quality management function. The question on the air quality function was broad and did not define
the specific tasks that would have been associated with the function. As a result, the question may have been interpreted differently by respondents encompassing a range of air quality tasks.

- The Western Cape seems to be the most capacitated province in terms of human and financial resources with up to 90% of officials' time being spent on the function. This is not withstanding their own challenges within the province related to the financial and human resource challenge.
- The eThekwini metropolitan, City of Cape Town, City of Joburg and Ekurhuleni municipalities have units that are 100% dedicated to the function of air quality management.
- In some cases a position is in place but there is either no budget to fill the position or the position is in place in an organogram but has not been prioritised.

Even with the challenges noted above in terms of financial and human resources, a certain degree of ambient air monitoring is being undertaken. The aspect of air quality management systems is further discussed in the Section 3.3 below.
3.3 Air Quality Management Systems (AQMS)

The main elements of an AQMS comprise:

- Ambient air monitoring
- Emission inventory
- Atmospheric Dispersion Modeling

These elements provide a basis on which to form a quantitative assessment of air quality within a given area. In responses received from the stakeholder questionnaires, the findings on the application of these systems within governance structures revealed the following:

- Fifty seven percent (57%) undertake ambient monitoring. The continuous ambient air monitoring was noted as being mainly done by external consultants.
- Forty eight percent (48%) had developed emission inventories.
- Thirty percent (30%) had undertaken modeling (commonly used models included ADMS, Calpuff, Aermod) – only one had included transboundary sources. Eighty three percent (83%) of the air dispersion modeling work had been outsourced. The limited work in this area was mainly due to the lack of air quality monitoring including meteorological data, accurate and comprehensive emission inventories and skills within government spheres.
- Thirty five percent (35%) of the AQMPs that were complete had identified areas at risk of exceeding air quality standards (Mainly PM and SO₂).

Those structures that indicated they undertook monitoring included ambient monitoring as inclusive of the following:

- Continuous ambient air monitoring (One respondent noting accreditation for monitoring SO₂)
- Passive monitoring for PM₁₀, Volatile Organic Compounds (VOC)
- Dust fallout
- Bubbler Network
- Street box type monitoring for SO₂, PM₁₀ and NOx

The most challenging aspect of the continuous ambient air monitoring being undertaken within the governance structures was providing a quality assurance/ quality control (QA/QC) platform on which to present valid data sets.

The results of the respondents noting that an emission inventory had been undertaken is presented in the Figure 3 below. The graphical presentation highlights the pollutants and sources identified by the respondents.

Figure 4 notes the distribution of the different air dispersion models used by the respondents.
Please provide a summary of the emissions inventory that has been completed, i.e. pollutants and sources included (tick relevant boxes)

**Figure 3: Composition of emission inventories undertaken**

Please provide a summary of the modelling that was completed (i.e. model used, for which pollutant).

**Figure 4: Summary of air dispersion models applied**
4. REVIEW OF EXISTING AQMPS IN SOUTH AFRICA

Further to the definition of an AQMP given in Section 2.1 of this report, the National Framework highlights that “All air quality management plans (AQMPs) are logical descriptions of interventions and required resources aimed at implementing a strategy or strategies to achieve a specific air quality objective. Given that the AQA prescribes an objectives based approach to air quality management, the overall objective or goal of all AQMPs may be framed as a desired outcome as follows – Ambient air quality complies with ambient air quality standards”

Further to this, the Framework also notes the following. “The successful development and implementation of an AQMP is also dependant on multi-stakeholder involvement throughout the process.”

A further requirement in the National Framework is presented as: “Whether data exists or not, an assessment needs to be made on the adequacy of the data and a monitoring strategy must be developed and implemented. Implementation of the strategy will ensure that the monitored data will provide information specific to the needs of the AQMP goal. Monitoring can be augmented with modeling to expand the spatial coverage. Modeling also allows the opportunity to subjectively assess and select emissions control options or intervention that will result in the greatest amount of progress towards achieving the goal of the AQMP.”

The appraisal/evaluation of the existing AQMPs in South Africa presented below highlights an assessment of the specific issues noted in the National Framework as indicated above.

As noted in Section 2.2, the Evaluation Checklist in the Manual for Air Quality Management Planning in South Africa (Appendix 8) was used to appraise the twenty four (24) AQMPs completed to date. The Checklist was used in each of the AQMPs to provide a consistent review across the board.

The findings of these reviews are presented below. Section 4.1 provides a description and understanding of the Checklist while Section 4.2 highlights the findings of the review.

4.1 Description of the Evaluation Checklist

The detailed Evaluation Checklist is intended to incorporate criteria against which an AQMP is assessed. The evaluation is based on a “Yes” or “No” response according to whether each individual criterion has been included, and whether it is judged to be acceptable. Numerical scores are not assigned, as this provides an unnecessary level of complexity. Commentary is included for the purpose of clarification. The main purpose of the checklist is to provide consistency in the appraisal of AQMPs.

The detailed Evaluation Checklists contain two parts:
Air Quality Assessment Evaluation: Intended to evaluate whether the potential air quality problems have been correctly identified, drawing upon available air quality monitoring and modeling studies. The key issues considered are:

- **Pollutants, Sources and Standards:** have the appropriate pollutants been considered; have the principal sources been identified; have the correct standards been applied?
- **Air Quality Assessment:** has air quality monitoring been carried out/proposed; are appropriate monitoring techniques used; have appropriate monitoring sites been selected; is the meteorology adequately described; are suitable emissions inventories available/proposed; have dispersion modeling studies been carried out; has an appropriate model been selected/proposed; has the model output been verified?
- **Key Impacts:** have the key pollutant hotspots been identified; have source apportionment studies been carried out/proposed; has relevant public and environmental exposure been taken into account; have key priorities for future assessment work been identified; does the air quality assessment reach the likely or expected conclusions?

Air Quality Management Plan Evaluation: Intended to evaluate the development and design of the AQMP, and the specific interventions that are proposed. The key issues considered are:

- **Process:** has all appropriate guidance been taken into account; has reference been made to all appropriate local and national policies; has appropriate and thorough stakeholder consultation been undertaken?
- **Summary of AQMP Components:** have the effects of the proposed interventions been quantified; have environmental and socio-economic aspects been adequately described; have realistic timescales for implementation provided; has resource availability and capacity-building been adequately addressed; have the organisations responsible for implementation been identified; has a suitable mechanism for evaluating progress with implementation been provided?
- ** Appropriateness and Proportionality:** have all appropriate interventions been identified; are the interventions expected to deliver the required improvements; are the relevant air quality standards expected to be achieved; have the interventions been prioritised based on cost-effectiveness; have the other environmental and socio-economic impacts been quantified; are the proposed interventions compliant and consistent with national policies?
- **Implementation and Progress:** have the appropriate organisations responsible for implementation been identified; are the proposed timescales realistic; have costs and funding been identified; are mechanisms for evaluating progress and the outcome of the interventions proposed?
- **Intervention Measures:** detailed checklists are provided to identify the proposed interventions on a source-by-source basis?
The key questions on the Checklist are summarised below.

1. Have the priority pollutants been identified?
2. Has a thorough air quality assessment been completed?
3. Have constraints on the air quality assessment been identified?
4. Has a strategy been proposed to remove any constraints on the air quality assessment?
5. Is an adequate monitoring network in place?
6. Have the key pollutant sources been identified and emissions quantified?
7. Have appropriate intervention measures been identified?
8. Is there an implementation plan in place for the key intervention measures?
9. Have stakeholders been actively involved in the assessment or AQMP process?

A summary of the findings of the key questions on the 24 appraisals is presented in Section 4.2 below while Sections 4.3 to 4.4 provides a wider discussion of the review and feedback from the stakeholder questionnaires.

4.2 Findings on the key questions in the Evaluation Checklist

Key factors drawn out of the appraisals undertaken comprise the points listed in Sections 4.2.1 to 4.2.9 below while Section 4.2.10 provides a graphic summary of the findings presented.

4.2.1 Have the priority pollutants been identified?

Seventy six percent (76%) of the AQMPs identified priority pollutants in line with South African Ambient Air Quality Standards. The identified priority pollutants included sulphur dioxide (SO\(_2\)), particulate matter less than 10 microns in aerodynamic diameter (PM\(_{10}\)) and PM\(_{2.5}\) (included not as priority pollutants) oxides of nitrogen (NOx), ozone (O\(_3\)) and benzene. Most of these were identified from a review of sources in the study areas. However, there was minimal monitoring data to support this. The balance (24%) of the AQMPs are either silent on priority pollutants or not explicit.

Forty percent (40%) of the AQMPs also identified that Hazardous Air Pollutants (HAPs) may also be of concern, but there are currently no monitoring data to confirm this. Potential loss of amenity due to dust nuisance impacts and odiferous compounds is also identified. Only 2% of AQMPs highlighted indoor air quality problems associated with the use of paraffin heating, and odour problems linked to a number of sources.

4.2.2 Has a thorough air quality assessment been completed?

Only 48% of AQMPs presented extensive air quality assessments that included the monitoring data and modeling at a regional scale. The CALPUFF model was mainly used in the modeling assessments. Other assessments included the improvements identified in Action Plans.
Fifty two percent (52%) of the AQMPs did not conduct air quality assessments or align the analysed monitoring data with the South African Ambient Air Quality Standards. An example is where an AQMP presents diurnal or annual variations or concentrations in relation to wind direction instead of presenting annual means or daily averages which relates to standards.

Further to the above, findings included:

- No real indication of where exceedances might be in the study area.
- The monitoring evaluation is not explicit in terms of where exceedances of the objectives are.
- No source apportionment undertaken, or discussed but discussions are on the theory of modeling.
- Pollutants and sources are identified but not accurately quantified.
- The key pollutants as well as the principal sources of these pollutants have been identified, but the relative importance of these sources is not understood.
- None of the intervention measures had been linked with specified pollutants and no indication of what standards were being used.

In some instances, a baseline assessment of existing ambient air quality was undertaken, pollutants and sources identified, however not accurately quantified. This results in an incomplete assessment due to the limited data, and is largely based on the experience of the consultants in identifying likely key problems.

The following limitations were presented in the AQMPs:

- Existing emission inventories were outdated.
- Sometimes the continuous ambient monitoring data was available from industrial operators but difficult to access.
- Absence of a detailed AQMS limit the study in determining the extent of exceedances of the air quality standards and whether the implementation of certain emission reduction strategies would be justified.
- Problems associated with air quality monitoring such as data capture and insufficient details on QA/QC.

4.2.3 Have constraints on the air quality assessment been identified?

The majority (92%) of AQMPs had identified that the current lack of a detailed AQMS severely restricted the development of a comprehensive list of interventions to reduce pollutant emissions.

It was further noted in the AQMPs that:

- There is lack of a coordinated monitoring programme.
- Lack of information necessary to compile inventory of emissions from the key sources.
- No emission rates readily available, therefore in the case of industrial sources, raw material consumption rates and emission factors are applied to quantify emissions.
- The capacity constraints in terms of the skills to carry out the necessary work and the associated training needs are identified.
- Some evidence provided – ineffective data transfer mechanisms in place between those responsible for monitoring.
- Lack of information on the spatial extent of monitoring and types of pollutants measured is a recognized constraint.
- Poor meteorological data and lack of modeling skills and tools is recognized as a constraint in baseline air quality characterization and in assessing the air quality impacts from proposed management and minimization strategies.
- In some municipalities the air quality is not monitored and the discharges into the environment are also not controlled or regulated.
- Some AQMPs identify the need to carry out additional monitoring, refine and update the emissions inventory, and undertake dispersion modeling studies.

4.2.4 Has a strategy been proposed to remove any constraints on the air quality assessment?
Most AQMPs (80%) set out detailed proposals for air quality monitoring networks, emissions inventories and an urban-scale dispersion model. The AQMPs also provided detailed analysis of resources and set out recommendations for capacity building and institutional strengthening.

Those institutions with monitoring networks in most cases proposed improving their networks e.g. upgrading communications by installing effective data logger systems and relevant software to enable data transfer.

The other 20% of AQMPs identified the need for air quality monitoring networks but failed to present a strategy setting out how it will be done, who will do it, within what timescale, and whether funding or involvement of other organisations is required.

4.2.5 Is an adequate monitoring network in place or proposed?
The old metropolitans’ AQMPs indicate that their monitoring networks are in place and adequate, although it could be expanded to include informal areas, as well as measurement of benzene and other pollutants.

The provinces that have monitoring networks indicated that they may not currently be of an adequate size to justify the area of coverage. But it is unclear from information provided where current monitors are, what equipment they use, the data itself, data capture and other relevant items. It is also difficult to ascertain what potential issues of the area might be.
One of the interventions presented frequently in the AQMPs is to understand the need to establish further ambient air monitoring stations since the majority of AQMPs noted that there were no monitoring networks in municipalities/province. In some cases, the available ambient monitoring was carried out by industrial operators, for their own purposes, and not those of meeting the requirements of the AQMP. The need for a network was identified and some general principles set out for taking this forward, including integrating the industrial monitoring stations into municipal/provincial networks, with particular attention paid to appropriate siting of the monitoring stations. Recommended locations and pollutants to be measured are also not always set out or justified in the AQMP.

4.2.6 Have the key pollutant sources been identified and emissions quantified?

Only 6% of AQMPs presented detailed sections on key pollutant sources, including source apportionment. Where air dispersion modeling was undertaken, the CALPUFF model was mainly used as a regional model to identify hotspot locations. Other AQMPs identified key pollutants and the principal sources of these pollutants, but the relative importance of these sources is not understood and they are not quantified. In some instances, the monitoring data is included but not well presented. No information was provided in these instances on techniques used, QA/QC, data capture/ even monitoring period or where the analysers are situated.

One AQMP stated that “The identification of priority pollutants was limited due to the absence of a comprehensive air quality monitoring network. This was partially overcome by making reference to monitoring data from various campaigns and nongovernmental monitoring stations, and to monitoring results from similar regions.”

4.2.7 Have appropriate intervention measures been identified?

A detailed section on intervention measures is provided in some cases by source and also to improve air quality management capacity at different levels of government. However, none of the intervention measures were linked with specified pollutants. Other AQMPs identified intervention measures but not comprehensively. It is noted in these AQMPs that in the absence of a detailed air quality management system (AQMS), it is not possible to identify the full range of intervention measures that may be justified. In this case, it is appropriate to ensure that a suitable AQMS is established sooner.

In addition, the AQMPs focused on interventions on the short to medium term for the priority pollutants and the key sources, where it is expected that air quality problems will arise. This would in turn ensure a reduction to exposure in highly impacted areas at the earliest opportunity.
4.2.8  Is there an implementation plan in place for the key intervention measures?

- 64% of the AQMPs included implementation timescales as short, medium and long term, but not much other detail. They also tried to cost the proposals and include the responsibilities.
- No indication was provided of the effectiveness of any of the proposed interventions, or of any other impacts (e.g. on climate change).
- 16% of the AQMPs clearly detailed the implementation plan, identified those organizations responsible, and the timelines for implementation. A timeframe for the implementation of individual intervention measures was also provided, together with an indication of who is to be responsible for the implementation.
- There is no implementation plans or timeframes included in the 36% of plans. Most of the document indicates what should be performed in the future with no real timeline for implementation or tasks assigned.

4.2.9  Have stakeholders been actively involved in the assessment or AQMP process

In addition to Section 3.1.4 on stakeholder participation, the following is noted on stakeholder engagement from the AQMP appraisals undertaken.

Most AQMPs did not include details of the stakeholder engagement so it was difficult to assess the extent to which this aspect of the AQMP process was actually applied.

Only 8% of the documented AQMPs did not have stakeholders’ participation during AQMP development. The other AQMPs refer to public participation in the executive summary but limited details were provided.

The common stakeholders in all AQMPs included government departments, industry, NGOs and members of the public. The participation was presented as either meetings or workshops. These meeting are recorded according to information provided in the AQMPs but this is not included in the document or as a stakeholders list. It is also not clear as to what involvement stakeholders have had in the preparation of the AQMP, or in the selection of the interventions.

The AQMPs appraised reported varying degrees of stakeholder involvement and included the following:

- In some cases a questionnaire would have been used as a tool for data gathering or to gain understanding of air quality issues in an area.
- Draft documents were sent to all key stakeholders for comment but it is not clear what the responses were, but it is stated that they were taken into account in preparing the final report.

The lack of comment from stakeholders is also noted.

4.2.10  Summary of the findings of the AQMP appraisals

A graphical presentation of the findings of the key questions raised in the AQMP appraisals is presented in Figure 5 below.
Figure 5: Graphical presentation of the key questions on the AQMP appraisals
4.3 Principal constraints to the development of an AQMP

Based on the questionnaire responses, appraisals of the existing AQMPs, project stakeholder engagement and further to the information presented in Sections 3 and 4 of this report, the principal constraints in the development of AQMPs in South Africa is presented in point form below (also see appendix C for constrains per government entity). There is no order of importance in the presentation of these findings.

1. **Defining the process**: While the Manual for Air Quality Management Planning presents a structured approach to developing an AQMP and provides an outline of the different levels of AQMP required, the document is still seen as having shortcomings in terms of providing adequate guidance in this area. It was noted that more direct, explicit detail on the development of an AQMP should be provided as well as some direction for those authorities that do not have serious air quality issues that need to be addressed by a comprehensive AQMP.

   While there was generally a lot of support for the manual where it was used, the call for a less technical document with an emphasis on planning processes was highlighted as a preference. It was further noted that the manual should provide guidance on the main areas of concern and a description of pollutants and sources.

   In general, a call for more explicit requirements in terms of the development of an AQMP should be provided the manual. Guidance in particular with regards to the starting point of the quantitative aspect of the planning process is expected.

2. **Project timeframes**: There seems to be an unrealistic understanding from provincial, district and local government levels on the time required in undertaking an AQMP. Most tender requests require projects to be completed within six months, which is in most cases impractical.

   Time required for, and delays experienced gathering data and the need for engagement with various stakeholders is not understood by many officials. The impacts of various internal processes at authorities, which affect project deliverable timeframes are underestimated. In addition, comment periods are often not adhered to and additional comments are provided beyond timelines indicated initially.

   Further to the above, project scope is often extended during the course of the project lifespan which also negatively affects on-time delivery.

3. **Human Resource Capacity**: The AQO or responsible person within an authority responsible for developing an AQMP often has other roles and responsibilities besides the air quality management function. This detracts from the core project principles most times as priority is placed in other areas where the need is perceived to be
more pressing. This often then result in project delays, lack of participation in the development of the AQMP document which also compromises the level of buy-in expected of the authority.

The capacity constraints in terms of the shortage of skills to carry out the necessary air quality management function and the associated training needs are also a common challenge in government spheres.

The air quality function has distinct skill requirements including but not limited to tasks such as air quality monitoring; emissions inventory and air dispersion modeling; air emissions licensing; monitoring and law enforcement.

These skills are of a very technical nature and require preferably personnel with a background in natural and related sciences. Team members with a with good understanding of atmospheric chemistry, local air quality influences, sources of pollution and monitored data would also be highly advantageous.

The function should where possible encompass staff with competence in the following functions:

- Technician able to perform routine maintenance on ambient air quality equipment (including troubleshooting equipment faults, basic maintenance and operation).
- Personnel able to understand the development of an emissions inventory and air dispersion modeling. This would include the capacity to be able to analyse industrial processes, understand the chemical emissions and the factors affecting emission rates. This function would also require a certain degree of interaction with other departments within the governance structures such as town planning and or transport departments.
- The function of the licensing of industrial processes would require an individual with an understanding of industrial processes, anticipated emissions and their impacts, environmental legislation. Further skills would include the ability to develop binding permits with relevant control requirements.
- An official would also be required for the monitoring and enforcement to ensure compliance to applicable standards or by-laws.

In addition a managerial component is required to direct, budget, control and manage the various components of the function. The nature of the training of the EHP (as seen previously is mainly held responsible in the governance structures for air quality management) is general in nature and additional targeted training would be required to gain the expertise in the air quality management functions noted above.

4. **Financial Resource Capacity:** Since the AQA has taken effect, the responsibility of air quality management has been placed on governance structures with the additional burden of financing the function. Unlike a service such as the provincial or municipal health service, air quality does not have an allocation budget through the national treasury and remains the responsibility of the governance structure to make budgetary provision.
This is evidenced through the annual reports received at the annual air quality Lekgotla from provincial and municipal structures as well as through the feedback on the stakeholder questionnaires on this project.

This constraint in air quality management planning had a common thread through all responses on the stakeholder questionnaires and presented as generally a lack of funding within governance structures.

Looking at the financing of the air quality function, it becomes complex with aspects to be considered including but not limited to the following:

- Recruiting and employing staff to undertake the function bearing mind those technical requirements highlighted in point 3 above.
- Training of staff where required.
- Implementation of the AQMA in terms of all the air quality management planning aspects. (Including the legal requirements aspects)
- Cost of developing an AQMP.
- Cost of the implementation of the AQMP. (Where intervention measures are identified)
- Cost of the procuring, installation and management of an ambient air quality management system where required.

5. **Stakeholder involvement:** As noted previously, the AQMPs appraised showed a degree of stakeholder involvement from technical committees, air quality stakeholder groups to public participation. The challenges noted included the following:

- Apathy on the part of some local municipality representatives within departments holding information required for input into the AQMP.
- Distrust between the public, NGOs, industry and the local authority.
- Attendance at stakeholder workshops. Non-attendance means that the meetings have to be rescheduled at additional costs or additional meetings to be held to address issues raised in the meetings.
- Adequate coverage to ensure that all relevant parties are involved in the process.
- Addressing all needs adequately and preventing withdrawal from engagement.

6. **Data availability:** The constraints experienced in the availability of data to compile a comprehensive AQMP included but not limited to the following:

- Lack of a coordinated monitoring programme.
- Unavailability of information necessary to compile inventory of emissions from key sources.
- No emission rates readily available, therefore in the case of industrial sources, coal consumption rates and emission factors are applied to quantify emissions.
● Ineffective data transfer mechanisms in place between those responsible for monitoring.
● Lack of information on the spatial extent of monitoring and types of pollutants measured.
● Poor meteorological data and lack of modeling skills and tools is recognised as a constraint in baseline air quality characterization and in assessing the air quality impacts from proposed management and minimization strategies.
● In some municipalities the air quality is not monitored and the discharges into the environment are also not controlled or regulated.
● Existing emission inventories are outdated.
● Sometimes the continuous ambient monitoring data is available from industrial operators but is difficult to access.
● Absence of a detailed Air Quality Management System limits the study in determining the extent of exceedances of the air quality standards and whether the implementation of certain emission reduction strategies would be justified.
● Problems associated with monitoring such as data capture and insufficient details on quality assurance/quality control (QA/QC).

7. **Other additional challenges reported by officials:**

   ● Failure by officials to commit on their duties and function
   ● Lack of commitment from top management and
   ● Buy-in from councillors to support the project.

However, 70% of the respondents thought they had adequate support from other departments, external organisations and politicians

4.4 **Principal constraints to the development and implementation of the intervention strategies**

1. The governance questionnaire responses indicated that of those AQMPs that had identified intervention strategies, 80% had been implemented either fully, or in part. Only 25% had a budget assigned to these strategies. Fifty percent (50%) had already reviewed their AQMP and evaluated the implementation strategies.

The development of intervention strategies was cited as:

   ● Being helpful in identifying problem areas,
   ● Assisting with providing direction for future planning,
   ● Formalising training needs.
2. Although the AQMPs provided useful interventions to improve air quality, they did not include any alternative options for implementation which make it difficult to include an analysis of which measures might provide the best option.

3. There has been no attempt to provide any indication of the possible impacts of any of the interventions and it is therefore not possible to quantify the emission reduction potential of the proposed measures, nor accurately monitor any progress. There is also no qualitative indication of the effectiveness of interventions or any indication of any other potential impacts of the proposed interventions (either positive or negative), for example on socio-economic indicators, or on other environmental parameters such as climate change gas emissions.

4. Most of the proposed intervention measures in the AQMPs appraised were generalised in nature with none of the intervention measures being linked with specific pollutants.

5. Another significant shortfall in the implementation of the intervention measures was identified as the lack of interaction between the various spheres of government. A communication and reporting framework however formed part of the AQMP.

6. As noted previously, the majority (92%) of appraised AQMPs identified that the current lack of a detailed AQMS severely restricted the development of a comprehensive list of interventions to reduce pollutant emissions. It would also not be possible to identify a full range of intervention measures that may be justified.

One of the AQMPs detailed: "The identification and quantification of sources was limited due to the absence of a comprehensive emissions inventory in other areas. Although emission reduction measures were identified for significant sources, the reduction in air pollutant concentrations due to the implementation of such sources could not be quantified due to the unavailability of accurate emissions data and an air dispersion model tailored for the area."

7. Some AQMPs identified the need to remove constraints on the air quality assessment but a strategy setting out how it will be done, who will do it, within what timescale, and whether funding or involvement of other organisations is required, was not provided.

8. Others presented a range of measures, but these were not comprehensive. The identification of a comprehensive set of intervention measures sometimes was not possible given the absence of detailed information on sources. However, based on the obvious problem areas, intervention measures were discussed. Interventions for other sources were discussed in general terms, with possible emission reduction strategies identified.
9. Even though it is difficult to develop a comprehensive implementation plan without all the detailed information on problem areas and sources, some AQMPs made an effort to put clear measures that should be being implemented. An implementation plan would be established that is added to over time and regularly reviewed. This plan would identify those organizations responsible and the timescales for implementation of the various interventions.

10. Other plans highlighted research initiatives being undertaken but were clearly linked to improving the intervention measures and taking forward the implementation plan. Sometimes not clear, referral to current, short and medium terms strategies only indicated what should be performed in the future.

11. A summary of some of the constraints facing implementation of the intervention plans are:
   - Lack of representatives from different government departments e.g. transport, for purposes of vehicular emission and road broadening.
   - No current information, e.g. 2001 statistics was used making it difficult to project the correct intervention strategies.
   - No non listed activity sources were identified making it difficult to identify activities to be declared controlled emitters because of their existence in a specific area.
   - Lack of participation of relevant stakeholders.
   - The main issue relates to financial resources to implement, relevant skills within the department, capacity constraints and lack of commitment from top management to support the implementation.

4.5 Extent of the DEA involvement in the development of AQMPs

The DEA Sub-Directorate: Air Quality Management Planning comprises a Director, Deputy Director and two Assistant Directors. The main function of the sub-directorate is to provide support to other spheres of government in terms of air quality management planning.

The function encompasses:
   - Input and developmental support to the development, review and approval of national departments’, provincial and municipal air quality management plans.
   - Active participation in the development of AQMP support tools such as manuals, guidelines, templates and best practice case studies.

The extent of this support has seen the involvement of the department as follows:
   - The Manual for Air Quality Management Planning was published in 2008 and provides a comprehensive support tool and templates for the development of an AQMP.
   - Attendance at key meetings in the development of provincial and municipal AQMPs.
   - Monitoring different stages of the development of AQMPs remotely.
Presentation within different governance structures on the aspects of AQMP and the expectations.

Written comment on the AQMP documents.

Mixed feelings were expressed by questionnaire respondents with regards to the DEA involvement in the developing of AQMPs. The following comments were levied in this regard:

- The development of an AQMP is an internal process and the DEA should be consulted where and when appropriate or directed by regulatory requirements.
- The DEA attended key meetings and advised on key issues in the plan.
- They also monitored the AQMP process to see whether the relevant stakeholders were consulted and that the necessary public participation processes had been followed.

In addition to the above DEA involvement, it was considered by respondents that their involvement should include:

- Providing training to officials.
- Implement AQA requirements for reporting on AQMP development and implementation.
- Provide feedback on AQM’s developed and technical support.
- Working with other spheres of government during AQMP review process.

Provide ready access to pre-processed information related to:

- Emissions inventories (corroborated),
- Listed Activities,
- Model runs,
- Monitored data (Validated).

5. AQMPS FOR NATIONAL DEPARTMENTS

Section 15 of AQA requires that all national departments that are responsible for developing Environmental Management Plans (EMPs) or Environmental Implementation Plans (EIPs) as mandated by chapter 3 of NEMA (i.e. NEMA schedule 1 and 2 departments), must develop and include those AQMPs into their respective EMPs/EIPs. A questionnaire was developed and sent to all National Department in (Table 5), with the aim of understanding the status of AQMP development by the National Departments; finding the level of inclusion of AQMPs into EMPs and/or EIPs, and understanding the challenges experienced by National Department with regard to fulfilling such a mandate. A desktop research was also undertaken to assess and appraise the inclusion of AQMP into EMPs/EIPs in schedule 1 and schedule 2 departments that did not respond to the questionnaire. The outcome of the assessments is shown in Table 5 below.
### Table 5: The status of AQMP development for national departments as reflected in the EIPs/EMPs

<table>
<thead>
<tr>
<th>National Departments</th>
<th>EIP/ EMP in place (Yes/No)</th>
<th>AQMP included (Yes/No)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Rural Development</td>
<td>Yes</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>Department of Agriculture, Forestry and Fisheries</td>
<td>Yes</td>
<td>No</td>
<td>Air quality impacts are mentioned briefly in the EIP but there is no indication of how air quality issues are going to be addressed</td>
</tr>
<tr>
<td>Department of Human Settlement</td>
<td>Yes</td>
<td>No</td>
<td>Air quality is mentioned in the EIP but there is no indication of how air quality issues are going to be addressed</td>
</tr>
<tr>
<td>Department of Trade and Industry</td>
<td>Yes</td>
<td>No</td>
<td>Air quality legislation is mentioned in the EIP but there is no indication of how air quality issues are going to be addressed</td>
</tr>
<tr>
<td>Department of Defence</td>
<td>Yes</td>
<td>No</td>
<td>Air quality legislation is mentioned in the EIP but there is no indication of how air quality issues are going to be addressed</td>
</tr>
<tr>
<td>Department of Energy</td>
<td>Yes</td>
<td>No</td>
<td>DoE indicated in their EMP plans/measures undertaken to reduce air pollution. However, there is no AQMP in place.</td>
</tr>
<tr>
<td>Department of Labour</td>
<td>Yes</td>
<td>No</td>
<td>There is a brief mentioning of air quality legislation</td>
</tr>
<tr>
<td>Department of Mineral Resources</td>
<td>Yes</td>
<td>No</td>
<td>DMR indicated in their EMP the key pollutants of concern and plans/measures undertaken to reduce air pollution. However, there is no AQMP in place.</td>
</tr>
<tr>
<td>Department of Health</td>
<td>Yes</td>
<td>No</td>
<td>Air quality mentioned in passing in the EMP</td>
</tr>
<tr>
<td>Department of Transport</td>
<td>Yes</td>
<td>No</td>
<td>No mention of strategies or plans that specifically target air quality</td>
</tr>
<tr>
<td>Department of Water Affairs</td>
<td>Yes</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>Department of Environmental Affairs</td>
<td>No</td>
<td>Yes</td>
<td>The National Framework for Air Quality Management in South Africa is the Department’s (DEA) AQMP</td>
</tr>
<tr>
<td>Department of Tourism</td>
<td>No</td>
<td>No</td>
<td>None</td>
</tr>
</tbody>
</table>

In general, the assessment showed that all national departments that are required to develop EMPs/EIPs have done so with the exception of the Departments of Environmental Affairs and of Tourism. In terms of AQMP development, no department has developed an AQMP. It is only the departments of Energy and of Mineral Resources that have, in their EMPs, characterised the nature of their air quality impacts and the plans/measures to address issues of air quality associated with their activities.
6. CONCLUSION

Notwithstanding the need for further capacity resources, commitment to the function of air quality management planning can be seen within the governance structures at varying degrees of involvement from the acknowledgement of the function through active campaigning to initiate an AQMP to the successful completion of an AQMP within an institution.

The DEA has formed a basis for this planning regime through the interventions outlined in the National Framework, considered as the national AQMP. This was further motivated by publishing of the Manual for Air Quality Management Planning in South Africa in 2008.

The assessment of the status quo has highlighted that even though there is a strategic planning focus for air quality management planning in South Africa, there is still a long way to go in order to gain a quantifiable understanding of the ambient air quality in the country and planning thereof.

Even though 87% of the AQMPs undertaken are aligned to other municipal priorities such as health, transport or an environmental plan, the processes currently in place do not provide a measureable basis on which to form informed air quality management decisions in the country. This is further supported by AQMPs not providing quality data on which to base informed decisions on the air quality within an area.

In order to gain a full understanding of the state of ambient air quality, the presentation of quality data would provide the basis from which to make informed assumptions. Instead, AQMPs have provided in most cases a baseline assessment of an area with a minimal understanding of the actual air quality but rather a qualitative approach to providing information on air quality management planning in an area.

As a result, the intervention strategies proposed are geared towards more practical hands on assignments regarding air quality management planning activities rather than setting specific ambient air quality goals within a region that can be quantified over time. In quantifying air quality into a measurement, the AQMP would remain in line with the definition of an AQMP noted in the National Framework as noted previously as

“All air quality management plans (AQMPs) are logical descriptions of interventions and required resources aimed at implementing a strategy or strategies to achieve a specific air quality objective. Given that the AQA prescribes an objectives based approach to air quality management, the overall objective or goal of all AQMPs may be framed as a desired outcome as follows – Ambient air quality complies with ambient air quality standards”

In essence an AQMP should provide an indication of the compliance to ambient air quality standards in a given area and report against a specified goal of the said AQMP.
In addition to the above, the various challenges presented in the report comprise varying degrees of constraints, the major one being that of capacity within governance structures, both human and financial resources noted as the main concerns throughout the process.

In terms of going forward to harmonise the air quality management planning regime, the design of the DEA support programme would need to take cognisance of the findings of this report as well as some items listed below that have been specifically highlighted as issues that need to be resolved as part of this programme.

1. Section 17 of the AQA notes that annual reporting on the implementation of the AQMP should be made. In some instances this is not being undertaken and should be viewed as a level of non-compliance of the Act.
2. A set of indicators should be applied to monitor working groups that manage the implementation of intervention strategies.
3. A national AQMP and monitoring system should be considered. The National Framework in this instance was not considered the national AQMP.
4. A review of AQMPs should consider actions/ problem areas that are common being elevated to the national AQMP level.
5. Qualitative versus quantitative AQMPs. The local municipality plans could be considered quantitative while the provincial plans would be seen as qualitative AQMPs providing a logical approach that feeds into each other.
6. Looking at ways to provide access to AQMP data readily.
7. Consider a mandate to Treasury to ring fence funding for the air quality management planning function.
8. Since AQMPs should assist with managing air quality, guidance on how to manage transboundary issues should be included. There somehow needs to be synergy between governance structures and areas.
9. Improve coordination between the levels of governance structures.
10. Consideration of a quarterly reporting function.
11. The process should provide a clear indication of the reporting and AQMP requirements.
12. Where possible, each strategy and objective should have a Council approved project budget to ensure implementation.

Further to the above, in determining the support programme for air quality management planning in South Africa, the current national projects underway would also be considered. These include but not limited to the national air emissions inventory, SAAQIS and the national reference laboratory initiative.

In essence, the success of the air quality planning mandate will largely be determined by the ability to provide the required resources such as skills, finance and infrastructure. The main issues relates to finances to implement the plans as well as specific guidance on the content of the AQMP. If no dedicated budget is available, the plan will be limited in its effectiveness as seen in the assessments undertaken for this report.
7. REFERENCES


Air Quality Management Plans:


Gauteng Province Air Quality Management Plan (FINAL REPORT): January 2009


Draft Air Quality Management Plan for the Mangaung Local Municipality. May 2005 (first draft


Air Quality Management Plan for the City of Cape Town, Report AQM 20050823 – 001
ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEL</td>
<td>Atmospheric Emission Licence</td>
</tr>
<tr>
<td>AQM</td>
<td>Air Quality Management</td>
</tr>
<tr>
<td>AQMP</td>
<td>Air Quality Management Plan</td>
</tr>
<tr>
<td>AQMS</td>
<td>Air Quality Management Systems</td>
</tr>
<tr>
<td>AQO</td>
<td>Air Quality Officer</td>
</tr>
<tr>
<td>CBO</td>
<td>Community Based Organisation</td>
</tr>
<tr>
<td>DEA</td>
<td>The Department of Environmental Affairs</td>
</tr>
<tr>
<td>DM</td>
<td>District Municipality</td>
</tr>
<tr>
<td>EHP</td>
<td>Environmental Health Practitioner</td>
</tr>
<tr>
<td>EIP</td>
<td>Environmental Implementation Plan as defined in the NEMA</td>
</tr>
<tr>
<td>EMP</td>
<td>Environmental Management Plan as defined in the NEMA</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>IDP</td>
<td>Integrated Development Plan</td>
</tr>
<tr>
<td>IEM</td>
<td>Integrated Environmental Management</td>
</tr>
<tr>
<td>LM</td>
<td>Local Municipality</td>
</tr>
<tr>
<td>NF</td>
<td>National Framework</td>
</tr>
<tr>
<td>NGO</td>
<td>Non Governmental Organisation</td>
</tr>
<tr>
<td>PM</td>
<td>Particulate matter</td>
</tr>
<tr>
<td>QA</td>
<td>Quality assurance</td>
</tr>
<tr>
<td>QC</td>
<td>Quality control</td>
</tr>
<tr>
<td>SAAQIS</td>
<td>South African Air Quality Information System</td>
</tr>
<tr>
<td>UK</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>US EPA</td>
<td>United States Environmental Protection Agency</td>
</tr>
<tr>
<td>VOCs</td>
<td>Volatile Organic Compounds</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
</tbody>
</table>
## GLOSSARY AND DEFINITIONS

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Quality Management Plan</td>
<td>Means a plan as contemplated in section 15 of AQA (Act 39 of 2004)</td>
</tr>
<tr>
<td>Air-shed</td>
<td>Geographical areas that are defined according to topographical, meteorological, political or other criteria in order to address air quality issues that are common to the area. Similar concept to river catchments.</td>
</tr>
<tr>
<td>Air Quality Officer</td>
<td>means an officer appointed in terms of section 14 of AQA as an air quality officer</td>
</tr>
<tr>
<td>Ambient Air</td>
<td>Air in the environment, excluding indoor air.</td>
</tr>
<tr>
<td>Ambient air quality standards</td>
<td>values that define targets for air quality management and establish the permissible amount or concentration of a particular substance in or property of discharges to air based on what a particular receiving environment can tolerate without significant deterioration</td>
</tr>
<tr>
<td>Baseline air quality assessment</td>
<td>A compilation of existing or current data and knowledge on air quality in a particular area. It forms an essential input into the subsequent formulation of the AQMP. It comprises an assessment of the current ambient air quality status; an assessment of current organisational structures for air quality management; and an assessment of current air quality initiatives to reduce air pollution.</td>
</tr>
<tr>
<td>Continuous sampling</td>
<td>Ambient air quality sampling conducted by drawing air into sampling equipment with real time analysis of concentrations using accepted reference methods. Measurement and recording is done in a continuous manner.</td>
</tr>
<tr>
<td>Cost- Benefit Analysis</td>
<td>the process that involves weighing the total accepted costs against the total expected benefits in order to choose the best option</td>
</tr>
<tr>
<td>Dispersion Modeling</td>
<td>Computer-based model that simulates the dispersion or movement of pollutants in the atmosphere based on a set of equations that are determined by the meteorological conditions of the atmosphere. The output is a set of predicted values of a pollutant for a defined location and time period.</td>
</tr>
<tr>
<td>Emission</td>
<td>Pollution discharged into the atmosphere from a range of stationary and mobile sources. These include smokestacks, vents and surface areas of commercial or industrial facilities; residential sources; motor vehicles and other transport related sources.</td>
</tr>
<tr>
<td>Emission inventory</td>
<td>a listing or register of the amount of pollution entering the atmosphere from all sources within a given time and geographic boundaries</td>
</tr>
<tr>
<td>Emission standard</td>
<td>A specific limit to the amount of pollutant that can be released to the atmosphere by a specified source.</td>
</tr>
<tr>
<td>Environment</td>
<td>The surroundings within which humans exist and that are made up of (i) the land, water and atmosphere of the earth; (ii) micro-organisms, plant and animal life; (iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and (iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being (definition from the National Environmental Management Act - NEMA).</td>
</tr>
<tr>
<td>Environmental Management Systems</td>
<td>A part of the management system of an organisation in which specific competencies, behaviours, procedures and demands for the implementation of an environment policy are defined.</td>
</tr>
<tr>
<td>Exceedances</td>
<td>A situation in which a measured ambient air quality concentration (or emission rate) of a particular pollutant exceeds the ambient air quality guideline or standard (or emission limit) for that pollutant. Exceedances are normally expressed as a total number per time period and give an indication of the severity of the air pollution problem.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Fugitive Emissions</td>
<td>Emissions that are difficult to identify and quantify, such as gases that “escape” from badly managed or maintained processes, e.g. leak in pipes.</td>
</tr>
<tr>
<td>Fugitive sources</td>
<td>Sources of emissions that are difficult to identify and quantify. As the name implies, fugitive emissions include gases that “escape” from wide activities/processes, e.g. leaky pipe-work.</td>
</tr>
<tr>
<td>Greenhouse gases (GHG)</td>
<td>Means gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and re-emit infrared radiation, and includes carbon dioxide, methane and nitrous oxide.</td>
</tr>
<tr>
<td>Guideline</td>
<td>A recommendation on the ambient concentration of a pollutant required for the protection of human health (or receptors in the environment) from the adverse effects of the pollutant. It is not restricted to a numerical value but might also be expressed, for example, as exposure-response information or as a unit risk estimate.</td>
</tr>
<tr>
<td>Mitigation measures</td>
<td>Efforts to attempt to prevent pollution or to reduce the effects of pollution that occur.</td>
</tr>
<tr>
<td>Mobile source</td>
<td>Means a single identifiable source of atmospheric emission which does not emanate from a fixed location.</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Periodic or continuous surveillance or testing to determine the level of compliance with statutory requirements and/or pollutant levels in various media or in humans, plants, and animals.</td>
</tr>
<tr>
<td>National Framework</td>
<td>“The 2007 National Framework for Air Quality Management in the Republic of South Africa” report produced for DEAT that provides detail on the practical implementation of the Air Quality Act (AQA) in order to achieve its objectives.</td>
</tr>
<tr>
<td>Natural Sources</td>
<td>Pollution sources that are related to natural processes as opposed to those which are due to human activities.</td>
</tr>
<tr>
<td>Non-point source</td>
<td>Means a source of atmospheric emissions which cannot be identified as having emanated from a single identifiable source or fixed location, and includes veld, forest and open fires, mining activities, agricultural activities and stockpiles.</td>
</tr>
<tr>
<td>Passive sampling</td>
<td>Air quality monitoring by means of exposure of the sampler to ambient air and adsorption of the pollution into the sampling medium. Sampling is over longer time periods and subsequent analysis is required to determine concentrations.</td>
</tr>
<tr>
<td>Priority Area</td>
<td>Means an area declared as such in terms of section 18 of AQA.</td>
</tr>
<tr>
<td>Priority Area AQMPs</td>
<td>means a plan referred to in section 19 of AQA</td>
</tr>
<tr>
<td>Priority pollutant</td>
<td>Pollutants which, through ambient concentrations, bioaccumulation, deposition or in any other way, present a threat to health, well-being or the environment. Factors that may influence whether a pollutant is identified as such include: its toxicity; the volume of emissions; or the proximity of the emission relative to sensitive receptors. A list of priority pollutants is contained in Chapter 5.3.2 of the National Framework (2007), Table 23.</td>
</tr>
<tr>
<td>Transboundary air</td>
<td>Air pollution can be released at one location and travel long distances through the atmosphere with prevailing winds. In this way, air pollution can affect air quality locally as well as many miles away.</td>
</tr>
<tr>
<td>Quality Control</td>
<td>The operational techniques and the activities used to fulfill and verify requirements of quality.</td>
</tr>
<tr>
<td>Quality assurance</td>
<td>Determining the actual quality of the data and if the data fulfils the Data Quality Objectives.</td>
</tr>
</tbody>
</table>
APPENDIX A

Number of questionnaire respondents per province.

<table>
<thead>
<tr>
<th>Name of province</th>
<th>Number of respondents including – municipalities and provinces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauteng</td>
<td>7</td>
</tr>
<tr>
<td>Limpopo</td>
<td>5</td>
</tr>
<tr>
<td>Mpumalanga</td>
<td>2</td>
</tr>
<tr>
<td>Northern Cape</td>
<td>3</td>
</tr>
<tr>
<td>KwaZulu-Natal</td>
<td>8</td>
</tr>
<tr>
<td>Free State</td>
<td>2</td>
</tr>
<tr>
<td>Western Cape</td>
<td>10</td>
</tr>
<tr>
<td>Eastern Cape</td>
<td>3</td>
</tr>
<tr>
<td>North West</td>
<td>3</td>
</tr>
</tbody>
</table>
APPENDIX B

Stakeholders' questionnaire
NOTE: Please note the instruction below before completing the questionnaire

SECTION A
Complete this section if there is an AQMP in place
OR
the governance structure is in the process of undertaking an AQMP

SECTION B
Complete this section if there is NO AQMP in place within the governance structure
SECTION A
SECTION A:
ANSWER THIS SECTION IF THERE IS AN AQMP IN PLACE OR IF ONE IS IN PROGRESS

SECTION A1:
This section seeks basic information about the authority, and the resources that are available to carry out an AQMP.

A1.1: Your name: 

A1.2: Your National, Provincial or Local Authority: 

A1.3: Your department and position in the Authority (Department responsible for undertaking the AQMP): 

A1.4. Contact Details:
Email: ________________________________ Phone: __________________________

A1.5: Please provide a short description of the resources available to your Authority to carry out AQMP work, e.g. how many staff work on air quality issues (both full and part-time), and what experience they have. Approximately how many hours per week are devoted to AQMP work?

A1.6: Have any staff attended training sessions related to AQMP work?
Yes  [ ]
No  [ ]
If YES, please answer A1.7.

A1.7: Please provide details below of what training you have received. Where possible, set out those particular aspects of AQMP work that the training covered (i.e. monitoring, modelling, emissions inventories, interventions, coordinating the process etc.).
SECTION A2:
The intent of this section is to understand better what elements of the system work well, what the principal constraints have been, and how the system could be improved.

A2.1. How far along is the development of the AQMP?
Completed  □  Partially Completed? □
If complete, when was the AQMP completed?  

Is the document available for review?    Yes □    No □
If incomplete, at what stage in the development is the AQMP?  

Is the document available for review?    Yes □    No □

A2.2. How long did it take to develop the AQMP? Provide an indication of timeframes below:
   a) Time from deciding on the development through the procurement process and appointing a service provider to undertake work. (Alternatively, if done in-house, time taken from decision to actually starting work on the AQMP)
   b) Time from inception of the project to a final copy of a baseline assessment.
   c) Time from final baseline assessment report to final AQMP being published.

A2.3. Was/ has an external consultant assigned/ been assigned to undertake the development of the AQMP or is this being done in-house?

External Consultant □
In-house □
A2.4. If being undertaken by an external consultant, please indicate the name of the consultant.

_____________________________________________________________

A2.5. What in your opinion was/is the level of skills transfer by Consultants involved in the development of the AQMP? Describe this involvement

A2.6: Was a Technical Committee set up to oversee the AQMP process? Yes ☐ No ☐

If YES, please answer A2.7 and A2.8. If NO, go to A2.9.

A2.7: Please provide a list of the departments and/ or organisations that comprised the Technical Committee. Please tick box as appropriate:

- Department of Environmental Affairs ☐
- Department of Housing ☐
- Department of Health ☐
- Department of Transport ☐
- Provincial Departments (please state) ☐
- District/local municipalities Departments (please state) ☐
- Other (please state) ☐

A2.8: How did the Technical Committee assist in the AQMP work?

i) ☐

ii) ☐

iii) ☐

A2.9: Was an Air Quality Stakeholder Group established? Yes ☐ No ☐

IF YES, please answer A2.10 and A2.11. If no, go to A2.12
A2.10: Please provide a list of the organisations that comprised the Stakeholder Group. Please tick box, or specify who, as appropriate:

- Department of Environmental Affairs
- Department of Housing
- Department of Health
- Department of Transport
- Provincial Departments (please state)
- District/local municipalities Departments (please state)
- NGOs (please state)
- Industry (please state)
- Other (please state)

A2.11: How did the Stakeholder Group assist in the AQMP work?

i) 

ii) 

iii) 

A2.12: What level of public participation was there during the development of the AQMP? Describe the interactions if any. (E.g. number of meetings, or correspondence)

A2.13: How many stakeholder meetings were held during the development of the AQMP? Please note details, including for each stakeholder group meeting held - number of meetings, stage in the AQMP development that meeting was held and the objective of meeting.

A2.14: What medium was used to invite these stakeholders to take part in the development of the AQMP? Please detail below.
A2.15. What was the extent of the National DEA involvement in the development of the AQMP?

A2.16. Has the AQMP been included in the IDP/ EMP/ EIP?  

Yes ☐  No ☐

A2.17: Do you carry out ambient air quality monitoring in your area?  

Yes ☐  No ☐

If YES, please go to A2.18. If NO, go to A2.19.

A2.18: Please provide a summary of the continuous ambient air monitoring carried out for each pollutant (i.e. number of sites, QA/QC programmes, and whether the management of the monitoring is carried out using in-house staff or through external consultants).

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Number of sites</th>
<th>QA/QC Programme (x if yes)</th>
<th>In house? (x if yes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulphur Dioxide</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Nitrogen Dioxide</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Particulate Matter (PM$_{10}$)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Ozone</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Benzene</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Lead</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
Any further details can be provided below: (For example, any passive ambient air sampling or information on other air sampling campaigns or information on non-priority pollutants)

A2.19: Has an emissions inventory been compiled for your area?  

Yes  

No  

If YES, please go to A2.20. If NO, go to A2.23.

A2.20: Please provide a summary of the emissions inventory that has been completed, i.e. pollutants and sources included (cross relevant boxes)

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Transport</th>
<th>Industrial Large</th>
<th>Industrial Small</th>
<th>Power generation</th>
<th>Domestic</th>
<th>Mining</th>
<th>Landfill and Waste disposal</th>
<th>Agricultural (including biomass burning)</th>
<th>Fugitive Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulphur Dioxide</td>
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<td>Nitrogen Dioxide</td>
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<td>Particulate Matter (PM$_{10}$)</td>
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<td>Carbon monoxide</td>
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</tbody>
</table>

A2.21. Was the majority of the emissions inventory work undertaken in house, or contracted out?

In house  

Contracted out  

A2.22. Could a copy of the emissions inventory report be made available for review?
Yes ☐ No ☐
If YES, please provide details below of where we can source this report.

Any further details can be provided below:

A2.23: Have any dispersion modelling assessments been carried out within your area? YES/NO
If YES, please go to A2.24. If NO, go to A2.28.

A2.24: Please provide a summary of the modelling that was completed (i.e. model used, for which pollutant).

<table>
<thead>
<tr>
<th></th>
<th>ADMS</th>
<th>Aermod</th>
<th>Caline 3</th>
<th>Calpuff</th>
<th>CAMx</th>
<th>CONCIX</th>
<th>HAWK</th>
<th>ISC</th>
<th>Other</th>
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</thead>
<tbody>
<tr>
<td>Sulphur Dioxide</td>
<td></td>
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<td>Nitrogen Dioxide</td>
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<td>Particulate Matter (PM_{10})</td>
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</tbody>
</table>
If other, please specify

A2.25. Did your modelling include sources outside your area (transboundary sources)?

Yes [ ] No [ ]

A2.26. How did you include regional background in your modelling?:

A2.27. Was the majority of the modelling work undertaken in house, or contracted out?

In house [ ] Contracted out [ ]

Any further details can be provided below:

A2.28: Did you use the *Manual for Air Quality Management Planning* published by DEA in September 2008 as the basis for undertaking your AQMP? Yes [ ] No [ ]

If YES, please answer A2.29 and A2.30. If NO, go to A2.31.

A2.29: Which parts of the Manual did you find most useful?

i) 

ii) 

iii) 

A2.30: Which parts of the Manual do you think could be improved?

i) 

ii) 

iii)
A2.31. What other documents besides the Manual for Air Quality Management Planning were consulted as a guide in developing the AQMP?

A2.32: Did the AQMP identify parts of your area that are at risk of exceeding the National Air Quality Standards? Yes ☐ No ☐ Incomplete ☐

If YES/INCOMPLETE, please answer A2.33. If NO, please go to A2.34

A2.33: Please provide a brief summary of the exceedences (e.g. which standards are exceeded, and what are the main source contributions)

<table>
<thead>
<tr>
<th>Source</th>
<th>Transport</th>
<th>Industrial Scheduled</th>
<th>Industrial small, non-scheduled</th>
<th>Power generation</th>
<th>Domestic</th>
<th>Mining</th>
<th>Landfill and Waste disposal</th>
<th>Agricultural (including biomass burning)</th>
<th>Fugitive Sources</th>
<th>Trans boundary</th>
<th>Secondary pollutant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulphur Dioxide</td>
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<td>Carbon monoxide</td>
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</tr>
</tbody>
</table>

Any further details can be provided below:

A2.34: Have you developed intervention strategies for the AQMP? Yes ☐  No ☐

If YES, please answer A2.35 to 41. If NO, please go to A2.42.
A2.35: Which institution(s) were primarily responsible for drawing up the list of interventions? Please comment on the reasons for this approach and whether it was successful.

A2.36: What (if any) were the main factors that constrained the development of a list of interventions? What actions (if any) were taken to resolve them?

i) 

ii) 

iii) 

A2.37: Did the development of interventions receive adequate support from relevant institutions, and local politicians? Yes ☐ No ☐

If NO, please answer A2.38. If YES, go to A2.39.

A2.38: What reasons for lack of support were given?

i) 

ii) 

iii) 

A2.39: Have the intervention strategies been implemented? Yes ☐ In Part ☐ No ☐

If YES/ IN PART go to A2.40 and 41. If NO, go to A2.42.

A2.40: What helped with the implementation of the intervention strategies?

i)
A2.41: What have been the main constraints to the implementation of the intervention strategies?

i)

ii)

iii)

A2.42: Is there a budget assigned to the AQMP intervention strategies to be implemented?

Yes ☐ No ☐

A2.43: If a budget has been assigned, is this reflected in the IDP/EMP/EIP?

Yes ☐ No ☐

A2.44: What internal reporting structures are in place to monitor the implementation of the intervention strategies?

A2.45: Has the AQMP undergone an evaluation process where the plan has been reviewed and intervention strategies evaluated?  Yes ☐ No ☐ ☐

A2.46: If yes, how often would this evaluation take place?
A2.47: Is the AQMP aligned to other governance (e.g. municipal) priorities?
Yes [ ] No [ ]

A2.48: If yes, give examples of these priorities below.

The following are general questions relating to your experience of the AQMP Process

A2.49: How has the development of an AQMP been helpful in your area?

i) 

ii) 

iii) 

A2.50: What (if any) additional support from National/ Provincial/ Local government would assist you in the AQMP process (e.g. training, guidance etc). Please be as specific as possible.

i) 

ii) 

iii)
A2.51: Can you suggest ways in which the AQMP Process can be made more effective?

i)  

ii)  

iii)  

Are there any comments that you wish to make regarding the AQMP Process that have not been addressed by earlier questions in this survey?
SECTION B
SECTION B:
ANSWER THIS SECTION IF THERE IS NO AQMP IN PLACE

SECTION B1:
This section seeks basic information about the authority, and the resources that are available to carry out an AQMP.

B1.1: Your name:

B1.2: Your National, Provincial or Local Authority:

B1.3: Your department and position in the Authority (Department responsible for undertaking the AQMP):

B1.4. Contact Details:
Email: ____________________________ Phone: ____________________________

B1.5: Please provide a short description of the resources available to your Authority to carry out AQMP work, e.g. how many staff work on air quality issues (both full and part-time), and what experience they have. Approximately how many hours per week are devoted to AQMP work?

B1.6: Have any staff attended training sessions related to AQMP work?
Yes ____________ No ____________
If YES, please answer B1.7.
B1.7: Please provide details of what training you have received below. Where possible, set out those particular aspects of AQMP work that the training covered (i.e. monitoring, modelling, emissions inventories, interventions, coordinating the process etc.).

**SECTION B2:**

This section is for those authorities who have not yet started work on an AQMP. The intent is to understand better what the principal constraints are, and how the system could be improved.

B2.1: Do you think it likely that there are areas within your authority where the National Air Quality Standards are being exceeded?  Yes  □ □  n’t know □

Can you provide further information on the basis of your judgement i.e. is this based on air quality monitoring data, professional judgement etc.

B2.2: Have you (or anyone within your department) read the *Manual for Air Quality Management Planning* published by DEA in September 2008?  Yes  □  No □ □

If YES, please answer B2.3 and B2.4. If NO, go to B2.5.

B2.3: Which parts of the Manual did you find useful?

i)

ii)

iii)
B2.4: Which parts of the Manual do you think could be improved?

i)  

ii)  

iii)  

B2.5: What have been the main obstacles/ challenges in your authority to undertaking an AQMP?

i)  

ii)  

iii)  

B2.6: What additional support/guidance from National/ Provincial/ Local government would assist you to complete an AQMP?

i)  

ii)  

iii)  

Are there any comments that you wish to make regarding the AQMP process that have not been addressed by earlier questions in this survey?
APPENDIX C

Summary table of issues from different government structures
### Summary table of issues from different structures

<table>
<thead>
<tr>
<th>Municipality/Province</th>
<th>AQMP in place (Y/N)</th>
<th>AQMP appraised</th>
<th>Ambient air monitoring undertaken (Y/N)</th>
<th>Emission inventory in place (Y/N)</th>
<th>Air dispersion modeling undertaken (Y/N)</th>
<th>Additional support requirements from DEA in the questionnaire response</th>
<th>Issues noted in AQMP appraisal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mpumalanga Department of Economic Development, Environment &amp; Tourism</td>
<td>in progress</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>1.) The main drawback, is that all environmental programmes in the provinces and municipalities have to be funded from own budgets. There are no mechanisms in place to address financing constraints in this regard. 2.) It may be necessary also to consider putting more effort to the O&amp;M requirements once an AQMP has been procured. 3.) It could be more helpful for the DEA to also arrange its institutional capacity to include secondments to other spheres of government for skill transfer. Such personnel compliment could assist to even monitor the outsourced activities.</td>
<td>N/A</td>
</tr>
<tr>
<td>District Authority (Frances Baard District Municipality)</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>1.) Training of officials in air quality and emission monitoring. 2.) Workshops on licensing applications</td>
<td>Not available for review</td>
</tr>
<tr>
<td>Emfuleni Local Municipality</td>
<td>Partially complete</td>
<td>N</td>
<td>No response provided</td>
<td>No response provided</td>
<td>No response provided</td>
<td>No response provided</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Table based on results of existing AQMP appraisals and responses to project questionnaire
## ASSESSMENT OF THE NATIONAL AIR QUALITY MANAGEMENT STATUS QUO

<table>
<thead>
<tr>
<th></th>
<th>Y</th>
<th>Y</th>
<th>N</th>
<th>N</th>
<th>N</th>
<th>Lack of staff competency in implementation AQMP</th>
<th>No additional issues identified except those detailed in the AQMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDARD</td>
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<tr>
<td>Provincial Department - Northern Cape</td>
<td>N</td>
<td></td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>No response provided</td>
<td>N/A</td>
</tr>
<tr>
<td>City of Johannesburg</td>
<td>Y</td>
<td>Y</td>
<td>No response provided</td>
<td>No response provided</td>
<td>No response provided</td>
<td>No response provided</td>
<td>No additional issues identified except those detailed in the AQMP</td>
</tr>
<tr>
<td>North West Province: Economic Development, Conservation, Environment &amp; Tourism</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Finance in implementing intervention strategies</td>
<td>1.) The Plan does not include any alternative options for implementation (and therefore cannot include an analysis of which measures might provide the best option). 2.) There has been no attempt to provide any indication of the possible impact of any of the interventions and it is therefore not possible to quantify the reduction that proposed measures may bring about, nor accurately monitor any progress. 3.) There is also no qualitative indication of the effectiveness of interventions or any indication of any other potential impacts of the proposed interventions (either positive or negative), for example on socio-economic indicators, or on other environmental parameters such as climate change gas emissions. 4.) None of the intervention measures are linked with specific pollutants. unclear from the report whether this funding is actually in place, or not. Not, an explicit strategy for evaluating specific actions.</td>
</tr>
<tr>
<td>Oudtshoorn Municipality</td>
<td>No response provided</td>
<td>No response provided</td>
<td>No response provided</td>
<td>No response provided</td>
<td>No response provided</td>
<td>N/A</td>
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<tr>
<td>Local Authority</td>
<td>Y</td>
<td>N</td>
<td>No response provided</td>
<td>No response provided</td>
<td>No response provided</td>
<td>1.) Capacity. 2.) Staffing. 3.) Financial constraints</td>
<td>N/A</td>
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<tr>
<td>Newcastle Local Authority</td>
<td>N</td>
<td>N</td>
<td>No response provided</td>
<td>No response provided</td>
<td>No response provided</td>
<td>1.) Capacity. 2.) Staffing. 3.) Financial constraints</td>
<td>N/A</td>
</tr>
<tr>
<td>West Coast DM</td>
<td>Y</td>
<td>N</td>
<td>No response provided</td>
<td>No response provided</td>
<td>No response provided</td>
<td>1.) Training. 2.) Capacity building</td>
<td>Interventions strategies are not linked with specific pollutants.</td>
</tr>
<tr>
<td>Overberg DM</td>
<td>Partially complete (The participation of the B municipalities and public are still to be done)</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>1.) Money. 2.) Training. 3.) Capacity</td>
<td></td>
</tr>
<tr>
<td>City of uMhlathuze</td>
<td>N</td>
<td>N</td>
<td>No response provided</td>
<td>No response provided</td>
<td>No response provided</td>
<td>Challenges include: 1.) Lack of budget. 2.) Change in management. 3.) Staff shortage. Further assistance in certain areas include: 1.) Mentorship. 2.) Funding for monitoring stations.</td>
<td>N/A</td>
</tr>
<tr>
<td>Fezile Dabi DM</td>
<td>Y</td>
<td>N</td>
<td>No response provided</td>
<td>No response provided</td>
<td>No response provided</td>
<td>1.) Financing. 2.) Training. 3.) Mentorship</td>
<td>Not available for review</td>
</tr>
<tr>
<td>John Taolo Gaetsewe DM</td>
<td>N</td>
<td>N</td>
<td>No response provided</td>
<td>No response provided</td>
<td>No response provided</td>
<td>No response provided</td>
<td>N/A</td>
</tr>
<tr>
<td>City of Cape Town</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>1.) Guidance on the review process would always be welcome. 2.) Mechanisms to assist internal review. We should not always have to employ expensive consultants to develop or review plans. 3.) The main issue relates to finances to implement. If no dedicated project budget is available the plan will be limited in effectiveness - it will remain a nice idea!!</td>
</tr>
<tr>
<td>Municipality</td>
<td>Assessment Status (Phase)</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Outcome/Issues</td>
<td></td>
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<tr>
<td>Buffalo City Metro</td>
<td>Partially complete</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Awaiting outcome of AQMP</td>
<td></td>
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<tr>
<td>Dr. Ruth Segomotsi Mompati DM</td>
<td>N</td>
<td>N</td>
<td>No response provided</td>
<td>No response provided</td>
<td>Capacity building</td>
<td>N/A</td>
<td></td>
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<tr>
<td>Msunduzi Municipality</td>
<td>Partially complete (Baseline assessment done)</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>1.) Funding. 2.) Use of consultants to facilitate</td>
<td></td>
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<tr>
<td>Polokwane Municipality</td>
<td>Partially complete (Public participation)</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>No response provided</td>
<td></td>
</tr>
<tr>
<td>Drakenstein Municipality</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Help increase the budget so that we can expand the number of staff that can be available to deal with AQMP matters. No additional issues identified except those detailed in the AQMP</td>
<td></td>
</tr>
<tr>
<td>Mossel Bay Municipality</td>
<td>N</td>
<td>N</td>
<td>No response provided</td>
<td>No response provided</td>
<td>1.) Capacity constraints. 2.) More detailed emissions studies</td>
<td>N/A</td>
<td></td>
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<tr>
<td>John Taolo Gaetsewe DM</td>
<td>N</td>
<td>N</td>
<td>No response provided</td>
<td>No response provided</td>
<td>1.) Capacity. 2.) Resources (equipment and budget)</td>
<td>N/A</td>
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<tr>
<td>Swartland Municipality</td>
<td>Partially complete (Final stage)</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>No response provided</td>
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<td>Merafong Municipality</td>
<td>N</td>
<td>N</td>
<td>No response provided</td>
<td>No response provided</td>
<td>1.) Finance. 2.) Necessary training</td>
<td></td>
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<tr>
<td>Mantsopa Municipality</td>
<td>N</td>
<td>N</td>
<td>No response provided</td>
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<td>Staffing requirements</td>
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Page 4 of 38
<table>
<thead>
<tr>
<th>District</th>
<th>Current Status</th>
<th>Technical Support</th>
<th>Urgent Training and Support</th>
<th>N/A</th>
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<tbody>
<tr>
<td>Chris Hani DM</td>
<td>In progress (ToR going to tender process)</td>
<td>N</td>
<td>N</td>
<td>N/A</td>
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<td>Ugu DM</td>
<td>N</td>
<td>No response provided</td>
<td>No response provided</td>
<td>No response provided</td>
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<tr>
<td>Vhembe DM</td>
<td>Partially complete (Tendering stage)</td>
<td>N</td>
<td>N</td>
<td>N/A</td>
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<tr>
<td>Gert Sibande DM</td>
<td>N</td>
<td>No response provided</td>
<td>No response provided</td>
<td>1.) Current status of air quality. 2.) Technical support on status quo information. 3.) Urgent training and support needed for current officials.</td>
</tr>
<tr>
<td>Sekhukhune DM</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>1.) Staff training. 2.) Guidance on how to develop an AQMP. 3.) Monitoring and evaluations of the air quality management and processes.</td>
</tr>
<tr>
<td>City of Tshwane</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>1.) Participation of the DEA in the review process. 2.) Strategy implementation. 3.) Simplify strategies that can be implemented. 4.) Budget for review process.</td>
</tr>
<tr>
<td>uThungulu DM</td>
<td>N</td>
<td>No response provided</td>
<td>No response provided</td>
<td>No response provided</td>
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<tr>
<td></td>
<td>Y</td>
<td>Y</td>
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<tr>
<td>Eden DM</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Sedibeng DM</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>
Capricorn DM | Y | Y | Y | Y | N | 1.) Guidance from DEA.  2.) Emission inventory.  3.) Modeling

1.) No comparisons were made to annual average guidelines.  2.) No indication was made as to whether data was available for shorter time scales (e.g. hourly or 10-min averages).  3.) The methodologies for data collection and QA/QC were not adequately described.  4.) A first approximation at an emission inventory has been made, but the final figures based on emission factors were not adequately presented and there was no source apportionment.  5.) Dispersion modeling for individual sectors was performed using ADMS-Urban, but there was no indication as to whether terrain was included and what the input meteorological data was.  6.) There was no combination of sources (e.g. all PM10), but this could perhaps also be addressed in the future. Various intervention measures are spelt out, with time frames, but these are recommendations only and no attempt is made to quantify the reductions, or apply any cost-benefit analysis.  7.) Despite mining being listed as a major pollution source and one of the main inputs to the economy, no intervention measures are addressed for this sector.
## ASSESSMENT OF THE NATIONAL AIR QUALITY MANAGEMENT STATUS QUO

<table>
<thead>
<tr>
<th>Department/Province</th>
<th>Capacity Building</th>
<th>Financial Support</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Cape Dept of</td>
<td>Y</td>
<td>Y</td>
<td>1.) Capacity building of municipal officials and councillors wrt AQM mandates. 2.) Financial support.</td>
</tr>
<tr>
<td>Environmental Affairs and</td>
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<tr>
<td>Development Planning</td>
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<tr>
<td>Central Karoo DM</td>
<td>N</td>
<td>N</td>
<td>1.) The absence of air quality problems. The need is not high at this moment. 2.) A draft plan do exist it should be revisited.</td>
</tr>
<tr>
<td>Eastern Cape Province</td>
<td>N</td>
<td>N</td>
<td>1.) Awaiting the completion of the Buffalo City and NMBMM AQMPs. 2.) Financial constraints</td>
</tr>
<tr>
<td>LEDET</td>
<td>N</td>
<td>No response</td>
<td>Human and financial resources</td>
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<tr>
<td></td>
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<td>provided</td>
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<tr>
<td>Chris Hani DM</td>
<td>N</td>
<td>No response</td>
<td>1.) Training. 2.) Financial assistance. 3.) General support.</td>
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<td></td>
<td></td>
<td>provided</td>
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</tbody>
</table>
### ASSESSMENT OF THE NATIONAL AIR QUALITY MANAGEMENT STATUS QUO

<table>
<thead>
<tr>
<th>KZN Province</th>
<th>N</th>
<th>N</th>
<th>No response provided</th>
<th>No response provided</th>
<th>No response provided</th>
<th>1.) Data collection (different methods i.e. acceptability of passive sampling). 2.) Monitoring data available from the DEA. 3.) Finance. 4.) Commitment of principals. 5.) Staff capacity and resources.</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madibeng</td>
<td>N</td>
<td>N</td>
<td>No response provided</td>
<td>No response provided</td>
<td>No response provided</td>
<td>1.) Funding. 2.) Capcitation of staff.</td>
<td>N/A</td>
</tr>
<tr>
<td>eThekwini Metro</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Ongoing training and development of standard approaches, documents etc.</td>
<td>1.) It is not clear how the AQMP takes issues forwards from the problems that were identified in November 2005. The organisations responsible for expanding the emission inventory and to undertake dispersion modelling, and the timescales within which it will be completed are not provided. 2.) A range of possible abatement measures are suggested, but the organisations responsible, the timescales for implementation, and the likelihood of success are not indicated. 3.) Whilst stakeholder engagement appears to have been undertaken during the MPP, and the early emergence of the AQMP, it is not clear how (or even if) this has influenced the current document. 4.) On the basis of the information provided, it is not clear as to how pollutants such as nitrogen dioxide and lead (associated with traffic emissions) and ozone, have been scoped out of any future priority work. 5.) The AQMP does not adequately describe the relevant responsibilities of local government and other regulatory organisations, nor does it include proposals for the early integration of air quality into the transport, land-use and industrial planning mechanisms, or this is seen as a long-term objective. 6.) Issues related to the interaction between climate change and local air quality is not identified. 7.) It is not clear from the AQMP how issues have moved forwards since November 2005.</td>
</tr>
<tr>
<td>West Rand DM</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>No response provided</td>
<td>No response provided</td>
<td>1.) Financial support. 2.) Lack of air quality officials. 3.) Lack of resources.</td>
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</tbody>
</table>

1.) The baseline assessment does not include any monitored data. 2.) Modelling has not been undertaken but an action to acquire and implement a suitable atmospheric dispersion model has been included. 3.) The Plan does not include any alternative options for implementation (and therefore cannot include an analysis of which measures might provide the best option). 4.) There has been no attempt to provide any indication of the possible impact of any of the interventions and it is therefore not possible to quantify the reduction that proposed measures may bring about, nor accurately monitor any progress. 5.) There is also no qualitative indication of the effectiveness of interventions or any indication of any other potential impacts of the proposed interventions (either positive or negative), for example on socio-economic indicators, or on other environmental parameters such as climate change gas emissions. 6.) None of the intervention measures are linked with specific pollutants.
<table>
<thead>
<tr>
<th>Area</th>
<th>Y</th>
<th>Y</th>
<th>No questionnaire response received</th>
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</thead>
<tbody>
<tr>
<td>Vaal Airshed Priority Area</td>
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<tr>
<td></td>
<td></td>
<td>1.) Information on monitoring techniques and data capture are not included. 2.) The Plan does not include any alternative options for implementation (and therefore cannot include an analysis of which measures might provide the best option). 3.) There has been no attempt to provide any indication of the possible impact of any of the interventions and it is therefore not possible to quantify the reduction that proposed measures may bring about, nor accurately monitor any progress. 4.) There is also no qualitative indication of the effectiveness of interventions or any indication of any other potential impacts of the proposed interventions (either positive or negative), for example on socio-economic indicators, or on other environmental parameters such as climate change gas emissions. 5.) There does not appear to be an explicit strategy for evaluating specific actions or reviewing the document as a whole.</td>
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<tr>
<td>Free State Province</td>
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<tr>
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<td>1.) Analysis of monitoring data but the indication of where exceedances might be in the province is not included. 2.) No source apportionment undertaken, or discussed. Modelling discussed, but not undertaken (no emissions information). 3.) With supplied information is difficult to ascertain what potential issues of the area might be (and therefore size of monitoring network required). 4.) None of the intervention measures are linked with specified pollutants. 5.) No indication of what standards etc are being used by the province. 6.) No indication of the effectiveness of any of the proposed interventions, or of any other impacts (eg on climate change).</td>
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### Amathole DM

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<tbody>
<tr>
<td>Y</td>
<td>Y</td>
<td>No questionnaire response received</td>
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</table>

1.) No priority pollutants been identified but this is described as an interim AQMP.  
2.) No emissions data or modelling or source apportionment.  
3.) Monitoring being undertaken at moment probably not adequate for size of the area, but difficult to ascertain what potential issues of the area might be (and therefore size of monitoring network required).  
4.) None of the intervention measures are linked with specified pollutants.  
5.) No indication of the effectiveness of any of the proposed interventions, or of any other impacts (e.g., on climate change).  
6.) No stakeholders been actively involved in the assessment or AQMP process.

### Rustenburg LM

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<tbody>
<tr>
<td>Y</td>
<td>Y</td>
<td>No questionnaire response received</td>
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</table>

1.) Air quality assessment is incomplete.  
2.) The key pollutants have been identified and the principal sources of these pollutants, but the relative importance of these sources is not understood.  
3.) The new monitoring network appears to be a recommendation only, and it is not clear whether an implementation plan for the monitoring network is in place.  
4.) No detailed proposals to implement an inventory are set out.  
5.) As with the monitoring and emission inventory work, no implementation plan is provided to take forward any of these interventions.  
6.) Research programmes looking at regional pollution levels are described, and national initiatives to reduce emissions outlined, but no specific recommendations are made for further research.
<table>
<thead>
<tr>
<th>Municipality</th>
<th>Y</th>
<th>Y</th>
<th>No questionnaire response received</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metsweding DM</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Highveld PA</td>
<td>Y</td>
<td>Y</td>
<td></td>
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<tr>
<td>Nelson Mandela Bay Metro</td>
<td>Y</td>
<td>Y</td>
<td></td>
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<tr>
<td>Lejweleptswa</td>
<td>Y</td>
<td>Y</td>
<td></td>
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<tr>
<td>Ekurhuleni</td>
<td>Y</td>
<td>Y</td>
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</tbody>
</table>

1.) A thorough air quality assessment was not completed due to lack of air quality monitoring data. 2.) Only inhalable dust and dust fallout to be released from tailings dams was predicted using model. 3.) Other pollutants such as NOx, SO2, VOCs, CO and PM was estimated using coal sales in an area. 4.) No detailed proposals to implement an inventory are set out.

1.) The constraints on the air quality assessment have been identified not explicitly in a separate. 2.) Some industrial intervention measures have been identified, but these are just possible suggested measures. 3.) There is no implementation plan in place for the key intervention measures.

1.) Priority pollutants not identified. 2.) No proper air quality assessment conducted. 3.) No strategies proposed except objectives. 4.) AQMS not discussed in the report but lack of data mentioned. 5.) Key pollutant sources not identified and no emissions quantified. 6.) No implementation plan in place for the key intervention measures.

1.) Air quality assessment is not explicit. 2.) No air quality constraints identified. 3.) A list of intervention strategies is presented without timelines or responsible authority. 4.) The AQMP proposed the procurement of air quality monitoring equipment but is not explicit on the pollutants to be measured. 5.) Key pollutant sources have been identified but emissions have not been quantified.

No additional issues identified except those detailed in the AQMP