



THE 2007

NATIONAL FRAMEWORK

FOR AIR QUALITY MANAGEMENT IN THE REPUBLIC OF SOUTH AFRICA

As contemplated in Section 7 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) and serving as the Department of Environmental Affairs and Tourism's Air Quality Management Plan as contemplated in Section 15(1) of the Act.

11 September 2007

FOREWORD

In the two years that have passed since I brought the new Air Quality Act into effect (the National Environmental Management: Air Quality Act (Act No. 39 of 2004)), we have seen, among others, a number of air quality monitoring networks being established across the nation, the identification of national priority areas, plans for improving the air quality in the Vaal Triangle Air-shed Priority Area at an advanced stage of development, intergovernmental coordination and cooperation structures set up, various provinces and municipalities eagerly gearing themselves up to meet their air quality challenges, all sectors of society actively participating in standard-setting and planning processes and the fledgling South African Air Quality Information System (SAAQIS) starting to provide South Africans with access to national air quality information.

Notwithstanding these achievements, the establishment of the 2007 National Framework for Air Quality Management, is a milestone in government's attempts to introduce a new efficient and effective air quality management regime in South Africa. For the first time, all interested South Africans have contributed to the establishment of the first national plan to clear our skies of pollution and ensure ambient air that is not harmful to health and well-being.

As an inaugural framework, it has been necessary to unpack the new Air Quality Act in some detail to ensure that all South African's understand the intentions of the Act's provisions. Never the less, although the framework may read like text book in some areas, it is a text book that is important and timely.

Furthermore, although the department has initiated a number of projects that will move the framework to a far more technical document in the future, the 2007 National Framework provides an excellent foundation for future frameworks. In this regard, and considering the rapidly evolving air quality management sector across the country, I have instructed the department to immediately initiate another round of consultations aimed at compiling a 2008 National Framework that will capture the technical norms and standards being developed by the various projects currently underway.

To provide further context and a baseline for measuring progress in the implementation of the Act and the National Framework, the department will publish a detailed State of the Air Report in December 2007. This report will be a compilation and assessment of all available air quality information up to 2005, the year that the Act was brought into effect.

The 2007 National Framework is a product of the hard work and dedication of all South Africans and I take this opportunity to thank everyone who was involved in its development.

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1. INTRODUCTION

1.1 Background

Following the publication of the Integrated Pollution and Waste Management Policy (IP&WM) in 2000 (DEAT, 2000), government set about drafting the legislation required to implement the policy. In the case of new air quality legislation, the draft National Environmental Management: Air Quality Bill was finalised as framework legislation that would have its detail added in accordance with a logical implementation plan. During the public participation process stakeholders expressed a concern that the Bill did not contain a requirement for government to develop and implement the logical implementation plan. In response to these concerns, a provision was created in the Bill for the development and publication of such a plan, namely, the National Framework. To this end, Section 7 of the National Environmental: Air Quality Act (Act No. 39 Of 2004) (the AQA) requires the Minister, by notice in the Gazette, to establish a National Framework for achieving the objectives of the AQA by 11 September 2007.

1.2 Overview

The Bill of Rights contained in the Constitution of the Republic of South Africa is the cornerstone of democracy in South Africa. It enshrines the rights of all people in the country and affirms the democratic values of human dignity, equality and freedom. The state must respect, protect, promote and fulfil the rights in the Bill of Rights.

Section 24 of the Constitution states that everyone has the right:

- a. *To an environment that is not harmful to their health or well-being; and*
- b. *To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that -*
 - i *prevent pollution and ecological degradation;*
 - ii *Promote conservation; and*
 - iii *secure ecologically sustainable development and the use of natural resources while promoting justifiable economic and social development*

In order to give effect to this right in the context of air quality, it is necessary to ensure that levels of air pollution are not harmful to human health or well-being. It follows that the setting of ambient air quality standards is necessary, as well as mechanisms to ensure that ambient air quality standards are achieved and maintained. Hence, the National Environmental Management: Air Quality Act (Act No. 39 of 2004) provides an objectives-based approach to the management of air quality at different governance and operational levels and is the legislative means to ensuring that the rights described above are upheld. Therefore, in implementing the AQA it is necessary to ensure that there is clarity on governance and technical objectives so air quality management measures are implemented in a cohesive, coherent and uniform manner that ensures the most benefit for the least cost through efficient and effective use of resources.

1.3 Purpose of the National Framework

The purpose of the National Framework, as stated in Paragraph 1.1, is to achieve the objectives of the AQA, and as such the National Framework provides a medium- to long-term plan of the practical implementation of the AQA.

The National Framework must provide mechanisms, systems and procedures to promote holistic and integrated air quality management through pollution prevention and minimisation at source, and through impact management with respect to the receiving environment from local scale to international issues. Hence, the National Framework provides norms and standards for all technical aspects of air quality management.

Section 7(1) of the AQA requires the National Framework to include the following:

- Mechanisms, systems and procedures to –
 - attain compliance with ambient air quality standards;
 - give effect to the Republic's obligations in terms of international agreements;

- National norms and standards for –
 - the control of emissions from point and non-point sources;
 - air quality monitoring;
 - air quality management planning;
 - air quality information management; and
- Any other matter which the Minister considers necessary for achieving the object of the AQA.

Section 7(2) of the AQA requires that the norms and standards established in the National Framework are aimed at ensuring:

- Opportunities for public participation in the protection and enhancement of air quality;
- Public access to air quality information;
- The prevention of air pollution and degradation of air quality;
- The reduction of discharges likely to impair air quality, including the reduction of air pollution at source;
- The promotion of efficient and effective air quality management;
- Effective air quality monitoring;
- Regular reporting on air quality; and
- Compliance with the Republic's obligations in terms of international agreements.

The National Framework, in terms of Section 7(3) of the AQA:

- binds all organs of state in all spheres of government; and
- may assign and delineate responsibilities for the implementation of the AQA amongst:
 - the different spheres of government; and
 - different organs of state.

According to Section 8 of the AQA, with respect to national monitoring and information standards, the National Framework must establish national standards for:

- municipalities to monitor:
 - ambient air quality; and
 - point, non-point and mobile sources;
- provinces to monitor:
 - ambient air quality; and
 - the performance of municipalities in implementing the AQA;
- the collection and management of data necessary to assess:
 - compliance with the AQA;
 - compliance with ambient air quality and emission standards;
 - the performance of organs of state in respect of air quality management plans and priority area air quality management plans;
 - the impact of, and compliance with, air quality management plans and priority area air quality management plans;
 - compliance with the Republic's obligations in terms of international agreements; and
 - access to information by the public.

1.4 Guiding principles

The National Framework is informed by the principles set out in Section 2 of the NEMA.

“SMART” principles are also relevant to goal and objective setting in air quality management. SMART principles are:

- **Specific:** Goals should be detailed and should relate to narrowly-defined tasks.
- **Measurable:** Goals should have defined end-points and a mechanism for benchmarking progress.
- **Achievable:** Goals should be set within the context of practical limitations.
- **Realistic:** Goals should acknowledge the current situation and aim to reach air quality goals that are protective of public health.
- **Time-related:** Time constraints should be factored into goal-setting exercises, and time frames provided for achieving goals that are set.

1.5 Scope of the National Framework

The development of the National Framework has been an iterative and integrative process that relies on contributions from a number of projects, as well as contributions from a number of inter- and intra-governmental processes.

Inputs were received from stakeholders during the public hearings for the Air Quality Bill and the public participation process conducted as an integral part of the development of this National Framework. Formal contributing projects to the National Framework include the:

- Development of a South African Air Quality Information System (SAAQIS) – Phase One project;
- AQA Implementation: Listed Activities and Minimum Emission Standards Project (see project description in Paragraph 5.4.3.5);
- APPA Registration Certificate Review Project (see 6.4);
- Air Quality Management Planning Implementation Manual Development Project (see project description in Paragraph 5.4.6.1);
- Vaal Triangle Air-shed Priority Area Air Quality Management Plan Development Project;
- Framework for Setting and Implementing National Ambient Air Quality Standards (SANS 69);
- Limits For Common Air Pollutants (SANS 1929); and
- Greenhouse Gas Information Management Project.

These projects, each with their own public participation requirements, are at different stages in their project cycles and will not be finalised prior to the date of publication of the National Framework, implying that they cannot fully contribute to this document. According to Section 7(1) of the AQA, the Minister must establish a National Framework for achieving the objectives of the Act, within two years of the Act taking effect, i.e. two years from 11 September 2005.

The scope of the National Framework is developed accordingly and this 1st Generation National Framework will be revised once the contributing projects have been finalised to produce a 2nd Generation National Framework by 11 September 2008.

1.6 Structure of the document

- **Chapter 1** provides the purpose of the National Framework and its scope.
- **Chapter 2** provides insights into the legislative and policy context relating to air quality management.
- **Chapter 3** describes the roles and responsibilities of the stakeholders in respect of air quality management.
- **Chapter 4** outlines the integrative air quality governance cycle emphasising the dependence of successful implementation on horizontal and vertical integration.
- **Chapter 5** discusses problem identification and prioritisation, norms and standards for the setting of ambient air quality standards, for Listed Activities and emission standards, Controlled Emitters, Controlled Fuels and Air Quality Management Plans (AQMPs) and provides information on regulations, compliance and enforcement, air quality impact assessments and the linkages between the approval process for Environmental Impact Assessments (EIAs) and the application for an Atmospheric Emission Licence (AEL). The underpinning principles of public participation, capacity development and information dissemination are also covered in Chapter 5.
- **Chapter 6** discusses the transition between the APPA and the AQA.
- **Chapter 7** discusses the National Framework review process.

2. LEGISLATIVE AND POLICY CONTEXT

2.1 Introduction

The management of air quality in South Africa is influenced by policy and legislation developed at international, national, provincial and municipal levels. National policy provides the critical reference point for air quality management and is discussed in detail in Paragraph 2.2. Provincial legislation expands on the national approach and can be used to address particular air quality issues, although there are currently no examples of provincial air quality legislation within South Africa. Municipal authorities influence air quality governance through the introduction of by-laws, which are legally enforceable within the municipal authority's jurisdiction (Paragraph 2.3). In an international context, trans-boundary air pollution and global air quality impacts are relevant. South Africa has obligations under multi-lateral environmental agreements, which are discussed in Paragraph 2.4. Some progress towards regional air pollution agreements within the southern African context has recently been made and is discussed in Paragraph 2.4.4.

2.2 National policy

2.2.1 Background

Since 1965, the approach to air pollution control in South Africa was informed and driven by the Atmospheric Pollution Prevention Act (APPA) (Act No. 45 of 1965) (hereinafter "the APPA"). The Act did not set targets or standards that would permit the achievement of an environment that is not harmful to health or well-being. This requirement is now contained in the Bill of Rights in the Constitution of the Republic of South Africa (Act No. 108 of 1996) (see Paragraph 1.2 of this document). The Constitution is thus the pivotal piece of legislation that informs all environmental legislation.

Given this environmental right, it was clear that air quality legislation that included an underlying drive towards cleaner air was needed. Following on from this, the publication in May 2000 of a critical policy document, the White Paper on Integrated Pollution and Waste Management for South Africa – A Policy on Pollution Prevention, Waste Minimisation, Impact Management and Remediation (IP&WM, 2000) marked a turning point for pollution and waste governance in South Africa. From an air quality management perspective, the new policy represented a paradigm shift in approach and necessitated the introduction of a new approach to air quality management, which is detailed in Paragraph 2.2.3.

The new national air quality legislation forms one of a suite of laws that are framed within overarching environmental management legislation, which is outlined in Paragraph 2.2.2 as a precursor to the discussion on national air quality legislation.

2.2.2 National Environmental Management Act (the NEMA)

The NEMA as amended provides the legislative framework for environmental management in South Africa. Its purpose is to provide for cooperative environmental governance, and it defines principles for decision-making on matters affecting the environment. Some of the key principles of the NEMA were mentioned in Paragraph 1.4. Further principles from Chapter 1 of the NEMA that are relevant to air pollution are:

- *pollution avoidance or minimisation* - that pollution and degradation of the environment must be avoided, or, where they cannot be altogether avoided, are minimised and remedied;
- *waste avoidance and consideration of life cycle assessment* - that waste is avoided, or where it cannot be altogether avoided, it must be minimised and re-used or recycled where possible or disposed of in a responsible manner;

The NEMA further provides for the establishment of the National Environmental Advisory Forum (NEAF) as a body to encourage stakeholder participation and develop management methods that include the guidance and perspectives of stakeholders within the NEAF (Chapter 2 of the NEMA). Cooperative governance is outlined in Chapter 3 of the NEMA and mechanisms for conflict resolution in Chapter 4. Integrated Environmental Management is used as a guiding philosophy to ensure that impacts are considered across different spheres of influence, including social dimensions (Chapter 5 of the NEMA). Chapter 6 of the NEMA takes cognisance of obligations in terms of international agreements, while Chapter 7 provides legislative means for compliance and enforcement. Methods of compliance, enforcement and protection within the jurisdiction of the NEMA are detailed, and the process for developing Environmental Management Cooperation Agreements, which are a mechanism for cooperative governance, is outlined in Chapter 8.

The NEMA provides government with the regulatory tools to implement the National Environmental Management Policy. The AQA forms one of the many pieces of legislation that fall under the ambit of the NEMA.

2.2.3 National Environmental Management: Air Quality Act (the AQA)

The AQA represents a distinct shift from exclusively source-based air pollution control to holistic and integrated effects-based air quality management. It focuses on the adverse impacts of air pollution on the ambient environment and sets standards to control ambient air quality levels. At the same time it sets emission standards to minimise the amount of pollution that enters the environment.

The objects of the legislation as stated in Chapter 1 are as follows:

- to protect the environment by providing reasonable measures for -
 - the protection and enhancement of the quality of air in the Republic;
 - the prevention of air pollution and ecological degradation; and
 - securing ecologically sustainable development while promoting justifiable economic and social development; and
- generally to give effect to Section 24(b) of the Constitution in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and well-being of people.

The National Framework is one of the significant functions detailed in Chapter 2 of the AQA. The framework serves as a blueprint for air quality management and aims to achieve the air quality objectives as described in the preamble of the AQA.

Chapter 3 of the AQA covers institutional and planning matters summarised as follows:

- The Minister may establish a National Air Quality Advisory Committee as a subcommittee of the NEAF established in terms of the NEMA;
- Air Quality Officers (AQOs) must be appointed at each level of government (national, provincial, municipal);
- Each national department or province preparing an Environmental Implementation Plan (EIP) or Environmental Management Plan (EMP) in terms of the NEMA must include an Air Quality Management Plan (AQMP). Each municipality preparing an Integrated Development Plan (IDP) must include an AQMP;
- The contents of the AQMPs are prescribed in detail;
- Each organ of state is required to report on the implementation of its AQMP in the annual report submitted in terms of the NEMA.

In Chapter 4 of the AQA, air quality management measures are outlined in terms of:

- the declaration of Priority Areas, where ambient air quality standards are being, or may be, exceeded;
- the listing of activities that result in atmospheric emissions and which have or may have a significant detrimental effect on the environment;
- the declaration of Controlled Emitters;
- the declaration of Controlled Fuels
- other measures to address substances contributing to air pollution, that may include the implementation of a Pollution Prevention Plan or an Atmospheric Impact Report;
- the requirements for addressing dust, noise and offensive odours.

Licensing of Listed Activities through an Atmospheric Emission Licence (AEL) is addressed in Chapter 5 of the AQA, international air quality management in Chapter 6 and offences and penalties in Chapter 7.

2.2.4 Other related national legislation

There are many other pieces of national legislation that impact either directly or indirectly on the implementation of the AQA. These have been captured in Table 1 showing the links and relevance to air quality management in general and the implementation of the AQA in particular.

Table 1: National legislation directly or indirectly linked to the management of air quality

Legislation	Air quality management links	Relevance
National Key Points Act (Act No. 102 of 1980)	<ul style="list-style-type: none"> Provides for the protection of significant State or private assets, relative to national security Regulates the flow of information regarding Key Point activity Allows for measures to be implemented to maintain the security of a Key Point 	Many significant emitters have been classified as National Key Points, and the Act is used to regulate access to information
Protection of Information Act (Act No. 84 of 1982)	<ul style="list-style-type: none"> Covers the protection of information related to defence, terrorism and hostile organisations Information regarding these activities in any form is prohibited access and cannot be disseminated Prohibited places can be declared, which also fall under this protection 	Can be used to regulate access to information on air quality
Conservation of Agricultural Resources Act (Act No. 43 of 1983)	<ul style="list-style-type: none"> Regulates burning of veld, except in state forests Allows for control and prevention of veld fires through prescribed control measures Allows for control measures to be prescribed regarding the utilisation and protection of veld that has been burned 	Addresses controlled burning, which directly impacts on ambient air quality
Local Government Municipal Structures Act (Act No. 117 of 1998)	<ul style="list-style-type: none"> Establishes municipal categories Designates functions and powers of municipalities 	Specifies that responsibility for integrated development planning, within which air quality management plans must reside, rests with district municipalities
National Veld and Forest Fires Act (Act No. 101 of 1998)	<ul style="list-style-type: none"> Purpose is to combat and prevent veld, forest and mountain fires Fire Protection Agency can be designated for control and has power to conduct controlled burning with respect to conservation of ecosystems and reduction of fire danger Lighting, maintenance and using of fires is regulated 	Addresses controlled burning, which directly impacts on ambient air quality
National Water Act (Act No. 36 of 1998)	<ul style="list-style-type: none"> Establishes strategy to address management of water resources including protection and use of water Establishes management agencies Provides for pollution prevention and remediation, including land-based sources Addresses emergency incidents, including land-based pollutant sources 	Pollution sources from land-based activities that impact on water resources
Local Government Municipal Systems Act (Act No. 32 of 2000)	<ul style="list-style-type: none"> Provides a framework for planning by local government Describes contents of an integrated development plan and the process to be followed 	Air quality management plans are to be incorporated into integrated development plans
Occupational Health and Safety Act (Act No. 85 of 1993)	<ul style="list-style-type: none"> Provides for the health and safety of persons at work, including atmospheric emission from workplaces Sets out certain general duties of employers and to their employees Empowers the Minister of Labour to make regulations regarding various matters Further require any employer to ensure that their activities do not expose non-employees to health hazards 	The air emissions from the workplace environment has atmospheric quality implications

Legislation	Air quality management links	Relevance
Promotion of Access to Information Act (Act No. 2 of 2000)	<ul style="list-style-type: none"> • Facilitates constitutional right of access to any information whether held by State or another person (if it is related to exercise or protection of a right) • Details the means to access records, whether public or private • Does not detract from provisions in the NEMA Section 1 and Section 2 • Allows for denial of access based on defence, security or international relations 	Promotes access to information, including air quality information, although it has provisions for refusing access
Promotion of Administrative Justice Act (Act No. 3 of 2000)	<ul style="list-style-type: none"> • Details the administrative procedure to be followed when carrying out an administrative action, and the process of review 	Formal interactions between government departments, the public and other stakeholders by informing due process in decision-making
International Trade Administration Act (Act No. 71 of 2002)	<ul style="list-style-type: none"> • Establishes the International Trade Administration Commission as an administrative body • Regulates the import and export of controlled substances 	Import and export control related to ozone-depleting substances through the declaration of controlled substance
Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)	<ul style="list-style-type: none"> • States that it is necessary to submit an environmental management programme if applying for a mining right, and an environmental management plan if applying for reconnaissance permission • The contents of such documents are specified and are subject to the approval of the Minister of Minerals and Energy • The Minister is required to consult with any state department which administers any law relating to matters that affect the environment and must request the comments of that department on the environmental plan or programme being considered • Regulations promulgated in 2004 state that the holder of a right or permit must comply with legislation relating to air quality management and control 	Grants the decision-making power on matters potentially affecting the air environment to the Minister of Minerals and Energy in the case of mining activities but includes a need to comply with the AQA
National Health Act (Act No. 61 of 2003)	<ul style="list-style-type: none"> • Makes reference to the performing of environmental pollution control by municipalities. • Municipal health services are defined as including the responsibility for environmental pollution control • The responsibility for municipal health services rests with metropolitan and district municipalities 	Air quality management falls within environmental pollution control
Intergovernmental Relations Framework Act (Act No. 13 of 2005)	<ul style="list-style-type: none"> • Determines a framework to facilitate interaction and coordination, in the implementation of legislation, between spheres of government • Principles of participation, consultation and consideration are included • Establishes structures for coordination at different spheres of government • Establishes an implementation protocol mechanism as a tool for coordination • Provides mechanisms for conflict resolution, including the appointment of a facilitator 	Provides mechanisms for coordination and conflict resolution across spheres of government in aspects of legislative implementation

Legislation	Air quality management links	Relevance
Mineral and Petroleum Resources Act Amendment (2007)	<ul style="list-style-type: none"> • General amendments are made to change the requirement for an EMP to that of an environmental authorisation in mining and prospecting • For authorisation, scoping, EIA, specialist reports, an EMP is needed • Makes provision for monitoring and auditing of environmental performance • Basic assessment report and standard EMP necessary with application • Stockpiles require compliance monitoring and decommissioning • Closure certificate authorisation is dependent on approval from other environmental departments that potential environmental impacts have been addressed • The holder of a mining right or permit must comply with laws relating to air quality management and control 	The Amendment strengthens controls on emissions from mining activities to the atmosphere and includes an obligation to consider the AQA
National Waste Management Bill (2007)	<ul style="list-style-type: none"> • Promotes cleaner technology, cleaner production and consumption practices for pollution minimisation • Addresses impacts of waste disposal on the environment, including air • Provides for numerous measures related to waste disposal including standards, integrated waste management planning, municipal waste management, priority wastes, licensing, waste management information system 	Closely linked through issues of emissions to the air from incinerators and landfill sites

2.3 Municipal by-laws

According to Section 156(2) of the Constitution, a municipality may make and administer by-laws for the effective administration of matters that it has the right to administer. Air pollution is listed as a matter in which local government has authority and national or provincial government may not compromise or impede a municipality's right to exercise its powers or perform its functions. Within this context, municipalities may develop by-laws that deal with air pollution. Model air pollution control by-laws are being developed by the national department to ensure that there is uniformity across municipalities. More details on this process are provided in Paragraph 5.8.2 of this document.

2.4 International policy

South Africa has ratified several multilateral environmental agreements relating to air quality and is obligated to implement the conditions of these agreements.

South Africa's commitments in the international arena address three major air quality issues, namely, greenhouse gases and associated climate change; stratospheric ozone depletion and persistent organic pollutants (POPs).

2.4.1 Greenhouse gases and climate change

2.4.1.1 United Nations Framework Convention on Climate Change (UNFCCC)

The United Nations Framework Convention on Climate Change (UNFCCC) provides the framework for addressing climate change as a global issue and was founded in 1992, and came into force in 1994. It provides a broad consensus for establishing institutions and practices to address climate change by introducing processes of ongoing review, discussion and information exchange. The UNFCCC also differentiated between the responsibilities of developed and developing countries, by designating Annex 1 and Non-Annex 1 status, respectively, to parties to the convention. Developed countries have greater commitments as stated in Annex 4 of the Convention. The framework convention is expanded on through protocols, of which the Kyoto Protocol is the most recent and well recognised.

South Africa ratified the UNFCCC in August 1997, and is classified as a non-Annex 1 Party, or a developing country. South Africa has obligations as stated in Article 4 Paragraph 1 of the UNFCCC, including the preparation of the National Communication, which incorporates an inventory of greenhouse gases (GHGs) not covered by the Montreal Protocol.

2.4.1.2 Kyoto Protocol

The Kyoto Protocol was adopted in December 1997 at the meeting of the Conference of the Parties to the UNFCCC, and came into force in February 2005. The protocol establishes the commitment of developed (Annex 1) countries to reduce GHG emissions by 5.2%, compared to 1990 levels, for the period 2008 – 2012. There are three principle mechanisms used to facilitate GHG emission reduction, including, the clean development mechanism (CDM), joint implementation, and international emissions trading. The purpose of the clean development mechanism is to assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments.

South Africa acceded to the protocol in 2002 and it came into force in 2005. However, South Africa's status as a non-Annex 1 country implies no binding commitment to cap or reduce GHG emissions. South Africa, as a developing country, is in a position to benefit from the CDM.

2.4.2 Stratospheric ozone depletion

2.4.2.1 The Vienna Convention for the Protection of the Ozone Layer

The Vienna Convention was agreed upon in 1985, with countries expressing commitment to conduct research and share information on stratospheric ozone depletion. The convention focused on the protection of human health and the environment from adverse effects resulting from anthropogenic influences on ozone destruction. Chemicals responsible for ozone destruction were also identified and monitored. The convention provided the framework for a binding agreement on addressing ozone depletion. The convention is also viewed as significant as it demonstrates the cooperation of international governments to address a global environmental issue. South Africa acceded to the convention in January 1990.

2.4.2.2 The Montreal Protocol on Substances that deplete the Ozone Layer

The Montreal Protocol was signed in September 1987 as a means of addressing the production, supply and use of ozone-depleting substances. It puts in place procedures for the phasing out of chlorofluorocarbons and halons. The schedules for phase-out and obligations take cognisance of developed and developing country status, designated as Article 5 and non-Article 5 parties respectively. The protocol was significantly amended in 1990 (London Amendment) and 1992 (Copenhagen Amendment), with further amendments made in 1997 (Montreal Amendment) and 1999 (Beijing Amendment). The amendments served to include additional obligations and additional ozone-depleting substances, such as methyl bromide, hydrochlorofluorocarbons and methyl chloroform, and also to tighten schedules of compliance.

South Africa ratified the protocol in January 1990, the London Amendment in May 1992, and ratification of the Copenhagen Amendment is in process. South Africa is currently in full compliance with the conditions of the protocol.

2.4.3 Trans-boundary air pollution

2.4.3.1 The Stockholm Convention on Persistent Organic Pollutants (POPs)

The Stockholm Convention was signed in May 2001, and came into force in May 2004. The Convention is intended to address the production and use, or banning, of POPs for the protection of human health and the environment. Twelve pollutants are considered in the convention, including pesticides such as dichlorodiphenyltrichloroethane (DDT), industrial chemicals of hexachlorobenzene and polychlorinated biphenyls, and unintended by-products including dioxins and furans. Intentionally produced POPs are targeted for reduction and elimination, and unintentional production requires feasible elimination. The management and disposal of stockpiles of obsolete chemicals are also addressed. Trade restrictions are included in the convention. Reporting processes, implementation plans and information provision measures are also included in the convention.

South Africa ratified the convention in 2002, and it came into force in 2004. DDT is still in use in the country despite the provisions of the convention, as sufficient epidemiological evidence has been provided to motivate its continued use in the control of malaria vectors. The use of the chemical is monitored through a reporting structure. An implementation

plan for the Convention is also being developed. The Africa Stockpiles Programme is also a significant measure as funds are provided by developed countries for the safe disposal of POPs and contaminated soil.

2.4.3.2 *International concerns around mercury*

There are international initiatives to address mercury but to date no international policy has been developed. A recent programme backed by the United Nations (UN) that aims to reduce the health and environmental impacts of mercury includes a two-year period of voluntary action to reduce emissions and an evaluation to determine whether an international treaty is necessary. It aims to develop partnerships between government, industry and other key groups to reduce emissions. Mercury is of interest to many organisations and could be dealt with in future generations of the National Framework.

2.4.4 **Regional policy**

Southern Africa has made progress toward developing environmental management policy across the region, including initiatives through the New Partnership for Africa's Development (NEPAD) and the Southern African Development Community (SADC).

2.4.5 **The AQA and International Policy**

The AQA contains a number of direct and indirect references to "the Republic's obligations in terms of international agreements". South Africa's membership of the "global community" is recognised in the preamble to the AQA as follows "...atmospheric emissions of ozone-depleting substances, greenhouse gases and other substances have deleterious effects on the environment both locally and globally". Furthermore, greenhouse gases are captured in the definitions section of AQA.

The AQA also includes a number of direct references and provisions regarding South Africa's commitments in respect of air quality related multilateral environmental agreements as illustrated in the following -

- **The National Framework** - In terms of section 7(1) of AQA, the Minister must establish a national framework for achieving the objectives of the Act and this framework must include, among others, mechanisms, systems and procedures to give effect to "the Republic's obligations in terms of international agreements" (S.7(1)(b)). Furthermore, the national norms and standards established by the national framework must be aimed at ensuring "compliance with the Republic's obligations in terms of international agreements" (S.7(2)(h)).
- **National monitoring and information management standards** - In terms of section 8(c) of AQA, the national framework must establish national standards for, among others, the collection and management of data necessary to "assess compliance with the Republic's obligations in terms of international agreements" (S.8(c)(v)).
- **Air Quality Management Plans** - In terms of section 16(1)(a) of AQA, air quality management plans must, among others, seek to implement the Republic's obligations in respect of international agreements (S.16(1)(a)(vii)).
- **Controlled Emitters** - In terms of Section 23(2) of the AQA, in declaring a controlled emitter the Minister or MEC must, among others, "take into account the Republic's obligations in terms of any applicable international agreement" (S.23(2)(c)).
- **Controlled Fuels** - In terms of Section 26(2) of the AQA, in declaring a controlled fuel the Minister or MEC must, among others, "take into account the Republic's obligations in terms of any applicable international agreement" (S.26(2)(c)).
- **International Air Quality Management** – The AQA contains an entire chapter dedicated to international air quality management, namely, Chapter 6. It deals with air pollution that has impacts outside of our borders, as well as with contraventions of multilateral environmental agreements that address environmental pollution. It makes provision for the investigation of offences, or possible offences, and the passing of regulations to address the air quality impacts.
- **Greenhouse Gas Emission Monitoring** - Section 43 of the AQA requires an atmospheric emission licence to specify, among others, greenhouse gas emission measurement and reporting requirements (S.43(1)(l)).
- **Regulations** - Section 53 of the AQA empowers the Minister to make regulations regarding, among others, "any matter necessary to give effect to the Republic's obligations in terms of an international agreement relating to air quality" (S.53(a)). Furthermore, these regulations may "incorporate, by reference, any code of practice or any national or international standard relating to air quality" (S.55(1)(d)).

3. ROLES AND RESPONSIBILITIES FOR AIR QUALITY MANAGEMENT

3.1 Introduction

Everyone, to a greater or lesser extent, is responsible for some form of atmospheric emission that has an impact on air quality. Hence, everyone has a role and various responsibilities in respect of air quality management as the following illustrates.

3.2 Government's roles and responsibilities

Government's roles and responsibilities are clearly spelt out in various government policies and legislation (see Chapter 4 in this document). However, these roles and responsibilities differ across departments and spheres of government and include, as per Section 24 of the Constitution, legislative and other means to improve air quality and progressively ensure that ambient air is not harmful to health and well-being.

In this regard, departments and spheres of government with specific air quality management mandates, including the Department of Environmental Affairs and Tourism (the national department), the provincial environmental management departments and all municipalities, exercise their roles and functions by implementing the governance cycle described in Chapter 4.

These differing roles and responsibilities are summarised in the following paragraphs.

3.2.1 The National Department of Environmental Affairs and Tourism (DEAT)

The Department of Environmental Affairs and Tourism (DEAT) is the national Lead Agent for environmental management, and hence air quality management, and must therefore provide national norms and standards to ensure coordinated, integrated and cohesive air quality governance.

To this end, the AQA provides for a number of DEAT responsibilities within the governance cycle which is described in Chapter 4. However, the national Minister of Environmental Affairs and Tourism has a number of exclusive air quality management powers as summarised below:

In this regard, the Minister must:

- Establish the National Framework that must include the items specified in Paragraph 1.2.
- Designate an officer in the Department as the national air quality officer to be responsible for coordinating matters pertaining to air quality management in national government (Section 14(1) of the AQA).
- Identify substances or mixtures of substances in ambient air which, through ambient concentrations, bioaccumulation, deposition or any other way, present a threat to health or well-being or the environment, or which the Minister reasonably believes present such a threat, and the subsequent establishment of national standards for ambient air quality for these substances (See Paragraphs 5.3 and 5.4.3.4 on problem identification and prioritisation and ambient air quality standards), and the establishment of national emission standards from point and non-point sources for these substances or mixture of substances (See Paragraphs 5.4.3.5 on Listed Activities and emission standards).
- Prescribe the manner in which ambient air quality measurements must be carried out and reported and the manner in which measurements of emissions from point and non-point sources are carried out and reported (See Paragraphs 5.2.3, page 43 and 5.2.1.2 on page 35 on air quality reporting and ambient air quality monitoring).
- Preparing a national air quality management plan (AQMP) (See Paragraph 5.4.6, page 63 on air quality management planning), and preparing an annual report providing information on progress regarding the implementation of the AQMP.
- Publish and maintain a national list of activities which result in atmospheric emissions and which the Minister reasonably believes have a detrimental effect on the environment, including health, social, economic and ecological conditions, or cultural heritage, and for establishing minimum emission standards in respect of a substances or mixture of substances resulting from the Listed Activity (See Paragraph 5.4.3.5, page 54, on Listed Activities).
- Execute the overarching auditing function to ensure that adequate ambient and compliance monitoring occurs nationally.

- Enforce compliance with the AQA, the National Framework and any other relevant legislation.
- Review the impact on air quality of all government policies, strategies, plans, programmes and actions and ensuring that they conform to any other relevant legislation.
- Ensure that air quality information is accessible to all stakeholders (See Paragraph 5.2.1, page 34, on SAAQIS).

The Minister may also:

- Establish a national Air Quality Advisory Committee as a subcommittee of the National Environmental Advisory Forum (NEAF), to advise the Minister on the implementation of AQA.
- Declare an area a national Priority Area if the Minister reasonably believed that ambient air quality standards are being exceeded or are likely to be exceeded, or the area requires specific air quality management action to rectify the situation (See Paragraph 5.4.6.4 on priority area air quality management planning).
- Prescribe the regulations necessary for implementing and enforcing the approved Priority Area AQMP (See Paragraph 5.4.4, page 61, on regulations).
- Declare an appliance or activity as a Controlled Emitter if that appliance or activity results in atmospheric emissions which through ambient concentrations, bioaccumulation, deposition or any other way, present a threat to health or well-being or the environment, or which the Minister reasonably believes present such a threat (See Paragraph 5.4.3.6, page 59, on Controlled Emitters).
- Declare a substance or a mixture of substances, which when used as a fuel in a combustion process, results in atmospheric emissions which through ambient concentrations, bioaccumulation, deposition or in any other way, present a threat to health or well-being or the environment, or which the Minister reasonably believes presents such a threat, as a Controlled Fuel (See Paragraph 5.4.3.7, page 60, on Controlled Fuels).
- Declare any substance contributing to air pollution as a priority air pollutant (See Paragraph 5.3.2 on identifying and prioritising pollutants of concern).
- Investigate situations which create, or are anticipated to contribute to air pollution across the Republic's borders, or air pollution that violates, or is likely to violate, an international agreement binding on the Republic in relation to the prevention, control or correction of pollution and for prescribing measures to prevent, control or correct the emissions within the Republic in consultation with the Cabinet member responsible for foreign affairs.
- Prescribe measures for the control of dust, noise and offensive odours (See Paragraph 5.5.3.6, page 70).

3.2.2 Provincial environmental departments

Provincial environmental departments are the provincial Lead Agents for environmental management, and hence air quality management, in each province and must therefore provide, where necessary, provincial norms and standards to ensure coordinated, integrated and cohesive air quality governance in the province.

As with the national department, provincial departments have a number of responsibilities within the governance cycle which is described in Chapter 4. However, each provincial member of the Executive Committee (MEC) responsible for the environment has a number of exclusive air quality management powers as summarised below:

In this regard, the MEC must:

- Designate an officer in the provincial administration as the provincial Air Quality Officer (AQO) who is responsible for the coordination of all air quality related matters in the province.
- Prepare a provincial AQMP as a component of the EIP (See Paragraph 5.4.6.5).
- Prepare an annual report providing information on progress regarding the implementation of the AQMP and compliance with the provincial implementation plan.
- Process an application for an Atmospheric Emission Licence (AEL) if the applicant is a municipality in the province.
- Review the AQMPs received from the municipalities.

The MEC may also:

- Identify substances or mixtures of substances in ambient air which, through ambient concentrations, bioaccumulation, deposition or any other way, present a threat to health or well-being or the environment, or which the MEC reasonably believes present such a threat, and the subsequent establishment of provincial

standards for ambient air quality for these substances, and the establishment of provincial emission standards from point and non-point sources for these substances or mixture of substances if national standards are not sufficiently strict (See problem identification and prioritisation in Paragraph 5.3).

- Declare an area as a provincial Priority Area if the MEC reasonably believes that ambient air quality standards are being exceeded or are likely to be exceeded, or the area requires specific air quality management action to rectify the situation.
- Prepare an AQMP for the area in consultation with the AQOs in the affected municipalities (See Paragraph 5.4.6.4), and presenting this plan to the MEC within a stipulated time frame.
- Prescribe the regulations necessary for implementing and enforcing the approved Priority Area AQMP.
- Publish and maintain a provincial list of activities which result in atmospheric emissions and which the MEC reasonably believes have a detrimental effect on the environment, including health, social, economic and ecological conditions, or cultural heritage.
- Establish minimum emission standards in respect of a substance or mixture of substances resulting from the Listed Activity if implementing national standards does not achieve the desired improvement in ambient air quality in the province.
- Declare an appliance or activity as a Controlled Emitter if that appliance or activity results in atmospheric emissions which through ambient concentrations, bioaccumulation, deposition or in any other way, presents a threat to health or well-being or the environment, or which the MEC reasonably believes presents such a threat.
- Declare a substance or a mixture of substances, which when used as a fuel in a combustion process, results in atmospheric emissions which through ambient concentrations, bioaccumulation, deposition or in any other way, presents a threat to health or well-being or the environment, or which the MEC reasonably believes presents such a threat, as a Controlled Fuel.
- Declare any substance contributing to air pollution as a provincial priority air pollutant.
- Prescribing measures for the control of dust, noise and offensive odours in the province.
- Establish a programme of public recognition of significant achievement in air pollution prevention in the province.

3.2.3 Municipalities

As with the national department and the provincial departments, municipalities have a number of responsibilities within the governance cycle which is described in Chapter 4. However, each municipality has a number of exclusive air quality management powers as summarised below:

In this regard, the municipality must:

- Designate a municipal AQO from its administration.
- Develop an AQMP for inclusion in its Integrated Development Plan (IDP) in accordance with Chapter 5 of the Municipal Systems Act (See air quality management planning in Paragraph 5.4.6.6, page 66).
- Prepare an annual report including progress regarding the implementation of the AQMP and compliance with the plan.

The municipality may also:

- Establish municipal standards for emissions from point, non-point and mobile sources if a municipality, in terms of its by-laws, identifies a substance or mixture of substances in ambient air which through ambient concentrations, bioaccumulation, deposition or any other way, presents a threat to health or well-being or the environment, or which the municipality reasonably believes presents such a threat.
- Require the appointment of an Emission Control Officer in a given company (Section 48 of AQA), thereby extending the powers of the authority by ensuring that the Emission Control Officer is responsible for the company applying the correct measures to minimise emissions.

In addition, Metropolitan and District Municipalities must:

- Implement the atmospheric emission licensing system, and carry out the responsibility for performing the functions of the licensing authority as set out in Chapter 5 of the AQA.

3.2.4 Other national departments

There are a number of national departments that, within their various jurisdictions, have an impact on air quality and, hence, have an interest or responsibilities in respect of managing atmospheric emissions within their jurisdictions as summarised in Table 2 below.

Table 2: National departments, other than DEAT, that have an interest or responsibilities in respect of managing atmospheric emissions within their jurisdictions

National departments, other than DEAT, that have an interest or responsibilities in respect of managing atmospheric emissions within their jurisdictions	
National Department	Examples of interest or responsibility
Department of Minerals and Energy (DME)	<ul style="list-style-type: none"> • Dust from mine spoil tailings dumps and other mining operations; • Emissions resulting from the use of fossil fuels; • Emissions from mining haul roads; • Dust from open-cast mining operations; • Emissions from fires in coal mines, including abandoned mines.
Department of Health (DoH)	<ul style="list-style-type: none"> • Household fuel burning; • Emissions from household products; • Emissions from building materials, furniture, floor coverings, adhesives, etc.; • Emissions from medical waste treatment plants; • Emissions from hospital boilers.
Department of Agriculture (DoA)	<ul style="list-style-type: none"> • Dust from agricultural activities (e.g. ploughing); • Emissions from stubble burning; • Emissions from sugar cane burning; • Emissions from un-surfaced farm roads; • Emissions from crop-spraying; • Emissions from the burning of fire breaks; • The impact of emissions on soil quality (e.g. acidification).
Department of Labour (DoL)	<ul style="list-style-type: none"> • Emissions within the workplace.
Department of Water Affairs and Forestry (DWAF)	<ul style="list-style-type: none"> • Emissions from veld and forest fires; • Emissions sinks (e.g. forests as carbon sinks); • The impact of emissions on water quality (e.g. acidification).
Department of Transport (DoT)	<ul style="list-style-type: none"> • Emissions from various forms of transport, including vehicle emissions; • Emissions from transport infrastructure construction.
Department of Land Affairs (DoLA)	<ul style="list-style-type: none"> • Emissions from various changes in land-use (e.g. the change from virgin to agricultural land)
Department of Provincial and Local Government (DPLG)	<ul style="list-style-type: none"> • Emissions from national disasters where such emissions occur.
Department of Housing	<ul style="list-style-type: none"> • Emission from coal and wood burning, especially in dense, low-income communities.
Department of Defence	<ul style="list-style-type: none"> • Emissions from the use and/or testing of explosives and other weapons.
Department of Public Enterprises (DPE)	<ul style="list-style-type: none"> • Emissions from State-owned enterprises.
Department of Trade and Industry	<ul style="list-style-type: none"> • Emissions resulting from technology choices.

With regard to specific air quality management responsibilities, national departments that are responsible for preparing an Environmental Implementation Plan (EIP) or Environmental Management Plan (EMP) in terms of Chapter 3 of the NEMA are responsible for:

- Including an AQMP in their respective plans (See Paragraph 5.4.6 on air quality management planning).
- Preparing an annual report providing information on progress regarding the implementation of its AQMP.

3.3 Industry

Emissions from some industries often have a measurable impact on air quality. In this regard, industry too has a responsibility not to impinge on everyone's right to air that is not harmful to health and well-being. Furthermore, in terms

of Section 28 of the NEMA, industries that cause, have caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.

In terms of the AQA, certain industries have further responsibilities, including:

- Taking reasonable steps to prevent the emission of any offensive odour caused by any activity on their premises.
- Compliance with any relevant standards for emissions from point, non-point or mobile sources in respect of substances or mixtures of substances identified by the Minister, MEC or municipality.
- Compliance with the measurements requirements of identified emissions from point, non-point or mobile sources and the form in which such measurements must be reported and the organs of state to whom such measurements must be reported.
- Compliance with relevant emission standards in respect of controlled emitters if an activity undertaken by the industry and/or an appliance used by the industry is identified as a controlled emitter.
- Compliance with any usage, manufacture or sale and/or emissions standards or prohibitions in respect of controlled fuels if such fuels are manufactured, sold or used by the industry.
- Comply with the Minister's requirement for the implementation of a pollution prevention plan in respect of a substance declared as a priority air pollutant.
- Comply with an Air Quality Officer's legal request to submit an atmospheric impact report in a prescribed form.

Furthermore, industries identified as Listed Activities (See Paragraph 5.4.3.5) have further responsibilities, including:

- Making application for an Atmospheric Emission Licence (AEL) and complying with its provisions.
- Compliance with any minimum emission standards in respect of a substance or mixture of substances identified as resulting from a listed activity.
- Designate an Emission Control Officer if required to do so.

3.4 Labour

Workers tend to be in the frontline of pollution problems and exposure to hazardous environments. Recognising this, the NEMA protects workers refusing to do environmentally hazardous work by providing that no person is civilly or criminally liable or may be dismissed, disciplined, prejudiced or harassed on account of having refused to perform any work if the person in good faith and reasonably believed at the time of the refusal that the performance of the work would result in an imminent and serious threat to the environment. Furthermore, the NEMA also protects 'whistleblowers' by providing that no person is civilly or criminally liable or may be dismissed, disciplined, prejudiced or harassed on account of having disclosed any information, if the person in good faith reasonably believed at the time of the disclosure that he or she was disclosing evidence of an environmental risk and the disclosure was made in accordance with certain provisions.

Finally, organised labour is specifically identified for participation in the National Environmental Advisory Forum and, as such, has a responsibility to represent the interests of their members in this forum.

3.5 The General Public

As mentioned in the introduction, everyone, to a greater or lesser extent, is responsible for some form of atmospheric emission that has an impact on air quality. Hence, everyone has a role and social responsibility in respect of air quality management. As private individuals, we all have a responsibility not to impinge on everyone's right to air that is not harmful to health and well-being. As with industries, in terms of Section 28 of the NEMA, persons that cause, have caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.

Notwithstanding the above, it can be argued that there is a social responsibility for everyone to actively participate in air quality governance by participating in the development of the regulatory framework for air quality management. In this

regard, the AQA provides numerous opportunities to submit to the Minister or MEC written or oral representations on or objections in respect of, for example:

- The national framework or any amendment to the framework.
- Ambient air quality standards.
- The declaration of priority areas
- priority area air quality management plans
- The listing of activities that require and Atmospheric Emission Licence to operate
- The declaration of controlled emitters.
- The declaration of controlled fuels.
- Any regulation.

Finally, the public may be directly affected by air pollution. The public and civil society groups therefore contribute local perspectives and also have an important watchdog role to play in bringing to the attention of the authorities through their municipal AQO, matters of concern or of non-compliance.

4. APPROACH TO AIR QUALITY GOVERNANCE

4.1 Introduction

Air quality governance can be described in terms of a simplified environmental governance cycle as illustrated in Figure 1. The governance cycle provides a useful framework for achieving continuous improvement over time. An overview of each of the components with reference to the governance roles and responsibilities contained in, or implied by, the AQA is given in Paragraph 4.2.

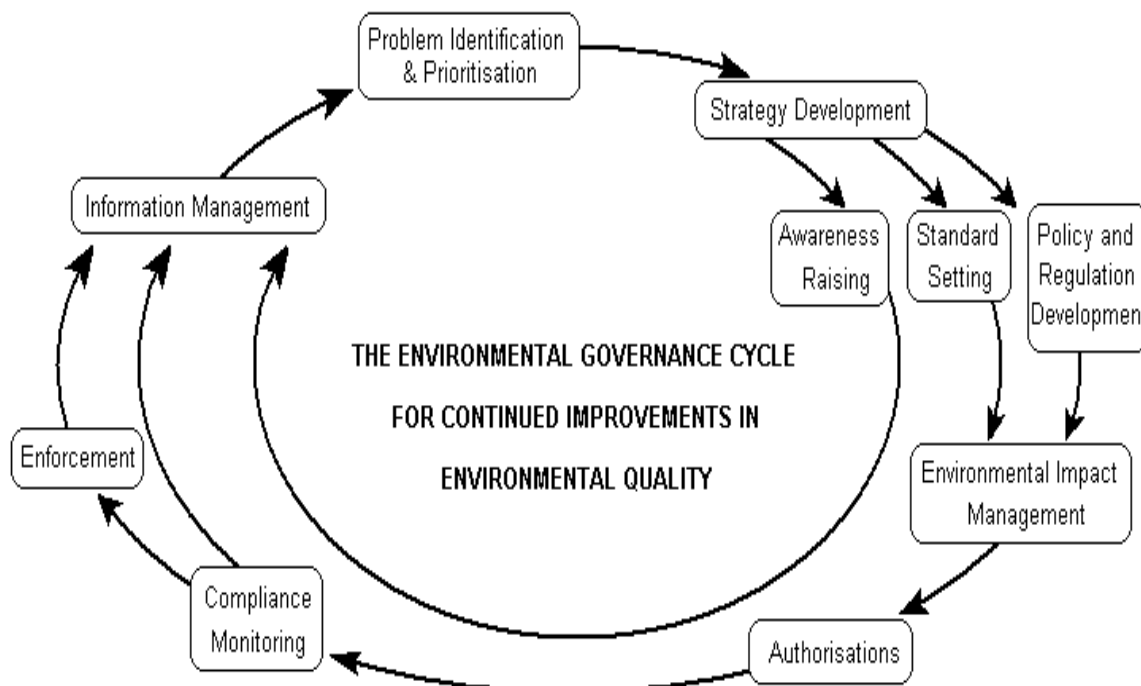


Figure 1: The environmental governance cycle for continued improvements in environmental quality

4.2 The environmental governance cycle

4.2.1 Information management

Informed decision-making is fundamental to good governance and decisions can only be informed if decision-shapers and decision-makers have ready access to accurate, relevant, current and complete information. The information management component of the governance cycle is critical and is often described as the engine that drives the cycle towards continuous improvements in environmental quality.

Given the above, it the AQA contains a number of information related provisions as illustrated in Table 3.

Table 3: Typical AQA governance functions relating to information management

Typical AQA governance functions relating to information management						
Function	AQA Ref.	DEAT	Prov.	Municipalities		
				Metro	Dist.	Local
Establish and maintain national norms and standards for air quality monitoring	7(1)(d)	PR	I	I	I	I
Establish and maintain national norms and standards for air quality information management	7(1)(f)	PR	I	I	I	I
Monitor ambient air quality and point, non-point and mobile source emissions	8(a)	O	O	PR	PR	PR
Monitor ambient air quality and the performance of municipalities in implementing the AQA	8(b)	O	PR	I	I	I
Establish and maintain national standards for the collection and	8(c)	PR	I	I	I	I

Typical AQA governance functions relating to information management						
Function	AQA Ref.	DEAT	Prov.	Municipalities		
				Metro	Dist.	Local
management of data necessary to assess: (i) compliance with the AQA; (ii) compliance with ambient air quality and emission standards; (iii) the performance of organs of state in respect of air quality management plans and priority area air quality management plans; (iv) the impact of, and compliance with, air quality management plans and priority area air quality management plans; (v) compliance with the Republic's obligations in terms of international agreements; and (vi) access to information by the public.						
The compilation and submission of an annual report including information on - (a) air quality management initiatives undertaken during the reporting period; (b) the level of compliance with ambient air quality standards; (c) measures taken by to secure compliance with those standards; (d) compliance with any applicable priority area air quality management plans; and (e) air quality monitoring activities.	17	PR	PR			
The consideration of any sound scientific information in the declaration of a controlled emitter	23(2)(d)(i)	PR	PR			
The consideration of any sound scientific information in the declaration of a controlled fuel	26(2)(d)(i)	PR	PR			
The development of regulations in respect of monitoring	53(m)	PR	PR			

Key: PR Principle Responsibility in relevant jurisdiction | Input O Oversight

4.2.2 Problem identification and prioritisation

Information and information management is not an end in itself. The gathering, storage and reporting of information is to no avail unless it is used for a purpose. Information must be analysed to identify air quality problems being experienced and also to establish whether air quality interventions are effective. AQA will not provide a solution to air quality problems in South Africa unless these problems are identified and defined and prioritised for action.

There are a number of sections in the AQA that deal with problem identification and prioritisation, including, those provided in Table 4.

Table 4: Typical AQA governance functions relating to problem identification and prioritisation

Typical AQA governance functions relating to problem identification and prioritisation						
Function	AQA Ref.	DEAT	Prov.	Municipalities		
				Metro	Dist.	Local
The identification of pollutants which, through ambient concentrations, bioaccumulation, deposition or in any other way, present a threat to health, well-being or the environment	S.9(1)(a)	PR	PR			
The declaration of an area as a priority area if ambient air quality standards are being, or may be, exceeded in the area, or any other situation exists which is causing, or may cause, a significant negative impact on air quality in the area; and the area requires specific air quality management action to rectify the situation	S.18(1)	PR	PR			
The publication of a list of activities which result in atmospheric emissions and which have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage	S.21(1)(a)	PR	PR			
The declaration of any appliance or activity, or any appliance or activity falling within a specified category, as a controlled emitter if such appliance or activity, or appliances or activities falling within such category, result in atmospheric emissions which through ambient concentrations, bioaccumulation, deposition or in any other way, present a threat to health or the environment.	S.23(1)	PR	PR			

Typical AQA governance functions relating to problem identification and prioritisation						
Function	AQA Ref.	DEAT	Prov.	Municipalities		
				Metro	Dist.	Local
The declaration of a substance or mixture of substances which, when used as a fuel in a combustion process, result in atmospheric emissions which through ambient concentrations, bioaccumulation, deposition or in any other way, present a threat to health or the environment, as a controlled fuel.	S.26(1)	PR	PR	I	I	I
The declaration of any substance contributing to air pollution as a priority air pollutant and requiring persons falling within a specified category to submit and implement a pollution prevention plan in respect of the priority air pollutant.	S.29(1)	PR	PR	I	I	I

Key:	PR	Principle Responsibility in relevant jurisdiction	I	Input	O	Oversight
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4.2.3 Strategy development

Once problems have been identified and prioritised, strategies must be devised to address the problems. These strategies are further detailed into plans of action that guide the interventions aimed at addressing the problems.

AQA requires a comprehensive planning regime as the examples in Table 5 illustrates.

Table 5: Typical AQA governance functions relating to strategy development

Typical AQA governance functions relating to strategy development						
Function	AQA Ref.	DEAT	Prov.	Municipalities		
				Metro	Dist.	Local
The establishment and maintenance of national norms and standards for air quality management planning	S.7(1)(e)	PR	I	I	I	I
The development of air quality management plans as a component of environmental implementation plans or environmental management plans submitted in terms of Chapter 3 of the NEMA.	S.15(1)	PR	PR	I	I	I
The development of air quality management plans as a component of integrated development plans as required by the Municipal Systems Act	S.15(2)	O	O	PR	PR	PR
The development of Priority Area Air Quality Management Plans	S.19	PR	PR	I	I	I
Assessment and approval of pollution prevention plans in respect of a priority air pollutant	S.29(1)	PR	PR	I	I	I

Key:	PR	Principle Responsibility in relevant jurisdiction	I	Input	O	Oversight
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4.2.4 Standard setting

Environmental improvements may also come about if certain minimum standards are set as targets and these standards are properly monitored and enforced. AQA is largely based on the use of this strategy as Table 6 illustrates.

Table 6: Typical AQA governance functions relating to standard setting

Typical AQA governance functions relating to standard setting						
Function	AQA Ref.	DEAT	Prov.	Municipalities		
				Metro	Dist.	Local
The setting of national norms and standards for: the control of emissions from point and non-point sources; air quality monitoring; air quality management planning; and air quality information management	S.7(1)	PR	I	I	I	I
The setting of national standards for municipalities to monitor: ambient air quality; and point, non-point and mobile source emissions.	S.8(a)	PR	I	I	I	I

Typical AQA governance functions relating to standard setting						
Function	AQA Ref.	DEAT	Prov.	Municipalities		
				Metro	Dist.	Local
The setting of national standards for provinces to monitor: ambient air quality; and the performance of municipalities in implementing this Act.	S.8(b)	PR	I	I	I	I
The setting of national standards for the collection and management of data necessary to assess: compliance with the AQA; compliance with ambient air quality and emission standards; the performance of organs of state in respect of air quality management plans and priority area air quality management plans; the impact of, and compliance with, air quality management plans and priority area air quality management plans; compliance with the Republic's obligations in terms of international agreements; and access to information by the public.	S.8(c)	PR	I	I	I	I
The setting of national ambient air quality standards for identified substances or mixtures of substances in ambient air which, through ambient concentrations, bioaccumulation, deposition or in any other way, present a threat to health, well- being or the environment	S.9(1)(b)	PR	I	I	I	I
The setting of national standards for emissions from point, non-point or mobile sources with respect to identified substances or mixtures of substances in ambient air which, through ambient concentrations, bioaccumulation, deposition or in any other way, present a threat to health, well- being or the environment	S.9(1)(c)	PR	I	I	I	I
The setting of provincial ambient air quality standards for identified substances or mixtures of substances in ambient air which, through ambient concentrations, bioaccumulation, deposition or in any other way, present a threat to health, well- being or the environment	S.10(1)(b)	O	PR	I	I	I
The setting of provincial standards for emissions from point, non-point or mobile sources with respect to identified substances or mixtures of substances in ambient air which, through ambient concentrations, bioaccumulation, deposition or in any other way, present a threat to health, well- being or the environment	S.10(1)(c)	O	PR	I	I	I
The setting of municipal standards for emissions from point, non-point or mobile sources in the municipality in respect of identified substances or mixtures of substances in ambient air which, through ambient concentrations, bioaccumulation, deposition or in any other way, present a threat to health, well- being or the environment in the municipality	S.11(1)	O	O	PR	PR	PR
The setting of national/provincial minimum emission standards in respect of a substance or mixture of substances resulting from a listed activity	S.21(3)(a)	PR	PR	I	I	I
The setting of national/provincial emission standards of any specified substance or mixture of substances that may be emitted from a controlled emitter	S.24(1)	PR	PR	I	I	I
The setting of national/provincial standards relating to controlled fuels, including: standards for the use of the controlled fuel in combustion processes; standards for the manufacture or sale of the controlled fuel; specifications, including maximum or minimum levels or concentrations of the constituents of substances or mixtures of substances, for the composition of controlled fuels; and the prohibition of the manufacture, sale or use of the controlled fuel	S.27	PR	PR	I	I	I
The setting of national standards for the control of noise, either in general or by specified machinery or activities or in specified places or areas; or for determining a definition of noise; and the maximum levels of noise.	S.34(1)	PR	I	I	I	I
Make regulations that incorporate by reference any code of practice or any national or international standard relating to air quality.	S.55(1)(d)	PR	PR	I	I	I
Key: PR Principle Responsibility in relevant jurisdiction I Input O Oversight						

4.2.5 Policy and regulation development

Although the AQA provides the legislative framework for air quality management and despite the fact that the making of by-laws in respect of air quality management is an exclusive municipal competence, the AQA also directs or implies a number of functions in this regard as illustrated in the Table 7.

Table 7: Typical AQA governance functions relating to policy and regulation development

Typical AQA governance functions relating to policy and regulation development						
Function	AQA Ref.	DEAT	Prov.	Municipalities		
				Metro	Dist.	Local
The development and promulgation of regulations necessary for implementing and enforcing approved priority area air quality management plans, including: funding arrangements; measures to facilitate compliance with such plans; penalties for any contravention of or any failure to comply with such plans; and regular review of such plans.	S.7(1)(e)	PR	PR			
The development and promulgation of regulations in respect of measures to prevent, control or correct the release of a substance into the air from a source in the Republic that may have a significant detrimental impact on air quality, the environment or health in a country other than the Republic.	S.50(2)	PR				
The development and promulgations of regulations in respect of: any matter necessary to give effect to the Republic's obligations in terms of an international agreement relating to air quality; and matters relating to environmental management cooperation agreements, to the extent that those agreements affect air quality;	S.53	PR				
The development and promulgations of regulations in respect of: emissions, including the prohibition of specific emissions, from point, non-point and mobile sources of emissions, including motor vehicles; open fires and incinerators; ozone-depleting substances; codes of practice; records and returns; labelling; trading schemes; powers and duties of air quality officers; appeals against decisions of officials in the performance of their functions in terms of the regulations; incentives to encourage change in behaviour towards air pollution by all sectors in society; requirements in respect of monitoring; the avoidance or reduction of harmful effects on air quality from activities not otherwise regulated in terms of this Act; any matter that may or must be prescribed in terms of this Act; or any other matter necessary for the implementation or application of this Act.	S.53	PR	PR			
Key: PR Principle Responsibility in relevant jurisdiction Input O Oversight						

4.2.6 Environmental impact management

Through impact assessment the safety, health and environmental impacts of developments and activities are scrutinised. This process encourages participation by all stakeholders and provides decision-makers with detailed information to determine whether an activity may proceed or not, and in the case of an approval provides information on the mitigation measures that must be introduced to ensure that safety, health and environmental impacts are kept to acceptable levels.

Reference to impact management is made in a number of sections of the AQA, including:

- An AQO may require any person to submit an Atmospheric Impact Report if it is reasonably believed that the person has contravened or failed to comply with the AQA or any conditions of a licence and the contravention has had, or may have, a detrimental effect on the environment (Section 30(a));
- An AQO may require any person to submit an Atmospheric Impact Report if a review of a licence is undertaken (Section 30(b));
- The application for an AEL, when the effect or likely effect of the pollution emitted or likely to be emitted by a Listed Activity on the environment must be considered (Section 39(b)); and,

- Significant trans-boundary impacts require management through preventative, control or corrective measures (Section 50(2)).

Furthermore, environmental impact management has been rolled out nationally and provincially in the form of the environmental impact assessment (EIA) process. This participatory process provides government with the detailed information required for it to make an informed decision on whether a development may go ahead or not and, in the case of a go-ahead, exactly what measures must be taken to ensure that safety, health and environmental impacts are kept to acceptable levels.

The use and importance of the EIA tool is fully acknowledged by the AQA and, as such, the use of EIAs is inextricably linked to the AQA’s atmospheric emission licensing process as discussed in 5.5.2.

4.2.7 Authorisations

An authorisation (permission, permit, licence, etc.) is a key component of traditional “command and control” regulatory practise. The principle authorisation in the AQA is the Atmospheric Emission Licence (AEL), which is described in detail in Section 36 to Section 49.

Table 8: the AQA governance functions relating to authorisations

AQA governance functions relating to authorisations						
Function	AQA Ref.	DEAT	Prov.	Municipalities		
				Metro	Dist.	Local
Implement the AQA atmospheric emission licensing system referred and for this purpose perform the functions of licensing authority as set out in this Chapter 5 and other provisions of the AQA	Chapter 5	O	PR	PR	PR	I
Key:	PR	Principle Responsibility in relevant jurisdiction	I	Input	O	Oversight

4.2.8 Compliance monitoring

Compliance with norms and standards is an important element of the environmental governance cycle (see Figure 1) and follows authorisation. Table 9 provides examples of these functions.

Table 9: Typical AQA governance functions relating to compliance monitoring

Typical AQA governance functions relating to compliance monitoring						
Function	AQA Ref.	DEAT	Prov.	Municipalities		
				Metro	Dist.	Local
Monitoring potential illegal listed activities	S.51(1)(a)	O	PR	PR	PR	I
Monitoring compliance with emission standards in respect of the manufacture, sale or use any appliance or conducting of an activity declared as a controlled emitter	S.51(1)(a)	PR	PR	PR	PR	I
Monitoring compliance in respect to reasonable steps to prevent the emission of any offensive odour caused by any activity.	S.51(1)(a)	O	O	PR	PR	PR
Monitoring compliance with directives to submit or to implement a pollution prevention plan	S.51(1)(b)	PR	PR	I	I	I
Monitoring compliance with directives to submit an atmospheric impact report	S.51(1)(c)	PR	PR	PR	PR	PR
Monitoring compliance with notification requirements in respect of mines that are likely to cease mining operations within a period of five years	S.51(1)(d)	PR	I	I	I	I
Monitoring compliance with conditions or requirements of an atmospheric emission licence	S.51(1)(e)	O	PR	PR	PR	I
Monitoring any application for an atmospheric emission licence, or for the transfer, variation or renewal of such a licence to ensure that it does not contain false or misleading information	S.51(1)(f)	O	PR	PR	PR	I
Monitoring any information provided to an air quality officer to ensure that it does not contain false or misleading information	S.51(1)(g)	O	PR	PR	PR	I

Typical AQA governance functions relating to compliance monitoring						
Function	AQA Ref.	DEAT	Prov.	Municipalities		
				Metro	Dist.	Local
Monitoring compliance with conditions subject to which exemption from a provision of the AQA was granted	S.51(1)(h)	PR	I	I	I	I
Key:	PR	Principle Responsibility in relevant jurisdiction	I	Input	O	Oversight

4.2.9 Enforcement

The AQA is regarded as a “specific environmental management Act” under the NEMA (see Schedule 1 of the AQA) and, as such, may be enforced by the Environmental Management Inspectorate – the so-called “Green Scorpions”.

With reference to the Green Scorpions, and as an example of compliance and enforcement provisions contained in the AQA, an Environmental Management Inspector may require the holder of the licence, on request, to submit to the inspector a certified statement indicating – (i) their compliance monitoring records; (ii) particulars of instances of non-compliance; (iii) the reasons for instances of non-compliance; and (iv) any action taken, or to be taken, to prevent a recurrence of the instance of non-compliance.

This notwithstanding, enforcement and/or compliance promotion actions in response to significant non-compliance must be taken in respect of the various examples of compliance monitoring described in the previous paragraph.

Furthermore, enforcement is also addressed in the following sections of AQA:

- The Minister or MEC may prescribe penalties for any contravention of or any failure to comply with Priority Area AQMPs (Section 20(c));
- An AEL must specify the penalties for non-compliance (Section 43(1)(k)), and can include other measures necessary for enforcement (Section 43(1)(m)); and,
- Sections on offences (Section 51) and penalties (Section 52 and Section 55(2)).

4.3 The implementation of the functions by the three spheres of government

Although the above sections provide a clear indication of the various air quality management functions to be implemented by the affected spheres of government, as the national, provincial and local spheres of government are autonomous, “how” these functions are to be implemented is up to each department and/or municipality. As such, it is important that all provinces and municipalities that experience air quality issues within their jurisdictions (see section 5.3.4 and Table 24, page 47) build the necessary organisational capacity to implement these functions in an efficient and effective manner and in a manner that is commensurate with the air quality problems to be addressed. In this regard, organisational capacity refers to the structures (including sustainable funding), systems, skills, strategies, incentives and interrelationships necessary to implement these functions in an efficient and effective manner and in a manner that is commensurate with the air quality problems to be addressed.

Notwithstanding the above, although the national department cannot dictate how other autonomous spheres of government should capacitate themselves to implement their air quality management functions, it will continue to provide assistance and guidance to all spheres of government through various means, including, but not limited to: the hosting of air quality governance events (see, for example, 4.4.6); the development of various implementation manuals, regulations, guidelines, software, standard formats, templates and best practise case studies aimed at the efficient and effective implementation of the AQA (see, for example, 5.4.6.1 and 5.4.2); and the hosting of short-courses in the use of these implementation manuals, guidelines, software, standard formats and templates (see 5.9.2.4). Through this assistance and guidance, the national department also wishes to ensure that the AQA and its National Framework are implemented in a coherent, cohesive, integrated and uniform fashion.

Furthermore, with a view to the effective and efficient use of government resources, the creation and maintenance of dedicated air quality management capacity in municipalities that are not listed in Table 24 may not be necessary to ensure effective air quality management. As such, provincial departments are encouraged to liaise with such municipalities with a view to cooperative agreements in respect of air quality management functions. This is especially relevant in respect to the atmospheric emission licensing function when considering Section 36(2) of the AQA which

reads – “If a metropolitan or district municipality has delegated its functions of licensing authority to a provincial organ of state in terms of section 238 of the Constitution, that provincial organ of state must for the purposes of this Act be regarded as the licensing authority in the area of that municipality”.

In line with the above, district municipality are also encouraged to liaise with local municipalities with a view to cooperative agreements in respect of air quality management functions.

Notwithstanding the above, how each sphere of government plans to implement its air quality management functions must be spelt out in the required provincial and municipal air quality management plans (see 5.4.6.5 and 5.4.6.6 respectively).

4.4 The need for vertical and horizontal integration

Government in South Africa is constituted as national, provincial and local spheres of government. The Intergovernmental Relations Framework Act (Act No. 13 of 2005) establishes a framework for the three spheres of government to promote and facilitate intergovernmental relations and to provide for mechanisms and procedures to facilitate the settlement of intergovernmental disputes. All spheres of government must work together and integrate as far as possible their actions in the provision of services. The object of this Act is to provide within the principles of cooperative government set out in Chapter 3 of the Constitution, a framework for national, provincial and local spheres of government and all organs of state to facilitate coordination in the implementation of policy and legislation.

In terms of the Constitution of South Africa (Act No. 108 of 1996), national and provincial spheres of government have concurrent executive and legislative powers in pollution control matters, while the local sphere of government has exclusive executive and legislative powers in air pollution matters. Effective execution of duties requires integration between the spheres of government as provided for by the Intergovernmental Relations Framework Act (Act No. 13 of 2005).

Coupled with vertical integration between spheres of government, is the need for horizontal integration in order to improve air quality management.

Intergovernmental coordination and cooperation are fundamental to good air quality governance. To achieve the above, government has created a number of structures to ensure both horizontal and vertical integration as illustrated in Figure 2.

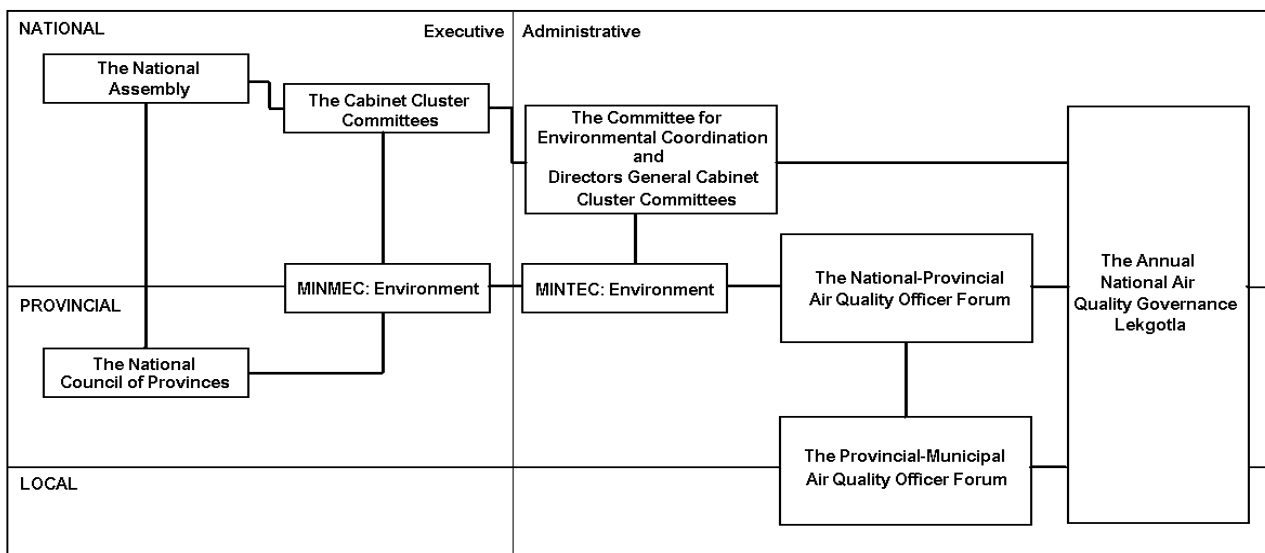


Figure 2: Intergovernmental horizontal and vertical coordination and cooperation structures associated with air quality governance.

Although Figure 2 provides the full set of linkages to the National Assembly and the National Council of Provinces, structures specifically involved in intergovernmental coordination and cooperation in respect of air quality governance as described below.

4.4.1 MINMEC: Environment

The MINMEC: Environment is a standing intergovernmental body consisting of the Minister for Environmental Affairs and Tourism and members of the provincial Executive Councils (MECs) responsible for environmental management functions. MINMEC meets quarterly.

4.4.2 MINTEC: Environment

The MINTEC: Environment is a standing intergovernmental body that provides technical input into the MINMEC. The MINTEC consists of the Director General of the Department of Environmental Affairs and Tourism and the heads of the provincial departments responsible for environmental management functions. MINTEC also meets quarterly.

4.4.3 The Committee for Environmental Coordination (CEC)

The Committee for Environmental Coordination was established in terms of Section 7 of the NEMA. The object of the Committee is to promote the integration and coordination of environmental functions by the relevant organs of state, and in particular to promote the achievement of the purpose and objectives of environmental implementation plans and environmental management plans.

The functions of the Committee include the following:

- Scrutinising, reporting and making recommendations on the environmental implementation plans;
- Investigating and making recommendations regarding the assignment and delegation of functions between organs of state under this Act or any other law affecting the environment and regarding the practical working arrangements, including memoranda of understanding, between the organs of state represented by members and other organs of state;
- Investigating and recommending the establishment of mechanisms in each province, with the concurrence of the MEC, for providing a single point in the province for the receipt of applications for authorisations, licences and similar permissions required for activities under legal provisions concerned with the protection of the environment where such authorisations, licences or permissions are required from more than one organ of state, and procedures for the coordinated consideration of such applications by the organs of state concerned;
- Making recommendations to coordinate the application of integrated environmental management, including cooperation in environmental assessment procedures and requirements and making determinations regarding the prevention of duplication of efforts;
- Making recommendations aimed at securing compliance with the NEMA principles and national norms and standards contemplated in Section 146(2)(b)(i) of the Constitution;
- Making recommendations regarding the harmonisation of the environmental functions of all relevant national departments and spheres of government;
- Advising the Minister on providing guidelines for the preparation of environmental management plans and environmental implementation plans; and
- Endeavouring to ensure compliance with the NEMA principles by making appropriate recommendations, requiring reports from its members and advising government on law reform.

The CEC comprises: the Director-General: Environmental Affairs and Tourism, who acts as chairperson; the Director-General: Water Affairs and Forestry; the Director-General: Minerals and Energy; the Director-General: Land Affairs; the Director-General: Constitutional Development; the Director-General: Housing; the Director-General: Agriculture; the Director-General: Health; the Director-General: Labour; the Director-General: Arts, Culture, Science and Technology; the heads of provincial environmental departments; and a representative from the South African Local Government Association (SALGA).

4.4.4 The National–Provincial Air Quality Officers’ Forum

The National–Provincial Air Quality Officers’ Forum is a subset of the existing MINTEC Working Group II (WGII). WGII meetings have been structured to separate waste and air quality management issues. Hence, quarterly WGII

deliberations on air quality management issues are regarded as the deliberations of the National–Provincial Air Quality Officers' Forum.

4.4.5 The Provincial–Municipal Air Quality Officers' Forum

Provincial–Municipal Air Quality Officers' Forums exist in the three key industrialised provinces of Gauteng, Western Cape and KwaZulu-Natal. In order to facilitate the efficient, effective and cohesive functioning of these forums, the national department provided all provincial AQOs with generic terms of reference for such forums.

The overall objective of the Forum is framed as a desired outcome as follows: *“An effective governance framework is developed, maintained and implemented in a manner that ensures that the unacceptable current and future impacts of atmospheric emissions are minimised, mitigated or managed in line with government policy, legislation, goals, strategies, norms and standards that are protective of everyone’s right to an environment that is not harmful to their health or well-being and protect the environment for the benefit of present and future generations through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and the use of natural resources while promoting justifiable economic and social development.”*

4.4.6 The Annual Air Quality Management Governance Lekgotla

This two-day event, which is aligned with the annual National Association for Clean Air (NACA) Conference, and focuses on practical air quality governance challenges facing all affected spheres of government, especially municipalities.

The Annual Air Quality Governance Lekgotla provides AQOs from all spheres of government with a unique opportunity to discuss and debate ways and means of addressing the various governance challenges and discuss planning for the year ahead. The Lekgotla is the premier event for AQOs to interact with their colleagues and peers and share experiences and lessons learned. The Lekgotla also provides the national department with an effective platform for informing all spheres of government about the national AQA rollout plans and progress reports.

4.5 3D governance model

The emphasis on both vertical and horizontal integration for effective environmental governance may be expressed in a multi-dimensional 3D governance model depicted in Figure 3. The central vertical core represents the coordinating department of each of the spheres of government, ranging from the national sphere, and the provincial spheres to municipalities. Vertical integration between the spheres of government is expressed by the vertical arrows. Responsibilities for elements within the environmental governance cycle rest with various government spheres, hence integration between them is critical.

The need for horizontal integration is expressed by the interrelationships which radiate from each of the coordinating departments, terminating in circles that represent subsidiary but important departments and stakeholders in the implementation of air quality governance.

4.6 Cross-cutting issues

Underpinning the 3D governance model described above are three cross-cutting issues essential for its successful integration. These are public participation, capacity development and information dissemination. Described as one of the fundamental principals of sustainable development, public participation ensures the public’s right to know and the right to participate in decision-making and is considered further in 5.9.1. Capacity development is of particular importance in the South African context and is judged as critical for the successful implementation of the AQA (See 5.9.2). The third cross-cutting issue, namely information dissemination, relates to all aspects of air quality management and is addressed in Paragraph 5.9.3.

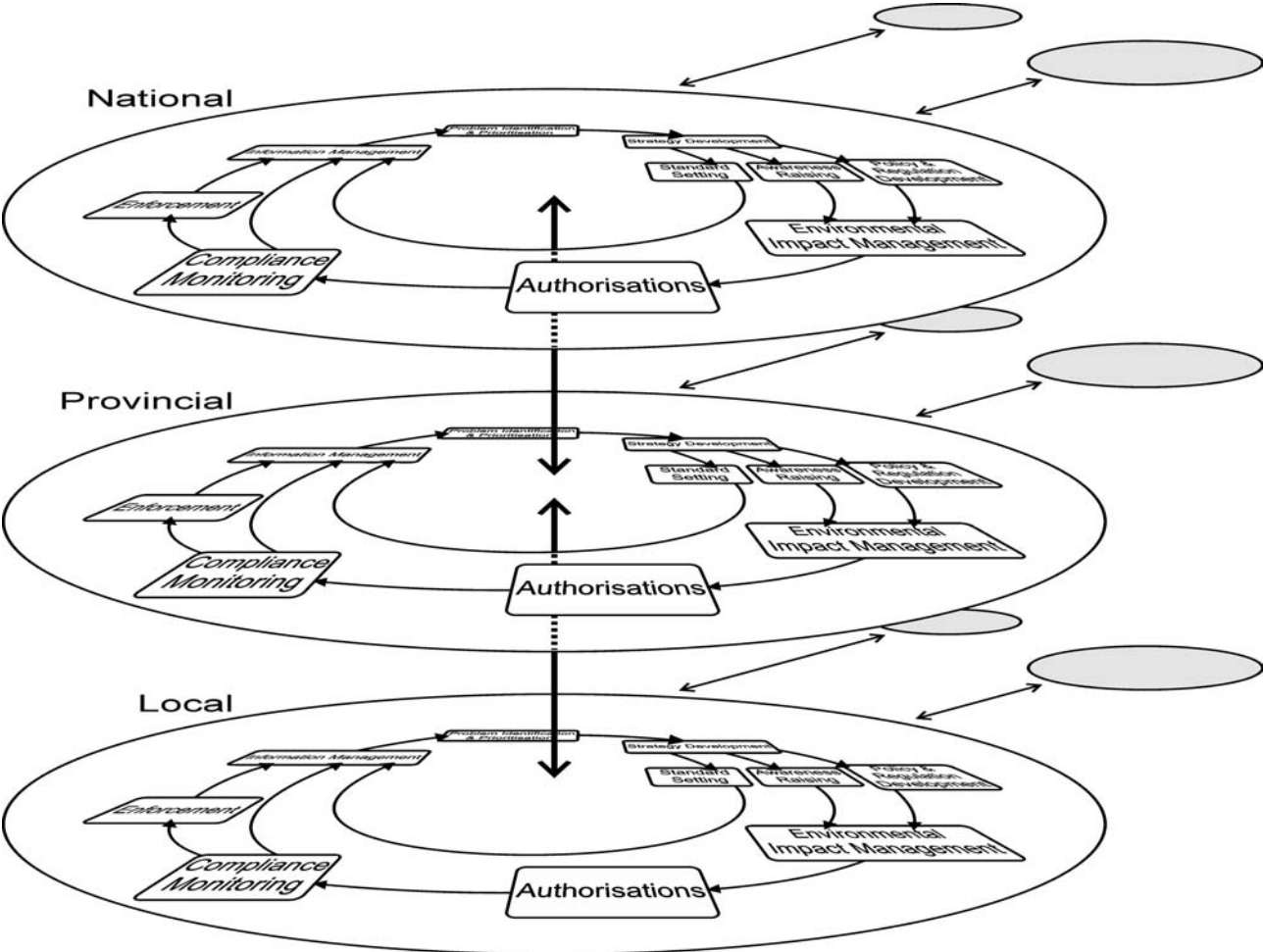


Figure 3: The 3D governance model

5. TOOLS FOR THE IMPLEMENTATION OF THE NATIONAL FRAMEWORK

5.1 Introduction

The implementation of the National Framework is dependent on a combination of both process/governance and technical mechanisms/measures. The process issues are overarching and integrated throughout the National Framework and include among others cooperative governance and enforcement. The technical mechanisms and measures are more specific and include norms and standards for matters relating to air quality management and meeting the requirements of the AQA.

5.2 Air quality information management

Informed decision-making is fundamental to good governance and decisions can only be informed if decision-shapers and decision-makers have ready access to accurate, relevant, current and complete information. Constructive participation in, and implementation of, air quality management matters are also dependent on the same information. Section 32 of the Bill of Rights states that all South Africans have the right of access to any information held by the state, and any information that is held by another person and that is required for the exercise or protection of any rights. Section 32 further states that national legislation must be enacted to give effect to this right. Such legislation has been enacted. For example, Section 31(1)(a) of the NEMA provides that “every person is entitled to have access to information held by the State and organs of state which relates to the implementation of the NEMA and any other law affecting the environment, and to the state of the environment and actual and future threats to the environment, including any emissions to water, air or soil and the production, handling, transportation, treatment, storage and disposal of hazardous waste and substances”.

Implicit in this right is that all South Africans shall have access to air quality information and that access shall be facilitated by the AQA and through the National Framework. In order to uphold this right and effectively address the air quality information requirements contained in the AQA, the national department, in partnership with the South African Weather Service (SAWS), will establish the South African Air Quality Information System (the SAAQIS), and develop guidance manuals and publications to provide support to AQOs and air quality information to a wider audience. Air quality information management is discussed in this paragraph, considering the requirements of the SAAQIS (5.2.1), the DEAT publication series (5.2.2) and air quality reporting (5.2.3).

Management of air quality information in this section includes the following:

- Ambient air quality information
- Emission inventories (including GHG inventory)
- Listed Activities
- Air quality related legislation and regulations
- Norms and standards for air quality information management
- Air Quality Management Plans
- Air quality publications
- Technical and scientific air quality reports

The system is intended to address the various steps within information management from the input of data, applications and the extraction of information in suitable formats.

5.2.1 The South African Air Quality Information System (SAAQIS)

The SAAQIS will make information available to stakeholders, provide a common system for managing air quality in South Africa and provide uniformity in the way data, information and reporting are managed in South Africa. A central aim of the SAAQIS is that it will allow the public access to air quality information. Improving the availability of information facilitates transparency in processes, informs decision making, and builds capacity. The SAAQIS will streamline the flow of relevant information; provide a tool to assist in managing air quality and build awareness about air quality among stakeholders in general. Where appropriate air quality information will be geographically referenced through a GIS interface. The SAAQIS is to be built in such a way as to assist providers and users of information and, thereby, motivate

the maintenance and updating of information by users. In achieving the objectives of the SAAQIS, the South African Weather Service (SAWS) has been identified as the relevant custodian of the SAAQIS.

The main objectives of the SAAQIS are to:

- Make information available to stakeholders, including the public, in “near real time”;
- Give relevant information to various stakeholders on different levels (through the use of profiles);
- Give relevant and practical advice to users; and
- Provide facilities for data providers that make it easier for them to use the SAAQIS rather than developing parallel solutions.

5.2.1.1 The national department’s SAAQIS Phase I Development project

In June 2007, the national department initiated the *Development of the South African Air Quality Information System (SAAQIS) – Phase One Project*. The overall objective of the project is framed as that for the entire SAAQIS, namely, “The SAAQIS provides all stakeholders with easy access to all relevant information about air quality in South Africa and further provides different stakeholders with different useful on-line applications to support effective and efficient management of the air quality.” To this end, this 18 month project has the following Phase I objectives:

- **Immediate Objective A – The Description and Plan Objective:** By project completion, the SAAQIS, informed by local requirements and needs and international experience, is fully described and detailed and its development articulated in a phased and costed implementation plan.
- **Immediate Objective B – The Phase I Implementation Objective:** By project completion, the SAAQIS framework, central database and core functions that are required for reporting ambient air quality monitoring data and status/management reports by all spheres of government are established, tested and fully operationalised for pilot areas.
- **Immediate Objective C – The Capacity Building Objective:** By project completion, both the department and SAWS are fully capacitated to manage and operate the Phase I SAAQIS efficiently and effectively.

5.2.1.2 Ambient air quality information

The SAAQIS will provide information on how to produce and present ambient air quality data. There are several activities that need to be defined to produce ambient air quality information. The recommended number of monitoring stations in a given area is discussed in 5.2.1.3, norms and standards for ambient air quality monitoring. Ambient air quality monitoring is achieved by deploying monitoring equipment (e.g. passive and/or continuous monitoring equipment) and analysing the results. To successfully place measurement equipment in the field requires the completion and documentation of certain tasks:

- Objectives for the measurements are stated
- Monitoring programme designed
- Operational sequence is stated
- Site selection is completed in accordance with agreed norms
- Indicators relevant to the objective are identified
- Instruments and methods to be used are selected in accordance with appropriate norms
- Systems for transferring data into the SAAQIS are defined
- Quality assurance and quality control (QA/QC) system is designed and fit for purpose
- Databases are established and usable
- Data presentation is determined taking into account the various users of the data

The SAAQIS will inform and support the design of measurement programmes so that the information can be optimised to achieve the objective. The SAAQIS will also provide the users with quality assurance and quality control (QA/QC) systems, data storage and presentation/reporting routines to assist users in meeting their monitoring and reporting requirements. The SAAQIS will provide information relating to the monitoring data (background information on measurement data and the contact information of the data owners). The data owners can restrict public access to the data until such time that the data have passed through the QA/QC system to define the quality of the data.

The SAAQIS will provide assistance with the importing of raw data into the system and associated reporting requirements, validation, assessment and exporting of the data, as well as the reporting and viewing of processed data. Norms and standards will be further defined by the 1st phase of the SAAQIS development project for inclusion in the 2nd generation National Framework.

Table 10: SAAQIS ambient air quality related implementation targets

Key Milestone, Product or Output		Timeframe
Module to be developed in the SAAQIS	Phase	
Ambient data report/view generating module	Phase I	2009/10
Ambient monitoring station description	Phase I	2009/10
Ambient raw data import module	Phase II	2011/12
Ambient data validation module	Phase II	2011/12
Ambient data assessment	Phase II	2011/12
Ambient data export module	Phase II	2011/12

5.2.1.3 Ambient air quality monitoring

Norms and standards for air quality monitoring

In accordance with the approach promoted in the AQA of prioritising air quality management activity where poor air quality exist, ambient air quality monitoring will focus in these areas (see Table 24, page 47). Despite this, an extensive network of monitoring activities exists, which are owned and operated by a variety of organisations. A logical progression is to integrate these networks into an integrated national ambient air quality monitoring network. However, such an integrated network may omit areas where it is necessary to monitor air quality. In this case the following approach will be used to guide further monitoring.

Ambient air quality monitoring needs to be conducted according to accepted norms and standards in order to ensure integrity, quality and representativeness of the resultant data. It is only when these attributes can be guaranteed that meaningful comparison can be made against ambient air quality standards. Recommendations for ambient air quality monitoring have been published in appendices in SANS 1929. These are based on accepted international practice and are used to inform the national norms and standards for ambient air quality monitoring in the National Framework

Assessment of ambient pollutant concentrations

Where pollutants are measured, the measurements shall be taken at fixed sites determined by appropriate assessment. The analyser can be permanent or movable, but in the case of movable analysers they shall monitor at each site for at least two weeks in every two month-period (SANS 1929). The measurements shall be taken either continuously or by random sampling and the number of measurements shall be sufficiently large to enable the levels observed to be determined.

For zones and agglomerations within which information from fixed measurement stations is supplemented by information from other sources, such as emissions inventories, indicative measurement methods and air quality modelling, the number of fixed measuring stations to be installed and the spatial resolution of other techniques shall be sufficient for the concentrations of air pollutants to be established in accordance with the norms and standards for macro- and micro-scale siting and data capture.

Sampling and analysis of sulphur dioxide (SO₂), nitrogen dioxide (NO₂), particulate matter (PM₁₀), ozone (O₃), lead (Pb), carbon monoxide (CO) and benzene (C₆H₆) shall be done according to the reference methods provided in SANS 1929.

Sampling and analysis of sulphur dioxide (SO₂), nitrogen dioxide (NO₂), particulate matter (PM₁₀), ozone (O₃), lead (Pb), carbon monoxide (CO) and benzene (C₆H₆) shall be done according to the reference methods provided in SANS 1929 or equivalent methods, certified as such by the STANSA, to allow for future developments in monitoring technology. Accreditation of ambient monitoring networks through SANAS is required to ensure data quality and integrity

Location of sampling sites for ambient air quality monitoring

In respect of the macro-scale siting of SO₂, NO₂, PM₁₀, CO, C₆H₆ and Pb sampling points, sampling points directed at the protection of human health shall be sited to provide:

- data on the areas within zones and agglomerations where the highest concentrations of pollutants occur to which the highest density of the population is likely to be directly or indirectly exposed for a period which is significant in relation to the period used to derive averages in the case of limit value(s), and
- data on levels in other areas within the zones and agglomerations which are representative of the exposure of the general population.

Sampling points shall be sited to avoid measuring very small micro-environments in their immediate vicinity. As a guideline, a sampling point shall be sited to be representative of air quality in a surrounding area of not less than 200 m² at traffic-orientated sites and of several square kilometres at urban-background sites.

Sampling points will also, where possible, be representative of similar locations not in their immediate vicinity.

The macro-scale siting of O₃ sampling points in different environments is provided in Table 11.

In respect of the macro-scale siting of dust-fall sampling points, the number and location of samplers shall be sufficient to monitor dust-fall at representative locations around the dust source, and will include monitors located at human residences and sensitive business, industrial or agricultural locations within a maximum distance of 2 km from the source boundary. Micro-surroundings of the samplers shall, where possible, comply with accepted practice e.g. ASTM 1739.

Table 11: Macro-scale siting criteria for O₃ sampling points (SANS 1929)

Type of station	Representative area ^a	Macro-scale siting criteria
Urban	A few square kilometres	<ul style="list-style-type: none"> • Away from the influence of local emissions such as traffic, petrol stations, etc. • Vented locations where well mixed levels can be measured • Locations such as residential and commercial areas of cities, parks (away from the trees), big streets or squares with very little or no traffic, open areas characteristic of educational, sports or recreation facilities
Suburban	Some tens of square kilometres	<ul style="list-style-type: none"> • At a certain distance from areas of maximum emissions, downwind following the main wind direction during conditions favourable to ozone formation • Where populations located in the outer fringe of an agglomeration are exposed to high ozone levels • Where appropriate, some suburban stations also upwind of the area of maximum emissions, in order to determine the regional background levels of ozone
Rural	Sub-regional levels (a few square kilometres)	<ul style="list-style-type: none"> • Stations can be located in small settlements • Representative of ozone away from the influence of immediate local emissions such as those from industrial installations and roads • At open area sites, but not on higher mountain tops
Rural background	Regional / national / continental levels (1 000 km ² to 10 000 km ²)	<ul style="list-style-type: none"> • Station located in areas with lower population density, far removed from urban and industrial areas and away from local emissions • Avoid locations which are subject to locally enhanced formation of near-ground inversion conditions, also summits of higher mountains • Coastal sites with pronounced diurnal wind cycles of local character are not recommended
^a Sampling points will also, where possible, be representative of similar locations not in their immediate vicinity		

In respect of the micro-scale siting of O₃, SO₂, NO₂, PM₁₀, CO, C₆H₆ and Pb sampling points, the following requirements will be complied with as far as is practicable:

- The flow around the inlet sampling probe shall be unrestricted, without any obstructions affecting the airflow in the vicinity of the sampler (normally some metres away from buildings, balconies, trees and other obstacles and at least 0,5 m from the nearest building in the case of sampling points representing air quality at the building line).
- In general, the inlet sampling point shall be between 1,5 m (the breathing zone) and 4 m above the ground. Higher positions (up to 8 m) might be necessary in some circumstances. Higher siting might also be appropriate if the station is representative of a large area.
- The inlet probe shall not be positioned in the immediate vicinity of sources in order to avoid direct intake of emissions unmixed with ambient air.
- The sampler's exhaust outlet shall be positioned so that recirculation of exhaust air to the sample inlet is avoided.

- Location of traffic-orientated samplers:
 - for all pollutants, such sampling points shall be at least 25 m from the edge of major junctions and at least 4 m from the centre of the nearest traffic lane;
 - for NO₂ and CO monoxide, inlets shall be not more than 5 m from the kerb;
 - for benzene, particulate matter and lead, inlets shall be sited so as to be representative of air quality near the building line.

The following factors can also be taken into account:

- interfering sources affecting the airflow in the vicinity of the sampler, e.g. overhanging trees, etc;
- security;
- access;
- availability of electrical power and telephone communications;
- visibility of the site in relation to its surroundings;
- safety of the public and operators;
- desirability of co-locating sampling points for different pollutants;
- educational awareness opportunity associated with the siting; and
- planning requirements.

The site selection procedures shall be fully documented at the classification stage by such means as compass-point photographs of the surrounding area and a detailed map. Sites shall be reviewed at intervals and documentation updated to ensure that selection criteria remain valid over time.

In the case of O₃, the site review process requires proper screening and interpretation of the monitoring data in the context of the meteorological and photochemical processes affecting the ozone concentrations measured at the respective site.

Criteria for determining the recommended minimum number of sampling sites

The number of sampling sites will vary according to the class of air quality experienced in a given area (See Figure 5, page 53). Monitoring in areas where class 1 or class 2 is experienced does not need to be as intensive as that in class 3, 4 or 5 air quality areas. The intensity refers to the type of monitoring required and the recommended number of monitoring sites required.

The recommended minimum number of sampling points for fixed measurements to assess compliance with SO₂, NO₂, PM₁₀, CO, C₆H₆ and Pb limit values for the protection of human health and alert thresholds in zones and agglomerations where fixed measurement is the sole source of information is presented in Table 12. The recommended minimum number of sampling points for O₃ measurement is presented in Table 13.

In the case of areas polluted by NO₂, particulate matter, benzene and carbon monoxide, in class 4 and 5 air quality areas, at least one urban background station and one traffic-orientated station will be included, provided this does not increase the number of sampling points.

For the assessment of pollution in the vicinity of point sources, the number of sampling points for fixed measurements will be calculated taking into account emission densities, the likely distribution patterns of ambient air pollution and potential exposure of the population.

Sampling points for fixed measurements shall be sited so as to ensure that the samples taken will be representative of the exposure of the sampled population.

Table 12: Recommended minimum number of sampling points for fixed measurements to assess compliance with national ambient standards for SO₂, NO₂, PM₁₀, CO, C₆H₆ and Pb (adapted from SANS 1929)

Population density in agglomeration or zone (thousands)	Recommended minimum number of sampling points		
	Class 4 and 5 air quality areas	Class 3 air quality areas	Class 1 and 2 air quality areas
0 – 249	1	1	Not applicable
250 – 499	2	1	1
500 – 749	2	1	1

Population density in agglomeration or zone (thousands)	Recommended minimum number of sampling points		
	Class 4 and 5 air quality areas	Class 3 air quality areas	Class 1 and 2 air quality areas
750 – 999	3	1	1
1000 – 1499	4	2	1
1500 – 1999	5	2	1
2000 – 2749	6	3	2
2750 – 3749	7	3	2
3750 – 4749	8	4	2
4750 – 5999	9	4	2
> 6000	10	5	3

Table 13: Recommended minimum number of sampling points for fixed measurements to assess compliance with ozone limit values for the protection of human health in zones and agglomerations where fixed measurement is the sole source of information (adapted from SANS 1929).

Population density in agglomeration or zone (thousands)	Recommended minimum number of sampling points		
	Agglomerations (urban and suburban) ^a	Other zones (suburban and rural) ^a	Rural background
0 – 249	-	1	One station per 50 000 km ² as an average density over all zones within the country ^b
250 – 499	1	2	
500 – 999	2	2	
1000 – 1499	3	3	
1500 – 1999	3	4	
2000 – 2749	4	5	
2750 – 3749	5	6	
> 3750	One additional station per two million inhabitants	One additional station per two million inhabitants	

^a least one station in suburban areas, where the highest exposure of the population is likely to occur. In agglomerations, at least 50% of the stations will be located in suburban areas.

^b One station per 25 000 km² for complex terrain is recommended.

Data quality objectives and compilation of results for air quality assessment

The data quality objectives for allowed uncertainty of assessment methods, of minimum time coverage and of data capture are provided in Table 14 to guide quality assurance programmes.

Table 14: Data quality objectives for ambient air quality monitoring stations (SANS 1929)

Measurement	SO ₂ and NO ₂ %	PM ₁₀ and Lead %	Ozone %	Benzene %	CO %
Fixed point, continuous measurements					
Uncertainty	15	25	15	25 ^a	15
Minimum data capture	90	90	90 (summer); 75 (winter)	90	90
Minimum time coverage				35 ^c ; 90 ^d	
Indicative measurements					
Uncertainty	25	50	30	30	25
Minimum data capture	90	90	90	90	90
Minimum time coverage	14 ^b	14 ^b	>10 (summer)	14 ^b	14 ^b
Objective estimation					
Uncertainty	75	100	75	75	75
a	Random measurements instead of continuous measurements may be applied for benzene if it can be demonstrated that the uncertainty, including the uncertainty due to random sampling, meets the quality objective of 25 %. Random sampling shall be evenly distributed over the year in order to avoid skewing of results.				
b	One day's measurement a week at random, evenly distributed over the year, or eight weeks evenly distributed over the year.				
c	Urban background and traffic sites (distributed over the year to be representative of various conditions for climate and traffic).				
d	Industrial sites.				

The uncertainty of the measurement methods will be evaluated in accordance with generally accepted principles as contained in ISO 5725-1.

For SO₂, NO₂, C₆H₆, CO and O₃, the volumes shall be standardized at a temperature of 25 °C and a pressure of 101.3 kPa.

Requirements for meteorological monitoring

Meteorological monitoring is an important aspect of air quality management. The number of monitoring stations must be sufficient to characterise the boundary layer meteorology of the air quality management area. Monitoring of the following parameters is recommended:

- Wind speed and direction;
- Temperature;
- Humidity;
- Atmospheric pressure;
- Rainfall; and
- Solar radiation.

The frequency of measurement must be sufficient to characterise temporal changes. The siting of monitoring stations should be done in conjunction with ambient air quality monitoring. The configuration of sensors (e.g. height above ground level) must be done according to accepted norms and standards, such as the World Meteorological Organisation.

5.2.1.4 Emission inventory

The SAAQIS will provide access to information that is necessary for the production of an emission inventory. It will also act as a repository for existing emission inventories in South Africa.

The information set will include:

- Norms and standards for emission inventories
- Examples of emission inventories compiled in South Africa
- Search tools to interrogate the inventories
- Details of licensed emissions
- Details of emissions from point sources
- Details of emissions from mobile sources
- Details of emissions from area sources
- Details of emission factors for various activities
- Documentation on Best Available Techniques (BAT)

Norms and standards for populating emission inventories will be communicated through the SAAQIS. This will illustrate ways of compiling emission inventories such as the “top-down” and “bottom-up” approaches.

Different types of emission factors will be available so that emissions from industries, where these are not measured, can be estimated. The SAAQIS will also make BAT information documents available that are updated regularly to provide stakeholders with current technological possibilities for industrial development.

Emission inventories for mobile sources are supported by statistical data on activities, such as vehicle purchases and scrapping, distribution and road infrastructure. The SAAQIS will also provide emission factors that are most applicable to the South African transport fleet. Guidance on the compilation of an emission inventory for mobile sources will be provided.

Area sources are usually defined as those sources which are not possible to pinpoint geographically or those with emissions from source types with spatial characteristics, e.g. landfills, marshes or energy use in residential settlements. Further, emissions from these activities can be estimated using sales statistics (e.g. petrol and other fuel purchases, vehicle purchases, etc.), population distribution or emission factors. Methodologies for the compilation of area source emission inventories will also be included in the SAAQIS.

Similar protocols to those discussed for ambient data are applicable to the treatment of emissions data in the SAAQIS, including assistance with the importing and reporting of raw data, validation, assessment, and exporting of data, and reporting and viewing of processed data.

Table 15: SAAQIS inventory related implementation targets

Key Milestone, Product or Output		Timeframe
Module to be developed in the SAAQIS	Phase	
Municipal emission inventories	Phase I	2009/10
Greenhouse Gas Inventory	Phase I	2009/10
Emission data reporting module	Phase IV	2015/2016
Emission data report/view generating module	Phase IV	2015/2016
Emission monitoring archive	Phase IV	2015/2016
Emission data import module	Phase V	2016/2017
Emission data assessment module	Phase V	2016/2017
Emission data export module	Phase V	2016/2017

5.2.1.5 Listed Activities and compliance monitoring

Databases for Listed Activities and compliance monitoring will be accessible from the SAAQIS. Norms and standards for the production of information from operators of Listed Activities will be provided through the SAAQIS. Within the context of stack and other emitter-based monitoring data, protocols may be included in the SAAQIS to incorporate emissions data in a more significant manner. Further policy development will be necessary to establish strict parameters within which emitter-based monitoring data will be used, in order to maintain impartiality within the system.

Table 16: SAAQIS listed activity related implementation targets

Key Milestone, Product or Output		Timeframe
Module to be developed in the SAAQIS	Phase	
Database of Listed Activities	Phase II	2008/9

5.2.1.6 Policy, legislation and regulations

Current legislation, regulations and by-laws will be made available via the SAAQIS through a user-friendly interface. The interface will help the user find relevant parts of the legislation and regulations. The SAAQIS will provide search facilities in the documents, general advice to stakeholders and guidance as to roles and responsibilities of different actors and agencies within the various regulations that are available.

Table 17: SAAQIS policy and legislation related implementation targets

Key Milestone, Product or Output		Timeframe
Module to be developed in the SAAQIS	Phase	
All current policy and legislation	Phase I	2007/8

5.2.1.7 South African air quality research database

A large body of scientific literature that has been generated by the South Africa air quality scientific community over the years has been drawn together into the *South African Air Quality Research Database*. This includes information on publications in the formal peer reviewed literature, presentations at international and national scientific conferences, 'grey literature' i.e. institutional research reports and post graduate theses. The database is searchable by fields that include details of the publication, and where this information is housed and available.

The database has a facility for authors to enter new material as it is published. This database will be made publicly available via a link from the SAAQIS.

Table 18: SAAQIS research related implementation targets

Key Milestone, Product or Output		Timeframe
Module to be developed in the SAAQIS	Phase	
Air quality scientific literature resource library	Phase I	2009/10

5.2.1.8 Norms and standards

The SAAQIS will make the norms and standards for air quality information management available. This will include links with other international standards and the access to the information used for setting the norms and standards. Reports and information will be made available through the system.

Table 19: SAAQIS norms and standards related implementation targets

Key Milestone, Product or Output		Timeframe
Module to be developed in the SAAQIS	Phase	
Norms and standards for air quality information management	Phase I (continuously updated throughout SAAQIS Project)	2009/10

5.2.1.9 Air Quality Management Plans

Methodological approaches and guidance on the standards expected for development of the Air Quality Management Plans will be made available via the SAAQIS. AQMPs that have been developed at national, provincial and municipal spheres, and for Priority Areas will also be made available.

Table 20: SAAQIS planning related implementation targets

Key Milestone, Product or Output		Timeframe
Module to be developed in the SAAQIS	Phase	
All current available AQMPs	Phase I (continuously updated throughout SAAQIS Project)	2009/10

5.2.1.10 Air quality reporting in the SAAQIS

The reports available in the SAAQIS will include, but will not be restricted to:

- Interactive reporting functions following norms and standards for air quality reporting;
- Automatically generated monthly air quality status reports;
- Facilitation of the state of air reporting;
- Reporting of emission of greenhouse gasses;
- Facilitation of report generation on South Africa's international commitments.

Further discussion relating to air quality reporting is found in Paragraph 5.2.3.

Table 21: SAAQIS reporting related implementation targets

Key Milestone, Product or Output		Timeframe
Module to be developed in the SAAQIS	Phase	
Ambient data reporting module	Phase I	2009/10
State of Air reports – report and view	Phase I	2009/10
National air quality status	Phase II	20011/12
International report generating module	Phase V	2016/17

5.2.1.11 Additional aspects of the SAAQIS

The SAAQIS is intended to provide a complete solution to the management of air quality information in South Africa, therefore the components discussed are expanded on and enhanced through mechanisms for education and skills development and accessing support on air quality issues and management. Provisions may also be included in the SAAQIS for:

- Interactive training using e-learning techniques;
- A support centre or helpdesk for assistance on air quality information related queries;
- A national website for updates on air quality status;
- A media library containing air quality information from media sources;
- A database of key stakeholders
- A library of relevant links to relevant national and international air quality information.

Table 22: SAAQIS other air quality related implementation targets

Key Milestone, Product or Output		Timeframe
Module to be developed in the SAAQIS	Phase	
Support centre/help desk	Phase I	2009/10
Guidelines documents	Phase I (continuously updated throughout SAAQIS Project)	2009/10
Air quality media archive	Phase V	2016/2017
Interactive training module	Phase V	2016/2017
Key stakeholder database	Phase V	2016/2017

5.2.2 Air quality publications

A series of information booklets are being developed by the national department with the objective of advancing the science and understanding of air quality management and to address the responsibility regarding the provision of air quality information to the public. The information series is also aimed at providing air quality management practitioners with technical guidance. The completed publications are available from the national department and will be available for downloading on SAAQIS. The titles of the booklets and their publication status are presented in Appendix 1.

The publications are structured in series that are aimed at specific target groups. Series A, the general information series, are aimed at a general readership. Series B, the specialist information series, is targeted at undergraduate students and practising professionals. It comprises booklets covering topics such as air pollution meteorology, air pollution dispersion modelling, pollution control approaches, impacts of air pollution and international agreements and climate change. Series C, the governance information series, provides detailed information on the implementation of air quality management, aimed at practitioners. Series D, the cleaner production series, is aimed at cleaner production and various booklets book will be developed for sectors that have been identified as priorities, e.g. brickworks, fish-meal plants, etc (see relevant prioritisation Paragraph 5.3.3, page 46).

5.2.3 Air quality reporting

The main objective of reporting on air quality is to convey information to a target user group, with variation in the purpose and content of air quality reports according to user groups. The following sections outline different types of air quality reports that may be required.

5.2.3.1 Atmospheric impact reports

An AQO may require any person to submit an Atmospheric Impact Report, in accordance with Section 30 of the AQA, provided that there is reasonable suspicion that the person has on one, or more, occasions contravened or failed to comply with the AQA or any condition of their AEL. The contents and compliance requirements of an Atmospheric Impact Report are detailed in Paragraph 5.5.4.

5.2.3.2 State of air reporting

State of environment reports are necessary to describe baseline environmental conditions against which changes or trends may be measured. These reports are important in prioritising and setting goals for environmental management and will include a chapter on the state of the air. This chapter will be reviewed every 5 years and include the following:

- A set of defined indicators to measure ambient air quality;
- Information on:
 - Air quality standards and objectives
 - Ambient air quality monitoring activities;

- Listed Activities and their related emissions;
- Status of ambient air quality and trends;
- Air quality management initiatives.

Notwithstanding the above, the national department will publish a National State of the Air Report by the end of 2007. This report, based on available air quality information up to 2005, i.e. the year that the AQA came into effect, will provide the baseline information for the initial implementation of the AQA and, hence the baseline against which the efficacy of the interventions implemented under the AQA will be measured.

5.2.3.3 National Communications to the UNFCCC

As a Party to the UNFCCC, South Africa will develop its 2nd national communication that will be used to communicate to the Conference of the Parties, through the secretariat, at least the following elements of information:

- A national inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases (GHGs) not controlled by the Montreal Protocol using the 2006 Intergovernmental Panel on Climate Change guidelines for GHG inventories;
- A general description of steps taken to implement the Convention; and
- Any other information that South Africa considers relevant to the achievement of the objective of the Convention and suitable for inclusion in the communication, including, if feasible, material relevant for calculations of global emission trends.

5.2.3.4 The Air Quality Officers' annual reports

In order to meet the progress reporting requirements in respect of air quality management plans, municipal AQOs, especially those AQOs in municipalities listed in Table 24 (page 47), will be required to submit a Municipal Air Quality Officer's Annual Report to the provincial AQO at least 1 month prior to the Annual National Air Quality Governance Lekgotla (see 4.4.6, page 32). The provincial AQOs will then use these reports to inform the compilation of a Provincial Air Quality Officer's Annual Report to be submitted to the National AQO at least 2 weeks prior to the Lekgotla. The National AQO will then compile the draft National Air Quality Officer's Annual Report for presentation to the Lekgotla for ratification and submission for publication. Details on the structure and content of the National Air Quality Officer's Annual Report can be found in Paragraph 7.2 (page 84).

5.3 Problem identification and prioritisation

5.3.1 Introduction

There are a number of areas in South Africa that have recognised air quality problems (see 5.3.4). For example, it is recognised that while larger municipalities have made significant progress in reducing air pollution in the city centres and the more affluent residential areas, the highest levels of air pollution at ground level are found in low-income urban residential areas, due, largely, to the use of coal and wood stoves for cooking and heating. As South Africa is a relatively dry country, dust pollution is also problematic. Sources of dust include construction, agricultural and industrial activities and mining and dust from un-surfaced roads in a large number of rural villages and low-income urban residential areas is a significant air pollution problem. Vehicle emissions from trucks and private vehicles exacerbate the air pollution problem.

A standard approach is required to identify situations of poor air quality and to quantify the scale and nature of the non-compliance in order to prioritise its importance for air quality management intervention. Prioritising poor air quality situations allows for a structured and coordinated approach to addressing the issues, including the focussing of resources. There are a number of sections in the AQA that deal with problem identification and prioritisation, including, among others:

- The Minister must identify pollutants which, through ambient concentrations, bioaccumulation, deposition or in any other way, present a threat to health, well-being or the environment or which the Minister reasonably believes present such a threat (Section 9(1)(a));
- The Minister may declare an area as a priority area if the Minister reasonably believes that: ambient air quality standards are being, or may be, exceeded in the area, or any other situation exists which is causing, or may cause, a significant negative impact on air quality in the area; and the area requires specific air quality

management action to rectify the situation (Section 18(1));

- The Minister must publish a list of activities which result in atmospheric emissions and which the Minister reasonably believes have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage (Section 21(1)(a));
- The Minister may declare any appliance or activity, or any appliance or activity falling within a specified category, as a controlled emitter if such appliance or activity, or appliances or activities falling within such category, result in atmospheric emissions which through ambient concentrations, bioaccumulation, deposition or in any other way, present a threat to health or the environment or which the Minister reasonably believes presents such a threat (Section 23(1));
- The Minister may, by notice in the *Gazette*, declare a substance or mixture of substances which, when used as a fuel in a combustion process, result in atmospheric emissions which through ambient concentrations, bioaccumulation, deposition or in any other way, present a threat to health or the environment or which the Minister reasonably believes present such a threat, as a controlled fuel (Section 26(1)); and
- The Minister may declare any substance contributing to air pollution as a priority air pollutant and require persons falling within a specified category to submit and implement a pollution prevention plan in respect of the priority air pollutant (Section 29(1)).

The underlying requirement for problem identification and prioritisation is information. Some guidelines are provided here for identifying and prioritising pollutants, emitters and areas of concern.

5.3.2 Identifying and prioritising pollutants of concern

The following guidelines will be applied when identifying and prioritising pollutants of concern:

- The possibility, severity and frequency of effects, with regard to human health and the environment as a whole, with irreversible effects being of special concern;
- Ubiquitous and high concentrations of the pollutant in the atmosphere;
- The feasibility of monitoring the air pollutant;
- Potential environmental transformations and metabolic alterations of the pollutant, as these changes may lead to the production of chemicals with greater toxicity or introduce other uncertainties;
- Persistence in the environment, particularly if the pollutant is not biodegradable and able to accumulate in humans, the environment or food chains;
- The impact of the pollutant taking the following criteria into consideration;
 - Size of the exposed population, living resources or ecosystems;
 - The existence of particularly sensitive receptors in the zone concerned;
- Pollutants that are controlled by international conventions.

Six criteria pollutants have been identified and are listed in Schedule II of the AQA (see Table 23). Benzene does not appear in Schedule II of the AQA but is included in the list of proposed ambient air quality standards published for public comment in 2006, as such it is included in the list of criteria pollutants. New ambient air quality standards have been proposed for all of these criteria pollutants¹. In time, additional pollutants may be added to the list. These future pollutants can be categorised as either of national or provincial significance. In the case of pollutants that have a provincial significance the MEC may declare these as provincial priority pollutants. Upon declaration as a priority pollutant the emitter may be required to prepare and submit a pollution prevention plan to the Minister or MEC. Table 23 contains a listing of possible future pollutants currently under consideration.

¹ On 9 June 2006, the Minister published a new set of ambient air quality standards for public comment in terms of Section 9 of the National Environmental Management: Air Quality Act (Act no 39 of 2004) in Notice 528, in *Government Gazette* No. 28899.

Table 23: Pollutants of Concern

Current Criteria Pollutants	Possible Future Pollutants	
	National Pollutants	Local Pollutants
Sulphur dioxide (SO ₂); Nitrogen dioxide (NO ₂); Ozone (O ₃); Carbon monoxide (CO); Lead (Pb); Particulate matter (PM ₁₀); Benzene (C ₆ H ₆).	Mercury (Hg); Particulate matter (PM _{2.5}); Dioxins; Furans; POPs; Other VOCs; Pollutants controlled by international conventions ratified by South Africa	Chrome (Cr ₆ ⁺); Fluoride (particulate and gas); Manganese (Mn).

In addition to the criteria pollutants discussed above, the four-band scale for dust deposition in residential and industrial areas is will be adopted (SANS 1929).

5.3.3 Identifying and prioritising emitters of concern

The following factors must be considered when identifying and prioritising emitters of concern:

- Emitters located in relatively close proximity to sensitive receptors, e.g. residential areas, schools, hospitals or sensitive ecological areas;
- Emitters of pollutants of concern based on volumes of emission and the nature of the pollutant, i.e. those identified in Table 23;
- Emitters that cannot, or do not, operate successfully within the conditions of their AEL;
- Emitters that are not regulated by an AEL, but emit pollutants identified to be of concern;
- Continuous emissions and accredited high emissions;
- Peak emissions in short time steps, and;
- Emitters of pollutants identified by multilateral environmental agreements that are ratified by South Africa.

5.3.4 Identifying and prioritising areas of concern

Air quality areas of concern are all areas where the ambient air quality does not comply with the national ambient air quality standards². In order to establish an indicative list of areas of concern, the national department has conducted an initial assessment of the current air quality status of the metropolitan and district municipalities in South Africa based on available information. Although current available information does not allow for a conclusive identification of areas of concern, Table 24 reflects the outcome of this initial assessment.

The municipalities have been rated as either:

- **Acceptable** – generally good air quality
- **Potentially Poor** – air quality may be poor at times or deteriorating
- **Poor** – ambient air quality standards regularly exceeded

The information used to rate the air quality status has been gathered from a number of different sources and include the following:

- The ambient air quality standards contained in Schedule 2 of the AQA;
- The draft State of Air Report (DEAT, 2007);
- NAQMP Phase II Project Report – Summary of Ambient Air Quality Monitoring in South Africa (DEAT, 2006);
- Discussions with national, provincial and municipal air quality officials;

² In terms of Section 63 of the AQA -Transitional provision regarding ambient air quality standards, until ambient air quality standards have been established in terms of section 9, 10 or 11, the ambient air quality standards contained in Schedule 2 apply.

- Environmental Impact Assessments;
- Strategic Environmental Assessments;
- Monitoring Campaigns; and
- Academic Research.

Table 24: Metropolitan and District Municipalities initially rated as having Poor or Potentially Poor Air Quality (an indicative assessment only)

Province	Metropolitan or District Municipality	Air Quality Rating	Reasoning
Northern Cape	Kgalagadi DM	Potentially Poor	Mining
Western Cape	West Coast DM	Poor	Industrial
	City of Cape Town MM	Poor	Urban
	Cape Winelands DM	Poor	Agriculture
	Eden DM	Potentially Poor	Urban and Industrial
Eastern Cape	Nelson Mandela MM	Poor	Urban
	Amatole DM	Potentially Poor	Urban
KwaZulu Natal	Ugu DM	Potentially Poor	Urban and Agriculture
	eThekweni MM	Poor	Urban and Industrial
	uMgungundlovu DM	Potentially Poor	Urban and Agriculture
	Uthukela DM	Potentially Poor	Urban and Agriculture
	iLembe DM	Potentially Poor	Urban and Agriculture
	Uthungulu DM	Poor	Industrial and Agriculture
	Amajuba DM	Potentially Poor	Urban and Agriculture
Mpumalanga	Ehlanzeni DM	Potentially Poor	Industrial
	Gert Sibande DM	Poor	Industrial
	Nkangala DM	Poor	Industrial
Gauteng	West Rand DM	Potentially Poor	Urban and Mining
	City of Johannesburg	Poor	Urban
	Sedibeng DM	Poor	Urban and Industrial
	Ekurhuleni DM	Poor	Urban and Industrial
	City of Tshwane	Potentially Poor	Urban
	Metsweding	Potentially Poor	Mining
North West	Bojanala Platinum DM	Poor	Mining
	Southern DM	Potentially Poor	Urban and Mining
Limpopo	Mopani DM	Potentially Poor	Mining
	Capricorn DM	Potentially Poor	Urban and Mining
	Waterberg DM	Potentially Poor	Industrial

Although a conclusive rating will only be carried out in accordance with the framework for the use and application of the standards or objective-based approach to air quality management as illustrated in Figure 5 (page 53) following the publication of the National Framework, the national department, based on available information, reasonably believes that: (i) municipalities that are rated as Potentially Poor in Table 24 may be Class 3 or 4 Air Quality Areas (see 5.4.3.4, page 51); and (ii) municipalities that are rated as Poor in Table 24 may be Class 4 or 5 Air Quality Areas.

Given the above, municipalities that are listed in Table 24 will be prioritised for support in terms of the national department's air quality planning project (see 5.4.6.1, page 64) which will, among others, confirm the rating provided in the table or otherwise.

5.4 Strategy development

5.4.1 Introduction

This section of the National Framework provides details on the mechanisms and norms and standards to address the air quality issues that have been identified and prioritised in the previous section. The various sections that follow, namely Awareness-raising, Standard Setting, Regulations and Air Quality Management Planning are directly aligned with the stages of the governance cycle (Figure 1).

5.4.2 Awareness-raising

The AQA does not provide specifically for awareness-raising activities, however, awareness-raising is one of the strategies identified in the air quality governance cycle depicted in Figure 1 aimed at addressing air pollution problems. In contrast to the formulation of policy and legislation, and the setting of norms and standards, awareness-raising aims to bring about positive changes in air quality by voluntary rather than forced means. Improvements in public knowledge through environmental education, sharing of knowledge and experience, and access to information, can lead to voluntary changes that are often more sustainable than forced changes initiated by legislation.

Awareness-raising is directly linked to two of the cross-cutting issues in the National Framework, namely capacity development (See Paragraph 5.9.2) and information dissemination (See Paragraph 5.9.3). By raising awareness, community well-being and empowerment is promoted and a contribution is made to capacity development. It is important to recognise the value and potential of well-informed and committed citizens for effecting positive change in air quality. Meaningful public involvement in air quality management issues will be strongly encouraged (See Paragraph 5.9.1). Access to information is a key factor in raising awareness and increasing the knowledge of the public (See Paragraph 5.2.1).

Strategies to raise awareness will emphasise the adverse impacts of air pollution, climate change and ozone layer protection, human health and the environment and the benefits of clean air. All spheres of government have a responsibility to raise awareness around air quality issues amongst the public, the private sector and their own departments. Strategies to raise awareness include the following:

- Media campaigns in the press, on radio, television, bill boards, etc.;
- Public seminars and workshops;
- Distribution of leaflets;
- Effective education programmes developed for primary and secondary schools taking into account the local context;
- The organisation of clean air events to coincide with recognised events such as World Environment Day; and
- Maintenance of an informative and up-to-date website.

5.4.3 Standard setting

5.4.3.1 *The standard setting process*

The AQA provides for the setting of standards for:

- Ambient air quality;
- Emissions;
- Controlled emitters, and
- Controlled fuels.

A generic standard setting process is described here for the setting of these standards.

The standards setting process is more than just the identification of the defined standard of a specific pollutant. A number of factors beyond the exposure-response relationship need to be taken into account. These factors include understanding the current concentration of pollutants and exposure levels of the population, the specific mixture of air pollutants, and the specific social, economic and cultural conditions encountered within a country. A technical and legal process must be followed to ensure the proposed ambient air quality standards can be achieved in practice and at a justifiable cost.

In deriving standards the following factors must be considered:

- The health, safety and environmental protection objectives;
- Analytical methodology;
- Technical feasibility;
- Monitoring capability; and
- Socio-economic consequences.

With reference to Figure 4, a protocol is provided here to ensure that the methodology for the determination of standards relating to the AQA follows a process that ensures the standards are realistically achievable at a justifiable cost.

Hazard identification

The Minister must (or MEC or municipality may) identify substances or mixtures of substances in ambient air (Section 9(1)(b)), emitted pollutants (Section 9(1)(c)), controlled emitters (Section 23(1)) or controlled fuels (Section 26(1)) that present a threat to health, well-being or the environment through any means. The identification of these will consider the guidelines provided on problem identification and prioritisation in Paragraph 5.3 of this document.

Establishment of an expert panel

Following the identification of a hazard as described above, the national department will request Standards South Africa (STANSA), a division of the South African Bureau of Standards (SABS), to establish standards for the identified hazard.

An expert panel must be established for the development of standards. This expert panel will include, but not necessarily be limited to representatives from: the national department, affected national departments, provincial and municipal government, industry, business, civil society and the academia. In this regard, the department, together with STANSA, will make every effort to ensure that the membership of the expert panel is representative and balanced.

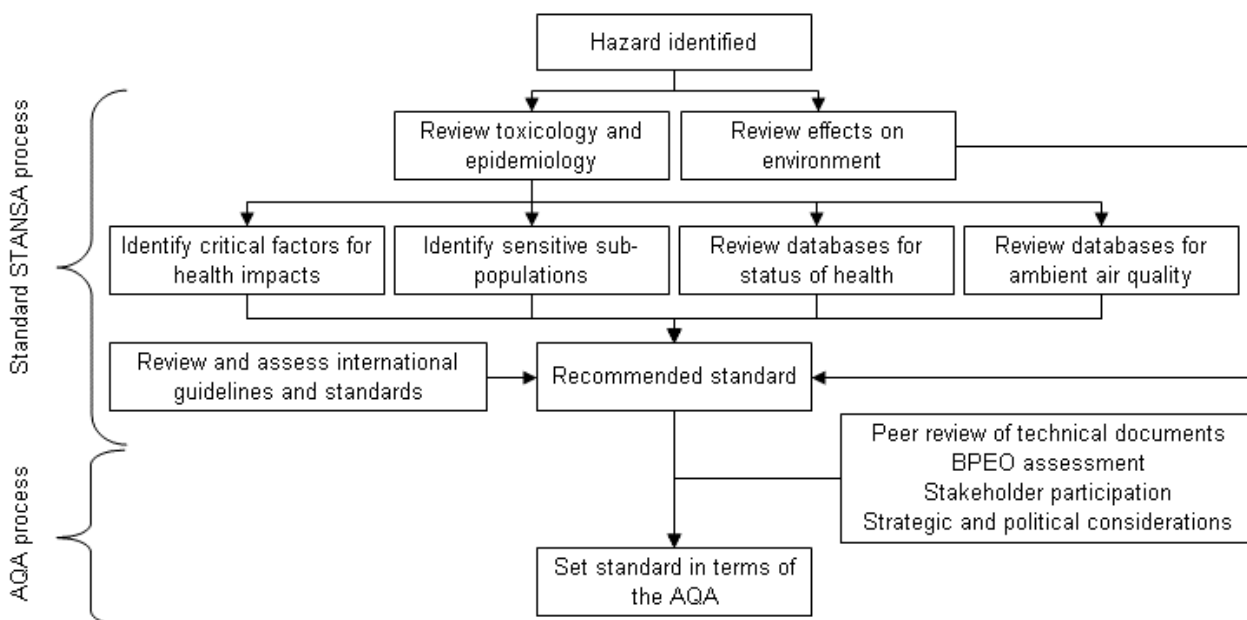


Figure 4: The generic standard setting process

Setting the standard

The expert panel has a specific role to play in the standard setting process for the pollutant of interest. This includes the review of all available toxicological and epidemiological information and all available information of the effects on the receiving environment. The generic standard setting process is depicted in Figure 4 and includes:

- Identify critical factors for health impact;
- Identify sensitive sub-populations;
- Review available databases for health status;
- Review available databases for ambient air quality information, and
- Review and assess international guidelines and standards.

Once the expert panel has submitted their findings, in terms of Section 56(2), the standard setting process must include: (a) consultations with all Cabinet members whose areas of responsibility will be affected by the standards, (b) consultations with the MECs responsible for air quality in each province that will be affected by the standards, and (c) allow public participation in the process in accordance with Section 57.

Publication of standards

With regard to Section 57(1) of the AQA the Minister must give notice of the proposed standards in: (a) the Gazette; and (b) at least one newspaper distributed nationally. In accordance with Section 57(2) of the AQA the notice described above must: (a) invite members of the public to submit written representations on or objections to the standards to the Minister within an appropriate time (a minimum of 30 days) of publication of the notice in the Gazette; and (b) contain sufficient information to enable members of the public to submit meaningful representations or objections.

In respect of Section 57(3), the Minister may in appropriate circumstances allow any interested person or community to present oral representations or objections to the Minister, or a person designated by the Minister.

In terms of Section 57(4), the Minister must give due consideration to all representations or objections received or presented before setting the standards.

In considering the technical complexity that may be associated with these standards, the Minister will positively consider a comment period longer than the minimum requirement.

5.4.3.2 The use of Best Available Technology/Technique (BAT)

Section 4(2)(b) of NEMA requires that “environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option” (BPEO). The national department has defined BPEO as the option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society in the long-term as well as in the short-term (DEAT, 2004).

The BPEO test for a decision comprises the following components:

- **Best** – meaning “state of the art”, most effective or most beneficial. “best” is informed by information provided in peer-reviewed local and international literature;
- **Practicable** – meaning feasible, realistic, possible, workable, practical, viable or doable, i.e. it is the opposite of impossible. “practicability” is informed by cost-benefit analyses (CBA), accessibility, affordability, availability and other information provided in peer-reviewed local and international literature; and
- **Environmental option** – meaning that the option must be measured in terms of its impact on the environment, where the environment means 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; any part or combination of (i) and (ii) and the interrelationships among and between them; and the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

In the standard setting context, specifically with respect to technically-based standards (e.g. emission standards) the “best” component of BPEO principle will be informed through the use of the Best Available Technology/Technique (BAT) approach. BAT implies the consideration of technologies or techniques that deliver pollution controls to the best degree technologically possible, without economic or other considerations. In this regard BAT is measured with reference to best practice documentation published internationally.

5.4.3.3 Standards, Limit Values, Tolerances and Compliance Time Frames

A standard may have many components that define it as a “standard”. These components may include some or all of the following:

- **Limit values** – a numerical value associated with a unit of measurement and averaging period that forms the basis of a standard;
- **Averaging period** – a period of time over which an average value is determined;
- **Permissible frequencies of exceedence** – a frequency (number/time) related to a limit value representing the tolerated exceedence of that limit value, i.e. if exceedences of the limit value are within the tolerances, then there is still compliance with the standard; and
- **Compliance time frames** – a date when compliance with the standard is required. This provides a transitional period that allows for activities to be undertaken to ensure compliance by the compliance date.

Given the above, a standard often comprises a limit value for an averaging period with associated tolerances and compliance time frames.

5.4.3.4 South African national ambient air quality standards

Introduction

In order to uphold the constitutional right to an environment that is not harmful to health and well-being, the setting of ambient air quality standards is mandatory. This document provides clarity on how these standards will be set.

Ambient air quality standards are defined in the Integrated Pollution and Waste Management policy (IP&WM, 2000) as those 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*”.

In line with the World Health Organisation’s position, the primary aim of ambient air quality standards is to provide a uniform basis for the protection of public health and ecosystems from the adverse effects of air pollution, and to eliminate or reduce to a minimum, exposure to those pollutants that are known or likely to be hazardous.

Ambient standards therefore provide the benchmark for air quality management and governance. Examples of how ambient standards are used are as follows:

- To objectively define what quality of ambient air South Africans agree is not harmful to their health and well being;
- To inform decisions on what type of developments are appropriate in specific areas;
- To use as a yardstick to measure air quality management performance;
- To provide the basis for triggering air quality governance interventions.

The IP&WM Policy clearly recognises both the political and technical dimensions of standard setting, namely:

- The universal, consultative application of the standards-setting process, taking into account the needs of, and information possessed by, the polluter, government departments, the scientific community and civil society;
- Guidelines for the development of the approach to, and the setting of standards, drawn up as part of the national strategies in collaboration with all relevant parties;
- The provision of access for civil society to the standards-setting process and the standards themselves, in accordance with the commitment to more readily available air quality management information.

National ambient air quality standards

Table 25 provides an example of how an ambient air quality standard for a particular pollutant will be scheduled in the *Gazette* that sets ambient air quality standards. From this it is clear that the standard must include limit values for specific exposures (the concentration and averaging period shown in the Table), the number of allowed exceedences and a timetable for compliance.

Table 25: Typical ambient air quality standard to be published in terms of Section 9 of the AQA

AQA Schedule 2			
Averaging period	Concentration	Frequency of permitted exceedence	Compliance Date
Interim level 1			
Averaging period	Concentration	Frequency of permitted exceedence	Compliance Date
Interim level 2			
Averaging period	Concentration	Frequency of permitted exceedence	Compliance Date
National ambient air quality standard			
Averaging period	Concentration	Frequency of permitted exceedence	Compliance Date

The limit values (concentrations) are based on a scientific process. A further review of the limit values and a feasibility assessment is however required in order to establish ambient air quality standards that includes amongst other, political and socio-economic considerations, which are agreed by all South Africans. This further process includes:

- Technical feasibility, i.e. is it possible to monitor the pollutant with the accuracy required by the proposed limit value?
- Economic feasibility, i.e. can the proposed limit values for the selected pollutant be achieved in practice at an affordable cost?
- Cost-benefit, i.e. is the cost of achieving the proposed limit value offset by similar reductions in the externalised cost to society associated with current levels of the pollutant?
- Public participation that assures, as far as possible, social equity or fairness, and understanding of the scientific and economic consequences.
- Socio-economic considerations, e.g. consideration of the social and economic implications of compliance or non-compliance.
- Strategic and political considerations, e.g. considerations of ambient standards in energy planning.

Implementation of ambient air quality standards

This discussion relates to the implementation of ambient air quality standards and refers to Figure 5. For a given pollutant, the ambient air quality standard's limit value is indicated as the bold horizontal line across the centre of Figure 5. This line therefore defines the agreed ambient standard's limit value for the given pollutant, i.e. concentrations of a given pollutant below this value are not considered harmful to health and well being, while those above this line are considered to pose a possible risk to health and well being. The different colour bands in Figure 5 and the degree of governance and air quality management that is required in each are described below.

- *Target Levels* – will be the ambient air quality targets for ambient air in South Africa that provide an adequate “development buffer” between air that is considered harmful and air that is not considered harmful to health and well-being. Target levels will be set at 80% of the national ambient air quality standards, where feasible (e.g. taking into account natural background levels for particular pollutants).
- *Green Zone – Class 1 Air Quality Area* – will be the areas where ambient air quality remains within Target Levels and no substantive corrective air quality management interventions are required other than basic good air quality governance – e.g. EIAs, licensing, periodic monitoring, etc.
- *Alert Levels* – will be the levels of ambient air quality where “pre-emptive” governance interventions are triggered that provide an adequate “intervention development buffer” between air that is considered harmful and air that is not considered harmful to health and well-being. Alert levels will be set at 90% of the national ambient air quality standards, where feasible.
- *Blue Zone – Class 2 Air Quality Area* – will be the areas where ambient air quality remains within Alert Levels, but “pre-emptive” air quality management interventions are required other than basic good air quality governance – e.g. an investigation into the causes of air pollution through, among others, the compilation of emission inventories and/or static air quality monitoring campaigns.
- *Purple Zone – Class 3 Air Quality Area* – will be the areas where ambient air quality remains within the standards, but sustained air quality management interventions are required to, at least, maintain or improve this situation – e.g. detailed investigation into the causes of air pollution through, among others, the compilation of emission inventories and/or static air quality monitoring campaigns, the detailed implementation of an air quality management planning regime, the design and implementation of targeted air quality improvement interventions, the review of Atmospheric Emission Licences in the area, etc.
- *The AQA Section 9 Ambient Air Quality Standard* – will be the limit values of ambient air quality where immediate governance interventions are triggered with the aim of, at least, bringing the area into compliance with the standard. This standard is the boundary between air that is considered potentially harmful and air that is not considered harmful to health and well-being.
- *Orange Zone – Class 4 Air Quality Area* – will be the areas where ambient air quality represents a possible threat to health and well-being and requires immediate and sustained air quality management interventions to, at least, bring the area into compliance with the standards within agreed time frames. In order for government to prioritise efficient and effective air quality interventions, although immediate interventions are required, Class 4 Air Quality

Areas need not necessarily be declared as priority areas in terms of the AQA. However, without limiting the types of interventions to be undertaken, the following interventions must be undertaken by the affected Air Quality Officers - detailed investigation into the causes of air pollution through, among others, the compilation of detailed emission inventories and continuous and/or static air quality monitoring campaigns, the detailed implementation of the AQA air quality management planning regime, the design and implementation of targeted air quality improvement interventions, the review of Atmospheric Emission Licences in the area, strict enforcement of Atmospheric Emission Licence conditions, etc. (See Chapter 4 - Roles and Responsibilities).

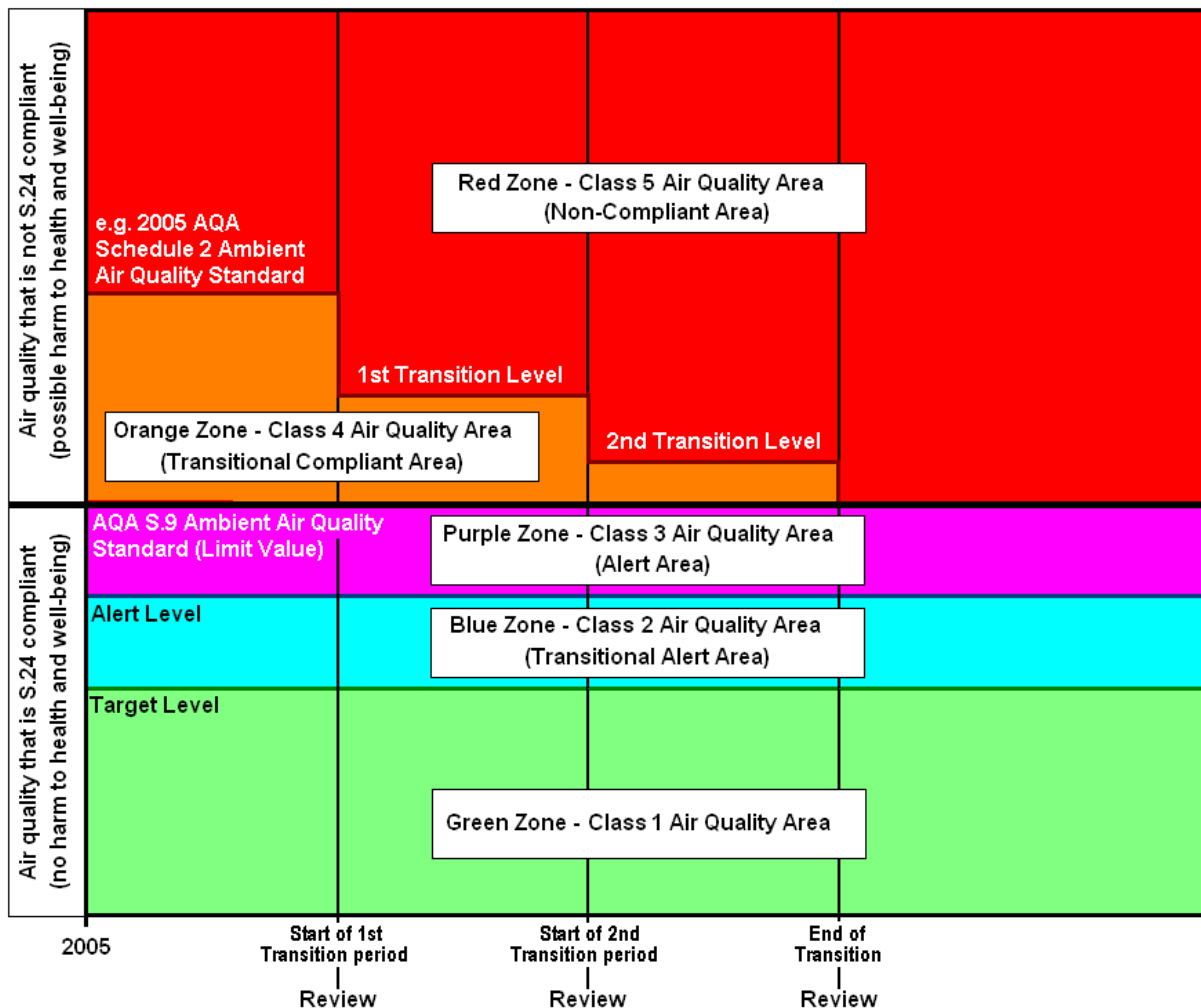


Figure 5: Framework for the use and application of the standards or objective-based approach to air quality management

- *Red Zone – Class 5 Air Quality Area* – will be the areas where ambient air quality represents a possible threat to health and well-being and requires immediate and sustained air quality management interventions to, at least, bring the area into compliance with the standards within agreed time frames. Class 5 Air Quality Areas must immediately be declared national or provincial priority areas in terms of the AQA.
- *Transition Levels* – these levels represent the time frames for compliance with the standards. These levels will be used to inform all interventions taken in respect of Class 4 and 5 Air Quality Areas. The interim standards as provided in Schedule 2 to the AQA provide the current level tolerance. The 1st transitional compliance period (i.e. the 1st transition period and associated transition level in Figure 5) is then likely to have a tolerance of 50% of the difference between the standards provided in Schedule 2 to the AQA and the national ambient air quality standards. The final, transitional compliance period (i.e. the 2nd transition period and associated transition level in Figure 5) is then likely to have a tolerance of 50% of the difference between the 1st Transition Level and the national ambient air quality standards.
- *Review* – a review of the Target Levels, Alert Levels, national ambient air quality standards and Transition Levels

must be undertaken at the end of each transition period or as part of the required the AQA National Framework review process (see 7, page 84).

- *Permitted Exceedences* – as infrequent exceedences of the standards may not be reflective of the general air quality of an area, permitted exceedences in respect of all national ambient standards are informed by those reflected in Schedule 2 of the AQA and through the standard setting process. Details of the frequency of exceedences must be detailed in the respective AQMP.

Ambient air quality standards are specific to individual pollutants. In reality pollutants do not occur in the atmosphere in isolation, but any number may exist. A standard approach to addressing the risk to a number of pollutants will be considered for implementation in the 2nd Generation National Framework through a health-based air quality index.

5.4.3.5 Listed activities and related emission standards

Introduction

One of the tools for controlling industrial emissions to the atmosphere is the traditional permit or licence which identifies activities that may only operate if they are correctly permitted to do so by the regulatory authority, and only if the conditions set in the permit or licence are met. This form of regulation was the basis for regulatory control of industrial emissions in terms of the APPA and has been repeated, with some significant modifications, in the AQA.

Section 21 of the AQA states that the Minister must publish a list of activities which result in atmospheric emissions and which it is reasonably believed have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage. The list applies nationally. The MEC may publish a list of activities which applies to the relevant province only.

Once identified, these activities are known as Listed Activities and require an AEL or provisional AEL in order to operate. Section 21 of the AQA also requires the setting of minimum emission standards for specified pollutants or mixtures of substances emitted by the identified activities. The permissible amount, volume, emission rate or concentration of the pollutant or mixture of pollutants must be specified as well as the manner in which measurements of such emissions must be carried out.

The national department's listed activity and associated emission standards project

In late 2006, the national department initiated the *AQA Implementation: Listed Activities and Minimum Emission Standards Project* in order to facilitate an efficient and effective transition from the authorisation regime contained in the APPA to that contained in the AQA. The overall objective of the project is framed as "Section 21 of the AQA is implemented efficiently and effectively" and, to this end, the project has the following objectives:

- **Immediate Objective A – The participation objective:** The identification of an initial list of activities and their related minimum emission standards are developed in accordance with the spirit and letter of the cooperative and participatory governance requirements and principles contained in Chapter 3 of the Constitution, the National Environmental Management Act (Act No. 107 of 1989), the Integrated Pollution and Waste Management Policy (2000) and the AQA;
- **Immediate Objective B – The review objective:** Current national and international work related to the identification of activities and their related minimum emission standards is reviewed with a view to informing and fast-tracking the work directed or implied in order to implement S.21 of the AQA efficiently and effectively;
- **Immediate Objective C – The S.21 implementation objective:** All work directed or implied in order to implement S.21 of the AQA efficiently and effectively is carried out to a standard such that the Minister is able to publish the required notice in the *Gazette*; and
- **Immediate Objective D – The capacity development objective:** The Sub-directorate: Atmospheric Policy, Norms and Standards is provided with initial assistance in the development of the structures, systems, skills, strategies and interrelationships necessary to ensure the continued rollout of the standard-setting process and the increased sophistication of this process over time.

Although this project will only be concluded in 2008, it has already compiled an indicative list of activities for consideration as listed activities in order to initiate the required listing process (see Table 26). At this early stage of the project, this list is neither exhaustive nor definitive and, as yet, does not make mention of the size or scope of activities to be considered as this work will be done by the project.

Furthermore the project will test and inform the procedure for the listing of activities and the required coordination and cooperation arrangements between the department and Standards South Africa (STANSA) (see 5.4.3.1)

Table 26: Indicative list of activities for consideration as listed activities

Indicative list of activities for consideration as listed activities	
Initial industrial Categories to be considered	Initial activities to be considered as listed activities
1. Combustion installations	<ul style="list-style-type: none"> • Coal, gas, biomass and liquid fuel combustion installations • Waste or recovered oil combustion
2. Petroleum industry	<ul style="list-style-type: none"> • Petrochemical production and petroleum refining (including bulk storage and handling of petroleum liquids and petroleum refinery wastewater systems) petrochemicals) • Natural gas reforming • Mineral oil refining • Refining of liquid fuels produced from coal or biomass gasification
3. Carbonisation and coal gasification	<ul style="list-style-type: none"> • Coal gasification • Refining or treatment of natural gas, producer gas or synthesis gas • Activities involving pyrolysis, carbonisation, distillation, liquefaction, partial oxidation or other heat treatment of coal, lignite, oil, other carbonaceous materials or mixtures • Processing of the by-products of carbonisation and coal gasification, including tar and bitumen production
4. Metallurgical industry	<ul style="list-style-type: none"> • Aluminium and aluminium alloys • Iron and steel production • Copper smelters • Lead smelters • Zinc smelters • Precious metals production and refining • Refractory metal production • Nickel processes • Cadmium processes • Production of silicon, magnesium, arsenic, selenium antimony, beryllium, chromium • Ferroalloy production (silicon, chromium, manganese, vanadium) • Ferrous metals (hot rolling) Lead-acid battery manufacturing • Secondary Brass and Bronze Production Plants
5. Mineral processing industry	<ul style="list-style-type: none"> • Cement and lime production and/or bulk handling • Asbestos activities • Glass and glass fibre manufacturing • Ceramic production (tiles, bricks, refractory material,, stoneware, porcelain production by firing) • Coal processing/preparation plants) • Metallic mineral processing plants (crushing, screening, handling) • Non-metallic mineral processing plants (crushing, screening, handling) • Phosphate rock plants • Storage of coal and ore not on mines • Waste rock dumps and slimes dams
6. Organic chemical industry	<ul style="list-style-type: none"> • Organic chemical production including: <ul style="list-style-type: none"> • hydrocarbons, • organic compounds containing oxygen, sulphur, nitrogen or phosphorus, organometallic compounds (e.g. lead alkyls) • plastic materials (polymers, synthetic fibres, cellulose-based fibres) • synthetic rubbers • dyes and pigments • surface-active agents • Polymerising or co-polymerising any unsaturated hydrocarbon or vinyl chloride • Use of toluene di-isocyanate or other di-isocyanate of comparable volatility or where partly polymerised • Recovery or purifying of acrylic acid or any ester of acrylic acid • Tyre manufacture • Storage of chemicals in bulk

Indicative list of activities for consideration as listed activities	
Initial industrial Categories to be considered	Initial activities to be considered as listed activities
7. Inorganic chemical industry	<ul style="list-style-type: none"> • Production of inorganic chemicals : • Gases (e.g. NH₃, HCl, HF, H₂S, SO_x, NO_x) • Acids (e.g. chromic acid, hydrofluoric acid, nitric acid, sulphuric acid, oleum) • Bases (e.g. ammonium hydroxide, sodium hydroxide) • Salts (e.g. ammonium chloride, sodium carbonate) • Metal oxides, metal carbonyls • Halogens or interhalogen compounds • Phosphorus and phosphate salts • Manufacturing activity involving the use of hydrogen cyanide or hydrogen sulphide • Manufacturing activity involving the use or recovery of: antimony, arsenic, beryllium, gallium, indium, lead, palladium, platinum, selenium, tellurium, thallium • Recovery of any compound of cadmium or mercury • Chemical fertilizer production • Calcium carbide production • Production of inorganic pigments • Bulk storage of chemicals • Explosives production
8. Incineration processes including hazardous waste	<ul style="list-style-type: none"> • Commercial and industrial waste incineration • Hospital/Medical/Infectious waste incineration • Municipal waste incineration
9. Wood products industry	<ul style="list-style-type: none"> • Paper, pulp and board manufacturing activities
10. Animal matter processing	<ul style="list-style-type: none"> • Tanning plants • Abattoirs • Rendering plants - animal carcasses or waste disposing or recycling

Procedure for the listing of activities

In publishing a list of activities, the Minister or MEC is required to follow a consultative process as outlined in Sections 56 and 57 of the AQA. This includes consultation with all Cabinet members (members of the Executive Council in the case of the MEC), whose areas of responsibility will be affected by the listing, and public participation by allowing for a minimum 30-day comment period.

Given the short timeframe within which the Minister is expected to publish a list of activities so as to meet the APPA to the AQA transitional phase objectives, the initial list of activities to be identified as part of the *AQA Implementation: Listed Activities And Minimum Emission Standards Project* will comprise a number of industry types which are known to be potentially significant in terms of their atmospheric emissions. The targeting of industries where the benefits of regulation are expected to outweigh the costs, based on experience from developed and developing countries, substantially reduces the risks of economic impacts arising due to the emission standards set.

Whilst the initial list of activities will be largely based on past scheduled processes under the APPA, the listing of activities must be informed by appropriate analysis, such as cost-benefit analysis (CBA). In targeting industry sectors for which information on emissions and impacts is less available or inconclusive, particularly those comprising small and/or older operations, provision for CBA studies will be made so as to extend the list of activities and associated set of national minimum emission standards in a manner which does not lead to unjustified economic impacts or mass non-compliance.

In summary, the procedure for listing of activities is depicted in the flowchart in Figure 6. The identification of all potential Listed Activities will be based on an international literature review (Step 1 in Figure 6). A prioritisation process based on those known to be significant emitters will be undertaken to arrive at an initial proposed list of Listed Activities (Table 26). In the future, the prioritisation will be informed by appropriate analysis (e.g. CBA) which would include potential detrimental effects to human health (Step 2). Thereafter, there is an appropriate comment period for a minimum 30-day period (Step 3) and the publication of the final list of Listed Activities (Step 4). There is provision for a regular review of the Listed Activities every five years (Step 5), but this does not preclude the ability of the Minister or MEC to amend the list either by adding further activities (Step 6) or removing activities (Step 7) from the list at shorter time intervals.

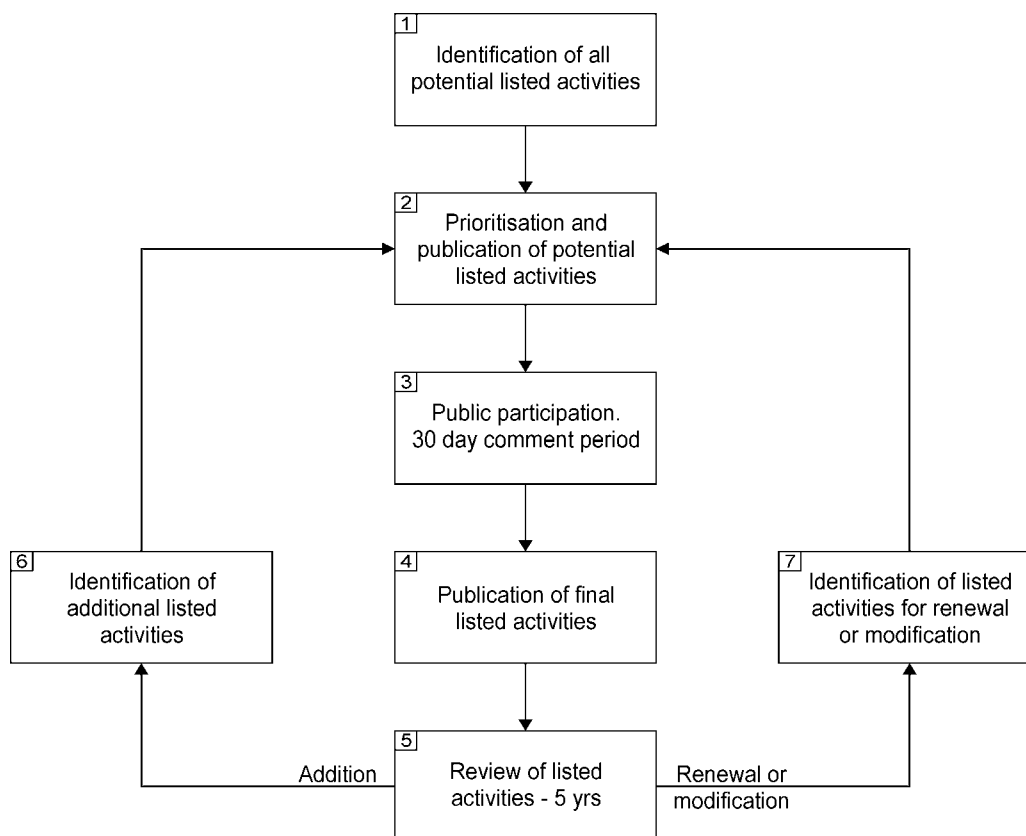


Figure 6: Procedure for the identification of listed activities

Standard-setting process

Principles

As discussed above (see 5.4.3.2), the process to establish national emission standards will be based on the application of the Best Practicable Environmental Option (BPEO) principle informed by the Best Available Technology/Technique (BAT) approach.

In the application of BAT for the purpose of informing emissions standards and monitoring protocols for the prioritised industry types, reference must be made to the best practice documentation published internationally. Emission standards must not prescribe the use of one specific technique of technology (i.e. technology forcing must be avoided).

A lower limit can be set for activity, throughput or production rate, or uncontrolled emission rate to prevent the inclusion of a large number of small facilities, which would be more appropriately controlled under Section 23 (Controlled Emitters) of the AQA if control is deemed necessary. Emission standards must be specified primarily for point sources (stacks and vents) where emission monitoring is possible. Where the control of diffuse emissions is considered significant enough to warrant inclusion in national standards (e.g. fugitive dust at bulk ore/coal handling and processing plants and certain metallurgical industries; evaporative emissions from bulk chemical storage and handling), emission limits expressed in the form of specific best practice control measures which are applicable across individual industries must be stipulated (e.g. floating roof tanks), or alternatively, a comprehensive fugitive emission management plan must be put in place.

Only those pollutants recognised to pose a potential threat to health and/or the environment must be selected for the setting of emission standards for each industry type selected (with the exception of incineration for which an extended number of substances must be regulated in line with current local and international experience). Reference must be made to international information and approaches in the selection of the most suitable substances to target. Where appropriate, use will be made of surrogate parameters to reduce compliance monitoring costs. In the procedure which is described below, there is a mechanism for reviewing this recommendation.

Format for expressing emission standards

The AQA stipulates that emission standards must include the permissible amount, volume, emission rate or concentration of that substance or mixture of substances that may be emitted and the manner in which measurements must be carried out. This requirement in the AQA came about as a result of the manner in which emission standards have been historically specified within the APPA Registration Certificates (i.e. typically as emission concentrations without limits on volumetric flows or on total masses of emissions). The specification of a total mass as a permissible amount or a volume in a general national minimum emission standard intended to regulate a number of individual industries is problematic, unless it is specified on a per unit production or output basis i.e. a performance standard.

Emission standards must be expressed either as an emission concentration or a performance standard (i.e. amount of pollutant emitted per unit of activity) or, where appropriate, a combination of both, with the actual concentration or level of performance taken from BAT. Total masses of emissions permissible can be included in the AELs of Listed Activities.

Measurement of emissions

The AQA stipulates that the manner in which the measurement of emissions from Listed Activities is undertaken must be specified. For purposes of compliance monitoring, it is necessary to carry out measurement of emissions.

The emission monitoring required clearly depends on the nature of the source, the pollutant and the emission standard. Emission standards expressed as emission concentrations require direct stack monitoring. The sector-specific monitoring method and frequency will be taken from internationally available best practice documentation. In most cases, continuous emissions monitoring will be prescribed for the larger sources of criteria pollutants as is typically best practice, with periodic (e.g. annual) testing campaigns stipulated for metals, persistent organic compounds etc. Continuous stack monitoring will be required in areas that are not in compliance with ambient air quality standards, especially within declared priority areas where the emissions from the stack significantly contribute to poor air quality in the area. Emission standards expressed as a performance standard (e.g. kg of pollutant per ton product) requires a combination of direct monitoring and product tonnage tracking methods.

Approach

The approach for establishing emissions standards for Listed Activities will follow the generic approach outlined in Paragraph 5.4.3.1. In summary, the national department will instruct STANSA to establish a technical committee, which will be responsible for collating information and recommending draft emission standards. The technical committee will comprise representatives from government, the relevant industrial sector, business, civil society and scientists/academics. It is likely that the technical committee will be more sectorally-based than in other standards setting processes and is likely to comprise more than one technical committee. Broad representation on this committee is fundamental to the principles of participatory process as outlined in Sections 56 and 57 of the AQA.

The responsibilities of each technical committee would be as follows:

- Identify key pollutants for Listed Activities within the sector for which emission standards are to be set;
- Collate sector guidance documents comprising information on BAT including associated emission standards and monitoring requirements, using international BAT documentation and industry-specific information;
- Consult/communicate with stakeholders such as industry, trade bodies and civil society;
- Draft emission standards for the selected industry types and selected pollutants in consultation with stakeholders;
- Continue to update information on BAT for use in the establishment of emission standards for additional industry types and additional pollutants, and the review of previously established emission standards;
- Undertake a five-year review of emission standards for identified pollutants from Listed Activities within each sector, with the purpose of identifying improvements in technology, as well as possible additional industry types and possible additional pollutants to be included where necessary.

Compliance time frames

Compliance time frames will be informed by industry cycles. Based on international experience, an effective approach would be to set minimum time frames for compliance nationally (taking account of industry cycles), with provision being made for more restricted compliance time frames to be specified by provinces or municipalities for industries within their jurisdictions and/or stricter timetables being negotiated for inclusion in permits. Compliance time frames, in line with international trends are typically:

- 2 to 3 years in the case of new or substantially modified facilities;
- 5 to 10 years in the case of existing facilities, potentially differentiated by age.

Given the potential economic implications of emission standards, and mindful that emission standard setting in South Africa is not likely to be based on comprehensive sector-based CBA (at least not for the initial group of Listed Activities), provision will be made for specific industries to apply for possible extensions to compliance time frames, provided ambient air quality standards in the area are in compliance. The proponent of a Listed Activity will be allowed to apply for a postponement of the compliance date and such an application will be positively considered based on the following conditions being met:

- An air pollution impact assessment being completed (in accordance with the format for Atmospheric Impact Reports, as contemplated in Section 30 of the AQA and specified by the National Air Quality Officer) and submitted to the national department at least 1 year before the compliance date; and
- Demonstration that the industry's air emissions are not causing any adverse impacts on the surrounding environment.

This provision would ensure that any requirement to upgrade is informed by an understanding of any environmental impact of the affected plant. At the end of the extension period granted, a further extension could be made possible subject to a repeat of the impact assessment process.

Phase-in and transitional arrangements

As outlined above, the initial list of activities comprises industry types which are known to be potentially significant in terms of their atmospheric emissions, and where based on experience from developed and developing countries, economic risks are likely to be minimal. Additional measures to reduce risk during this initial phase include: (i) restricting pollutants for which emission standards are specified to the key ones for that industry type, thus reducing compliance monitoring and reporting costs; (ii) taking industry cycles into account in the setting of national minimum compliance timeframes, and (iii) making provision for industries to apply for extensions based on impact assessments being undertaken.

Allowance is made for emission standards to be varied to take account of the age of facilities. The setting (retention) of less stringent emission standards for older facilities has a place in the regulatory process internationally. It is however notable that these emission standards are not static, but that there are time frames within which facilities are expected to meet firmer standards. Generally, the approach adopted is to link required improvements to major plant modifications and to take advantage of industry cycles.

A further transitional arrangement practised internationally is the specification of general emission standards for application to industries for which sector-specific emission standards are not yet applicable. Taking into account the recommendation that a select list of industry types be prioritised for the setting of specific emission standards, general emission standards for application to industries which are initially not listed are to be used.

Compliance tolerances

Compliance tolerances will be dealt with as part of the standard setting process.

5.4.3.6 Controlled Emitters

Introduction

According to Section 23 of the AQA, the Minister or MEC may declare any appliance or activity, or any appliance or activity falling within a specified category, as a controlled emitter if it results in atmospheric emissions which present a threat to health or the environment or which the Minister or MEC reasonably believes presents such a threat. The controlled emitter regulatory tool is principally for the management of emissions from widespread, small-scale emitters.

Examples of potential controlled emitters include the following:

- Motor vehicles;
- Small boilers; and
- Fuel transfer facilities.

Identification of controlled emitters

The procedure for identification and declaration of controlled emitters will be based on a prioritisation process taking account of the following factors:

- Severity of impacts on health and well-being;
- Activity likely to yield the most incremental improvement in ambient air quality;
- International experience;
- Availability of technology.

In declaring an appliance or activity as a controlled emitter, the Minister or MEC is required to:

- follow a consultative process in accordance with Sections 56 and 57 of the AQA;
- to apply the precautionary principle contained in the NEMA;
- to take account of international obligations;
- to consider any sound scientific information; and
- to consider any risk assessments.

Activities/appliances likely to be declared potential controlled emitters within the next five years will be prioritised following a similar procedure outlined in Paragraph 5.4.3.

Standard-setting process

Once an appliance or activity is declared a controlled emitter, emission standards must be set. The standards must set the permissible amount, volume, emission rate or concentration of any specified substance or mixture of substances that may be emitted from the controlled emitter. The manner in which the measurements of emissions from controlled emitters must be carried out must also be prescribed. International best practice, with the consideration of local circumstances, must be used to inform the principles upon which standards are based and the standard setting process.

Compliance time frames

Compliance time frames will be established for each of the controlled emitters taking account risks to human health, relative contribution to ambient air quality levels, and ability to monitor for compliance.

Phase-in and transitional arrangements

With the introduction of controlled emitters and consequent emission standards for the first time in South Africa, a phased approach will be adopted.

In respect of motor vehicles, which are likely to be the declared the first controlled emitter, the phase-in arrangements are likely to be those scheduled in Table 27.

Table 27: Key milestones and target dates for the phasing-in of emission standards for tailpipe emission

Key milestones	Target date
Implementation of Euro 1 emission standards for all homologated vehicles	January 2004
Implementation of Euro 2 emission standards for all newly homologated vehicles	January 2006
Implementation of Euro 2 emission standards for all newly manufactured vehicles	January 2008
Implementation of Euro 4 emission standards for all newly homologated vehicles	January 2010
Implementation of Euro 4 emission standards for all newly manufactured vehicles	January 2012

Compliance tolerances

Compliance tolerances will be determined as part of the standards setting process.

5.4.3.7 Controlled Fuels**Introduction**

Section 26 of AQA provides for the Minister or MEC to declare a substance or mixture of substances as a controlled fuel, if when it is used as a fuel in a combustion process, it results in emissions to the atmosphere which the Minister or MEC reasonably believes present a threat to health or the environment. Controlled fuels may be defined as those substances or mixtures of substances that have caloric value but are not controlled by the Department of Minerals and Energy and are sometimes referred to as alternative fuels.

Examples of potential controlled fuels include:

- Waste organic chemicals;
- Tyres; and
- Spent pot linings.

Procedure for identification of controlled fuels

The national department is in the process of developing a policy on waste incineration and other thermal waste treatment processes. As the so called alternative fuels will be dealt with in this policy process, the controlled fuel tool will, where appropriate, be used to regulate the manufacture, use and/or prohibition of such fuels in order to address those sections of the policy dealing with such fuels.

Standard-setting process

The generic procedure described in Paragraph 5.4.3 above on standard setting will be utilised for this.

Compliance time frames

Timeframes for compliance for controlled fuels will be dealt with as part of the standards setting process.

5.4.3.8 Noise and odour

Section 34 of the AQA makes provision for the Minister to prescribe national standards for the control of noise in general or by specified machinery or activities or in specified places or areas. In so doing, as well as defining noise and determining maximum levels of noise.

In terms of the above, noise is however controlled at Provincial and local spheres of government through regulations and by-laws.

Section 35 of the AQA makes provision for the Minister or the MEC to prescribe measures for the control of offensive odours emanating from specified activities. It is the responsibility of the occupier of any premises to take all reasonable steps to prevent the emission of any offensive odour caused by any activity on their premises.

Notwithstanding the above, the impact of noise and odour are usually localised and, hence, are best managed at the local level. However, in order to promote a uniform approach to noise and odour management, the national department will deal with these issues in its model air pollution control by-laws (see 5.8.2.3, page 74).

5.4.3.9 Dust

Section 32 of the AQA makes provision for the Minister or the MEC to prescribe measures for the control of dust in specific places or areas, or by specified machinery or in specific instances. While dust generally does not pose a health risk, it may be regarded as a nuisance. It is the responsibility of the owner of the dust generating activity to take reasonable measures to limit the nuisance factor.

Notwithstanding the above, the national department will consider the management of dust in its model air pollution control by-laws (see 5.8.2.3, page 74) and the identification of dust in future national standard setting processes. With regard to the latter, the dust related limits provided in SANS 1929 will be considered.

5.4.4 Regulations

Table 28 lists the regulations that are scheduled for promulgation in terms of the AQA in the foreseeable future. Most of the proposed regulations were identified from the projects that the department is currently undertaking, namely, the APPA Registration Certificate Review Project; the AQA Implementation: Listed Activities and Minimum Emission Standards Project; the Greenhouse Gas Information Management Project; the Air Quality Management Planning Implementation Manual Development Project and the South African Air Quality Information System.

Table 28: Schedule of Government Notices and regulations in terms of the AQA

Ref.	Description	Current status	Proposed publication date for public comment	Proposed date for final publication
AQA S9(1)(a) & (b)	Notice identifying substances in ambient air and establishing national standards for the permissible amount or concentration of each substance in ambient air – the 1 st ambient air quality standards.	Published for public comment on 9 June 2006 (Notice 528, Government Gazette No. 28899). To be re-drafted to incorporate public comments and National Framework requirements.	2007/8	2008/9
AQA S18(1)	Notice declaring the 2 nd National Priority Area (Highveld Priority Area).	Published for public comment on 4 May 2007 (Notice 396, Government Gazette No. 29864).	2007/8	2007/8
AQA S19(5)	Notice publishing the Vaal Triangle Air-shed Priority Area Air Quality Management Plan	Under development	2007/8	2007/8
AQA S20	Possible regulations for implementing and enforcing the Vaal Triangle Air-shed Priority Area Air Quality Management Plan.	Dependent on the nature of the Vaal Triangle Air-shed Priority Area Air Quality Management Plan.	2007/8	2007/8
AQA S21(1) & (3)	Notice publishing a list of activities which result in atmospheric emissions and establishing minimum emission standards for each listed activity.	Outputs C2 and C3 of the AQA Implementation: Listed Activities And Minimum Emission Standards Project.	2007/8	2007/8
AQA S23(1)	Notice declaring motor vehicles as Controlled Emitters and their associated emission standards.	Initial draft notice to be published for public comment following comments from DME and technical and legal review.	2007/8	2007/8
AQA S30	Regulation in respect of the “prescribed form” for Atmospheric Impact Reports.	Prescribed form for Atmospheric Impact Reports drafted and tested.	2007/8	2007/8
AQA S37	Possible regulations relating to information management in respect of atmospheric emission licences, the review of atmospheric emission licences, the content and format of atmospheric emission licences and the form of application.	Outputs A.6, C.4 and D.3 of the APPA Registration Certificate Review Project.	2008/9	2008/9
AQA S53(a)	Possible regulations relating to greenhouse gas information management.	Output A.5 of the “Greenhouse Gas Information Management Project”.	2007/8	2007/8
AQA S15	Possible regulations relating to air quality management planning.	Output B.3 of the “AQA Implementation: Air Quality Management Planning Project”.	2008/9	2008/9
AQA S53(e)	Possible regulations on the management of Ozone-Depleting Substances.	Initial draft regulations ready to be workshopped with stakeholders. Thereafter technical and legal reviews will be undertaken.	2008/9	2008/9
AQA S53(p)	AQA amendment and/or regulations in respect of “atmospheric user charge” aimed at providing a revenue stream through the “polluter pays” principle to municipal air quality governance.	The “atmospheric user charge” concept was discussed at the MINTEC meeting and workshop.	2008/9	2008/9
AQA S53(p)	Possible regulations on fee calculator to be used in calculating the prescribed processing fee for atmospheric emission licence as required by Sections 44 & 47.	Outputs E1 & E2 of the APPA Registration Certificate Review Project.	2007/8	2008/9

Ref.	Description	Current status	Proposed publication date for public comment	Proposed date for final publication
AQA S53(p)	Possible regulations on model air pollution control by-laws to be adopted by municipalities.	One of the projects identified to assist municipalities in promulgating air pollution control by-laws.	2007/8	2008/9

5.4.5 Economic instruments

The National Treasury has developed a draft policy paper to outline the role that market-based instruments, specifically environmentally-related taxes and charges, could play in supporting sustainable development in South Africa, and to outline a framework for considering their potential application (National Treasury, 2006). The draft policy paper focuses on the options for environmental fiscal reform and the policies and measures capable of contributing to both revenue requirements and environmental objectives.

Options currently being investigated include:

- Levies;
- Reforms to existing environmentally-related taxes;
- Development of new environmentally-related taxes;
- Reforming non-environmentally-related taxes with environmental incentives; and
- Fiscal incentives to improve environmental outcomes.

It is intended to include a full discussion of each of the options, as well as the other economic instruments in a booklet in the DEAT Publication Series (See Appendix 1). Furthermore, the national department will continue its active engagement with treasury on the use of economic instruments for effective air quality management.

5.4.6 Air Quality Management Plans

Each national department or province responsible for preparing an environmental implementation plan or environmental management plan must include in that plan an air quality management plan. Furthermore, each municipality must include an air quality management plan in its integrated development plan (IDP) (Municipal Systems Act: Chapter 5). Furthermore, a person conducting a listed activity (see 5.3.3) which involves the emission of a substance declared as a priority air pollutant may be required to develop, submit and implement a pollution prevention plan (Section 29 of the AQA). This latter plan may also be regarded as a form of air quality management planning.

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”.

Notwithstanding the class of air quality experienced in a given area (See bands in Figure 5), all air quality management planning follows a systematic process illustrated in Figure 7. The nature of the involvement and the degree or depth of management required in each of the generic activities will vary for different government departments and for different planning and implementation spheres in government. Furthermore, the intensity of air quality management planning, implementation and control will differ depending on the class of air quality experienced in the area.

The successful development and implementation of an AQMP is also dependant on multi-stakeholder involvement throughout the process.

The development of an AQMP starts with establishing the goal of the plan and defining the boundaries of the AQMP geographic area (Block 1 in Figure 7). Although, as mentioned above, the overall objective or goal of all AQMPs is the same, specific goals could vary depending on the air quality class, e.g. to maintain air quality that is compliant with air quality standards, or to attain compliance with national air quality standards over a defined time period for a Priority area. Similarly, the goal of the national department’s AQMP will be different to that of a provincial AQMP. Information (Blocks 2, 3 and 4 in Figure 7) is critically important in informing the AQMP. Such information identifies the deviation of the current quality status from the goal. Information on the quality on ambient air and emission sources may be readily available in the AQMP area from monitoring or modelling activities, emissions inventories, research campaigns, etc.

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 modelling to expand the spatial coverage. Modelling also allows the opportunity to subjectively assess and select emissions control options or intervention (Block 5 in Figure 7) that will result in the greatest amount of progress towards achieving the goal of the AQMP. Limited monitoring will be required in Class 1 and 2 air quality zones while comprehensive monitoring will be required in other zones. The implementation of the intervention (Block 6 in Figure 7) follows and the efficacy of the intervention is evaluated through specific measurements (Block 7 in Figure 7). The implementation of the intervention can be revisited if its effect is not achieving the desired outcome in terms of ambient air quality. The AQMP is a dynamic process and the goal is revisited in an ongoing process of ever improving air quality.

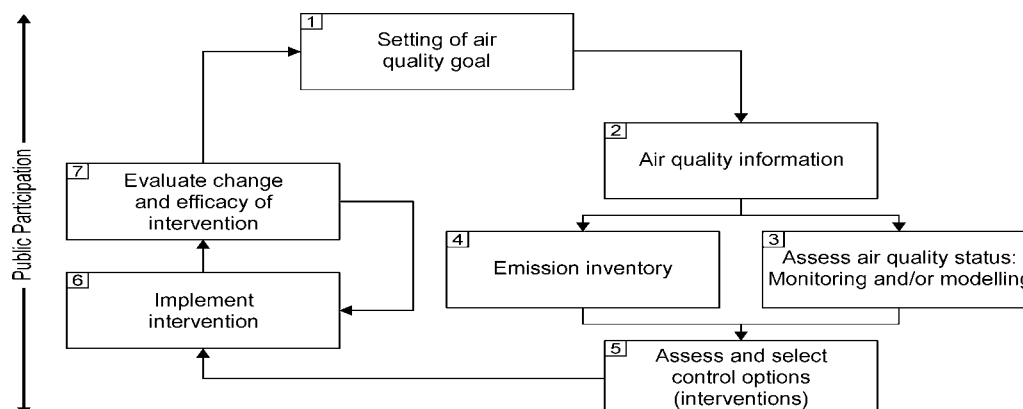


Figure 7: The generic air quality management planning process

5.4.6.1 The national department's air quality planning project

In late 2006, the national department initiated the *AQA Implementation: Air Quality Management Planning Project*. The overall objective of the project is framed as "the air quality management planning and reporting regime as directed and/or implied by the AQA is efficiently and effectively implemented by all relevant spheres of government through, in part, support and leadership from the national department". To this end, the project has the following objectives:

- **Immediate Objective A – The review objective:** All current air quality management planning initiatives are reviewed with a view to informing the various implementation manuals, regulations, guidelines, software, standard formats, templates and best practise case studies aimed at the efficient and effective implementation of the air quality management planning and reporting regime.
- **Immediate Objective B – The systems objective:** The various implementation manuals, regulations, guidelines, software, standard formats, templates and best practise case studies aimed at the efficient and effective implementation of the air quality management planning and reporting regime are published and presented to all relevant spheres of government.
- **Immediate Objective C – The capacity development objective:** The department and selected pilot provinces and/or municipalities are provided with initial assistance in the rollout of the air quality management planning and reporting regime and the department is able to efficiently and effectively provide sustainable support to all relevant spheres of government in this regard.

5.4.6.2 The National Air Quality Management Plan

As the National Framework includes a logical description of the national department's interventions and required resources aimed at implementing a strategy or strategies to achieve the objectives of the AQA, the National Framework serves as the Department of Environmental Affairs and Tourism's Air Quality Management Plan as contemplated in Section 15(1) of the AQA.

This notwithstanding, the department is also involved in the development of other air quality related plans as summarised in Table 29.

Table 29: Climate Change response planning implementation targets

Key milestones	Target date
Long term mitigation scenario process finalised	2008/9
Climate change policy development process initiated	2007/8
Sectoral CC mitigation and/or adaptation plans in place	2009/10
National communications under the UNFCCC	2008/9

5.4.6.3 AQMPs for other National Government Departments

Setting an air quality goal

Each national department that is responsible for preparing an environmental implementation plan or environmental management plan must include in that plan an air quality management plan (NEMA: Chapter 3).

The *AQA Implementation: Air Quality Management Planning Project* (see 5.4.6.1) will also develop any necessary implementation manuals, regulations, guidelines, software, standard formats, templates and/or best practise case studies for other national departments aimed at the efficient and effective implementation of the air quality management planning and reporting regime.

Notwithstanding the above, the main air quality management goal for national government departments is: to ensure that activities that fall within their jurisdiction do not compromise ambient air quality; to ensure implementation of the Republic's obligations in respect of international agreements; and to ensure that their air quality management plan is coordinated with the National AQMP.

Air quality information

In order to contribute towards a coordinated approach to air quality management in South Africa, national government department must have a fundamental understanding of the air quality implications of their technology, development and economic planning. While this may not be air quality information *per se*, information on motor vehicle emission characteristics and fuel specifications, as example, have implications on air quality, as do national planning decisions on public transport alternatives.

Not all national departments need to actively participate in the development of the national AQMP. The list below provides an indication of some departments that must make an input to the national AQMP:

- The Department of Minerals and Energy (DME) sets regulations, norms, standards and guidelines for dust control from mine spoil tailings and other mining operations. DME is also involved in fuel specifications, the use of low-smoke fuels and renewable energy initiatives.
- The Department of Health (DoH) sets regulations and guidelines for all medical wastes and treatment facilities, in consultation with the national department, and regulates the medical industry within the context of environmental and health legislation.
- The Department of Agriculture (DoA) is involved in dust from agricultural activities and the use of herbicides and pesticides.
- The Department of Labour (DoL) sets regulations for air quality in workplaces.
- The Department of Water Affairs and Forestry (DWAF) sets regulations for forest and veld fires
- The Department of Transport (DoT) sets regulations in respect of roads and various modes of transport.
- The Department of Land Affairs (DoLA) deals with land-use issues.

Control options (interventions)

Development of interventions will require coordinated decision making and the nature of the control options will vary from department to department.

Implementation of interventions

Implementation of interventions may not be limited to a single department and will require coordinated governance, hence the need for horizontal integration (see Figure 2).

Evaluate change and efficacy of intervention

The efficacy of these interventions will be evaluated, through the National Framework review process and through evidence of improved air quality in state of the air reporting.

Climate change response

In order to contribute toward a coordinated approach to climate change response in South Africa, national government departments must have a fundamental understanding of the climate change implications of their technology, development and economic planning and/or their vulnerability to climate change.

5.4.6.4 Priority Area AQMPs

AQMPs for declared priority areas must be developed in accordance with the implementation manuals, regulations, guidelines, software, standard formats, templates and best practise case studies aimed at the efficient and effective implementation of the air quality management planning and reporting regime that are currently under development as part of the *AQA Implementation: Air Quality Management Planning Project* (see 5.4.6.1).

5.4.6.5 Provincial AQMPs

Each province responsible for preparing an environmental implementation plan must include in that plan an air quality management plan (NEMA: Chapter 3).

As with the priority area AQMPs, provincial AQMPs must be developed in accordance with the implementation manuals, regulations, guidelines, software, standard formats, templates and best practise case studies aimed at the efficient and effective implementation of the air quality management planning and reporting regime that are currently under development as part of the *AQA Implementation: Air Quality Management Planning Project* (see 5.4.6.1).

Notwithstanding the above, provinces that only have one metropolitan or district municipality listed in Table 24 (page 47) 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.

5.4.6.6 Municipal AQMPs

Each municipality must include an air quality management plan in its Integrated Development Plan (Municipal Systems Act: Chapter 5).

Some municipalities have already developed detailed air quality management plans and others are currently developing plans as summarised in Table 30.

Table 30: 2007 air quality management planning status

Planning status	Type of municipality	Municipality
Completed Air quality management plan	Metropolitan Municipalities	Johannesburg, Ekurhuleni, Cape Town, Tshwane and eThekweni
	District Municipalities	Capricorn
	Local Municipalities	Rustenburg
Air quality management plan under development	District Municipalities	Drankenstein, Overburg, Eden, Cape Winelands,
	Local Municipalities	Mangaung Local Municipality, Motheo, Lejweleputswa, and Umhlathuze
	Priority Areas	Vaal Triangle Air-shed Priority Area

As with the priority area AQMPs and provincial AQMPs, municipal AQMPs must be developed in accordance with the implementation manuals, regulations, guidelines, software, standard formats, templates and best practise case studies aimed at the efficient and effective implementation of the air quality management planning and reporting regime that are currently under development as part of the *AQA Implementation: Air Quality Management Planning Project* (see 5.4.6.1).

Notwithstanding the above, municipalities that are not listed in Table 24 (page 47) 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.

5.4.6.7 AQMPs for other emitters

Setting an air quality goal

The main air quality management goal for other emitters is to comply with the requirements of a pollution prevention plan emissions reduction strategy if this is requested by the Minister or MEC in terms of Section 29 of the AQA, or to demonstrate the nature, extent or significance of any environmental impact, for existing or new developments and to ensure implementation of the Republic's obligations in respect of international agreements.

Air quality information

The air quality information requirements for an emission reduction strategy must include a comprehensive site emission inventory. Detailed information is also required on concentrations of pollutants in ambient air from monitoring, and where appropriate complemented by air dispersion modelling in order to measure progress towards the specified goal.

Control options (interventions)

Control options available to other emitters may include, but not be limited to:

- Alternative fuels;
- Alternative technology;
- The installation of emissions abatement technology;
- Process changes; and/or
- Behavioural changes, e.g. selection of a non-polluting mode of transport.

Implementation of interventions

Implementation of interventions will be specific to the intervention and the targeted emission source or sources. The rules for implementation and sequence of events will have to be agreed upon among the participating government departments and experts. For point sources this will be specified in the AEL.

Evaluate change and efficacy of intervention

The efficacy of the interventions needs to be evaluated through measurement specific to the intervention, e.g. emission monitoring for emissions reduction or licence interventions, or ambient monitoring for interventions that impact on residential sources. The AEL must establish time frames for measurement and reporting.

5.5 Impact management

5.5.1 Environmental Impact Assessments

The Environmental Impact Assessment (EIA) process is well established in South Africa. It aims to assess the likely impacts of a proposed development or activity, with the intention of providing sufficient information to aid decision-making. The key legislation for the implementation of the EIA process is NEMA, together with the EIA Regulations published in Government Notice No. R. 385 of 2006, which provides a list of activities identified in terms of Section 24 of NEMA.

The requirements of the AQA interface with the EIA process in a number of ways that are addressed in the following sections. First, the process of granting an Atmospheric Emission Licence (AEL) is linked to the issuing of a Record of Decision (RoD)³ for an EIA application. The intergovernmental cooperation and coordination that is required is illustrated in Figure 8 (see also 4.4). Secondly, the AQA has introduced some fundamental changes to air quality legislation in South Africa that will shape and inform the specialist Air Quality Impact Assessment reports, which generally form part of an EIA. These latter aspects are considered in Paragraph 5.5.3. Finally the Atmospheric Impact Reports which are required in terms of Section 30 of the AQA are discussed in Paragraph 5.5.4.

³ Although the term "Record of Decision" and its acronym RoD is used throughout this document to describe an authorisation relating to an environmental impact assessment as this is still a familiar term, the correct term for such an authorisation is an "Environmental Authorisation" as introduced by the new NEMA EIA regulations of 2006.

5.5.2 EIA-AEL procedural relationship

The linkage between the EIA process for a listed activity and the AQA's atmospheric emission licensing process is illustrated in the simplified flow chart in Figure 8. Metropolitan and district municipalities are charged with implementing the atmospheric emission licensing system (Section 36 of the AQA). Exceptions include circumstances in which they have delegated this function to a provincial organ of state in terms of section 238 of the Constitution, or when a municipality applies for an AEL, in which case a provincial organ of state is designated by the MEC as the licensing authority.

The competent authority in the case of EIA applications, either province or national, is responsible for the issuing of a RoD for a listed activity.

The EIA and AEL applications and decision-making processes are phased as shown in Figure 8 to take account of the information needs of each. When considering an application for an AEL, according to Section 39 of the AQA, the licensing authority must take into account, amongst others, the pollution being or likely to be caused by that activity and the effect on the environment, including health, economic conditions, cultural heritage and ambient air quality.

In order for the licensing authority to properly discharge its duties, this information must be available to inform the decision. Hence it is necessary for the EIA process and specialist Air Quality Impact Assessment to have been completed prior to the consideration of an AEL application by the licensing authority. It is important that there only be one information gathering phase and this is most appropriately done during the EIA process. The authority reviews must be synchronized and there must be interaction between the relevant municipal and provincial authorities as shown Figure 8. Ideally, they should review the information jointly.

The RoD in the EIA process must precede and inform the AEL decision. The EIA process is required to consider all potential environmental impacts, not only impacts of atmospheric emissions. The specialist Air Quality Impact Assessment is one of a number of possible specialist studies. Conceivably, the activity could result in significant impacts, other than those on the atmosphere, which could result in a negative RoD, thus negating the need for an AEL application.

The public participation requirements of the EIA process are also more comprehensive and may contribute meaningfully to the atmospheric emission licensing process if the two processes are aligned. The public participation process required for an AEL application is specified in Section 38 (3) of the AQA. An applicant must bring the application to the attention of relevant organs of state, interested persons and the public. The applicant is required to publish a notice in at least two newspapers in the area where the listed activity is to be undertaken. By aligning the public participation of the two processes, it is clear that the interests of the public are served through the more comprehensive public participation requirements of the EIA process, which may include newspaper advertisements, preparation of Background Information Documents, mail drops, public meetings and on-site notices; duplication of the public participation process is avoided; and the requirement to bring the AEL application to the attention of stakeholders can be limited to two newspaper advertisements in view of the extensive public participation that was undertaken as part of the EIA process.

The success of such an alignment of processes is contingent on intergovernmental cooperation and a robust and effective EIA process.

5.5.3 Specialist Air Quality Impact Assessment Reports

In general, all development applications involving listed activities will be required to undergo an EIA and will require a specialist Air Quality Impact Assessment study. Through its various requirements, the AQA prescribes and informs the scope and content of such specialist Air Quality Impact Assessment studies. The key elements of the AQA that are relevant to the EIA process are summarized, followed by the establishment of norms for a specialist Air Quality Impact Assessment report based on these requirements.

Key requirements of the AQA are as follows:

5.5.3.1 Human health impacts

One of the objectives of the AQA is to give effect to our constitutional right to an environment that is not harmful to the health and well-being of people. The emphasis on human health requires that the specialist Air Quality Impact Assessment for a proposed listed activity includes an assessment of potential health impacts. The level of detail required is dependent on the nature and extent of atmospheric emissions and could range from a simple comparative assessment of predicted ambient air quality levels with ambient air quality standards through to a full health risk assessment.

5.5.3.2 Ambient air quality standards

The AQA is effects-based legislation, with the result that activities that result in atmospheric emissions are to be determined with the objective of achieving health-based ambient air quality standards. Each new development proposal with potential impacts on air quality must be assessed not only in terms of its individual contribution, but in terms of its additive contribution to baseline ambient air quality i.e. cumulative effects must be considered.

5.5.3.3 Point source emission standards

The AQA may also prescribe minimum standards for certain point source emissions and these must be taken into account in the specialist study.

5.5.3.4 Mitigation measures

Related to the above, the AQA states that the Best Practicable Environmental Option (BPEO) that would prevent, control, abate or mitigate pollution, must be used.

5.5.3.5 Atmospheric Emission Licence (AEL) requirements

Notwithstanding the procedural linkages between an EIA and an AEL (see 5.5.2), the AQA prescribes factors that need to be taken into account by licensing authorities when considering an application for an AEL (Section 39) and also stipulates the contents of AELs (Section 43).

Factors that need to be taken into account include, amongst others:

- the effect or likely effect of pollution on the environment, including health, social and economic conditions, cultural heritage and ambient air quality.
- The contents of an AEL or provisional AEL must include, amongst others:
 - the maximum allowed amount, volume, emission rate or concentration of pollutants that may be discharged into the atmosphere under normal working conditions, and under normal start-up, maintenance and shut-down conditions;
 - any other operating requirements relating to atmospheric discharges, including non-point source.

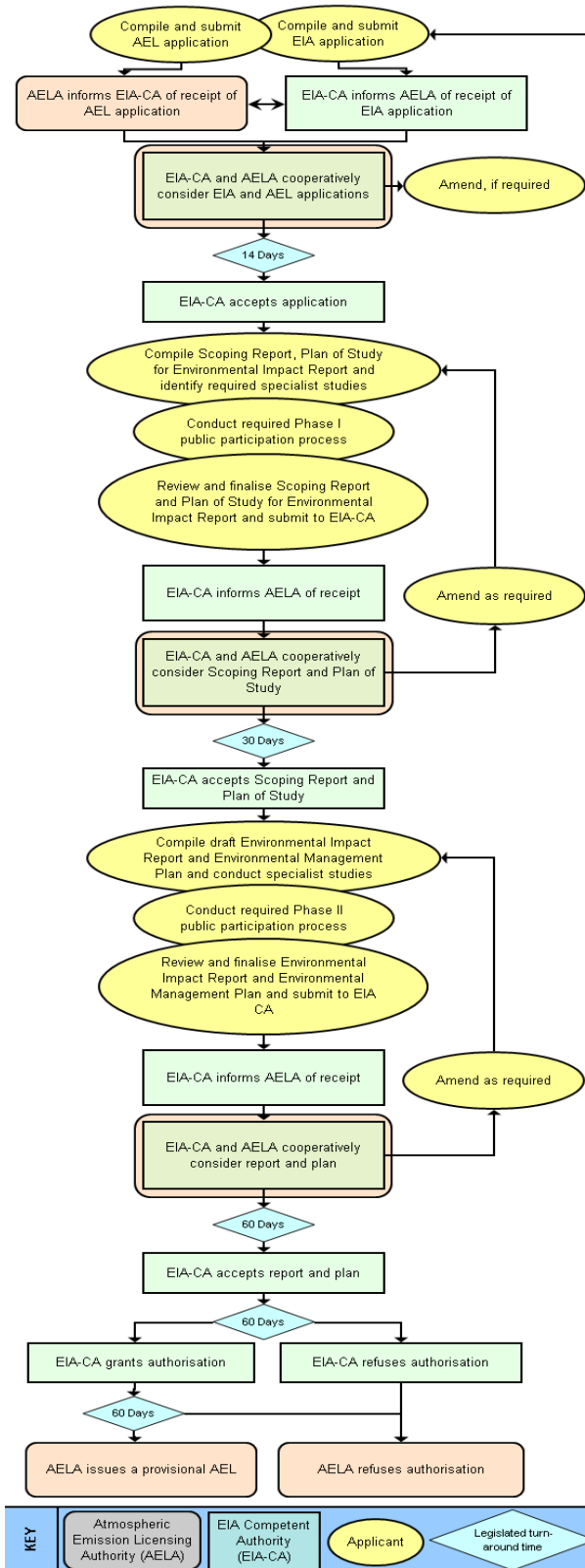


Figure 8: The interrelationship between the atmospheric emission licensing and environmental impact assessment processes

The information required by the licensing authority in the licensing process, such as atmospheric emission impacts, discharges to the atmosphere under various scenarios and fugitive emissions, is best addressed in the specialist Air Quality Impact Assessment study.

5.5.3.6 *Odour, noise and dust*

The national Minister or the provincial Member of the Executive Council (MEC) may prescribe measures for the control of dust, noise and offensive odours. Further, the occupier of any premises must take all reasonable steps to prevent the emission of any offensive odour caused by an activity on the premises. Currently there is no obligation to consider odour, noise and dust impacts as part of the specialist Air Quality Impact Assessment study, but there may be circumstances where these are required, particularly if it is likely that the AEL will specify conditions in respect of odour and noise in accordance with Section 43(2) (a) of the AQA .

5.5.3.7 *International obligations*

The AQA requires that AQMPs seek to implement South Africa's obligations in respect of international agreements and an AEL must specify greenhouse gas emission measurements and reporting requirements (Section 43(1)(l) of the AQA). In view of this, specialist Air Quality Impact Assessments must consider greenhouse gas emissions as well.

5.5.4 **Atmospheric Impact Reports**

An AQO may require the submission of an Atmospheric Impact Report in terms of Section 30 of the AQA, if:

- The AQO reasonably suspects that a person has contravened or failed to comply with the AQA or any conditions of an AEL and that detrimental effects on the environment occurred or there was a contribution to the degradation in ambient air quality. The environment is defined as including health, social, economic and ecological conditions, as well as cultural heritage;
- A review of a provisional AEL or an AEL is undertaken in terms of Section 45 of the AQA.

The format for an Atmospheric Impact Report is currently under consideration by the national department and will include the following aspects, among others:

- Introductory section containing, amongst other, company details, location and nature of the activity;
- Individual process details including a balance sheet of inputs, outputs and emissions;
- Detailed information on point source and fugitive emissions, and a summary of emissions under emergency and upset conditions;
- Impact of the activity on ambient air quality in the area;
- Statistics on respiratory illnesses and complaints in the area and a comparison with national averages;
- Compliance history; and
- Current or planned air quality interventions.

The national department will publish the form of the Atmospheric Impact Report in the Gazette.

Table 31: Atmospheric impact reporting implementation targets

Key milestones	Target date
Regulation in respect of the prescribed form for Atmospheric Impact Report (Section 30 of the AQA)	2007/2008

5.6 **Authorisations**

Authorisation is required in order to operate any listed activity anywhere in the Republic if that activity appears on the national list, or anywhere in a province where the activity may be listed. The authorisation for the operation of a listed activity is gained through the atmospheric licensing process, described in Chapter 5 of the AQA. Some relevant excerpts are provided here:

Metropolitan and district municipalities are charged with implementing the atmospheric emission licensing system and must for this purpose perform the functions of licensing authority as set out in Chapter 5 of the AQA and other provisions of the AQA , subject to the three conditions below:

- If a metropolitan or district municipality has delegated its functions of licensing authority to a provincial organ of

state, that provincial organ of state must be regarded as the licensing authority in the area of that municipality.

- If the MEC has in terms of section 139 of the Constitution intervened in a metropolitan or district municipality on the grounds that that municipality cannot or does not fulfil its obligations as licensing authority in terms of this Act, a provincial organ of state designated by the MEC must for the duration of the intervention be regarded as the licensing authority in the area of that municipality.
- If a municipality applies for an atmospheric emission licence, a provincial organ of state designated by the MEC must be regarded as the licensing authority for the purpose of that application; and the implementation of this Act in relation to any licence that may be issued to the municipality.

Application for atmospheric emission licences and the procedure for licence applications is discussed in Section 37 and Section 38 of the AQA.

The factors to be taken into account by licensing authorities are detailed in Section 39 of the AQA and include, among others:

- Any applicable minimum standards set for ambient air and point source emissions;
- The best practicable environmental options available that could be taken to prevent, control, abate or mitigate that pollution; and to protect the environment, including health, social conditions, economic conditions, cultural heritage and ambient air quality, from harm as a result of that pollution;

The issuing of atmospheric emission licences and the contents of the licence are detailed in Section 42 and Section 43 of the AQA. A provisional atmospheric emission licence and an atmospheric emission licence must specify:

- the activity in respect of which it is issued;
- the premises in respect of which it is issued;
- the person to whom it is issued;
- the period for which the licence is issued;
- the name of the licensing authority;
- the periods at which the licence may be reviewed;
- the maximum allowed amount, volume, emission rate or concentration of pollutants that may be discharged in the atmosphere -
 - under normal working conditions; and
 - under normal start-up, maintenance and shut-down conditions;
- any other operating requirements relating to atmospheric discharges, including non-point source or fugitive emissions;
- point source emission measurement and reporting requirements;
- ambient air quality measurement and reporting requirements;
- penalties for non-compliance;
- greenhouse gas emission measurement and reporting requirements; and
- any other matters which are necessary for the protection or enforcement of air quality.

Furthermore, a licence may:

- specify conditions in respect of odour and noise;
- require the holder of the licence to comply with all lawful requirements of an environmental management inspector carrying out his or her duties in terms of the NEMA, including a requirement that the holder of the licence must, on request, submit to the inspector a certified statement indicating:
 - the extent to which the conditions and requirements of the licence have or have not been complied with;
 - particulars of any failure to comply with any of those conditions or requirements;
 - the reasons for any failure to comply with any of those conditions or requirements; and
 - any action taken, or to be taken, to prevent any recurrence of that failure or to mitigate the effects of that failure.

Section 44 of the AQA discusses the requirements relating to the transfer of provisional atmospheric emission licences and atmospheric emission licences.

A licensing authority must review a provisional atmospheric emission licence or an atmospheric emission licence at intervals specified in the licence, or when circumstances demand that a review is necessary (Section 45 of the AQA). The licence holder and the relevant provincial AQO must be informed of the intention to review the licence. For the review, the AQO may require the licence holder to compile and submit an atmospheric impact report (See Paragraph 5.4.2.1).

AQA requires that the applicant for an AEL must bring the application to the attention of the public by issuing a notice in at least two local newspapers. The notice must also indicate where and when public comments can be submitted. In addition to these legal requirements, the applicant must ensure that the application is brought to the attention of interested and affected local groups and community organisations, such as church groups, schools, crèches, or hospitals. In addition, municipal and provincial health authorities, as appropriate, must be involved in giving consideration to the licensing application process. The relationship between the EIA and AEL application is shown in Figure 8.

In cases where the application is subject to EIA requirements (i.e. for new developments or facility expansion), the public participation processes required under the AQA and the EIA regulations must be undertaken in an integrated manner.

Table 32: Atmospheric emission licensing implementation targets

Key milestones	Target date
Publication of “ <i>Atmospheric Emission Licensing - An Implementation Manual for Air Quality Officers</i> ”	2008/2009
Initial training workshops in the use of the Atmospheric Emission Licensing Manual concluded	2008/2009

5.7 Compliance monitoring

5.7.1 Introduction

An important element of the environmental governance cycle is that of ensuring compliance with air quality management requirements as stated in the relevant legislation. A number of tools are provided for in the AQA, including compliance monitoring, the provision of emission control officers, and processes for voluntary compliance measures. These tools allow for the analysis of the compliance of various regulated activities, and are used in relation to the most appropriate level of government.

5.7.2 National measures

National responsibilities in terms of compliance monitoring relate to responsibility in respect of international commitments, monitoring compliance with goals of national Priority Area AQMPs (See Paragraph 5.4.5) and with conditions relevant to air quality contained in EIA Records of Decision issued by national government. Reporting on compliance will be included in the national AQO’s annual report.

National government will further undertake compliance monitoring on behalf of provinces if province fails to fulfil its executive obligation in this respect (See Chapter 3 on roles and responsibilities).

5.7.3 Provincial measures

The provincial AQO is responsible for monitoring compliance with the targets specified in the provincial AQMP and for reporting compliance in the annual report. Further compliance monitoring with the conditions relevant to air quality contained in EIA Records of Decision issued by province is required.

5.7.4 Municipal measures

The municipality AQO also has compliance monitoring and reporting requirements regarding AQMPs that are consistent with requirements at national and provincial levels. Compliance monitoring at municipal level deals specifically with AELs, and uses licences as the primary means to ensure compliance with ambient air quality standards.

Atmospheric Impact Reports are an additional means of monitoring compliance and can be requested of any individual that is under reasonable suspicion of contravening the AQA or causing negative impacts, as well as within the context of a licensing process (See Paragraph 5.5.4).

5.8 Enforcement

In terms of Chapter 7 of the NEMA as amended, the functions of the Environmental Management Inspectors (EMIs) are to monitor compliance with, and enforce the NEMA and specific environmental management legislation, known as “specific environmental management acts”.

The following officials may be designated as EMIs:

- Officials in the national department and other organs of state. These officials are designated by the Minister.
- Officials in provincial environmental departments and provincial organs of state, and municipalities. These officials are designated by the MEC.

Officials designated as EMIs in terms of the NEMA are able to enforce the AQA. EMIs are given a range of powers that include rights of inspection, investigation, gathering of evidence and enforcement, to enable them to fulfil their functions.

5.8.1 Offences

Section 51(1) of the AQA, a person is guilty of an offence if that person:

- conducts a listed activity without a provisional AEL or AEL (not yet in effect);
- contravenes or fails to comply with a condition or requirement of an AEL (not yet in effect);
- emits air pollutants at concentrations above emission limits specified in an AEL as a result of a listed activity (not yet in effect);
- manufactures, sells or uses any appliance or conducts an activity declared as a controlled emitter, that does not comply with specified standards (not yet in effect);
- operates a controlled emitter when emissions from that controlled emitter do not comply with standards (not yet in effect);
- fails to take all reasonable steps to prevent the emission of any offensive odour caused by an activity on their premises (in effect);
- fails to submit or to implement a pollution prevention plan when required to do so (not yet in effect);
- fails to submit an atmospheric impact report when required to do so (not yet in effect);
- fails to notify the Minister of the likely cessation of mining activities and the plans that are in place for rehabilitation and the prevention of pollution by dust once mining operations have ceased (in effect);
- supplies false or misleading information in an application for an AEL, or for the transfer, variation or renewal of such a licence (not yet in effect);
- supplies false or misleading information to an AQO (in effect);
- contravenes or fails to comply with a condition subject to which exemption from a provision of this Act was granted in terms of Section 59 (in effect).

Penalties (Section 52 of the AQA) may be incurred if a person is convicted of an offence as described above. A person is liable to a fine or to imprisonment for a period not exceeding ten years, or to both. The fine may not exceed R 200 000 in terms of the Adjustment of Fines Act (Act No. 101 of 1991) and must be determined with due consideration of the following factors:

- the severity of the offence in terms of the impact, or potential impact, on the health, well-being, safety and the environment;
- the monetary or other benefits which accrued to the convicted person through the commission of the offence; and,
- the extent of the convicted person's contribution to the overall pollution load of the area under normal working conditions.

In addition to penalties, other regulatory tools include an Atmospheric Impact Report (Section 30 of the AQA), which is discussed in detail in Paragraph 5.5.4 of this document, and a Pollution Prevention Plan (Section 29 of the AQA), when the Minister or MEC may require a person conducting a Listed Activity that emits priority air pollution to prepare a Pollution Prevention Plan.

5.8.2 By-laws

5.8.2.1 Local government competence

Section 156 of the Constitution provides for the powers and functions of municipalities. Section 156(1)(a) of the Constitution states that “A municipality has executive authority in respect of, and has the right to administer the local government matters listed in Part B of Schedule 4 and Part B of Schedule 5”.

Section 156(2) – “A municipality may make and administer by-laws for the effective administration of the matters which it has the right to administer”. Section 156(3) – “A by-law that conflicts with national or provincial legislation is invalid. If there is a conflict between a by-law and national or provincial legislation that is inoperative, the by-law must be regarded as valid for as long as that legislation is inoperative”.

5.8.2.2 Schedule 4 functional areas

In Part A of Schedule 4 of the Constitution, which are the functional areas of concurrent national and provincial legislative competence, one of the functional areas listed is “pollution control” while “air pollution” is listed in Part B of Schedule 4. This means that national and provincial spheres of government must cooperate in regulating and/or administering pollution control matters, while local government has exclusive executive and administrative authority in dealing with air pollution matters. In addition, in terms of Section 151(4) of the Constitution, the national or a provincial government may not compromise or impede a municipality’s ability or right to exercise its powers or perform its functions.

5.8.2.3 Model environmental management by-laws

Section 46(1) of the NEMA allows the Minister to make model bylaws aimed at establishing measures for the management of environmental impacts of any development within the jurisdiction of a municipality, which may be adopted by a municipality as municipal bylaws. In terms of Section 46(2) of the NEMA, any municipality may request the Director-General to assist it with the preparation of bylaws on matters affecting the environment and the Director-General may not unreasonably refuse such a request.

One of the purposes, as set out in Section 46(4)(a) of the NEMA, is to mitigate adverse environmental impacts. The model bylaws must include measures for environmental management, which may include the following –

- auditing, monitoring and ensuring compliance; and
- reporting requirements and the furnishing of information.

5.8.2.4 Application of the constitution principles

It follows from the above that national and provincial spheres of government have concurrent executive and legislative powers in pollution control matters (broadly), and local government has exclusive executive and legislative powers in air pollution matters. Examples illustrating national and provincial government’s concurrent executive and legislative powers include the NEMA, National Water Act, 1998 (Act No. 36 of 1998), National Heritage Resources Act, 1999 (Act No. 25 of 1999) and the AQA.

The AQA brings the system of air pollution control in line with the Constitutional allocation of functions between the national, provincial and local spheres of government. It is within this constitutional approach and cooperative governance that the department has commissioned a project to develop model air pollution control by-laws. The bylaws will be published under AQA and may be adopted by municipalities. The development of the model air pollution control by-laws will ensure uniformity across the country on air quality management. This uniformity will assist government in implementing and enforcing air quality management plans and achieving acceptable ambient air quality.

5.8.2.5 Procedure for the development of model air pollution control by-law

Notwithstanding the Constitutional allocation of functions between three spheres of government, it must be clearly stated that is not the intention of the national department to interfere on the municipalities’ exclusive functional areas. However, it is the intention of the national department to assist municipalities in mitigating adverse environmental impacts.

The process of developing model environmental management bylaws will be initiated by a formal communication with municipalities requesting them to forward copies, if any, of their municipal bylaws to the national department. This exercise will assist the national department in formulating a clear picture of the number of municipalities regulating a certain environmental issue and the extent to which such issue is regulated at the municipal level.

The second step will be an analysis report on the by-laws forwarded to the national department. This analysis will be limited to the bylaws which were forwarded to the department. A draft analysis report will be submitted and discussed at the quarterly national-provincial air quality officers' forum and at the provincial-municipal air quality officers' forum. The comments from these forums will be incorporated before the finalisation of the analysis report. The analysis report will inform the next step, namely, drafting of the model by-law.

The next step will be the drafting of the model by-law. This bylaw will be drafted in generic format, so as to have the bylaw easily adaptable to the different environments that exist in the municipalities.

The department foresees the process unfolding as follows. The Minister will publish the model by-law in the Gazette as a regulation, in terms of Section 53(p) of AQA. Section 53(p) of AQA states that "*The Minister may make regulations that are not in conflict with this Act, regarding any other matter necessary for the implementation or application of this Act*". The model by-laws will be made available as a book in the DEAT Air Quality Publication Series.

With regard to the consultative and public participation processes, Sections 56 and 57 of AQA respectively will be followed. The notice, as stated in Section 57 of AQA, will invite the public to submit to the Minister, within 30 days of publication of the notice in the Gazette, their comments on the draft model by-law. The Minister will respond and/or incorporate the public comments in the final model bylaws. The final model by-law will be promulgated by the Minister in the Gazette.

After the publication of the model by-law, municipalities may adopt the bylaw, under Section 156(2) of the Constitution, as a by-law applicable within their municipal jurisdiction. However, municipalities across the country face different air quality management challenges hence it is foreseeable that municipalities may adopt and amend the model bylaw in order to address their unique problems. The department will always be available to consult with municipalities in those situations.

Table 33: By-law related implementation targets

Key Milestone, Product or Output	Timeframe
Model air pollution control by-laws	2007/08

5.9 Cross-cutting principles

5.9.1 Public Participation

5.9.1.1 *The importance of public participation in air quality decision-making*

Government plays a crucial role in achieving and maintaining clean air in South Africa, but it cannot reach this goal alone. Active participation and contributions from individual citizens and citizen groups is of utmost importance in developing, implementing and enforcing air quality management decisions within the context of the AQA. The potential benefits of public participation are numerous. If well-planned and managed, public participation can bring new and important knowledge to the table, mediate between conflicting perspectives early in the process and facilitate more efficient air quality governance. Equally important, public participation in air quality management plays a vital role in strengthening and deepening democracy in South Africa and in giving effect to the constitutional right to an environment which is conducive to health and well-being.

Section 4(2) of the NEMA, which is the overarching environmental law in South Africa (See Chapter 1 of this document) embodies a number of principles aimed at ensuring effective and equitable public participation. These principles were listed in Paragraph 1.4.

5.9.1.2 *Promoting best practices for effective and equitable public participation*

When designing and implementing air quality decision-processes, all three spheres of government in South Africa must strive to apply best practices of engaging with stakeholder groups and citizens, with the goal of reaping the full benefits of public participation. Although the AQA prescribes a standard approach to participation in its Sections 56 and 57, experience suggests that implementing the following measures and principles will significantly contribute towards ensuring effective and equitable participation, as called for in the NEMA. However, experience has also shown that a "one-size-fits-all" approach to public participation is not always effective or efficient and, as such, a flexible and innovative approach to participation must be considered.

5.9.1.3 Establishment of a national air quality reference group

In order to design and implement participation processes that are both efficient and effective, the national department wishes to establish a representative national reference group (see Figure 9) comprising representatives from industry, business and civil society, to provide strategic guidance to the National AQO on important aspects of air quality management, especially with respect to participatory processes.

The establishment of this group will be based on the department's experience in establishing a similar group for the Vaal Triangle Air-shed Priority Area as follows.

The objective of national air quality reference group will be to:

- Inform the National Air Quality Officer of the views of stakeholders regarding the implementation of the AQA and the National Framework;
- Advise the National Air Quality Officer on any matter concerning air quality management and governance and specifically the setting and achievement of objectives and priorities for air quality governance;
- Advise the National Air Quality Officer on appropriate participatory processes related to the implementation of the AQA and the National Framework; and
- Advise the National Air Quality Officer on appropriate methods of monitoring progress in respect to the implementation of the AQA and the National Framework.

The national air quality reference group, will consist of at least 12 but not more than 15 members appointed by the National Air Quality Officer. Membership of the group should be made up of persons who represent stakeholders, and persons who have experience, expertise or skills necessary to enable the group to carry out its functions. To this end, the National Air Quality Officer will invite nominations for membership of the national air quality reference group from interested and affected business and industry associations, non-governmental organizations, organised labour and community groups.

In response to the invitation, stakeholders should submit nominations and a justification for membership of the national air quality reference group to the Director-General: Environmental Affairs and Tourism.

It is envisaged that this group will meet four times a year, in regular meetings aligned with the quarterly meetings of the National-Provincial AQO forum (see 4.4.4). During these meetings, the national AQO will provide the reference group with an update on progress in respect of the implementation of the National Framework and other air quality related initiatives. In turn, the reference group will assist the National AQO in designing required participatory processes that take, at least, the following into account.

Provision of up-to-date information on project activities

To keep stakeholders informed about ongoing and planned air quality management projects and decision-processes (and related public participation opportunities), all three spheres of government must make relevant information available in a timely manner through, for example, dedicated air quality management websites and other suitable means, such as actively notifying known stakeholders (See information dissemination in Paragraph 5.9.3, page 81). At the national level, the national department will publish a monthly newsletter, the *National Air Quality Office News*, providing a regular overview of ongoing and planned air quality related projects, decision-processes and other initiatives. In addition to websites, and newsletters other media will be considered to reach communities (See Paragraph 5.4.2).

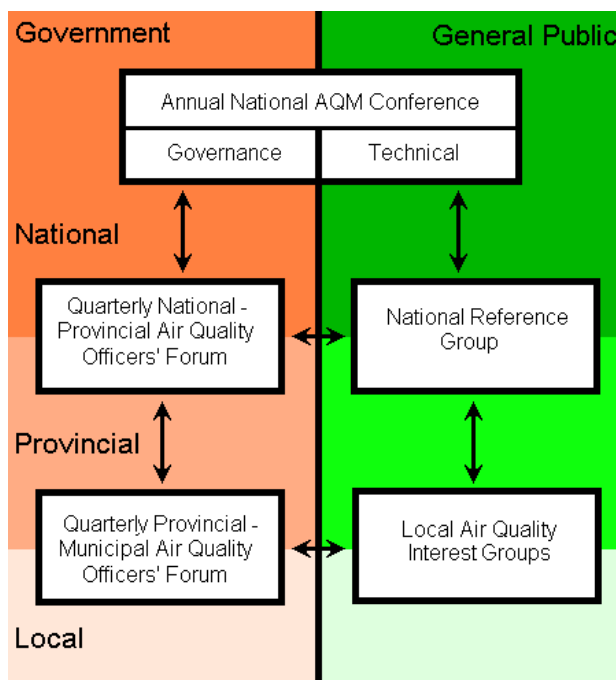


Figure 9: Vertical air quality governance interrelationships

Effective announcement of public participation opportunities

Public participation opportunities for air quality decision-processes referred to in the AQA must be publicised on the national department websites and in other appropriate media and notifications sent electronically to stakeholders directly using up-to-date databases and electronic mailing lists. Special efforts will be made to ensure that vulnerable and affected communities are informed about relevant decision-processes. Information on the stage in the decision-process at which public participation is planned and the type of public participation activities envisaged will assist stakeholders in planning their participation and assigning necessary time and resources. It will also allow stakeholders to suggest possible adjustments to the envisaged public participation process early in the decision-process.

Ensuring early and balanced participation

Public participation must take place early in the process, when key options are still open. This will ensure that all perspectives are captured and can be properly assessed at the outset. It will also ensure that all stakeholder groups have equal opportunities to convey their views. For major decision-processes, consideration must be given to the organisation of stakeholder workshops and other participatory tools that facilitate in-depth interaction and deliberation at early stages, and which promote face-to-face dialogue.

Responding to stakeholder contributions

Providing feedback and acknowledging written contributions from stakeholders is considered essential to participatory processes and will strengthen the relationship and build trust between government and the public. To address related stakeholder expectations in a practical manner, government must prepare concise response documents that explain the rationale for final decisions or outcomes. Government must also provide explanation on why important comments may not have been addressed. The response document must be made available to the public on request.

Addressing the needs of vulnerable groups

Vulnerable groups and communities have specific needs in order to effectively participate in air quality decision-making. Capacity constraints include lack of technical and human resources as well as lack of financial resources to attend meetings. Government must take cognisance of these constraints when organising meeting locations and times and when setting timelines for public comment.

Professional and skilled process management

Ensuring that public participation processes are managed in a professional manner will enhance the quality of engagement and strengthen the relationship of government with stakeholders. Relevant measures include, for example, neutral facilitation of meetings, making meeting and workshop reports available in a timely manner, and keeping stakeholders informed concerning follow-up activities. The national department will engage, as appropriate, in capacity building activities aimed at strengthening the skills of officials in all spheres of government concerning effective management of stakeholder processes.

5.9.1.4 Issues relevant for specific air quality decision-processes

The AQA includes more than 20 Sections authorising government to initiate subsidiary decision-processes. In addition, there are public participation requirements in other existing legislation, such as the Promotion of Access to Information Act, Promotion of Administrative Justice Act, the Public Audit Act and the Municipal Systems Act apply. Government is responsible for the implementation of public participation in the standard setting process and air quality management planning (See Chapters 3 and 4 of this document). Participation in the emission licensing process falls under the responsibility of the applicant (See Paragraph 5.5.2).

5.9.1.5 Standard setting processes

Rules, norms and standards developed under the AQA will provide a suite of subsidiary legal requirements which will, in turn, inform and guide more specific air quality decision-processes (e.g. licensing). It is thus of utmost importance that principles of effective and equitable public participation are adhered to. An open, transparent and formalised standard setting process should, in order to be considered fully legitimate, consider and include the following:

- organisation of inclusive stakeholder workshops early on in the process to document stakeholder expectations and concerns, including those of affected communities;
- establishment of a multi-stakeholder representative technical committee (or steering group) to support writing and/or review of the rules, norms and standards;
- provision of regular updates of the technical work, with draft documents made available to the public, as

appropriate;

- allowance of an extended period for notice and comment of the draft standards, and other associated processes of a technical nature.

5.9.1.6 Air quality planning processes

Effective public participation in the development of Priority Area AQMPs must be ensured. Multi-stakeholder reference groups with fair and representative participation must be established in areas in which AQMPs are being developed to provide input into the planning process. Specific activities must be implemented to raise awareness of and build capacity of vulnerable and affected groups to enable them to effectively participate in the process. When submitting important documentation for public comment, a minimum comment period of 30 days must be provided for written submissions.

The development of AQMPs in non-priority areas takes place within broader decision-making frameworks (See Paragraph 5.4.6). Public participation must take place within the participatory frameworks provided by these processes.

5.9.1.7 Licensing processes

For public participation in licensing refer to Paragraph 5.5.

5.9.1.8 Raising awareness and engaging the public in air quality decision-processes

Progress towards achieving the goal of clean air in South Africa requires raising awareness and the meaningful involvement of all citizens (See Paragraph 5.4.2 on awareness-raising and Paragraph 5.9.2 on capacity development).

5.9.2 Capacity development

5.9.2.1 Introduction

Capacity development is a cross-cutting issue that underpins every element of the environmental governance cycle illustrated in Figure 1. Within the AQA, capacity development is not explicitly addressed, however, its consideration and inclusion is necessitated by the obligation for the fulfilment of the duties and responsibilities stipulated in the AQA and elaborated upon in Chapters 3 and 4 of this document.

The scarcity of skills in South Africa is a key constraint to service delivery within both government and the country at large. National government has recognized this through the passing of the Skills Development Act (Act No. 97 of 1998), which aims to provide an institutional framework to devise and implement strategies to develop and improve the skills of the South African workforce. The national department has taken up the challenge through the initiation of an internship programme and the development of an internship policy, and by addressing capacity development as an integral part of many of their projects.

Whilst the skills shortage applies generally in South Africa, the shortage is critical in the field of air quality. The limited pool of current air quality specialists, along with the paradigm shift in approach to air quality management, justifies the need for urgent intervention. A multi-pronged approach to capacity development is needed, where tertiary level training at regional centres, complemented by in-service training, and other interventions are considered. In addition, there is the need for capacity development amongst the general public in order to ensure that civil society can fully contribute to the air quality management process in an effective manner. These latter aspects were addressed in Paragraph 5.4.2.

5.9.2.2 Definition

Although capacity development is often seen as simply the provision of extra financial or staff resources, or the provision of extra skills through training and education, capacity development must be seen as the attempt to build an organisation's capacity to fulfil its role efficiently and effectively. The section below therefore describes a diverse range of strategies that can be implemented to allow effective and appropriate air quality work to be carried out at all levels of governance.

5.9.2.3 Strategies

Strategies of capacity development can be distinguished based on the proposed outcomes and the approach of stakeholders to the project. They are categorised as follows:

- Applying additional financial and physical resources - addressing a simple lack of resources within a well-managed organisation to stimulate growth;
- Improving the organisational and technical capabilities - addressing lack of technique and proper structure

through activities such as technical assistance, training, systems improvement and better working conditions;

- Helping to settle on a clear strategic direction - addressing lack of consistent direction, overextending, inappropriate objectives or lack of political consensus on organisational purpose though inducing policy dialogue for action and capacity development;
- Protecting innovation and providing opportunities for experimentation and learning - addresses lack of a protected learning space through development of social capital and creation of opportunities to experiment and learn;
- Strengthening the bigger organisational system - addresses systemic capacity through emphasising the development of interrelationships and resolving public policy issues collectively – public-private partnerships;
- Helping to shape an enabling environment - addresses the lack of an enabling environment through creating protected pockets of capacity development or trying to improve institutions and broader social and political patterns;
- Creating more performance incentives and pressures - addresses structural incentives that lead to poor performance by redesigning organisations and improving the overall approach to governance and democratization.

By identifying the type of strategy to be pursued based on the desired outcomes as well as informed by the current context of capacity, the most appropriate path of capacity development can be followed. This allows the outcomes of the programme or project to fulfil the need identified prior to implementation.

Implicit in the list of strategies outlined above, is a recognition that capacity development is much more than training and awareness programmes for individuals. It is also about organisational, management, financial and technical systems and procedures. Having noted this broad definition, proposed interventions for improving technical capacity in the field of air quality management are presented in the next section.

5.9.2.4 Technical capacity development

A variety of interventions is needed to address the skills shortage in air quality management. All are relevant, with some addressing longer term needs, others the immediate needs and others the need for an informed public.

Tertiary level qualifications

Tertiary level programmes present a long term planning measure aimed at securing future capacity in the field of air quality management. They provide an opportunity to enhance research in the field and to add to the national body of knowledge on air quality management. These inputs are necessary to guide the implementation of the AQA into the future.

There is a need to strengthen tertiary institution offerings in the air quality field. There are few national specialists in air quality and they are scattered across a handful of institutions around the country. A coordinated approach to offering a post-graduate qualification (NQF level 7 and/or 8 i.e. the equivalent of Honours and/or Masters degrees), which could be jointly offered at one or more institutions is recommended.

Internships

Internships provide a means to invest in young people and to provide them with relevant experience that will enable them to function effectively in the work place in the future. These programmes are targeted at providing on-the-job training under the guidance of a mentor and they provide a useful bridge between formal tertiary level training and employment. Internships also provide a means to directly transfer the expertise of people with long-standing professional experience to those with only a practical or theoretical training.

In-service short courses

Short courses provide a means of addressing current capacity needs and targeting particular people and skills that are most urgently needed for intervention. Short training courses, generally ranging from one to five days, are the fundamental aspect of capacity development for those who are already in employment. They provide a means for building on existing skills, refreshing or updating skills, for imparting specialist knowledge, and importantly they directly enhance the internal capacity in an organisation. In many cases single day courses can provide sufficient steerage in the process for AQOs to learn about key issues and follow up any specific issues relating to their own local issues through the means of a helpdesk facility (see below).

The most urgent need is for capacity development amongst government officials at all levels tasked with implementing the AQA. To this end, the national department will consider the development of a suite of air quality modules which could

be South African Qualifications Authority (SAQA) accredited at NQF level 7 and delivered to relevant government officials in all spheres of government. In this regard, the use of e-learning through the SAAQIS (see 5.2.1.11) will be investigated to provide broad access to the short courses.

A modular structure is proposed, with modules falling into one of the following categories:

- Bridging training module – a single module on air quality science designed to impart basic knowledge to an employee with no previous formal air quality courses;
- Basic training modules – a suite of modules designed to provide basic detail on all aspects of air quality management – both the scientific aspects and also the policy context;
- Specialist training modules – a suite of modules designed to provide advanced training in selected topics;
- Refresher training module/s – a module designed to provide scientific and technological updates on air quality science.

Partnerships

Bilateral partnerships (e.g. municipality-municipality and province-province) are an excellent means of promoting the replication of best practices and lessons learned, and allowing smaller, less capacitated provinces and municipalities to benefit from the experiences of their stronger counterparts. Pilot projects will be initiated by the national AQO and each of the provincial AQOs.

Forums

Quarterly provincial forums between province and municipalities as outlined in 4.4.5 must be used as a capacity development platform for provincial and municipal officials. Such forums can promote the sharing of experiences, the dissemination of ideas and the replication of best practice. These forums are important both in building a sense of 'community' within the air quality profession, as well as playing a key role in the feeding of information on the effectiveness of the air quality management process upwards from municipal to national levels.

Public awareness campaigns

Capacity development is not confined to individuals working in the air quality field. There will also be awareness-raising amongst the general public using the approaches outlined in Paragraph 5.4.2. An informed and knowledgeable civil society leads to better decision-making.

Guidance

One of the key strategies for approaching the issue of capacity development is not to rely on there being a dispersed number of individual expert AQOs all trained to carry out their roles independently. Effective use of resources requires that specialist AQOs are used where they are needed most, where there are numerous pollution sources – or other issues leading to poor air quality. Where expert AQOs are not needed, all that is required is sufficient capacity to be able to ensure that good air quality is maintained.

One way to ensure that non-specialist AQOs are capable of making this judgement is by setting out clear and detailed guidance as to how initial screening and scoping analyses should be carried out. When these studies indicate the likelihood of a significant threat to good air quality, the municipal government will then be able to decide the most appropriate means to approach the problem (for example seeking new skilled officers or training up existing staff).

This guidance can also be used to outline key technical aspects of more advanced analyses; however, the basic role is to ensure that initial assessment of local air quality issues is carried out in a reliable and consistent manner which does not necessarily rely on the technical expertise of the officer responsible. By ensuring that this guidance is clear and prescriptive, it can also play an important role in developing the basic skills of untrained AQOs.

Helpdesk

In addition to any formal, printed guidance notes on aspects of air quality governance (see below), the national department has established the position of intergovernmental air quality management coordinator. In addition to actively networking with all government air quality managers, the intergovernmental air quality management coordinator also provides a Helpdesk facility. This provides a means by which AQOs at the provincial and municipal spheres can seek expert advice and information relating to the implementation of the AQA from the national department, or the national department approved advisers. Air quality managers are able to access the helpdesk by telephone and through e-mail.

In addition to the provision of one-to-one communication via phone or e-mail, will also establish a website providing information on the National Framework and its implementation as part of the SAAQIS which will contain information such as 'Frequently Asked Questions' (FAQ) examples of good air quality management practice, updates and addendums to printed guidance, and so forth.

National AQO communiqués

Based on frequently asked questions in the various intergovernmental air quality governance forums (see 4.4), the National AQO will continue to compile various discussion, briefing and guidance documents aimed at providing guidance on air quality governance issues. The documents are circulated to all government air quality managers by the intergovernmental air quality management coordinator (see above).

5.9.3 Information dissemination

All aspects of implementing the National Framework require the dissemination of information. The main instrument of dissemination of information will be through the SAAQIS. However, the SAAQIS has limitations in this regard in that it does not necessarily provide access to all stakeholders, especially those that do not have the necessary technology or prior exposure to air pollution information. This means that a strategy for reaching these parts of the population must be developed and tools other than the SAAQIS are needed.

The dissemination of information will raise awareness in the population and this awareness will greatly support the achievement of compliance with air quality standards. Dissemination of information is a skill and experts may be employed to inform and/or drive this process. At the same time, ongoing public participation processes will identify the best ways of effectively communicating with all stakeholder groups of the population (see also 5.9.1.3). The following approaches to disseminating air quality information will be considered, amongst others:

- Newspaper articles
- Booklets/Pamphlets /brochures/leaflets
- Posters on air pollution in central places such as schools and hospitals
- Radio, national and local
- TV
- Public meetings
- Bill boards

Key information will be made available in, at least, four of the official languages in South Africa. The dissemination of information can be done through different stakeholders. Possible routes for dissemination may include:

- The formal schooling system
- Programmes targeting women
- Programmes targeting health professionals
- Programmes targeting political bodies and parties
- Programmes targeting religious organizations
- Programmes targeting industry
- Programmes targeting NGOs

To be able to conduct successful awareness-raising, information is required at the appropriate technical level and teachers (or facilitators) need to be trained in the subject matter. The SAAQIS will have a dedicated facility for educational and awareness-raising material so that it is readily available for course presentations and awareness-raising campaigns. Based on this, material and courses can be accessed, printed and copied and made available.

6. THE ATMOSPHERIC POLLUTION PREVENTION ACT-AIR QUALITY ACT TRANSITION

6.1 Ambient air quality guidelines to national ambient air quality standards

Although various ambient air quality guidelines were published in terms of APPA from time to time, the AQA requires the setting of national ambient air quality standards. The initial transition from guidelines to standards took place with the AQA's entry into effect on 11 September 2005. In terms of Section 63 of the AQA, i.e. the transitional provision regarding ambient air quality standards, until ambient air quality standards have been established in terms of section 9, 10 or 11, the ambient air quality standards contained in Schedule 2 to the AQA apply. In this regard, the following process will be implemented to progress from the current transitional standards for ambient air quality contained in Schedule 2 of the AQA to national ambient air quality standards as defined in Paragraph 5.4.3.4:

- **Step 1: Use the National Framework** to define the purpose of ambient air quality standards in order to take the finalisation process regarding ambient air quality standards forward in an efficient and effective manner. The intent of these standards is presented in Paragraph 5.4.3.1.
- **Step 2: Publication of the national ambient air quality standards**, as defined in Paragraph 5.4.3.1, for comment, following the publication of the National Framework by 11 September 2007.
- **Step 3: Formal letters from the Minister** acknowledging comments in respect of his invitation to submit written representation on or objections to his intention to identify substances in ambient air and the establishment of national standards for the permissible amount or concentration of each substance in ambient air.
- **Step 4: Finalisation and publication** of ambient air quality standards based on the comments.

Table 34: Ambient air quality standards related implementation targets

Key milestones	Target date
Submit 2 nd set of ambient air quality standards formulated in accordance with the National Framework with a view to final promulgation	2007/8
Conclude agreement with the SABS on the initiation of a standard setting process for additional national ambient air quality standards.	2007/8
Identify additional pollutants requiring ambient air quality standards.	2008/9

6.2 Scheduled processes to listed activities

The process to convert scheduled process (as defined in APPA) to Listed Activities (as defined in section 21 of the AQA) is described in 5.4.3.5.

Pending the listing of activities by the Minister, the processes identified in the Second Schedule of APPA are regarded as activities listed by the Minister under section 21 of the AQA.

Table 35: Listed Activity related implementation targets

Key milestones	Target date
Draft "Listed Activity" Notice published in the Gazette and a newspaper advert published following the Minister's approval.	2008/9

6.3 APPA emission guidelines to emission standards

The process to convert APPA emission guidelines process (as defined in APPA) to Listed Activities emission standards (as defined in section 21(3) of the AQA) is described in Paragraph 5.4.3.5 (see Table 35 for time frames).

6.4 Registration certificates to Atmospheric Emission Licences (AELs)

The national department is responsible for regulating all industries and other enterprises undertaking so-called "scheduled processes", i.e. processes, listed in the second schedule of APPA which have the potential to release significant quantities of pollutants to the atmosphere. Enterprises are regulated through a system of Registration

Certificates (permits), with certificates being required as authorisation of schedule processes and the operators of such processes being required to meet conditions outlined in the certificate.

The administration of Registration Certificates issued for scheduled processes under APPA by national government is intended to be replaced by the administration of AELs for Listed Activities under the AQA. AELs will be administered by the relevant metropolitan or district municipality unless they have asked the provincial environmental department to do this or when the metropolitan or municipality is the operator of the Listed Activity.

APPA is scheduled to be replaced, in its entirety, by the AQA. On 11 September 2005 various sections of the AQA were put into effect, with the exception of the sections dealing with Listed Activities. APPA will only be repealed once these sections are put into effect.

A process is currently underway to facilitate the conversion of Registration Certificates to AELs, namely the APPA Registration Certificate Review Project. The transitional arrangements in respect of Registration Certificates issued in terms of APPA are detailed in Section 61 of the AQA.

The main objectives of the APPA Registration Certificate Review Project that are relevant to the transition from Registration Certificates to AELs are:

- The compilation of a database of all current Registration Certificates;
- The development and prioritisation of a list of polluters;
- Review and amendment of the Registration Certificates, jointly with provinces and affected municipalities, in order to yield measurable air quality improvements during the APPA to the AQA transition period.

Table 36: APPA repeal related implementation targets

Key milestones	Target date
APPA repealed	2009/10

6.5 Chief Air Pollution Control Officer to Air Quality Officers

In accordance with Section 9 of APPA, the Minister may appoint a Chief Air Pollution Control Officer and inspectors. Section 14 of the AQA makes provision for the designation of Air Quality Officers by the Minister, MEC and the Municipalities.

- An air quality officer must perform the duties or exercise the powers assigned or delegated to that officer in terms of this Act.
- An air quality officer may delegate a power or assign a duty to an official in the service of that officer's administration, subject to such limitations or conditions as may be prescribed by the Minister.
- Air quality officers must coordinate their activities in such a manner as may be set out in the national framework or prescribed by the Minister.

The APPA Chief Air Pollution Control Officer and inspector designations will become null and void with the repeal of the APPA (see Table 36).

7. THE NATIONAL FRAMEWORK REVIEW PROCESS

7.1 Background to the National Framework review process

The publication of the 1st Generation National Framework by 11th September 2007 has meant final inputs from other contributing projects cannot be made at this time. Following the gazetting of the 1st Generation National Framework the document will undergo a twelve month review process. Final outputs of the contributing projects outlined in Section 1.5 will inform the development of the 2nd Generation National Framework. This process will again allow for widespread stakeholder consultation. The 2nd Generation National Framework will then be finalised and established by September 2008.

According to Section 7 (5) of the AQA, the National Framework “must be reviewed by the Minister at intervals of not more than five years”, Section 7 (6) of the AQA continues, “Before publishing the National Framework, or any amendments to the framework, the Minister must follow a consultative process in accordance with sections 56 and 57”. (Section 56 and 57 of the AQA outline the consultative and public participation processes to be considered). To ensure that the National Framework is both efficient and effective it is essential that both the air quality and the governance processes are continually assessed.

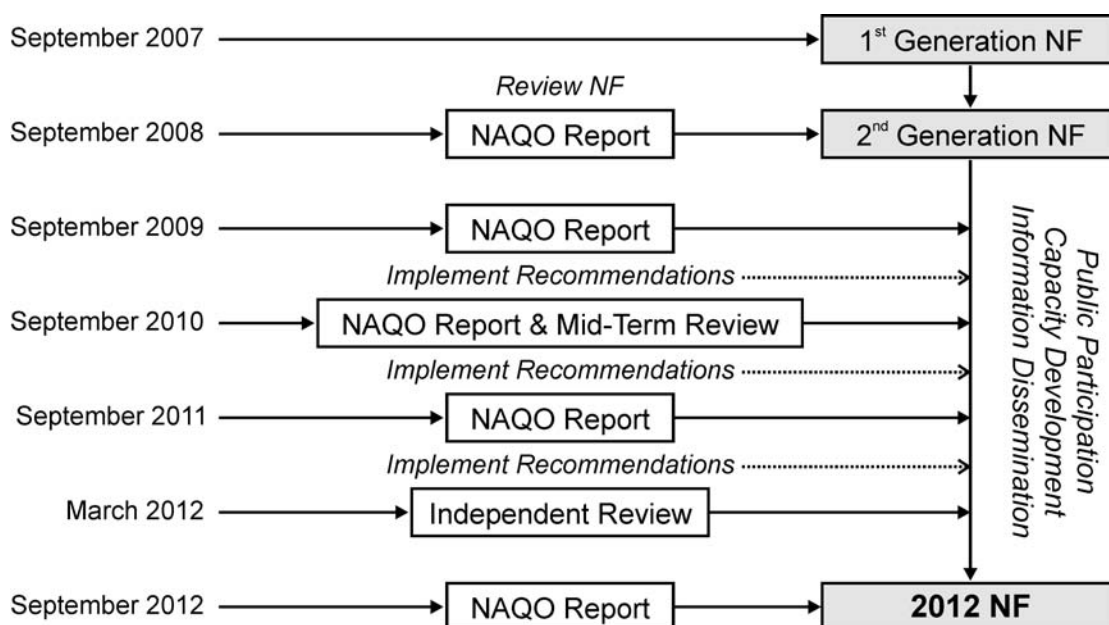


Figure 10: Five year timetable for the National Framework review process

The process of reviewing the National Framework over the next five years will centre on three key activities (see Figure 10):

- The National Air Quality Officer’s Annual Report, including reporting on the National Framework Assessment Indicators and a Mid-Term Review;
- A Mid-Term Review of the National Framework by the national department including input from provincial AQOs and the national reference group (2010); and
- An Independent Review of the National Framework (2012).

7.2 The National Air Quality Officer’s Annual Report

The National Air Quality Officer will report on an annual basis on the progress relating to the implementation of the National Framework (see also 5.2.3.4, page 44). A set of indicators have been established to guide this review (Appendix 2). These indicators will have three basic functions; to simplify, quantify and communicate key information about both the quality of air in South Africa, and the efficacy of the air quality management process itself.

The assessment indicators will be:

- objective;
- scientifically sound;
- easily understandable and explainable;
- able to develop and illustrate trends over time and differences between geographical areas;
- sensitive to the change that they are intended to measure;
- measurable and capable of being updated regularly; and
- based on readily available data and information.

The reports will be issued annually commencing in 2008. The reports will be based on the previous year's assessment indicators but will also allow the reporting of additional information relating to the implementation of the National Framework. The draft report will be presented by the National Air Quality Officer during the Annual Air Quality Governance Lekgotla, with the final report published in December each year.

This report will include:

- a list of new and emerging priority issues collated by air quality officers at a national, provincial and regional level (See Paragraph 7.5.2);
- an identification of recommendations that are required to improve the indicator output;
- recommendations for the development of new indicators or the amendment of existing indicators;
- a commentary by the national department on the recommendations and proposals, and taking appropriate action on these recommendations over the subsequent 12 months.

Table 37: The National Air Quality Officer's Annual Report related implementation targets

Key milestones	Target date
Publication of the National Air Quality Officer's Annual Report	Annually from 2007/8

7.3 Mid-Term review of the National Framework

The second part of the National Framework review process is a Mid-Term Review to be undertaken in 2010 (i.e. half way through the first five years of the National Framework). The Mid-Term Review will be undertaken by the national department and the results will be incorporated into the National Air Quality Officer's Annual Report for 2010.

The Mid-term Review will incorporate a questionnaire survey of the primary air quality professionals involved in the National Framework process. This will include, but not limited to, the members of the National-Provincial AQO forum, the Provincial-Municipal AQO forum and the National Reference Group.

Following the completion and analysis of the questionnaire survey, a series of recommendations will be developed regarding potential modifications to existing practices. The national department will also provide commentary on the recommendations outlined. Thereafter, the conclusions and recommendations of the Mid-Term Review will be reviewed by stakeholders in a workshop format (the 2010 Lekgotla may provide a suitable opportunity). In addition, the workshop group can be used for a Horizon Scanning exercise to further identify any information gaps and future issues for consideration (See Paragraph 7.5.1 for further information on Horizon Scanning).

7.4 Independent Review of the National Framework

The third component of the National Framework review process will be an Independent Review to be completed by March 2012 in order to fulfil the requirements of Section 7(5) of the AQA. The Independent Review must be undertaken by an external contractor to the national department ensuring a neutral and objective assessment of the implementation of the process. The Independent Review of the National Framework will incorporate extensive questionnaire surveys of various stakeholders including, but not limited to, members of the National-Provincial AQO forum, the Provincial-Municipal AQO forum and the National Reference Group, air quality practitioners and other interested parties including representatives of industry, NGOs and civil society groups.

Following the questionnaire surveys and analyses, a number of cases will be identified and case studies (including interviews) will be undertaken in order to provide a complete assessment of the key drivers, barriers, opportunities and information gaps in the management and implementation of the National Framework process. A final Independent Review report will be completed and submitted to the national department for comment in time for any potential redrafting of the National Framework in 2012.

The review of the National Framework in 2012 will incorporate:

- all of the beneficial aspects and lessons learned in the current National Framework development and consultation phases;
- all recommendations generated over the previous 5 years in the National Framework Indicator Assessment Reports, the Mid-Term Review and the Independent Review;
- an assessment of the review process itself.

As stated in Section 7(6) of AQA, before publishing the National Framework, or any amendments to the framework, the Minister must follow a consultative process in accordance with Section 56 and Section 57 of AQA. At these consultative stages there is also the opportunity to include a Horizon Scanning exercise to further identify any information gaps and future issues for consideration. The 2012 version of the National Framework will include an outline for the future review process in the subsequent 5 years incorporating the lessons learned in 2007-2012 review timescale.

7.5 The future

The review process outlined in the previous section clearly establishes the principle of ongoing change within the National Framework. In addition to the identification of improvements and refinements that can be made to the process, the success of the process itself will lead to further needs to change and adapt the National Framework. Firstly, as the Framework process leads to a more detailed assessment and analysis of air pollution in South Africa the development in air pollution science will potentially highlight new sources or other problems that were previously unseen and need to be taken into account by the National Framework. Secondly, as improvements are made to air quality by reductions in key primary pollutants and the targeting of issues that are relatively easily addressed, the significance of other pollutants (particularly secondary pollutants) will increase and the focus of the National Framework may need to be adjusted accordingly.

7.5.1 Horizon Scanning

In order that new and emerging issues can be identified and remedial actions formulated before they become problematic, it is useful to engage in the process of 'Horizon Scanning'. Horizon Scanning allows proactive rather than reactive development and delivery of preventative and adaptive policies and strategies. Horizon Scanning also provides the opportunity for the National Framework to remain abreast with international air quality management techniques, science and research. Horizon Scanning is a structured procedure for identifying issues and prioritising them according to their importance and relevance. It is based on risk assessment and ranks issues numerically according to their perceived scale, probability, trend, degree of recognition and potential impacts. The outcomes from Horizon Scanning exercises can be categorised as, for example, low probability but high consequence events such as pollution arising from extreme weather conditions, or alternatively high probability and high consequence events such as pollution from increased motor vehicle usage in urban areas.

As outlined above, a Mid-Term Review and an Independent Review of the National Framework will be undertaken. It is at these stages that new and emerging issues can be highlighted for further study. The consultation workshops at the Mid-Term (2010) and Independent Review (2012) stages will include Horizon Scanning by relevant stakeholders including air quality practitioners and other stakeholders such as industry and the general public. All of the air quality issues that have been identified during the development of the 1st and 2nd Generation National Frameworks but have not been prioritised for action can be readdressed and reconsidered in 2012 for inclusion in the next generation of the National Framework. Additionally, new and emerging issues can be logged and discussed at any stage by AQOs, air quality practitioners and members of the public through appropriate Air Quality Forums e.g. training events, awareness-raising events, municipal/provincial meetings etc. AQOs at municipal, provincial and national levels are responsible for maintaining an evolving list of priority and emerging issues. This list can be published annually in the annual National Framework Indicators Assessment Report.

7.5.2 Potential Issues for Future Development

Possible future issues and research priorities identified to date include but are not limited to:

- Consideration of new or emerging pollutants, their impact on health and the establishment of health-based objectives;
- Consideration of existing, new and/or emerging pollutants, their impact on the environment and ecosystems and the establishment of appropriate objectives;
- Development of proactive management of future potentially problematic sources (e.g. new fuels).
- Consideration of policies and strategies to address both climate change and air pollutant emissions to deliver co-benefit solutions;
- Investigation of trans-boundary air pollution sources and their impacts on South Africa;
- Development of strategies to deal with ambient concentrations of heavy metals and POPs, their impact and the establishment of suitable objectives;
- Development of strategies for tackling nuisance pollutants such as odours and dust and the establishment of guidelines and objectives for effective management.

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ABBREVIATIONS

AEL	Atmospheric Emission Licence
APPA	Atmospheric Pollution Prevention Act (Act No. 45 of 1965).
AQA	National Environmental Management: Air Quality Act (Act No. 39 of 2004).
AQMP	Air Quality Management Plan
AQO	Air Quality Officer
BAT	Best Available Technology/Technique
BPEO	Best Practical Environmental Option
CAPCO	Chief Air Pollution Control Officer
CBA	Cost-Benefit Analysis
CDM	Clean Development Mechanism
DDT	Dichlorodiphenyltrichloroethane
DEAT	The Department of Environmental Affairs and Tourism
DME	Department of Minerals and Energy
DoA	Department of Agriculture
DoE	Department of Energy
DoH	Department of Health
DoL	Department of Labour
DoLA	Department of Land Affairs
DoT	Department of Transport
DPLG	Department Provincial and Local Government
DWAF	Department of Water Affairs and Forestry
EIA	Environmental Impact Assessment
EIP	Environmental Implementation Plan as defined in the NEMA
EMIs	Environmental Management Inspectors
EMP	Environmental Management Plan as defined in the NEMA
GHGs	Greenhouse Gases
IDP	Integrated Development Plan
IP&WM	Integrated Pollution and Waste Management
MEC	Member of the provincial Executive Council
MINMEC	A standing intergovernmental body consisting of at least a Cabinet member and members of the provincial Executive Councils responsible for functional areas similar to those of the Cabinet member
NACA	National Association for Clean Air
NEAF	National Environmental Advisory Forum as defined in the NEMA.
NEMA	National Environmental Management Act (Act No. 107 of 1998).
NEPAD	New Partnership for Africa's Development.
NGOs	Non-Governmental Organizations
PM	Particulate matter
POPs	Persistent Organic Pollutants
QA	Quality assurance

QC	Quality control
RoD	Record of Decision in respect of an environmental impact assessment application
SAAQIS	South African Air Quality Information System
SABS	South African Bureau of Standards
SADC	Southern African Development Community
SAQA	South African Qualifications Authority
STANSA	Standards South Africa
UNFCCC	United Nations Framework Convention on Climate Change, adopted in New York on 9 May 1992
VOCs	Volatile Organic Compounds
WHO	World Health Organization

GLOSSARY AND DEFINITIONS

Air Quality Management Plan	means a plan referred to in section 15 of AQA
Air Quality Officer	means an officer appointed in terms of section 14 of AQA as an air quality officer
Ambient air quality standards	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
Atmospheric Emission Licence	means an atmospheric emission licence contemplated in Chapter 5 of AQA
Bioaccumulation	occurs when an organism absorbs a toxic substance at a rate greater than that at which the substance is lost, i.e. it accumulates the substance over time. Thus, the longer the biological half- life of the substance the greater the risk of chronic poisoning, even if environmental levels of the toxin are very low.
Clean technology	includes the wind power, solar power, biomass, hydropower, biofuels, information technology, electric motors, lighting, and many other appliances that are now more energy efficient.
Clean fuels	any fuel that does not contain heavy metals and having a maximum benzene content of 3%, aromatics content of 42%, sulphur level of 500ppm and a maximum of oxygenate content of ethers and selected alcohols of less than 2.7%. Diesel that contains less than 500ppm of sulphur will also be included
Controlled emitter	means any appliance or activity declared as a controlled emitter in terms of section 23 of AQA
Controlled fuels	means any fuel as defined under Section 26 of AQA
Cost- Benefit Analysis	the process that involves weighing the total accepted costs against the total expected benefits in order to choose the best option
Ecological degradation	is related to the deterioration of the environment both in terms of quantity and extinction of some wildlife species and quality like air, water or land pollution
Emission inventory	a listing or register of the amount of pollution entering the atmosphere from all sources within a given time and geographic boundaries
Emission standard	a specific limit to the amount of pollutant that can be released to the atmosphere by a specified source
Environmental Management Systems	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
Fugitive sources	sources of emissions that are difficult to identify and quantify. As the name implies, fugitive emissions include gases that “escape” from badly managed or maintained processes, e.g. leaky pipe-work
Greenhouse gases (GHG)	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
Homologated	an item that is accredited or approved by an authority
ISO 14001	a system of environmental management standards that assist organisations to minimise the negative impacts, aid compliance and facilitate continual improvement
Listed activity	means any activity listed in terms of section 21 of AQA
Mitigation measures	efforts to attempt to prevent pollution or to reduce the effects of pollution that occur

Mobile source	means a single identifiable source of atmospheric emission which does not emanate from a fixed location
Non-point source	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
Offensive odour	means any smell which is considered to be malodorous or a nuisance to a reasonable person
Ozone- depleting substance	means a substance having chemical or physical properties which, by its release into the atmosphere, can cause a depletion of the stratospheric ozone layer; i.e. chlorofluorocarbon (CFC) compounds, commonly called freons, and of bromofluorocarbon compounds known as halons CFCs, halons and other contributory substances are commonly referred to as ozone- depleting substances
Persistent organic pollutants (POPs)	organic compounds that are resistant to environmental degradation through chemical, biological, and photolytic processes. Because of this, they have been observed to persist in the environment, to be capable of long-range transport, bioaccumulate in human and animal tissue, bio-magnify in food chains, and to have potential significant impacts on human health and the environment i.e. aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex, polychlorinated biphenyls, polychlorinated dibenzo-p-dioxins, polychlorinated dibenzofurans, and toxaphene.
Point source	means a single identifiable source and fixed location of atmospheric emission, and includes smoke stacks and residential chimneys
Priority area	means an area declared as such in terms of section 18 of AQA
Priority area air quality management plan	means a plan referred to in section 19 of AQA
Provisional atmospheric emission licence	means a provisional atmospheric emission licence contemplated in Chapter 5 of AQA
Quality assurance and control	activities that determine the level of confidence in produced data and reduce error
Stratospheric ozone depletion	describes the observable decline of stratospheric ozone layer as a result of anthropogenic activities
Sustainable development	Balancing the fulfilment of human needs with the protection of the natural environment so that these needs can be met not only in the present, but in the indefinite future. The term was used by the Brundtland Commission which coined what has become the most often quoted definition of sustainable development as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs.

APPENDIX 1: DEAT'S AIR AND ATMOSPHERIC QUALITY PUBLICATIONS

A. THE GENERAL INFORMATION SERIES			
TARGET AUDIENCE: The General Public, specifically senior school learners and undergraduates			
No.	Title	Description	Scheduled publication date / status
A.1	<i>The National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) and the Air Quality Act Companion - South Africa's new air quality management legislation and an insight into the thinking that informed the legislation.</i>	The Act and an explanation of new and/or novel provisions of the Act.	2007/8
A.2	<i>Air and Air Quality - A source Book of Ideas, Information and Activities related to air and air pollution</i>	An information booklet published in May 2003 that was developed by the department, Share-net, EJNF, WWF, Rhodes University and teachers in KZN to support teachers in the Senior Phase (Grade 7 - 9)	Available
A.3	<i>Montreal protocol - The ozone depletion story and the measures taken towards the protection of the ozone layer in South Africa</i>	A general introductory information booklet.	Available
A.4	<i>Why we need to Manage Air Quality - An introduction to the health, environmental and economic impacts of air pollution</i>	This booklet will deal with, among others: (i) early history of air pollution problems; (ii) hazardous effects of air pollutants on the human body; (iii) air pollution and entry into the human body; (iv) health effects of selected pollutants; (v) health effects of toxic air pollutants; (vi) links between pollution and health; (vii) environmental effects of air pollution; and (viii) the economic impact of poor air quality.	2007/8
A.5	<i>An introduction to Air Quality Management</i>	This booklet will deal with, among others: (i) developing an air quality management program – traditional approaches to air quality management (point source emission controls), new approaches to air quality management (ambient standards, management of priority pollutants); (ii) strategies (air quality management, emission standards, emission taxes, cost-benefit strategies, non-degradation strategy, emission density strategy; (iii) overview of major components of an AQM System (Laws and Regulations, Setting Air Quality Goals, Pollutant Sources, Emission Inventory, Monitoring, Modelling, Data Analysis and Interpretation for Decision Makers, Public Access to Information, Control Strategy Planning and development, Pollution Prevention, Compliance and Enforcement, Public Participation and Environmental Justice.	2007/8
A.6	<i>An Introduction to the Types and Sources of Air Pollutants</i>	This booklet will deal with, among others: (i) Mobile Sources of Air Pollutants (Type/Nature of Sources, Pollutants Emitted, South Africa's Specific Sources and "Hot Spots"); (ii) Stationary Sources; (iii) Biogenic Sources; (iv) Fugitive Sources; (v) Area Sources.	2007/8
A.7	<i>An Introduction to Air pollution sources, dispersion and effects</i>	This booklet will provided an introduction to topics like: (i) Air pollution meteorology and dispersion; (ii) Plume behaviour; (iii) Effects of topography on wind flow; and (iv) Effects of stack height and emission on dispersion.	2008/9
A.8	<i>An Introduction to Air Quality Management</i>	This booklet aims to provide the reader with an introduction to air quality management systems in the context of APPA and the AQA. It also reviews some more traditional air quality management strategies and evaluates the advantages and disadvantages of these.	2007/8
A.9	<i>Climate Change and International Agreements</i>	This booklet aims to provide the reader with an introduction to the basics of climate change theory as well as the policies, legislation and international agreements that have been formulated to respond to these impacts.	2007/8

B. THE SPECIALIST INFORMATION SERIES			
TARGET AUDIENCE: Under- and post-graduate students and practising professionals			
No.	Title	Description	Scheduled publication date / status
B.1	<i>Types and Sources of Air Pollutants</i>	This booklet will deal with, among others: (i) expressions of gaseous compounds; (ii) averaging times; (iii) gaseous compounds of carbon (carbon monoxide); (iv) gaseous compounds of sulphur (sulphur dioxide, sulphur trioxide, sulphides, sulphuric acid); (v) gaseous compounds of nitrogen (nitric oxide, nitrogen dioxide, nitrous oxide, PAN); (vi) volatile organic compounds (alkanes, alkenes (olefins), aromatic hydrocarbons, oxygenated hydrocarbons, terpenes; (vii) ozone; (viii) aerosols; and (ix) trace metals (lead, mercury, cadmium, arsenic).	2007/8
B.2	<i>Air Pollution Meteorology</i>	This booklet will deal with, among others: (i) Vertical Dispersion (Lapse Rates, Determination of Atmospheric Stability, Variations in Environmental Lapse Rate, Indicators of Stability; (ii) Horizontal Dispersion (Global Scale, Synoptic Scale, Local Scale, Vertical Profile of Wind); and (iii) Air Pollution Climatology.	2007/8
B.3	<i>Atmospheric Modelling</i>	This booklet will deal with, among others: (i) Needs/Purpose of Modelling; (ii) Data Requirements; (iii) Limitations and Assumptions; (iv) Application Areas of Air Pollution Models (Regulatory Purposes, Policy Support, Public Information, Scientific Research); (v) Air Pollution Model; (vi) Meteorological Models; (vii) Air Pollution Models used for the Different Scales of Atmospheric Processes; (viii) Quality Assurance of Air Pollution Models, Model Validation and Evaluation; and (ix) Trends in Air Pollution Modelling.	2007/8
B.4	<i>Air Pollution control approaches</i>	This booklet will deal with, among others: (i) Theory of pollution control approaches in industry; (ii) Control approaches for transportation; and (iii) Control approaches for residential emissions.	2007/8
B.5	<i>Impacts of air pollution</i>	This booklet will deal with, among others: (i) Effects of air pollution on human health; and (ii) Effects of air pollution on ecological systems.	2007/8
B.6	<i>Multilateral Environmental Agreements and the Air Quality Act</i>	An introduction to the possible use of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) in addressing South Africa's commitments in respect of atmospheric quality related international agreements.	2008/9
B.7	<i>Air Pollution Dispersion and Topographical Effects</i>	This booklet will deal with how the atmosphere behaves with a view to creating an understanding of the movement of pollutants and hence the determination of concentrations at particular locations, including: (i) The vertical movement of pollutants and atmospheric stability; (ii) the horizontal movement of pollutants and wind speed and direction; (iii) chemical transformation of pollutants in the atmosphere and solar radiation and moisture; and (iv) removal of pollutants from the atmosphere and precipitation.	2007/8
B.8	<i>The State of the Air Report 2006</i>	A comprehensive document detail current air quality knowledge in South Africa. A document that will effectively be used as the base-line for measuring the impact of interventions made in terms of the AQA.	2007/8

C. THE GOVERNANCE INFORMATION SERIES		
TARGET AUDIENCE: Government air quality managers		
No.	Title	Scheduled publication date / status
C.1	<i>Regulating the Trans-boundary Movement of Ozone-Depleting Substances - Training and Resource Materials for Customs Officials (A file containing: (i) South Africa: Customs Handbook (Training Manual) - Ozone Depleting Substances; (ii) Illegal Trade in Ozone Depleting Substances (OzonAction); (iii) Controlling the ODS Trade (EIA); (iv) Unfinished Business (EIA); (v) Lost in Transit (EIA)).</i>	Available
C.2	<i>Air Quality Management in identified Priority Areas - An Implementation Manual for Air Quality Officers</i>	Draft available
C.3	<i>Air Quality Management Planning and Reporting - An Implementation Manual for Air Quality Officers</i>	2007/8
C.4	<i>Atmospheric Emission Licensing - An Implementation Manual for Air Quality Officers</i>	2007/8
C.5	<i>Air Quality Monitoring - An Implementation Manual for Air Quality Officers</i>	2007/8
C.6	<i>Air quality compliance and enforcement - An Implementation Manual for Air Quality Officers</i>	2008/9
C.7	<i>Regulating Controlled Emitters - An Implementation Manual for Air Quality Officers</i>	2008/9
C.8	<i>Regulating Controlled Fuels - An Implementation Manual for Air Quality Officers</i>	2008/9
C.9	<i>The Air Quality Officers Handbook</i>	2008/9
C.10	<i>Urban Air Quality Management Strategies - Best Practice and case studies</i>	2008/9
C.11	<i>Mitigating pollution from residential fossil-fuel combustion - Best Practice and case studies</i>	2008/9

D. THE CLEANER PRODUCTION SERIES		
TARGET AUDIENCE: Government Air Quality Managers and EIA assessors, Emission Control Officers, industrial process engineers and factory managers		
No.	Title	Scheduled publication date
D.1	<i>Air Pollution Control and Brickworks - Best Practice and Best Available Technology</i>	2008/9
D.2	<i>Air Pollution Control and small industrial boilers - Best Practice and Best Available Technology</i>	2009/10
D.3	<i>Air Pollution Control and...</i>	
D.4	<i>Air Pollution Control and...</i>	
D.5	<i>Air Pollution Control and ...</i>	

APPENDIX 2: INDICATORS TO BE INCLUDED IN THE NATIONAL AQO'S ANNUAL REPORT

No.	Indicator	Baseline, July 2007	Target	Date
1.	Problem Identification and Prioritisation			
1.1	Number of pollutants with associated ambient air quality standards	7	8	2007/8
1.2	Initial set of Listed Activities identified with associated minimum emission standards	0		2008/9
1.3	Number of National Priority Areas declared	1	2	2007/8
1.4	Number of Provincial Air Quality Areas declared	0	2	2008/9
1.5	Number of metros and district municipalities with air quality that does not conform to ambient air quality standards	28	0	2019/20
1.6	Number of Controlled Emitters declared	0	2	2008/9
1.7	Number of Controlled Fuels declared	0	2	2008/9
2.	Strategy development			
2.1	Number of National Priority Area Air Quality Management Plans under implementation	0	2	2008/9
2.2	Number of Provincial Priority Area Air Quality Management Plans under implementation	0	2	2009/10
2.3	Number of municipalities with Air Quality Management Plans in place	5	28	2009/10
2.4	Strategy for addressing air pollution in dense, low-income settlements published	0	1	2008/9
3.	Standard-setting			
3.1	Submit 2 nd set of ambient air quality standards formulated in accordance with the National Framework with a view to final promulgation	0	1	2007/8
3.2	Conclude agreement with the SABS on the initiation of a standard setting process for additional national ambient air quality standards.	0	1	2008/9
3.3	Identify additional pollutants requiring ambient air quality standards.	0	4	2008/9
3.4	Number of pollutants with associated ambient air quality standards	7	8	2007/8
3.5	Initial set of Listed Activities identified with associated minimum emission standards	0		2008/9
3.6	Number of Controlled Emitters and associated standards declared	0	2	2008/9
3.7	Number of Controlled Fuels and associated standards or prohibitions declared	0	2	2008/9
4.	Awareness-raising			
4.1	Number of air quality related publications available	4	10	2009/10
5.	Air Quality Impact Management			
5.1	Number of National Priority Area Air Quality Management Plans under implementation	0	2	2008/9
5.2	Number of Provincial Priority Area Air Quality Management Plans under implementation	0	2	2009/10
5.3	Number of Cleaner Production best practise guidelines published	0	2	2009/10
5.4	Regulation in respect of the prescribed form for Atmospheric Impact Report (Section 30 of the AQA)	0	1	2007/2008
6.	Atmospheric Emission Licensing			
6.1	Atmospheric Emission Licensing manual published	0	1	2008/9
6.2	Number of provincial and municipal officials trained in the use of the Atmospheric Emission Licensing manual	0	100	2008/9
6.3	Number of provincial and municipal officials participating in the APPA Registration Certificate Review process	0	100	2008/9
6.4	Licence fee protocol and implementation manual published	0	1	2008/9
6.5	Number of municipal CAPCOs designated as part of the APPA-AQA transition process	0	3	2009/10
6.6	Number of APPA Registration Certificates reviewed and converted to the AEL format	0	100	2008/9
6.7	APPA repealed			2009/10
7.	Compliance Monitoring			
7.1	Number of government ambient air quality monitoring stations	37	50	2011/12
7.2	Number of EMIs trained in air quality compliance monitoring	0	200	2011/12
7.3	Number of continuous stack emission monitoring reports submitted	0	72	2011/12
8.	Enforcement			
8.1	Number of EMIs designated	900	1200	2011/12
8.2	Model air pollution control by-laws	0	1	2007/08

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No.	Indicator	Baseline, July 2007	Target	Date
9.	Information management (the SAAQIS)			
9.1	Ambient data report/view generating module	0	1	2009/10
9.2	Ambient monitoring station description	0	1	2009/10
9.3	Ambient raw data import module	0	1	2011/12
9.4	Ambient data validation module	0	1	2011/12
9.5	Ambient data assessment	0	1	2011/12
9.6	Ambient data export module	0	1	2011/12
9.7	Municipal emission inventories	0	1	2009/10
9.8	Greenhouse Gas Inventory	0	1	2009/10
9.9	Emission data reporting module	0	1	2015/16
9.10	Emission data report/view generating module	0	1	2015/16
9.11	Emission monitoring archive	0	1	2015/16
9.12	Emission data import module	0	1	2016/17
9.13	Emission data assessment module	0	1	2016/17
9.14	Emission data export module	0	1	2016/17
9.15	Database of Listed Activities	0	1	2008/9
9.16	All current policy and legislation available	0	1	2007/8
9.17	Air quality scientific literature resource library	0	1	2009/10
9.18	Norms and standards for air quality information management	0	1	2009/10
9.19	All current available AQMPs	0	1	2009/10
9.20	Support centre/help desk	0	1	2009/10
9.21	Guidelines documents	0	1	2009/10
9.22	AQ media archive	0	1	2016/2017
9.23	Interactive training module	0	1	2016/2017
9.24	Key stakeholder database	0	1	2016/2017
10.	Climate change response			
10.1	Long term mitigation scenario process finalised	0	1	2008/9
10.2	Climate change policy development process initiated	0	1	2007/8
10.3	Sectoral CC mitigation and/or adaptation plans in place	0	1	2009/10
10.4	National communications under the UNFCCC	0	1	2008/9