Western Cape Government
Environmental Affairs & Development Planning

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Western Cape Air Quality Management Plan

Air Quality Management Plan 2016

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Environmental Affairs and Development Planning

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CONTENTS

ACRONYMS

ACSA	Airports Company South Africa
AEL	Atmospheric Emission Licence
APPA	Atmospheric Pollution Prevention Act (No. 45 of 1965)
AQMP	Air Quality Management Plan
AQM	Air Quality Management
AQO	Air Quality Officer
AQOF	Air Quality Officer's Forum
CCT	City of Cape Town
CKDM	Central Karoo District Municipality
CH_4	Methane
COP	Conference of the Parties
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide equivalent
CWDM	Cape Winelands District Municipality
DEROs	Desired Emission Reduction Outcomes
DoE	Department of Energy
DEA	Department of Environmental Affairs
DEA&DP	Department of Environmental Affairs and Development Planning
DoT	Department of Transport
EDM	Eden District Municipality
EMI	Environmental Management Inspector
GHG	Greenhouse Gas
GN	Government Notice
GSB-IGTT	Greater Saldanha Bay Inter-Governmental Task Team
H_2S	Hydrogen Sulphide
IDP	Integrated Development Plan
IDZ	Industrial Development Zone
IGTT	Inter-Governmental Task Team
IRP	Integrated Resource Plan

MEC	Member of the Executive Council
NAAQS	National Ambient Air Quality Standards
NAEIS	National Atmospheric Emissions Inventory System
NEMA	National Environmental Management Act (No. 107 of 1998)
NEM: AQA	National Environmental Management Air Quality Act (No. 39 of 2004)
N_2O	Nitrous Oxide
NO_2	Nitrogen Dioxide
NO_x	Nitric Oxides
O_3	Ozone
ODM	Overberg District Municipality
PAEL	Provisional Atmospheric Emission Licence
PERO	Provincial Economic Review and Outlook
PM	Particulate Matter
PM_{10}	Particulate matter with an aerodynamic diameter of 10µm and smaller
$PM_{2.5}$	Particulate matter with an aerodynamic diameter of 2.5µm and smaller
PPP	Public Participation Process
SAAELIP	South African Atmospheric Emission Licensing and Inventory Portal
SAAQIS	South African Air Quality Information System
SBIDZ	Saldanha Bay Industrial Development Zone
SEA	Strategic Environmental Assessment
SEMA	Specific Environmental Management Act
SNAEL	System National Atmospheric Emission Licensing
SO_2	Sulphur Dioxide
StatsSA	Statistics South Africa
UNFCCC	United Nations Framework Convention on Climate Change
US EPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds
WCDM	West Coast District Municipality
WHO	World Health Organization

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View of Table Mountain covered in clouds at sunset, South Africa

FOREWORD

It gives me great pleasure to present to you the 2nd Generation Western Cape Air Quality Management Plan. It has been 5 years since the Province's very first Air Quality Management Plan 2010 was adopted for implementation. During the past 5 years, the air quality management fraternity in the Western Cape has grown from strength to strength, with Licensing Authorities taking on the all-important task of regulating Section 21 Listed Activities in terms of the National Environmental Management: Air Quality Act (No. 39 of 2004; NEM: AQA).

Following 5 years of the Plan's implementation, this 2nd Generation Western Cape Air Quality Management Plan is the culmination of a review process that involved authorities and stakeholders across the Province during 2015 and 2016.

The 2nd Generation Western Cape Air Quality Management Plan's vision of "Clean and healthy air for all in the Western Cape" can only be met when emissions from industry, commercial activities and communities are monitored, regulated where required and managed. Air quality awareness raising will be a key focus for the Department during the next 5 years, especially in terms of linking it to climate change mitigation and adaptation activities. As both the population and per capita energy consumption are anticipated to increase in the Western Cape, this linkage will be all-important in terms of reducing greenhouse gas emissions in the Province.

Air emissions are closely linked with the burning of fossil fuels which not only increases the accumulation of greenhouse gases, but also results in carbon monoxide, sulphur dioxide, nitric oxides and volatile organic compounds being emitted. Increased air emissions poses a risk to human health and the environment. Therefore, reducing such emissions will likely have ancillary benefits such as slowing the pace of climate change.

Sustainable economic growth and development is all-important in the Western Cape; as such, this Department will continue to work closely with all Municipalities in the Western Cape to fulfil their mandatory obligation in terms of the NEM: AQA. This 2nd Generation Western Cape Air Quality Management Plan provides the "blue-print" upon which the Department and Municipalities will continue to effectively and efficiently implement air quality management in the Province over the next few years, to continually ensure good air quality for our children and future generations.

ANTON BREDELL

Minister of Local Government, Environmental Affairs and Development Planning

MESSAGE FROM THE HEAD OF DEPARTMENT

It has been 12 years since the promulgation of the National Environmental Management: Air Quality Act (No. 39 of 2004; NEM: AQA) and six years since its full implementation. With the full implementation of the NEM: AQA, authorities in the Western Cape have embraced the changes to the legislation and have been implementing all air quality management functions, as well as the Atmospheric Emission Licensing system. At present, a total of 43 Provisional Atmospheric Emission Licences and 73 final Atmospheric Emission Licences have been issued since 01 April 2010, when the function was devolved to the Provincial Departments, and Metropolitan and District Municipalities. All licenses are actively being regulated by the Licensing Authorities in the Western Cape.

Moreover, the Province has seen a total of 12 Municipal By-laws published so that Municipalities can further regulate air quality in the regions. In addition, the DEA&DP has published the Western Cape Noise Control Regulation on 20 June 2013 (P.N. 200/2013), which have largely assisted our Municipalities to regulate and manage noise pollution in their areas. Most Municipalities have adopted their Air Quality Management Plans and have designated Air Quality Officers to ensure that air quality in their regions are managed effectively and efficiently so that we can continue to breathe good quality air in the Province.

The next few years will be the "litmus test" for our Province's Air Quality Officers as they further implement the 2nd Generation Air Quality Management Plan, while strengthening co-operative governance, not only between authorities, but also with industry and communities, in terms linking air quality and climate change mitigation and adaptation interventions, while also raising awareness thereof. As we know, the severity of the linkage has been likened to being a "dangerous pair", with air quality in many parts of the world anticipated to worsen due to climate change. Therefore, our industries, as well as our communities plays an important role in reducing greenhouse gases and air pollution; and hence indirectly aid in reducing the impact of climate change on society.

Good progress has been made. However, I call upon your continued interest in the environment. Together, we can do better to ensure that we find a balance between air quality management and sustained growth and development, so that we can continue to breathe good, clean air in the Western Cape.

PIET VAN ZYL

Head of Department: Environmental Affairs and Development Planning

MESSAGE FROM THE PROVINCIAL AIR QUALITY OFFICER: WESTERN CAPE

The Western Cape Government, through the Department of Environmental Affairs and Development Planning both implements systems and provides an oversight role in the Province with respect to air quality management. In line with the NEM: AQA, the 1st Generation Western Cape Air Quality Management Plan 2010 was adopted to manage air quality in the Province.

During the early years of the Plan's implementation the Department focused on putting in place systems to manage air quality in the Western Cape, whilst co-ordinating and overseeing air quality management activities at Municipalities across the Province. Great strides have been made in terms of monitoring ambient air quality in the Province; the Western Cape's Ambient Air Quality Monitoring Network currently has 11 ambient air quality monitoring stations operated by the Department, while 13 are operated by the City of Cape Town and 2 are operated by the Saldanha Bay Municipality. The air quality monitoring data provides important information for use in airshed planning, which is a crucial part of the Western Cape Government's work to improve air quality.

In implementing the 2nd Generation Air Quality Management Plan, the Department aims to assess and link the current air quality status or "air carrying capacity" vs future air quality requirements with spatial planning, as well as growth and development in the Province during the next few years. This will be integrally linked to air quality management planning and the atmospheric emission licensing system, which is being implemented by the Department, City of Cape Town and District Municipalities in the Province.

The Department will also continue to have regular engagements with regulated facilities in the Province in respect of their Atmospheric Emission Licence conditions, undertake compliance inspections and explore new regulations to control problematic sources of air pollution in the Province; of course, all of this will be jointly undertaken with Municipal Air Quality Officers in the respective regions.

As climate change is all important and integrally links to air quality management, we will continue to work closely with our climate change colleagues at all spheres of government to strengthen climate change mitigation and adaptation interventions so that, as a country, we can meet our international agreements, as per the NEM: AQA.

The next 5 years will focus on building stronger partnerships between all authorities to ensure that limited resources are used effectively to manage air quality so that the air that we breathe continues to remain good for future generations. Most importantly, however, partnerships will be strengthened with industry so that our youth can follow careers that link to improving air quality management in the workplace, while partnerships with communities will be explored to raise awareness of air quality management and to further the notion of "citizen science and air quality".

JOY LEANER (PhD)

Provincial Air Quality Officer: Western Cape

Photograph by: Mellisa Naiker | DEA&DP Competition 2016/17

OUTLINE

2ND GENERATION WESTERN CAPE AIR QUALITY MANAGEMENT PLAN

CHAPTER 1:
INTRODUCTION

Chapter one provides a background to the challenges of air quality and climate change.

CHAPTER 2:
AIR QUALITY MANAGEMENT AND CLIMATE CHANGE

Chapter two explains the legislative and policy developments in respect of air quality management and climate change in South Africa.

CHAPTER 3:
REVIEW OF THE WESTERN CAPE AIR QUALITY MANAGEMENT PLAN 2010

Chapter three provides an overview of the Public Participation Workshops, which the DEA&DP has conducted as part of the review of the Western Cape AQMP2010.

CHAPTER 4:
AIR QUALITY IN THE WESTERN CAPE: A PROVINCIAL, NATIONAL AND INTERNATIONAL AIR QUALITY ASSET

Chapter four provides a summary of the situational analysis in respect of air quality management in the Western Cape, inclusive of the progress made during the implementation of the Provincial AQMP2010 and those of the Municipal AQMPs, where adopted; Air Quality Officer designation in the Province; the quarterly Western Cape Provincial Air Quality Officer's Forums; the status of ambient air quality monitoring and inventories; as well as air quality compliance and enforcement programmes.

CHAPTER 5:
GAPS AND RECOMMENDATIONS

This chapter identifies the gaps and recommendations made in terms of managing air quality in the Western Cape. The recommendations are addressed in this 2nd Generation Western Cape Air Quality Management Plan.

CHAPTER 6:
2ND GENERATION WESTERN CAPE AIR QUALITY MANAGEMENT PLAN

Chapter six provides the Vision, Mission, Goals and Action Plan of the 2nd Generation Western Cape Air Quality Management Plan.

CHAPTER 7:
APPENDICES

This chapter provides Appendices that are pertinent to the 2nd Generation Western Cape Air Quality Management Plan.

CHAPTER 8:
REFERENCES

This chapter provides the references included in the 2nd Generation Western Cape Air Quality Management Plan.

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1

INTRODUCTION

The Western Cape has embraced and fully implemented the roles and responsibilities of air quality management, as assigned to it through the National Environmental Management: Air Quality Act (Act No. 39 of 2004; NEM: AQA) and as spelt out in the National Air Quality Management Framework 2007, as amended in 2012 (DEA, 2013). It has been 12 years since the promulgation of the NEM: AQA, and six years since its full implementation. As such, air quality management in South Africa has undeniably grown from being an "infant" to that of an "adolescent" during the past few years.

With the full implementation of the NEM: AQA, it became clear that various regulations and policies were required to further advance the management of air quality in the country. Various regulations and policies have been developed, while various amendments to the NEM: AQA have been made over the past six years. The new regulatory and policy developments in respect of the NEM: AQA place South Africa and the Provinces on a good trajectory towards managing air quality to ensure the health and well-being of the citizens of the country and our environment.

It is anticipated that air quality in many parts of the world will worsen due to climate change, and hence worsen the impact on public health (US EPA, 2009). It has also been reported that "air pollution is among the most serious of indirect health effects of climate change" and that "climate change and air pollution make a dangerous pair" (The Lancet, 2015). The concoction of priority pollutants and greenhouse gases (GHGs) such as carbon dioxide (CO_2), methane (CH_4), volatile organic compounds (VOC), nitrous oxide (NO_x) and particulate matter (PM) make for a dangerous interaction that potentially impact human health and the environment (The Lancet, 2015). An increase in priority pollutant and GHG emissions therefore has a direct effect on air quality and climate change.

South Africa announced its voluntary commitment to reduce its GHG emissions at the United Nations Framework Convention on Climate Change's (UNFCCC) 15th Conference of the Parties (COP 15) negotiations in December 2009. This commitment is reflected in the Copenhagen Accord made by the Parties to the Convention and the Kyoto Protocol and provides political direction to international climate change negotiations. South Africa committed to take nationally appropriate CO_2 mitigation action to enable the following:

- a 34% deviation below the "Business-as-Usual" emissions growth trajectory by 2020; and
- a 42% deviation below the "Business-as-Usual" emission growth trajectory by 2025.

The National Department of Environmental Affairs (DEA) has recognised that "the extent to which this action will be implemented depends on financial resources, the transfer of technology and capacity building support by developed countries. The action requires the finalisation of an ambitious, fair, effective and binding multilateral agreement under the UNFCCC."

In response to its commitments, South Africa's National Climate Change Response White Paper (DEA, 2011) outlines the country's response to climate change. It provides that South Africa will build its climate resilience, its economy and its people and manage the transition to a climate-resilient, equitable and internationally competitive lower carbon economy and society, and the country will:

- effectively manage inevitable climate change impacts through interventions that build and sustain South Africa's social, economic and environmental resilience and emergency response capacity; and
- make a fair contribution to the global efforts to stabilise GHG concentrations in the atmosphere at a level that avoids dangerous anthropogenic interferences with the climate system within a timeframe that enables economic, social and environmental development to proceed in a sustainable manner.

Post the Kyoto Protocol, South Africa committed to the 'Paris Agreement' on 12 December 2015 at the UNFCCC's 21st COP (i.e. COP21). The key commitment made by all nations is to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels. This rise in the average global temperature was found to be primarily due to the increased concentration of GHGs in the atmosphere. To ensure that the increase in the global average temperature is kept below 2°C above pre-industrial levels, targets to reduce GHG emissions will need to be formalised through submission of Intended Nationally Determined Contributions to the UNFCCC. South Africa ratified the Paris Agreement, which came into force from 4 November 2016.

Air quality management and climate change are thus integrally linked. At the national government level, the Department of Environmental Affairs (DEA) is mandated with both air quality management and climate change matters, with two distinct branches, viz. Air Quality Management and Climate Change, developing and implementing legislation in this regard. In the Western Cape, the Western Cape Government, through the Department of Environmental Affairs and Development Planning (DEA&DP), implements systems and provides an oversight role with respect to air quality management and climate change in the Province. Within the DEA&DP, the Directorate: Air Quality Management is responsible for air quality management, which includes air quality planning, monitoring and regulatory services; while the Directorate: Climate Change facilitates and enables the implementation of climate change mitigation and adaptation responses. Both Directorates have recognised the strong linkage between air quality management and climate change and work co-operatively to achieve air quality and climate change targets in an integrated manner. The local sphere of government in the Province (i.e. 30 municipalities) is tasked with air quality management, and hence also climate change adaptation related-matters through the NEM: AQA and the Municipal Systems Act (Act No. 32 of 2000).

The Municipalities have embraced their roles and responsibilities in air quality management, while the link between air quality and climate change require advancement.

This 2nd Generation Western Cape Air Quality Management Plan builds upon the strengths and successes of the AQMP2010, and was informed via formal Public Participation Process workshops with interested and Affected Parties (I&APs), authorities and industry during 2015 and 2016.

It has been 5 years since the implementation of the Western Cape Air Quality Management Plan 2010 (AQMP2010). Significant strides have been made in terms of managing air quality in the Province. In going forward, the 2nd Generation Western Cape Air Quality Management Plan focused on strengthening the linkages between air quality management and climate change response, as well as spatial planning for growth and development in the Province.

The Air Quality Management Plan is a tool that aims to minimize the emissions of air pollutants and environmental impacts through implementing interventions and strategies that would contribute towards communities becoming resilient to climate change vulnerabilities, natural hazards and disasters.

South Africa has seen various legislative reform and policy developments towards ensuring that the country's obligations in respect of air quality management and international agreements on climate change are met.

Photograph by: Bruce Sutherland | City of Cape Town

2 AIR QUALITY MANAGEMENT AND CLIMATE CHANGE

2.1. NATIONAL LEGISLATIVE AND POLICY DEVELOPMENTS

2.1.1 AIR QUALITY MANAGEMENT

The rapid development of heavy industry in South Africa during the 1950's to 1960's resulted in a rapid increase in atmospheric emissions and air pollution, with a concomitant reduction of ambient air quality in the urban and industrial areas of the country. During this time, air quality management in South Africa was informed and regulated by the Atmospheric Pollution Prevention Act (Act No, 45 of 1965; APPA), which followed a traditional command and control approach with respect to emissions permitting for industries, where identified as significant sources of air pollution. However, by the 1990s it became clear that a more modern approach to air quality regulation was required.

A new dawn in air quality management witnessed the development of a draft Air Quality Bill, which was initiated during 2001, and the subsequent promulgation of the National Environmental Management: Air Quality Act (Act No. 39 of 2004; NEM: AQA), which is a Specific Environmental Management Act (SEMA), on 24 February 2005 under the National Environmental Management Act (Act No. 107 of 1998; NEMA). This was followed by the publication of Government Gazette Notice No. R 898, dated 09 September 2005, in which the Minister, in terms of section 64(1), read with section 64(2), declared that the NEM: AQA will become effective on 11 September 2005.

The promulgation of the NEM: AQA marked a turning point in the approach to air pollution control and governance in South Africa. The focus shifted from source control to the management of air pollutant levels in the ambient environment. The philosophy of "air quality management" as it stands today was introduced and is in line with international policy developments and the environmental right, viz. Section 24 of the Constitution (Act No. 108 of 1996; RSA, 1996). The NEM: AQA defined air quality that is not harmful to health and well-being through the promulgation of the National Ambient Air Quality Standards (DEA, 2009) and provides the regulatory tools and mandates for government to deliver the desired outcome.

At the time, the APPA was not repealed as sections 21, 22, 36 to 49, 51(1)(e), 51(1)(f), 51(3), 60 and 61 of the NEM: AQA had not commenced; it was therefore declared a SEMA on 11 September 2009. The APPA was repealed in its entirety on 31 March 2010 due to a delay in commencement of sections 21, 22, 36 to 49, 51(1)(e), 51(1)(f), 51(3), 60 and 61 of the NEM: AQA, with the full implementation of NEM: AQA on 01 April 2010 (Government

Notice No. 33041). Probably the most significant shift from APPA is that Provinces, as well as District and Metropolitan Municipalities became Licensing Authorities for Section 21 Listed Activities. As such, the function of atmospheric emission licensing was devolved from the National DEA to the Provinces and Municipalities. Further amendments to the NEM: AQA on 19 May 2014 (Government Notice No. 37666) made provision for the National Minister of Environmental Affairs to become a Licensing Authority for certain activities, in terms of Section 36(5).

In terms of Section 7 of the NEM: AQA, the National Department of Environmental Affairs developed the National Framework for Air Quality Management (the Framework) in order to ensure the efficient and effective implementation of the NEM: AQA throughout the country. Following a review of the 2007 Framework, implementation of the 2012 Framework commenced on 29 November 2013 (DEA, 2013). The Framework provides norms and standards for all technical aspects of air quality management in South Africa. Table 2-1 provides a list of the regulations and / or guidelines gazetted under the NEM: AQA, to date.

TABLE 2-1. REGULATIONS PROMULGATED IN TERMS OF NEM: AQA DURING 2009 – 2016

LEGISLATION	COMMENCEMENT DATE
National Ambient Air Quality Standards	24 December 2009 (GN 1210 of GG No. 32816)
List of Activities which Result in Atmospheric Emissions which have or may have a Significant Detrimental Effect on the Environment, including Health, Social Conditions, Economic Conditions, Ecological Conditions or Cultural Heritage	01 April 2010 (GN 248 of GG No. 33064)
National Ambient Air Quality Standard for Particulate Matter with Aerodynamic Diameter less than 2.5 micron metres ($PM_{2.5}$)	29 June 2012 (GN 486 of GG No. 35463)
National Dust Control Regulations	01 November 2013 (GN 827 of GG No.36974)
Declaration of a small boiler as a controlled emitter and establishment of emission standards	01 November 2013 (GN 831 of GG No. 36973)
Regulations Prescribing the Format of the Atmospheric Impact Report	02 April 2015 (GN 747, as amended by GN R284)
National Atmospheric Emission Reporting Regulations	02 April 2015(GN 283)
Amendments to the List of Activities which Result in Atmospheric Emissions which have or may have a Significant Detrimental Effect on the Environment, including Health, Social Conditions, Economic Conditions, Ecological Conditions or Cultural Heritage	12 June 2015 (GN 551 of GG No. 38863)
Declaration of Small-scale Char And Small-scale Charcoal Plants as Controlled Emitters and Establishment of Emission Standards	18 September 2015 (GN 602 of GG No. 39220)
Regulations Prescribing the Atmospheric Emission Licence Processing Fee	11 March 2016 (GN 250 of GG No. 39805)
Regulations for the Procedure and Criteria to be followed in the Determination of an Administrative Fine in terms of section 22a of the Act	18 March 2016 (GN 332 of GG No. 39833)
Air Quality Offsets Guideline	18 March 2016 (GN 333 of GG No. 39833)

2.1.2 NATIONAL LEGISLATIVE AND POLICY DEVELOPMENTS: LINKAGES WITH CLIMATE CHANGE

More recently, the DEA has published draft regulations in terms of the NEM: AQA that directly addresses both the management of air quality and climate change matters. Table 2-2 provides a list of the regulations gazetted, in respect of air quality management and climate change. The National DEA is also in the process of developing a National GHG Inventory System, which will ensure that data related to climate change is managed in a consistent, transparent and accurate manner for both internal and external reporting.

As with all new legislation and policies, the next few years will see air quality management maturing, with strict compliance and enforcement required to ensure that air quality is managed effectively and efficiently in the country.

TABLE 2-2. REGULATORY DEVELOPMENTS IN RESPECT OF CLIMATE CHANGE AND AIR QUALITY MANAGEMENT, PUBLISHED FOR COMMENT IN TERMS OF THE NEM: AQA

LEGISLATION	DATE PUBLISHED FOR COMMENT
Regulations regarding the phasing-out and management of ozone-depleting substances	08 May 2014 (GN 351 of GG No. 37621)
Declaration of Greenhouse Gases as Priority Air Pollutants	08 January 2016 (GN 6 of GG No. 39578)
National Pollution Prevention Plans Regulations	08 January 2016 (GN 5 of GG No. 39578)
Draft National Greenhouse Gas Emission Reporting Regulations	07 June 2016 (GN 336 of GG No. 40054)

The National Climate Change Response White Paper requires the management of any response measures generated by our action, as well as being able to respond to the response measures of other countries that have negative consequences for our country (DEA, 2011). In terms of air quality, it provides that South Africa will integrate climate change considerations into health sector plans to:

"reduce the incidence of respiratory diseases and improve air quality through reducing ambient PM, O_3 and SO_2 concentrations by legislative and other measures to ensure full compliance with the National Ambient Air Quality Standards by 2020. In this regard, the use of legislative and other measures that also have the co-benefit of reducing GHG emissions will be prioritised. Progress on this will be published on the South African Air Quality Information System (SAAQIS)."

All spheres of government need to respond to climate change mitigation, and therefore also indirectly manage air quality. The following regulatory reform and policy development at both national and provincial levels contribute towards South Africa meeting its emission reduction obligations under the Kyoto Protocol and the Paris Agreement. A number of policy and legislative instruments have also been developed as it relates to emission limits and tax incentives to reduce carbon emissions. Table 2-3 provides a summary of the legislative and policy developments in South Africa to formally address climate change, and thereby also indirectly the management of air quality in the country.

TABLE 2-3. LEGISLATIVE AND POLICY DEVELOPMENTS TO ADDRESS CLIMATE CHANGE

LEGISLATION	DATE PUBLISHED FOR COMMENT / COMMENCEMENT
National Climate Change Response White Paper	19 October 2011
Draft Carbon Tax Bill	02 November 2015
Draft Regulations on the Carbon Offset	20 June 2016

Aside from the above, the National departments have developed the following instruments to further address climate change, and therefore also air quality:

DESIRED EMISSION REDUCTION OUTCOMES

The DEA has developed the Desired Emission Reduction Outcomes (DEROs), which are referenced in the National Climate Change Response White Paper (DEA, 2011) as one of the key elements for the implementation of South Africa's long-term climate mitigation goal. The DEROs are defined for the short, medium and long term, on a five-year cycle, allowing for flexibility in the development of the overall mitigation system, national and sectoral policy, and the incorporation of updated information on emissions, technology opportunities and costs and other relevant information.

The DEROs are intended for the implementation of policies and measures intended to meet South Africa's long-term climate mitigation goals and serves as a roadmap to a low-carbon future. As the DEA has recently initiated the development of a comprehensive GHG mitigation system, inclusive of a carbon budget system, the DEROs will be developed in phases.

INTEGRATED RESOURCE PLAN

The National DEA very recently gazetted the following notice to address its international commitments made in terms of the UNFCCC:

- Identification of the Minister as Competent Authority for the Consideration and Processing of Environmental Authorisations and Amendments thereto for Activities related to the Integrated Resource Plan (GN 779 of GG No. 40110), with a commencement date of 01 July 2016.

The Integrated Resource Plan 2010 – 2030 for South Africa (IRP 2010 – 2030) promulgated in 2011 by the Department of Energy, laid out the proposed generation new build fleet for South Africa for the period 2010 – 2030 (DoE, 2011). The IRP 2010 – 2030 made provision for a Revised Balanced Scenario, which included the following: Nuclear Fleet (9.6 GW); Coal (6.3 GW); Renewables (11.4 GW); and other Energy Generation Sources (11.0 GW). This is currently being revised.

GREEN ECONOMY

The legislative reform and policy developments in respect of air quality and climate change contributes to the Green Economy, which refers to two interlinked developmental outcomes for the South African economy:

- Growing economic activity (which leads to investment, jobs and competitiveness) in the green industry sector; and
- A shift in the economy as a whole towards cleaner industries and sectors with a low environmental impact compared to its socio-economic impact.

It is envisaged that the Green Economy will be able to create "green" jobs, ensure real sustainable economic growth and prevent environmental pollution, global warming, resource depletion and environmental degradation. It is a growing economic development model based on the knowledge that aims to address the interdependence of economic growth and natural ecosystems and the adverse impact economic activities can have on the environment.

2.1.3 PROVINCIAL POLICY DEVELOPMENTS

Climate change has been identified as a policy priority of the Western Cape Government. As such, the following policy developments and initiatives have been implemented to address climate change, and therefore indirectly contributes to managing air quality in the Province. A summary of the policy developments and initiatives that have been developed in the Western Cape is provided below.

2014 WESTERN CAPE CLIMATE CHANGE RESPONSE STRATEGY

The Western Cape Climate Change Response Strategy was approved and adopted by the Western Cape Government in 2014. The Strategy provides a coordinated response to climate change and aims to guide the implementation of innovative projects that combined a low carbon development trajectory with increased climate resilience, enhancement of ecosystems and the services they provide, as well as economic stability and growth.

In line with the National Climate Change Response Policy, the Strategy takes a two-pronged approach to addressing climate change:

- Mitigation: Contribute to national and global efforts to significantly reduce GHG emissions and build a low carbon economy, which simultaneously addresses the need for economic growth, job creation and improving socio-economic conditions;
- Adaptation: reduce climate vulnerability and develop the adaptive capacity of the Western Cape's economy, its people, its ecosystems and its critical infrastructure in a manner that simultaneously addresses the province's socio-economic and environmental goals (DEA&DP, 2014).

The Strategy will be updated in 2017/18 and this update will include a review of the focus areas, as well as the priority programmes.

2014 WESTERN CAPE CLIMATE CHANGE RESPONSE IMPLEMENTATION FRAMEWORK

The Western Cape Climate Change Response Implementation Framework was published in August 2014. The Framework outlines each focus area in order to identify impact potential or benefit for priority programmes and to discuss the opportunities for and barriers to the implementation of priority programmes, as identified in the Western Cape Climate Change Response Strategy. The impact potential or benefits were used to finalise a set of indicators that could be used to contribute to the national Climate Change Monitoring and Evaluation Report, which is scheduled for publication in 2017/2018.

2.2 ALIGNMENT OF AIR QUALITY MANAGEMENT AND CLIMATE CHANGE WITH OTHER EXISTING NATIONAL AND PROVINCIAL PLANS AND STRATEGIES

Applicable existing plans and strategies exist at the National and Provincial levels. A synopsis is provided below in respect of the key matters of relevance to air quality management and climate change in the Province.

2.2.1 NATIONAL MATTERS OF RELEVANCE TO THE WESTERN CAPE 2ND GENERATION AQMP

2030 NATIONAL DEVELOPMENT PLAN	20 YEAR PLAN
Objectives and actions ● Economy and employment ● Economic Infrastructure ● Environmental sustainability and resilience ● An integrated and inclusive rural economy ● Positioning South Africa in the region and the world ● Building a capable and developmental state ● National building and social cohesion ● Improving education, training and innovation ● Social protection	

2020 NEW GROWTH PATH	10 YEAR PLAN
Job Drivers ● Infrastructure ● Spatial Development ● Main economic sectors ● Seizing the potential of new economies ● Investing in social capital and public services	
Job Sector ● Green Economy	

OUTCOME 10 DELIVERY AGREEMENT	5 YEAR PLAN
Environmental assets and natural resources that are valued, protected and continually enhanced.	
Sub-outcome: An effective climate change mitigation and adaptation response ● Main outputs and measures: Green Transport and Implementation Plan; Thematic areas in implementing environmental fiscal reform policy instruments; Renewable power generation (to incorporate off-grid energy); Energy efficient improvement; Sector adaptation strategies and plans; Functional climate change research network formalised; Biennial report on State of Climate Change Science and Technology; National framework for climate services; Framework for reporting on greenhouse emissions by industry; Biennial calorific value for fuel carriers; Annual energy balances to support GHG inventory.	
Sub-outcome: Enhanced governance systems and capacity ● Main outputs and measures: Compliance inspections; Enforcement actions undertaken for non-compliance; Compliance with National Ambient Air Quality Standards; Atmospheric Emission Licenses issued; Atmospheric Emission Licenses reporting to the NAEIS. ● Sub-outcome: Sustainable Human Communities ● Renewable energy deployed off-grid; solar home systems (PV) installed; Reduced total emissions of CO_2; Reduced vulnerability and risks associated with climate change impacts.	

MEDIUM TERM STRATEGIC FRAMEWORK	5 YEAR PLAN
5 year definition of strategic objectives and mandate of government	
Relevant Objectives ● Ensure more equitable distribution of benefits of economic growth and reduce inequality ● Halve poverty and unemployment by 2014	
Relevant Priority Areas ● Cohesive and sustainable communities ● Sustainable resource management and use ● Rural development, food security and land reform ● Economic and social infrastructure	

2.2.2 PROVINCIAL MATTERS OF RELEVANCE TO THE WESTERN CAPE 2ND GENERATION AQMP

ONE CAPE 2040	30 YEAR PLAN
5 year definition of strategic objectives and mandate of government	
Relevant Priority Actions ● Transition from a clean economy is paramount ● Safe and efficient public transport and embracing non-motorised transport ● Energy security from renewable sources ● Enhance municipal service delivery in poor areas	

WESTERN CAPE PROVINCIAL STRATEGIC PLAN 2014 – 2019 (DOTP, 2015)	5 YEAR PLAN
Provincial Strategic Goals ● Create opportunities for growth and jobs ● Improve education outcomes and opportunities for youth development ● Increase wellness, safety and tackle social ills ● Enable a resilient, sustainable, quality and inclusive living environment ● Embed good governance and integrated service delivery through partnerships and spatial alignment	
Relevant Departmental Working Groups ● Climate Change Response	

WESTERN CAPE PROVINCIAL SPATIAL DEVELOPMENT FRAMEWORK (DEA&DP, 2013A)	5 YEAR PLAN
Relevant Spatial Goals ● Better protection of spatial assets and strengthen resilience of natural and built environments ● Improved effectiveness in the governance of its urban and rural areas	
Spatial Vision ● Green Cape ● Living Cape ● Leading Cape ● Educating Cape ● Working Cape ● Connecting Cape	
Spatial Framework and Themes ● Sustainable use of the Western Cape's spatial assets ● Opening up opportunities in the provincial space-economy ● Developing integrated and sustainable settlements	

WESTERN CAPE STATE OF THE ENVIRONMENT OUTLOOK REPORT (DEA&DP, 2013B)	5 YEAR PLAN
Priorities for Green Growth ● Natural gas and renewables ● Green jobs ● Financial infrastructure (attract capital and investment into green innovation)	
Green Drivers ● Smart living and working ● Smart mobility ● Smart eco-systems ● Smart agri-production ● Smart enterprise	
Actions ● Promote innovation ● Create an enabling environment ● Grow / develop the market	

WESTERN CAPE GREEN ECONOMY STRATEGY FRAMEWORK (WCG, 2013)	5 YEAR PLAN
Strategic Priorities ● Green built environment – infrastructure services, human settlement ● Actively strengthen ecological goods and services to enhance resilience and limit impact on the poor ● Enhance systems for integrated planning and implementation incorporating biodiversity and ecosystem vulnerability ● Good governance – environmental monitoring, waste management, integrated planning	

2.2.3 LOCAL MATTERS OF RELEVANCE TO THE WESTERN CAPE 2ND GENERATION AQMP

CITY OF CAPE TOWN AQMP (CCT, 2009)	5 YEAR PLAN
Vision ● To be the city with the cleanest air in Africa.	
Mission ● To reduce the adverse health effects of poor air quality on the citizens of Cape Town especially during 'brown haze' episodes.	

CAPE WINELANDS DISTRICT AQMP (CWDM, 2009)	5 YEAR PLAN
Vision ● To be a district within which the constitutional right of all inhabitants to clean and healthy air is maintained in a sustainable manner without compromising economic and social development for the benefit of present and future generations.	
Mission ● To implement sustainable air quality management practices throughout the district to progressively achieve air quality goals.	

CENTRAL KAROO DISTRICT AQMP (CKDM, 2012)	5 YEAR PLAN
Vision ● To maintain air quality to such a standard that economic and social development will flourish without jeopardizing the environment.	
Mission ● To minimise the impact of air pollutant emissions on the population and the natural environment of the Central Karoo District and to promote the use of renewable energy sources such as wind, sun and water in order to support global initiatives to prevent ozone depletion and global warming.	

OVERBERG DISTRICT AQMP (ODM, 2012)	5 YEAR PLAN

Vision

- To be a district where the constitutional right of all human beings to clean air is maintained to such a standard where economic and social development will flourish without jeopardizing the environment.

Mission

- To ensure effective and maintain implementation of sustainable air quality management practices throughout the Overberg district to progressively achieve air quality goals minimise the impact of air pollutant emissions on the population and the natural environment of the Overberg municipal district.

EDEN DISTRICT AQMP (EDM, 2011)	5 YEAR PLAN

Vision

- To have air quality worthy of the names “Eden” and “the Garden Route”

Mission

- To minimise the impact of air pollutant emissions on the population and the natural environment of the Eden municipal district.

WEST COAST DISTRICT AQMP (WCDM, 2011)	5 YEAR PLAN

Vision

- Attainment and maintenance of good air quality for the benefit of all inhabitants and natural environmental ecosystems within the West Coast District Municipality.

Mission

- To ensure the maintenance of good quality air through proactive and effective management principles that take into account the need for sustainable development into the future.
- To work in partnership with communities and stakeholders to ensure the air is healthy to breathe and is not detrimental to the well-being of persons in the District.
- To ensure that future developments (transportation, housing etc.) incorporate strategies to minimise air quality impacts.
- To reduce the potential for damage to sensitive natural environmental systems from air pollution, both in the short and long-term.
- To facilitate intergovernmental communication at the Local, Provincial and National levels in order to ensure effective air quality management and control in the WCDM.

It is clear that air quality and climate change are integrally linked. With the ever-increasing linkages between the two arenas, it is evident that key role players remain in communication. A need for clear and precise policy and legislative guidance is essential to the implementation of strategies toward climate change mitigation, which will inevitably determine the effectiveness of strategies inaugurated. Further, informed decision-making is fundamental to good governance and is critical towards continuous improvements in climate change and air quality management, as well as streamlining of legislation.

Continued efforts to reduce air pollutant and GHG emissions are essential, as these likely pose serious risks to both human health and the environment. Moreover, air pollution and climate change influence each other through complex interactions in the atmosphere. Increasing levels of GHGs alter the energy balance between the atmosphere and the Earth’s surface which, in turn, can lead to temperature changes that alter the chemical composition of the atmosphere (Law, 2010). Direct emissions of air pollutants (e.g. black carbon) or those formed from emissions such as sulphate and ozone can also influence this energy balance. Thus, climate change and air quality management have significant consequences for each other. The implementation of legislation and policies relating to the management of air quality and climate change can provide mutual benefits that contribute towards maintaining good, clean air, while also reducing global warming.

Photograph by: Mellisa Naiker | DEA&DP Competition 2016/17

3

REVIEW OF THE WESTERN CAPE AIR QUALITY MANAGEMENT PLAN 2010

Section 15(1) of the NEM: AQA requires that Provinces and Municipalities develop Air Quality Management Plans (AQMPs) to manage air quality in their regions. In order for it to be effective, the AQMP needs to be reviewed every 5 years to establish whether the identified goals and targets have been effectively implemented and whether they were still valid in terms of new developments and economic growth, where implemented.

In accordance with the requirements of Section 15(1) of the NEM: AQA, the DEA&DP has developed the Western Cape Air Quality Management Plan, which was adopted in 2010 ("AQMP2010"), with the following:

VISION:
"Clean and healthy air for all in the Western Cape"

MISSION:
"To ensure the effective and consistent implementation of sustainable air quality management practices, by all spheres of government, relevant stakeholders and civil society to progressively achieve and efficiently maintain clean and healthy air in the Western Cape"

The AQMP2010 took into account the roles and responsibilities of the different spheres of government, as well as other stakeholders in respect of air quality management in the Province, as outlined in the National Framework for Air Quality Management in South Africa (DEA, 2007; 2013). The roles and responsibilities for the three spheres of government, which promotes co-operative governance were taken into account in the AQMP2010. In this regard, the DEA&DP both implements systems and provides an oversight role in the Province with respect to air quality management.

Therefore, following 5 years of its implementation, the DEA&DP embarked on a review of the Western Cape AQMP2010 to, amongst others:

- assess progress made in air quality management in the Province;
- establish whether the identified goals and targets have been effectively implemented;
- establish whether the goals and targets were still valid in terms of new developments and economic growth in the Province; and
- identify potential air quality risks and interventions that can be translated into new goals and objectives, where required.

During 2015 and 2016, members of the public participated in the review of the Western Cape AQMP2010. The aim was to assess progress made in terms of implementing the Western Cape AQMP2010, while identifying potential air quality risks and interventions that can be translated into air quality management goals and objectives in going forward. The following phases were followed during the review process:

PHASE 1: a series of regional Public Participation Process (PPP) Workshops was held during 16 – 22 September 2015, which contributed towards the development of the Status Quo Report (2010 – 2015).

PHASE 2: a series of regional PPP Workshops was held during 17 – 24 August 2016, which contributed towards the development of the 2nd Generation Western Cape AQMP.

Overall, the PPP indicated that the management of air quality was extremely relevant, and needed to be prioritised throughout the Province. Further, the need to elevate and integrate air quality management and climate change was also highlighted. The gaps and recommendations identified at the workshops, in respect of the four goals of the AQMP2010, are summarised below:

FOR MORE SEE PAGES 55-56 & 62-74

GOAL 1:

ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY MANAGEMENT

This goal and its targets were deemed relevant five years on; an average score of 7/10 was rated for relevancy. The implementation of Goal 1 was, however, rated as low and attributed this to air quality not being prioritised throughout the Province, particularly in the District and Local Municipal levels, as Municipal AQOs do not focus solely on air quality matters. This results in personnel, budget and training being significantly below the necessary requirements.

Air quality management training and capacity building is needed at all levels of government, as well as for industry and the community. A call was also made for industry to be recognised for their positive achievements in the field.

Overall, participants agreed that co-operative governance on air quality management had improved over the past five years, with the formation of District Air Quality Officer's Forums (AQOFs) being a positive and welcomed development. It was viewed as a process that "narrowed the gap between industry and government" in the Province.

FOR MORE SEE PAGES 57 & 75-78

GOAL 2:

CONTINUALLY ENGAGE WITH STAKEHOLDERS TO RAISE AWARENESS WITH RESPECT TO AIR QUALITY MANAGEMENT

Raising awareness with respect to air quality management remains very relevant; an average score of 9/10 was rated for relevancy. This goal, however, require significantly more effort in terms of raising awareness to the general public. Industry requested that they be engaged more frequently, as "there was a real thirst for knowledge about air quality and its management". Industry noted that larger companies were obliged by law to engage their local stakeholders regarding air quality matters.

An overarching Air Quality Communications Strategy, with dedicated focus and implementation by all spheres of government in the Province, was highlighted for development.

GOAL 3:
ENSURE EFFECTIVE AND CONSISTENT COMPLIANCE MONITORING AND ENFORCEMENT

FOR MORE SEE PAGES 58 & 79-81

Effective and consistent compliance monitoring and enforcement with respect to air quality management remains very important; an average score of 8/10 was rated for relevancy. There was strong agreement, especially from industry and civil society, for the need for effective compliance monitoring and enforcement, and for Provincial Government to use all its available legislative powers to encourage Municipalities to perform air quality compliance monitoring and enforcement in their jurisdictional areas.

Awareness raising of By-laws and the roles and responsibilities of agencies involved is necessary for effective and efficient compliance monitoring and enforcement practices. This goal was also strongly linked to capacity building and training of authorities in Municipal By-law or air quality regulation application, as it relates to continuous compliance monitoring and enforcement.

GOAL 4:
SUPPORT CLIMATE CHANGE PROTECTION PROGRAMMES, INCLUDING PROMOTING THE REDUCTION OF GREENHOUSE GAS EMISSIONS

FOR MORE SEE PAGES 58-59 & 82-85

This goal was deemed very relevant and was rated at an average score of 8/10 for relevancy. Local Municipalities are to include air quality management in their planning processes (IDPs, town planning, waste management, urban creep) and as it relates to climate change. The regulation to reduce carbon emissions through renewable energy, and the potential financial benefits from such interventions were deemed important. Vehicle emissions testing was viewed as extremely important in terms of addressing carbon emissions reduction.

Better alignment between air quality management and climate change was emphasized; as there was a 'disconnect' between the two areas, yet it is integrally linked. Overall, the new developments in the climate change arena at an international level (e.g. COP21) needed to be addressed in the 2nd Generation AQMP for the Western Cape.

Further to the goals and objectives, an AQMP Steering Committee and three Working Groups were established as the primary mechanism to drive the AQMP2010 implementation, as a means to direct the activities and involve all necessary stakeholders.

Overall, strong emphasis was placed on integrally linking air quality management and climate change in the 2nd Generation Western Cape Air Quality Management Plan. As such, Goals 2 and 4 of the 2nd Generation Western Cape Air Quality Management Plan were adapted to strengthen the integration between air quality management and climate change response (See Chapter 6).

Photograph by: Shiraz Chakera | https://www.flickr.com/photos/shirazc/8084063319 (CC)

4

AIR QUALITY IN THE WESTERN CAPE: A PROVINCIAL, NATIONAL & INTERNATIONAL ASSET

Air pollutants are able to move over great distances in moving air masses. Therefore, the long-range transport of air pollutants may result in transboundary air quality impacts. The impacts of poor air quality can therefore be felt in another region or country, some distance away.

The Western Cape boasts some of the best air quality in South Africa. As the air quality is "good" in the Western Cape, it can be regarded as a provincial, national and international asset that must continue to be protected and managed, to ensure that air pollution does not impact on other provinces, regions and countries.

The Western Cape comprises of one Metropolitan Municipality, viz. City of Cape Town, and five District Municipalities (Figure 4-1). These are the West Coast, Cape Winelands, Central Karoo, Eden and Overberg District Municipalities, which are further comprised of 24 Local Municipalities.

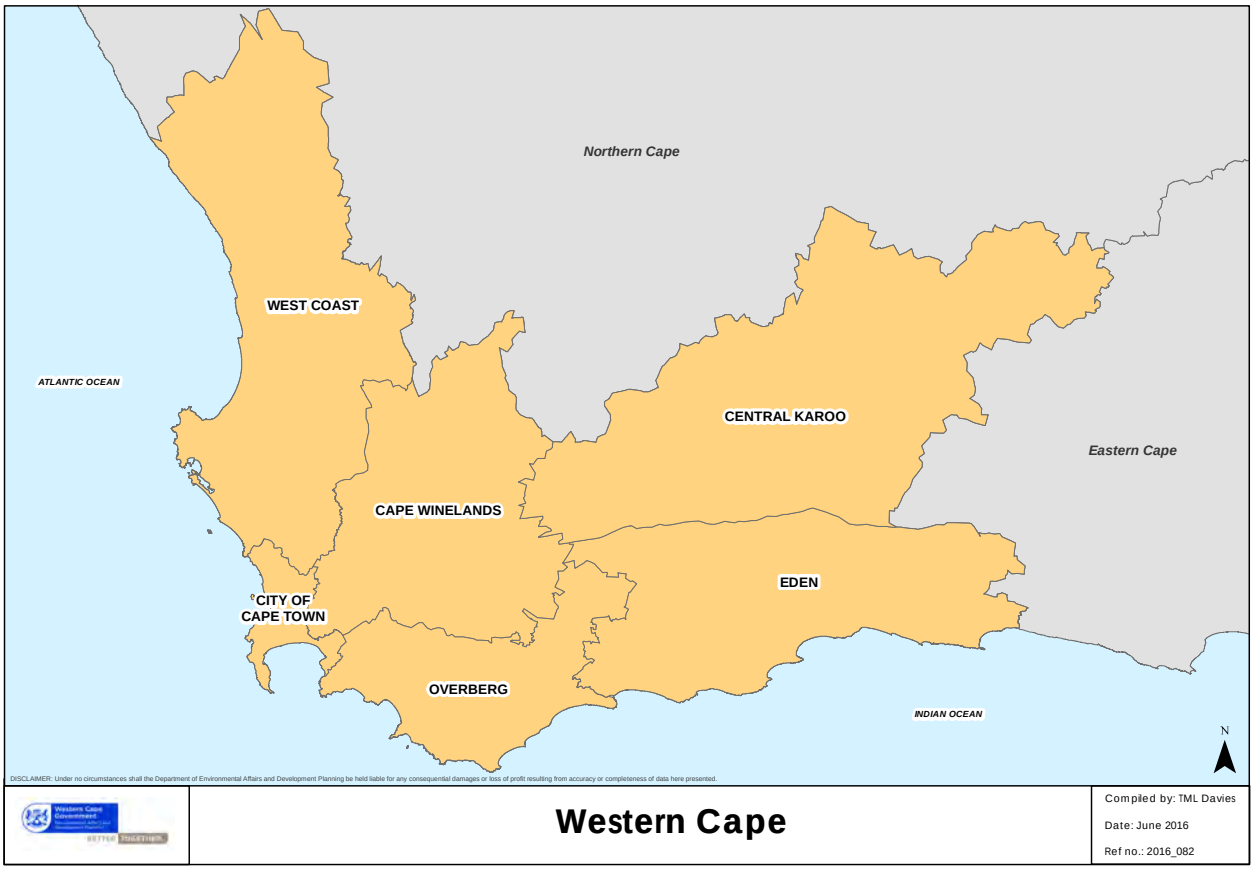

FIGURE 4-1. LOCALITY MAP OF THE WESTERN CAPE PROVINCE

The Western Cape accommodates 11.3 % of the country's population. Geographically, the City of Cape Town Metropolitan Municipality hosts approximately 64.1% of the population, followed by the District Municipalities in the order: Cape Winelands (13.5 %), Eden (9.7 %), West Coast (6.8 %), Overberg (4.5 %) and the Central Karoo (1.2 %) (PT, 2015a). The Western Cape's increasing population is placing ever greater demand on housing, transportation, energy and water services. Although this growth correlates with economic growth, it will likely also show a concomitant increase in air emissions from sources such as vehicles and industry, etc.

The Province generally enjoys good quality air, except for some areas where multiple sources of air pollution and inherently poor atmospheric dispersion, particularly in winter, likely result in some exceedances of the National Ambient Air Quality Standards (NAAQS) (Appendix 1) for Particulate Matter less than 10 micron (PM_{10}). Exceedances of PM_{10} have mostly been measured at the City of Cape Town's Khayelitsha monitoring station; however, the levels have been declining over the years. The PM_{10} levels in this area is mostly associated with residential wood burning, refuse burning and dust from unpaved roads, etc.

The following provides a summary of the situational analysis of air quality, a provincial, national and international asset of the Western Cape Province.

4.1 SUMMARY OF THE SITUATIONAL ANALYSIS

4.1.1 OVERVIEW: SOCIO-ECONOMIC CONTEXT

CITY OF CAPE TOWN – CCT

The population of Cape Town was 3.7 million in 2011 and equates to an increase of 29.3 % since 2001. It is projected that by 2031 the population of the CCT will grow to at least 4.4 million (StatsSA, 2011; CCT, 2015). Finance, insurance, real estate and business services constitute 36 % of economic activity in the CCT, followed by manufacturing (16 %), trade and hospitality (16 %) and communication (11 %) (CCT, 2013).

CENTRAL KAROO DISTRICT MUNICIPALITY – CKDM

The Prince Albert Local Municipality includes the towns of Prince Albert, Leeu-Gamka and Klaarstroom and has a total population of approximately 13 136 residents. Laingsburg Local Municipality, which includes the settlement of Matjiesfontein is the smallest Municipality and has the smallest population in the CKDM at 8 289 residents. Beaufort West Local Municipality has a total population of approximately 49 586 (StatsSA, 2011).

Commercial services (50 %), agriculture (15 %) and manufacturing (15 %) are the prominent economic activities in the CKDM, with smaller contributions from construction and general services. Agricultural activities are important in the Laingsburg and Prince Albert Local Municipalities (PT, 2015b).

Large-scale uranium mining in Beaufort West and shale gas development has been identified as potential economic development drivers for CKDM and are likely to take place in the future. This is significant as both prospecting and mining of these minerals are likely to be associated with various environmental impacts, including air quality impacts.

WEST COAST DISTRICT MUNICIPALITY – WCDM

The population of the WCDM is 410 045 inhabitants. At the end of 2014, the WCDM population represented 6.8 % of the total population of the Western Cape, making it the 3rd largest district, with Saldanha Bay and Swartland being among the ten largest local municipalities in the Province, viz. 8th and 6th largest, respectively (PT, 2015b).

The Swartland and Saldanha Bay populations comprise 55 % of the District's population of 410 045, comprising of 118 704 and 105 351 inhabitants, respectively. The remaining 45 % of the WCDM population is split between Matzikama with 69 495, Bergrivier with 64 892 and Cederberg with 51 603 inhabitants (PT, 2015b).

The WCDM has the third largest non-metro district economy in the Province. It possesses a long coastline and is well-known for the industrial hub surrounding the steel plant in Saldanha Bay (also being the location of the IDZ development recently commissioned and being linked to the oil and gas industry). The grain fields of the Swartland and the natural beauty of the whole region, in turn, is a drawing card for tourists (PT, 2015b).

EDEN DISTRICT MUNICIPALITY - EDM

The EDM had a population growth rate averaging 2.1 % per annum over the period under review. Municipal specific growth rates across the EDM nevertheless vary, ranging from 0.3 % (Kannaland) to 4.6 % (Bitou). The discrepancies in these growth rates imply that population growth does not stem entirely from natural causes, but is also related to net migration (PT, 2015b).

As at the end of 2014, the EDM accounted for 9.8 % of the total population of the Western Cape, making it the second largest non-metro district (the largest being the Cape Winelands District), with George and Oudtshoorn being among the 10 largest local municipalities in the Province, viz. 2nd and 10th largest, respectively (PT, 2015b).

The George and Oudtshoorn populations comprises 50 % of the District's population of 464 105, with each containing 201 736 and 95 954 inhabitants. The remaining 50 percent of the District's population is split between Mossel Bay with 93 803, Knysna with 71 315, Hessequa with 53 935, Bitou with 52 346 and Kannaland with 25 013 inhabitants (PT, 2015b).

Commercial services and manufacturing are the two largest economic sectors in the EDM. Manufacturing of animal products increases the contribution of agriculture, as does the trade in agricultural commodities (animal products) and agri-tourism; while tourist attractions include the scenic Garden Route along the coast, including Knysna and the Wilderness, the Cango Caves near Oudtshoorn, the Swartberg and the ostrich farms (PT, 2015b).

CAPE WINELANDS DISTRICT MUNICIPALITY – CWDM

The CWDM has a total population of approximately 787 490 inhabitants. The CWDM experienced a population growth within the 5 Local Municipalities, ranging from 1.3 to 3.1 % per annum, from 2001 to 2013 (StatsSA, 2011). As at the end of 2014, the CWDM population represented 13.7 % of the total population of the Western Cape, making it the largest district (excluding the CCT), with all its Local Municipalities being among the 10 largest Local Municipalities in the Province (PT, 2015b).

The Drakenstein and Breede Valley populations comprise 53 % of the CWDM's population of 820 695, with each containing 260 472 and 172 268 inhabitants. The remaining 47 % of the CWDM population is split between Stellenbosch with 165 266, Witzenberg with 122 146 and Langeberg with 100 543 inhabitants. The main towns within the CWDM are Stellenbosch, Paarl, Worcester, Ceres, Wellington and Robertson (PT, 2015b).

Commercial services, manufacturing and agriculture are prominent economic activities in the CWDM, with smaller contributions from construction. Agricultural activities are dominated by wine and deciduous fruit production. Hex River, Paarl, Robertson, Worcester and Stellenbosch are the main wine producing areas. Deciduous fruit is grown and processed in Ceres (PT, 2015b).

Most of the manufacturing industries are located within the Drakenstein, Stellenbosch and Breede Valley Local Municipalities. These include food and tobacco, textiles, wood and paper products, chemicals, metals, machinery, household and medical supplies, vehicle and jewellery production (PT, 2015b).

OVERBERG DISTRICT MUNICIPALITY - ODM

The ODM has a population of approximately 258 175 inhabitants, with a population growth rate within the four local municipalities ranging from 1.5 to 3.4 % per annum (StatsSA, 2011). The Theewaterskloof and Overstrand populations comprise 74 % of the ODM's population of 269 649 inhabitants, with each containing 113 306 and 85 167 inhabitants, respectively. The remaining 17 % of the ODM population is split between Swellendam with 37 133 and Cape Agulhas with 34 004 inhabitants (PT, 2015b).

The major economic activities taking place in the ODM include agriculture, fishing, forestry, commercial services and tourism. The strong agricultural sector includes dry land agriculture such as wheat, canola, barley and deciduous fruit. More than a third of the country's exported deciduous fruit is produced in the Elgin Valley. Apples, pears, plums and nectarines are grown at Elgin, Grabouw, Bot River, Houw Hoek, Vyeboom, Villiersdorp and the Hemel-en-Aarde Valley. Some of the country's largest fruit processors are found in Grabouw. Livestock farming includes merino sheep and ostriches. The mariculture industry in sheltered bays includes mussels, oysters, scallops, abalone, finfish, seaweed, prawns and other species such as clams, mullets and red bait. The fishing industry is centred on the harbour towns of Hermanus, Gansbaai and Struisbaai (PT, 2015b).

4.1.2 PRIMARY ECONOMIC ACTIVITIES

The contribution of the economic sectors, as reported in the Western Cape Spatial Development Framework (DEA&DP, 2013a), the Provincial Economic Review and Outlook Report (PERO; PT, 2013; 2015a), the Municipal Economic Review and Outlook Report (MERO; PT, 2015b) and other published reports were reviewed. From these, the potential impact on air quality, in respect of the economic activities in the Province, is highlighted below.

MANUFACTURING

The Provincial Economic Review and Outlook Report (PERO; PT, 2015a) indicates that manufacturing contributed 15 % towards the GDP in the Western Cape, and that it is forecasted to grow 2.2 % per annum between the period 2015 to 2020. As a mix of electricity, coal and diesel is used

for various forms of manufacturing, there is a huge reliance on fossil fuel combustion in the Province, which translates into a concomitant release of GHG emissions.

More than two thirds of the Province's manufacturing sector is located in the CCT area. This, together with the fact that over 60 % of the Western Cape's population is concentrated in this area in the Western Cape, makes it understandably the biggest energy user of all the Municipal areas. The Western Cape Spatial Development Framework indicates that the CCT accounts for 60 % of the Province's total energy consumption, followed by the West Coast (24 %) due to its energy-intensive heavy industries. The EDM and CWDM accounts for 7 % each; while the ODM accounts for 2 % and the CKDM accounts for less than 1 % (DEA&DP, 2013a).

OIL AND GAS SECTOR TRENDS

The African oil industry is likely to continue to grow, thereby providing a service-market for the Western Cape. According to Transnet, 80 to 100 oil rigs are in operation off the west coast of Africa and a further 120 oil rigs pass by the southern tip of Africa each year (PT, 2015a). Saldanha Bay is targeted as the home of the key oil rig repair hub; it also hosts a large oil-storage facility. The country's leading gas facility is stationed at the Port of Mossel Bay near PetroSA's gas-to-liquid refinery, operating as a service hub for the regional gas industry (PT, 2015a).

SALDANHA BAY INDUSTRIAL DEVELOPMENT ZONE – IDZ

As of October 2013, the Saldanha Bay IDZ was promulgated by the Minister for Trade and Industry (SBIDZ, 2016). The IDZ is situated on the outskirts of the town of Saldanha Bay and occupies a total land area of ca. 330 ha. The Saldanha Bay IDZ is a joint project between national, provincial and local government, which aims to attract key investors and companies operating in the upstream (offshore) oil and gas sector of the African east and west coasts (WESGRO, 2014). The zone aims to deliver engineering services, marine repair and supply services to these enterprises.

A feasibility study for the Saldanha Bay IDZ revealed the potential for a broad range of industrial project clusters, including mineral beneficiation to renewable energy manufacturing and services to the upstream oil and gas industry (WESGRO, 2011). Phase 1 of the Saldanha Bay IDZ will focus on the Offshore Supply Base and Marine Repair Industry.

In light of the developments in Saldanha Bay, the DEA&DP has convened the Greater Saldanha Bay Inter-Governmental Task Team (GSB-IGTT) with authorities from all three spheres of government in November 2014. The purpose of the GSB-IGTT is to facilitate a co-ordinated and coherent response from all spheres of government and public entities to ensure that the natural resource-based assets are not undermined and that desired environmental qualities for the Greater Saldanha Bay area are achieved into the future. In support of the GSB-IGTT an associated Stakeholder Forum was also established and convened by the DEA&DP as a means of meaningful/dedicated engagement with civil society and industry.

Due to the potential air quality impacts from the proposed developments in the area, it has been recommended that the Saldanha Bay Municipality review its Municipal Air Quality Management Plan (AQMP) every two years. The Saldanha Bay AQMP, as well as the 2nd Generation Western Cape AQMP is to place emphasis on measures to manage air quality in the greater Saldanha Bay region (e.g. airshed planning).

TRANSPORT, STORAGE AND COMMUNICATION

When looking at the provincial energy use by fuel type, the transport sector is the main energy user in the Province. The Energy Consumption and CO_2e Emissions Database for the Western Cape shows that the transport sector is the second largest contributor of GHG emissions in the Province (DEA&DP, 2013a).

The Province has a well-developed transport network that consists of airports, ports, roads and public transport and rail lines. Port expansion is required in Cape Town and Saldanha Bay in response to local and international markets, and as economic catalysts (DEA&DP, 2013a).

AGRICULTURE

The agricultural sector comprises 15 % of WCDM's economic activity, and 11 % of the CWDM and the ODM. In absolute terms, the CWDM has the largest agriculture, forestry and fishing sector and is home to more than one third of the Province-wide agricultural sector. Factoring in downstream linkages with the agro-processing sector, agri-business is a key economic activity across all the districts, including the CCT (PT, 2013).

Despite the importance of secondary and tertiary economic activities, agriculture remains the backbone of the Provincial economy. Farming in the Western Cape covers some 11.5m hectares, and contributes almost 21 % of the country's agricultural production. The agricultural sector comprises of 6 682 commercial farmers, 9 844 smallholder farmers, and some 201 230 farm workers (DEA&DP, 2013b).

Outside the CCT, agricultural production and agro-processing of the following products underpins the local economies:

- Horticultural products (i.e. apples, pears and peaches, wine and table grapes, potatoes and onions, citrus; and vegetables) are produced in the CWDM, CCT, WCDM and ODM.
- Animals and animal products (i.e. poultry, cattle, sheep, ostrich, and pigs) are produced throughout the Province.
- Field crops (i.e. wheat, maize, barley) are produced mainly in the Malmesbury, Moorreesburg, Piketberg regions (WCDM), as well as Caledon and Bredasdorp (ODM).

Agriculture and the agro-processing industry have substantial competitive advantage in relation to the other Provinces and in terms of export growth. Exports and the development of the local agro-processing industries as a source of local demand for agricultural products should be the focus of developmental policies (DEA&DP, 2013a). In terms of meeting climate change obligations regarding the phasing out of ozone-depleting substances, the use of natural refrigerants for refrigeration and air cooling in the agro-processing industry has been identified.

FISHERIES

The Western Cape contributes approximately 90 % of the country's fishing revenue and employs approximately 70 % of its workforce. Trawling contributes just under half of the fish revenues (DEA&DP, 2013a). The fishing industry contributes a large percentage to the country's revenue; inclusive of fish rendering processes in the towns of Hout Bay and St. Helena Bay. The need for alternative measures to reduce odour from fishmeal processing in the Province has been identified.

MINING AND QUARRYING

The mining sector contributes less than 1 % to the Western Cape's economy. Whilst current mining activity is concentrated in the West Coast, the Province's mineral resources are widespread (DEA&DP, 2013a). To our knowledge, current mining and / or quarrying activities taking place in the respective Municipal areas of the Province are presented in Table 4-1.

Future mining, in particular in the West Coast and Central Karoo, are activities which could impact on these areas or districts.

TABLE 4-1. MINING AND QUARRYING ACTIVITIES IN THE WESTERN CAPE

MUNICIPALITY	MINING AND / OR QUARRYING ACTIVITIES
WEST COAST DISTRICT MUNICIPALITY	rare earths; agricultural lime; dimension stone and sandstone; limestone; heavy minerals; titanium and zirconium; phosphate; construction materials
CAPE WINELANDS DISTRICT MUNICIPALITY	limestone
OVERBERG DISTRICT MUNICIPALITY	pharmaceutical grade manganese; limestone; agricultural lime
CENTRAL KAROO DISTRICT MUNICIPALITY	shale-gas; gypsum for construction material and agri-use; uranium; construction materials
CITY OF CAPE TOWN; EDEN DISTRICT MUNICIPALITY	construction materials

SHALE GAS DEVELOPMENT IN THE KAROO

A Strategic Environmental Assessment (SEA) of shale gas is currently being undertaken. Its mission is to provide an integrated assessment and decision-making framework that will enable South Africa to establish effective policy, legislation, and sustainability conditions under which shale gas development could occur. Commissioned in February 2015, the SEA process is expected to span 24 months, with the preliminary end date set as March 2017. In keeping with South African legislative requirements, and given the contentious nature of hydraulic fracturing, the SEA will rely heavily on evidence-based evaluations. To date, more than 50 investigations undertaken by 29 institutions, as well as other discussions regarding shale gas exploration, are underway and will inform the SEA. Other sources of evidence include research undertaken by other local organisations and by other countries. In short, the extent of research and degree of attention being focused on hydraulic fracturing is substantial, and conducive to providing much needed answers.

The timely completion of the SEA would be of benefit in addressing any existing regulatory gaps associated with hydraulic fracturing, and in providing an early indication of the most appropriate way forward for shale gas development. To achieve the latter, the assessment will consider a range of scenarios from 'exploration only' through 'minimal development' to 'maximal development', with a 'no shale gas exploration or development' scenario as a benchmark.

Much attention is being focussed on the proposed hydraulic fracturing of shale deposits within the Karoo Basin, and considerable inroads have been made by the South African Government in addressing its regulatory, as well as strategic limitations associated with hydraulic fracturing. The Government's reliance on evidence-based policy development remains a key priority for providing relevant information, upon which decisions can be taken.

In terms of air quality management, shale gas exploration and hydraulic fracturing projects will need to be managed to reduce emissions from potential sources of air pollution, e.g. drilling operation and drilling development, drilling activities, as well as activities resulting from transporting of production equipment and fracking fluids. The 2nd Generation Western Cape AQMP takes this into account when it set new targets or interventions to manage air quality in the Province.

4.1.3 GOVERNANCE: AIR QUALITY MANAGEMENT PLANNING

Sections 14 and 15 of the National Environmental Management: Air Quality Act (No. 39 of 2004; NEM: AQA) requires that all three spheres of government designate Air Quality Officers (AQOs) and also develop Air Quality Management Plans (AQMPs), respectively, in their areas.

During the period 2010 – 2015, the DEA&DPs Directorate: Air Quality Management successfully hosted capacity building workshops with Councillors and Municipal Managers of various Municipalities in terms of developing their Municipal AQMPs. The aim of these workshops was to gain support from Councillors and Municipal Managers to:

- Understand and accept the roles and responsibilities of the air quality management function;
- ensure that Municipalities designate Air Quality Officers; and
- secure funding for the Municipalities to develop and implement their AQMPs.

To date, a total of 27 AQMPs (*viz*. 1 Provincial and 26 Municipalities) have been developed and adopted; while a total of 30 AQOs have been designated (*viz*. 1 Provincial and 29 Municipalities) in the Province. See Table 4-2.

TABLE 4-2. STATUS OF AQMPs AND DESIGNATED AQOs IN THE WESTERN CAPE

AUTHORITY	YEAR ADOPTED & IMPLEMENTED	AQMP REVIEWED	AIR QUALITY OFFICER DESIGNATED
CITY OF CAPE TOWN	2009	in progress	✓
CAPE WINELANDS	2009		✓
DEA&DP	2010	in progress	✓
DRAKENSTEIN	2011		✓
WEST COAST	2011		✓
EDEN	2011	2013	✓
OVERBERG	2012		✓
BERGRIVIER	2012		✓
MATZIKAMA	2012		✓
SALDANHA	2012		✓
SWARTLAND	2012		✓
CENTRAL KAROO	2012		✓
CAPE AGULHAS	2013		✓
OVERSTRAND	2013		✓
WITZENBERG	2013	2014	✓
GEORGE	2013		✓
HESSEQUA	2013		✓
BITOU	2013		✓
KNYSNA	2013		✓
KANNALAND	2013		✓
MOSSEL BAY	2013		✓
THEEWATERSKLOOF	2014	2015	✓
PRINCE ALBERT	2014		✓
SWELLENDAM	2015		✓
STELLENBOSCH	2015		✓
CEDERBERG	2016		✓
LAINGSBURG	2016		✓
BREEDE VALLEY	draft		✓
LANGEBERG	draft		✓
BEAUFORT WEST	X		✓
OUDTSHOORN	draft		X

4.1.4 GOVERNANCE: AIR QUALITY OFFICER'S FORUMS

The Western Cape Provincial Air Quality Officer's Forum (AQOF), inclusive of the Noise Control Forum took place quarterly across the five Districts and the Metropolitan Municipality within the Province (Table 4-3). The forums served as a platform for AQOs to coordinate progress on the implementation of the NEM: AQA, as well as the 2012 National Framework, as well as provided an opportunity for AQOs to strengthen and/or fine-tune their air quality management interventions, to share their experiences and challenges, and to plan for the year ahead.

Special AQOFs afforded AQOs the opportunity to address air quality-related matters with the National DEA, and to engage on legislative and policy development (Table 4-3).

TABLE 4-3. AIR QUALITY OFFICER AND NOISE CONTROL FORUMS HELD DURING 2010 – 2015

YEAR	DATE	LOCATION
2010	9 – 11 February 13 – 14 May 05 – 06 August	• George, EDM • Beaufort West, CKDM • Woodstock, CCT
2011	09 – 11 February 13 May 12 August	• George, EDM • Witsand, CWDM • Sea Point, CCT
2012	10 February 10 – 11 May 23 – 24 August	• Langebaan, WCDM • Knysna, EDM • Robertson, CWDM
2013	07 – 08 February 09 – 10 May 29 – 30 August	• Arniston, ODM • Matjiesfontein, CKDM • Klapmuts, CWDM
2014	13 – 14 February 15 – 16 May 14 – 15 August 01 – 02 November	• Citrusdal, WCDM • Cape Town, CCT • Calitzdorp, EDM • Cape Town, CCT – Special AQOF
2015	13 – 14 February 14 – 15 May 13 – 14 August 03 – 04 November	• Caledon, ODM • Beaufort West, CKDM • Paarl, CWDM • Driftsands, CCT – Special AQOF
2016	12 – 13 May 11 – 12 August 21 October	• Driftsands, CCT • Mossel Bay, EDM • Cape Town, CCT – Special AQOF

WESTERN CAPE AIR QUALITY MANAGEMENT PLAN WORKING GROUPS I – III

Three Provincial AQMP Working Groups were the primary mechanisms identified to implement the AQMP2010. The Working Group meetings were held concurrently with the Western Cape AQOFs, and were held during the period 2010 – 2015, as outlined in Table 4-3. The Working Groups comprised of:

- **WORKING GROUP I**
  Air Quality Management and Climate Change;
- **WORKING GROUP II**
  Air Quality Education and Awareness Raising; and
- **WORKING GROUP III**
  Compliance Monitoring and Enforcement.

The implementation of Working Group I and II has highlighted the need for all Municipalities to create awareness raising programmes and establish various forums. A summary of the activities in the various regions is provided in Table 4-4.

TABLE 4-4. AWARENESS RAISING PROGRAMMES AND ACTIVITIES IN THE REGIONS

MUNICIPALITY	ACTIVITIES
CAPE WINELANDS DISTRICT MUNICIPALITY	Awareness raising programs include an interactive theatre at schools and the development of placards, pamphlets, posters and other educational material.
CITY OF CAPE TOWN	The message of clean air is delivered to young learners with the help of their air quality mascot "Sniffles the air pollution sniffing cat". Various air quality related projects were implemented.
EDEN DISTRICT MUNICIPALITY	Various air quality awareness projects have been implemented and are ongoing in terms of the Eden Clean Fires Campaign, the Diesel Vehicle Smoke Detection Campaign at the traffic and fire department in Oudtshoorn and in the region.
WEST COAST DISTRICT MUNICIPALITY	Established the Joint Municipal Air Quality Working Group and environmental stakeholders' forums (air quality information and awareness raising between District and Local Municipal officials, and the public and industry).
OVERBERG DISTRICT MUNICIPALITY	Established an Air Quality Forum with Local Municipalities to share information and awareness raising ideas via programmes.

Air quality officials engaged in capacity building sessions to implement, amongst others, Section 21 Listed Activities of the NEM: AQA and Section 30: Emergency Incidents of NEMA. During 2012, a total of 17 Municipal AQOs attended and successfully completed the Environmental Management Inspectorate (EMI) course, and were designated as EMIs during 2012 and 2013.

Working Group III encouraged Municipalities to develop Municipal By-laws. Since 2008, a total of 12 Municipal By-laws, in respect of air quality management were gazetted in the Western Cape, with one By-law pending in the CWDM (Table 4-5).

TABLE 4-5. LIST OF AIR QUALITY BY-LAWS IN THE WESTERN CAPE

MUNICIPALITY	BY-LAW	GAZETTE NO.	DATE
DRAKENSTEIN	The Prevention of Atmospheric Pollution	6426	16 March 2007
HESSEQUA	Air Pollution Control By-law	6588	19 December 2008
CITY OF CAPE TOWN	Air Quality Management By-law	6772	30 July 2010
GEORGE	Air Pollution Control By-law	6816	30 November 2010
EDEN	Air Quality Management By-law	7043	12 October 2012
SALDANHA BAY	Air Pollution Control By-law	7077	24 December 2012
WEST COAST	Air Quality Management By-law	7170	06 September 2013
MOSSEL BAY	Air Quality Control By-law	7184	04 October 2013
BERGRIVIER	Air Pollution Control By-law	7208	06 December 2013
SWELLENDAM	Air Quality Control By-law	7338	05 December 2014
SWARTLAND	Air Quality By-law	7394	22 May 2014
OVERBERG	Air Quality Management By-law	7389	15 May 2015
THEEWATERSKLOOF	Air Quality Management By-law	7488	11 September 2015
CAPE WINELANDS	Air Quality Management By-law	draft	Pending

As of 2012, two District Municipalities (*viz*. WCDM and EDM) have established Municipal Air Quality Officers / Industry Forums within their respective areas in the Western Cape. The municipal forums are conducted on a quarterly basis and attended by industries that operate under Section 21 Listed Activities, the Local Municipal AQOs, as well as the DEA&DP air quality

officials. These forums serve as platforms to communicate and engage on important air quality matters with industry and Local Municipalities in their respective areas.

4.1.5 ATMOSPHERIC EMISSION LICENSING

The Licensing Authorities in the Western Cape have embraced the atmospheric emission licensing process. Table 4-6 provides a summary of the AELs and PAELs issued annually per Licensing Authority during the period 2010 – 2015, and regulated as at 31 December 2015. Engagements between the Licensing Authorities and facilities transitioning from APPA Registration Certificates took place within the required timeframes, as specified by the NEM: AQA.

TABLE 4-6. SUMMARY OF AELS AND PAELS ISSUED DURING 2010 – 2015

LICENSING AUTHORITY	2010		2011		2012		2013		2014		2015		REGULATED, AS AT 31 DECEMBER 2015	
	PAEL	AEL	PAEL	AEL	PAEL	AEL	PAEL	AEL	PAEL	AEL	PAEL	AEL	PAEL	AEL
WCDM	0	0	5	1	1	1	6	1	7	9	3	1	12	9
EDM	5	0	4	0	7	2	2	14	3	6	1	1	2	23
ODM	0	0	0	0	0	0	1	0	2	0	2	0	5	0
CKDM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CCT	0	0	2	0	1	3	3	2	14	19	11	8	16	31
CWDM	0	0	1	0	0	0	0	0	4	11	0	0	5	10
DEA&DP	0	0	0	0	0	0	0	0	1	0	2	0	3	0
TOTAL PER YEAR	5	0	12	1	9	6	12	17	31	45	19	10	43	73

The National DEA launched the South African Atmospheric Emission Licensing and Inventory Portal (SAAELIP) at the 10th Air Quality Governance Lekgotla in Bloemfontein on 30 September 2015. This singular platform monitors AEL emission reporting and atmospheric emission inventory reporting via the System for National Atmospheric Emission Licensing (SNAEL) and the National Atmospheric Emission Inventory System (NAEIS), respectively. The portal can be accessed: https://saaelip.environment.gov.za/SAAELIP/home/.

The NAEIS provides online reporting of emission inventories, as mandated under the National Atmospheric Emission Reporting Regulations (G.N. 38633 of 2015). The system requires of facilities who have been issued AELs or PAELs to submit and manage their emission inventory reports online. To date, a total of 139 facilities in the Western Cape have registered on the NAEIS (Table 4-7). The NAEIS provides the public with a summary of the National Emission Inventory Report of significant pollutants.

The System for National Atmospheric Emission Licensing (SNAEL) aims to

standardize the application, processing and issuing of AELs in the country. It provides for industries who have Section 21 Listed Activities to apply for an AEL online, as well as track the status of their AEL applications online. The system further provides for Licensing Authorities to schedule licensing related inspections and track inspection results, as well as manage online compliance reporting. The general public can access information about air pollutants permitted in AELs for specific industries.

TABLE 4-7. NUMBER OF FACILITIES IN THE WESTERN CAPE, AS REGISTERED ON THE NAEIS

LICENSING AUTHORITY	NUMBER OF REGISTERED FACILITIES
CCT	74
CWDM	18
EDM	25
ODM	3
WCDM	16
DEA&DP	3
TOTAL	139

4.1.6 AIR QUALITY COMPLIANCE AND ENFORCEMENT

Since 2013, the DEA&DPs Air Quality Officers and Environmental Management Inspectors, together with the Metropolitan, District and Local Municipalities, undertook compliance inspections of facilities that have Section 21 Listed Activities throughout the Western Cape. To date, a total of 18 facilities were formally inspected for compliance with their AEL conditions. The AEL Compliance Inspections Programme has strengthened air quality governance procedures in the Province. The engagements also promoted cooperative governance and built capacity in the municipalities where air quality management was a relatively new area of specialisation.

The amendments to the NEM: AQA on 19 May 2014 introduced amendments to Section 22 Consequences of Listing. Section 22A empowers Licensing Authorities to address the unlawful conduct of listed activities resulting in atmospheric emissions. Regulations informing the Section 22A administrative fine fee structure were promulgated on 18 March 2016, and provides for the determination of an administrative fine, as well as for an applicant to pay the applicable AEL processing fee as stipulated. To date, no Section 22A administrative fines have been issued in the Western Cape.

INTER-GOVERNMENTAL TASK TEAMS – IGTT'S

During 2010 – 2015, various Inter-Governmental Task Teams (IGTTs), comprising of all three spheres of government, with separate interactions with industry and the community, were established in order to investigate and resolve complaints related to complex air quality matters. Table 4-8 provides a summary of the IGTTs formed, as well as the nature of the complaints that required investigation and the actions undertaken to resolve the complaints.

TABLE 4-8. SUMMARY OF IGTTS FORMED IN THE WESTERN CAPE

AREA	NATURE OF COMPLAINT
OUDTSHOORN	Complaints of alleged offensive odours emanating from various industries were lodged, resulting in the formation of an IGTT in February 2010. The EDM has actively investigated and worked closely with industries to reduce odour from its processes, and continues to undertake routine inspections to ensure that industries comply with their AEL conditions.
ALBERTINIA	Alleged air pollution complaints in Albertinia were extensively investigated in 2010. Matters were successfully resolved following the implementation of all actions by the relevant industry, as recommended by the IGTT.
MOSSEL BAY	Alleged offensive, as well as chemical odours, in the Dana Bay area in Mossel Bay were extensively investigated and have resulted in complaints having reduced, mainly as result of action items implemented by the IGTT.
ST. HELENA BAY	Alleged adverse health effects associated with emissions from fishmeal processing plants in St. Helena Bay were investigated. Industry has implemented various odour abatement equipment at their facilities, resulting in a noticeable reduction in odour related complaints since 2013.
SALDANHA BAY	Alleged unlawful activities with regards to iron ore dust pollution in Saldanha Bay were investigated following complaints received by all three spheres of Government. An IGTT, headed by WCDM, focused on ensuring that iron ore dust emissions in the area do not pose a nuisance or health risk to surrounding communities. Recently, manganese ore handling and dust have been investigated in the area. These matters are being addressed at the Greater Saldanha Bay IGTT, established in 2015 by the DEA&DP.

COMPLAINTS MANAGEMENT

- ### EDEN DISTRICT MUNICIPALITY

  Complaints overwhelmingly included smoke and odour, with the former having reduced over the past few years. Odour complaints have largely been resolved in Oudtshoorn; while complaints are currently being addressed in Mossel Bay. In 2015, the EDM formed a task team comprising of officials, complainants and industry to address the odour related to animal matter processing in Mossel Bay. A full facility-wide study was conducted and the mitigation measures were transformed into an Action Plan, linked to specific time scales for implementation.

- ### WEST COAST DISTRICT MUNICIPALITY

  The WCDM actively managed complaints and have trained three Environmental Management Inspectors during the period. Moreover, an Air Quality Complaints Register was implemented at the WCDM, and legally required that all industries with Section 21 Listed Activities record and investigate complaints lodged directly at their facilities.

  Many complaints were resolved through discussions with industry at the West Coast Air Quality Management Working Group, which meets on a quarterly basis. Odour remains a challenge in the St. Helena Bay area. Facilities were required to establish communication forums and meet at regular intervals with the public, the planned upgrades and improvements were conveyed.

  Complaints regarding iron ore dust increased in the Saldanha Bay region and were mostly related to iron ore storage and handling in the area. The WCDM and the DEA&DP have worked co-operatively to address the matter via the atmospheric emission licensing process and its associated compliance monitoring and enforcement. Authorities are actively engaging with industry to reduce iron ore dust emissions in the area.

Complaints of manganese storage and handling in the area have also been investigated recently, with authorities resolving that airshed planning, linked to the Precautionary Principle of NEMA as an interim measure, will be used to address all ore storage and handling in the Saldanha Bay region. In the absence of the requirement of an authorisation, authorities have resolved to apply the NEMA Section 28 – Duty of Care Principle, as communicated at the Greater Saldanha Bay IGTT Authorities and Public meetings, convened by the DEA&DP in 2016. The public, however, should note that airshed planning is complex and will require time for authorities to make informed decisions for the region.

- **CAPE WINELANDS DISTRICT MUNICIPALITY**

  Complaints were mostly related to odour, noise and agricultural (dust, crop spraying, farmland/tyre burning) related. Complaints regarding crop spraying and agricultural burning require a harmonized legislative approach between various authorities, including the Department of Agriculture. Odour related complaints, particularly in the Breede Valley Municipal region has required that the CWDM and the DEA&DP set up an IGTT to investigate the conditions of authorisation for a Category 10: Animal Matter Processing Listed Activity; which has since been resolved.

- **CENTRAL KAROO DISTRICT MUNICIPALITY**

  Complaints comprised mostly of noise, offensive odour and waste/tyre burning, particularly at the Beaufort West refuse site. These matters were investigated and resolved by the CKDM.

- **OVERBERG DISTRICT MUNICIPALITY**

  Complaints comprised mostly of offensive odour, followed by dust, smoke from waste and land burning, as well as noise. These matters were investigated and resolved by the ODM.

- **CITY OF CAPE TOWN**

  Overall, air quality complaints in the CCT comprised mostly of noise, fumes, odour and farmland/tyre/waste burning.

  During the period 2010 – 2015, the CCT conducted compliance and enforcement actions investigations on the following activities: galvanising facilities; illegal foundry operators; metal spray operators; and hazardous waste incinerator operators.

  Complaints cases related to odour emissions and nuisance smoke were referred to the Director: Public Prosecutions for consideration for prosecution. Numerous By-law enforcement actions were also undertaken during the reporting period.

  The CCT reported in 2015 that their three diesel vehicle emission testing teams conducted daily roadside vehicle testing operations; in excess of 7000 vehicles were tested. It was also noted that the vehicle emission failure rates have dropped to below 1 % for all vehicles tested during the period.

4.1.7 EMMISIONS INVENTORIES

The DEA&DP developed the Western Cape Emissions Inventory during 2006, which was limited to fuel burning equipment. The DEA&DP expanded this into the Western Cape Air Pollutant and Greenhouse Gas Inventory during 2011. The inventory houses data on point, non-point and mobile sources of air pollution in the Province. Information on 90 airports located in the Western Cape was received from the Civil Aviation Authority, Johannesburg and Airports Company South Africa (ACSA). The various airports and seaports identified in the Western Cape are illustrated in Figure 4-2. The airports range from small landing strips to major airports in the Western Cape. All information was subsequently made available to the DEA for developing and populating the NAEIS.

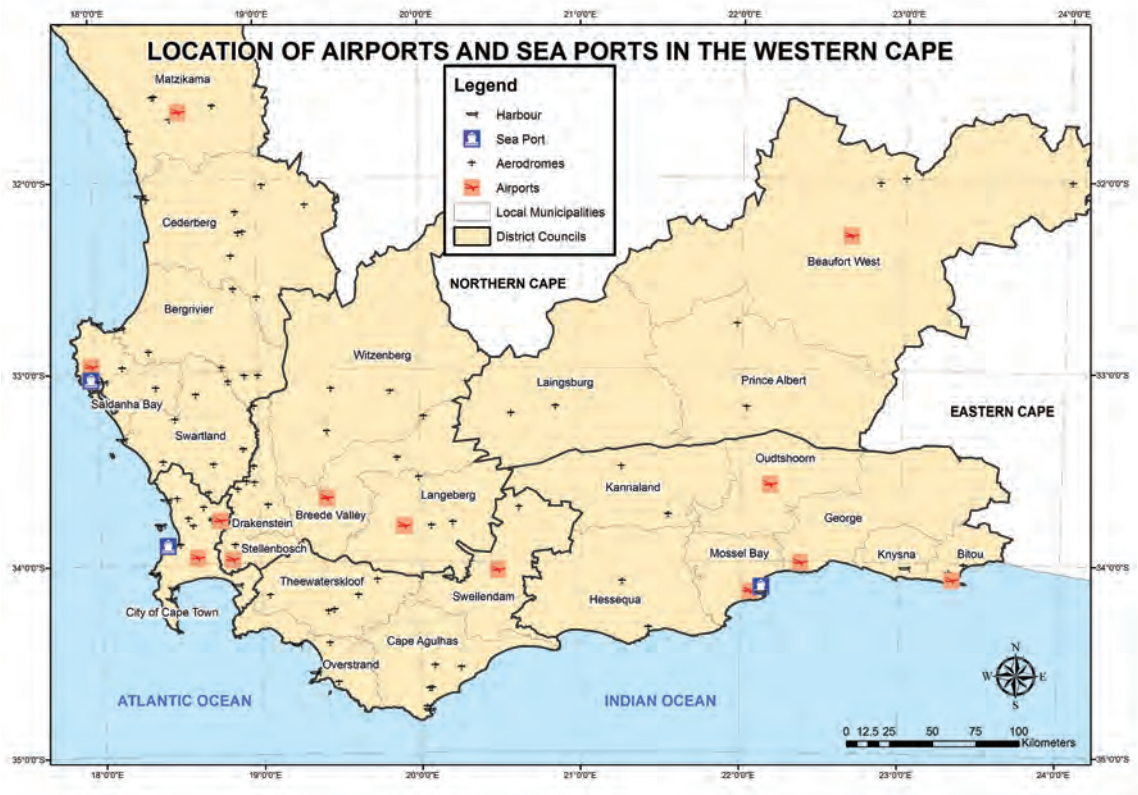

FIGURE 4-2. LOCATION OF AIRPORTS AND SEAPORTS IN THE WESTERN CAPE

The Western Cape Air Pollutant and Greenhouse Gas Emissions Inventory and NAEIS platform can also be used as a decision-supporting tool to inform air quality management planning in the Western Cape. This is to be used in an effort to produce accurate air quality dispersion modelling results, through the necessary air quality dispersion modelling tools.

The DEA&DPs Directorate: Air Quality Management served as an integral part of the development of the Western Cape energy consumption and CO_2 emissions database, as headed by the DEA&DP's Directorate: Climate Change. The purpose of this project was to amongst others, establish a baseline for monitoring and evaluation relating to Provincial commitments, as per the Western Cape White Paper on Sustainable Energy (DEA&DP, 2008) and national goals relating to the National Climate Change Response White Paper (DEA, 2011).

The emission inventories were compiled during 2014 to show the estimated yield for PM_{10}, SO_2, NO_x, CO and VOCs per category of Section 21 Listed Activities in each Municipal region in the Western Cape.

The total estimated emissions (kg / annum) in respect of PM_{10}, SO_2, NO_x, VOC and CO from all Section 21 Listed Activities in the Municipal areas of the Western Cape are presented in Table 4-9. The general sources of the air pollutants are shown in Appendix 2.

TABLE 4-9. ESTIMATED EMISSIONS FROM SECTION 21 LISTED ACTIVITIES IN THE WESTERN CAPE (KG / ANNUM)

DISTRICT MUNICIPALITY	PM_{10}	SO_2	NO_x	VOC	CO
CAPE WINELANDS	50 425	64 665	25 486	236 620	13 689
CITY OF CAPE TOWN	2 767 037	15 301 562	4 382 425	1 465 096	1 501 385
EDEN	1 626 296	6 624 969	5 310 474	503 626	1 439 350
WEST COAST	1 528 822	7 694 044	6 733 757	627 991	1 335 007

The total estimated emissions (kg / annum) in respect of CO_2, N_2O, CH_4, $PM_{2.5}$, PM_{10}, SO_2, NO_x, CO, Benzene and VOCs from unlisted activities in the Municipal areas of the Western Cape are presented in Table 4-10. Overall, estimates of CO_2 emissions were the highest, followed by NO_x, PM_{10}, CO, SO_2, $PM_{2.5}$ and then VOC and other emissions.

4.1.8 AMBIENT AIR QUALITY MONITORING IN THE WESTERN CAPE

Section 8 of the NEM: AQA mandates Provinces and Municipalities to monitor ambient air quality. In the Western Cape, the DEA&DP's Directorate Air Quality Management, CCT and SBM actively monitor ambient air quality in their jurisdictions, as part of the Western Cape Ambient Air Quality Monitoring Network within the Western Cape Province (Table 4-11), while the EDM conducts passive sampling of various air pollutants (Table 4-12).

The ambient air quality monitoring stations of the DEA&DP, CCT and SBM are operated in accordance with the US EPA ambient air quality monitoring methods (Quality Assurance Handbook for Air Pollution Measurement Systems, Vol II), ISO/IEC17025:2005 standards and SANAS TR07-03 requirements.

Air quality monitoring data measured at the stations are recorded on data loggers, after which it is transferred via a modem to a server for storage and further processing. The data is quality controlled and assured and is used to produce daily and monthly reports. All data in the Western Cape Ambient Air Quality Monitoring Network is reported to the South African Air Quality Information System (SAAQIS) on a monthly or quarterly basis.

TABLE 4-10. ESTIMATED EMISSIONS FROM UNLISTED ACTIVITIES IN THE WESTERN CAPE (KG / ANNUM)

DISTRICT MUNICIPALITY	CO_2	N_2O	CH_4	PM_{10}	NO_x	SO_2	VOC	BENZENE	CO	$PM_{2.5}$
CAPE WINELANDS	658 666 181	12 808	17 021	507 947	788 820	6 791 709	2 015 615	2 130	1 121 517	329 678
CENTRAL KAROO	788 245	14	6	215	618	9 988	8	0	1 346	70
EDEN	497 623 976	16 727	630 398	763 682	1 431 378	1 146 023	32 246	80 644	2 981 839	647 649
OVERBERG	97 023 369	2 307	5 027	80 693	137 298	817 395	3 087	738	212 210	60 539
WEST COAST	541 247 608	9 312	4 484	708 328	3 035 974	7 389 887	44 362	1 521	450 193	222 701
CITY OF CAPE TOWN	268 957 797	4 514	2 870	287 206	320 615	198 195	23 679	1 245	255 264	195 396

TABLE 4-11. AMBIENT AIR QUALITY MONITORING NETWORKS IN THE WESTERN CAPE

MUNICIPAL AREA	LOCATION	DATE COMMENCED
DEA&DP WESTERN CAPE – AMBIENT AIR QUALITY MONITORING NETWORK		
CAPE WINELANDS	Traffic Department, van Riebieck Rd, Paarl	March 2008 – May 2009*
EDEN	Voorbaai electrical substation, Mosselbay	August 2008 – February 2010*
WEST COAST	Vredenburg High School, Vredenburg	April 2008*
CAPE WINELANDS	Meirings Park Electrical Substation, Worcester 33° 37' 39.26" S, 19° 28' 54.2" E	July 2009
WEST COAST	Swartland High School, Malmesbury 33° 27' 19.51" S, 18° 43' 54.62" E	April 2010
EDEN	Municipal Swimming Pool, George 33° 58' 45.75" S , 22° 28' 22.50"E	July 2010
CITY OF CAPE TOWN	Panther Park, Berkeley Rd, Maitland	August 2010*
EDEN	Bongolethu Clinic, Oudtshoorn 33° 36' 22.56'' S, 22° 14' 17.80'' E	April 2011
WEST COAST	HP Williams Primary School, St Helena Bay 32° 43' 24.03" S, 17° 58' 21.74" E	April 2011
CITY OF CAPE TOWN	Khayelitsha Training Centre, Khayelitsha 34° 2'21.51"S, 18°40'11.25"E	May 2011 – 2014*
CITY OF CAPE TOWN	Khayelitsha District Hospital, Khayelitsha 34° 3'4.39"S, 18°40'33.07"E	January 2015
CITY OF CAPE TOWN	Morningstar Small Holdings, Vissershok 33°45' 07.37"S, 18° 31' 53.65"E	September 2011
CAPE WINELANDS	CWDM Office, Dorp Street, Stellenbosch 33° 55' 39.50" S , 18° 51' 25.94" E	October 2011
EDEN	Dana Bay Reservoir, Dana Bay 34° 11' 29.42" S, 22° 03' 06.61" E	November 2011– October 2016*
EDEN	EDM Office, C/O Marlin & Samson Street, Mossel Bay 34° 10'44.97"S, 22° 5'50.78"E	November 2016
CITY OF CAPE TOWN	Sentinel Primary School, Hout Bay 34°25'12.42'' S, 19°12'47.37'' E	March 2014
OVERBERG	Mount Pleasant Primary School, Hermanus 34°25'12.40" S, 19°12'47.17" E	March 2014
CITY OF CAPE TOWN – AMBIENT AIR QUALITY MONITORING NETWORK		
CITY OF CAPE TOWN	Molteno	1992
	Goodwood	1993
	Athlone	1993
	City Hall, City of Cape Town	1994
	Tableview	1994
	Foreshore, City of Cape Town	1995
	Bothasig	1995
	Khayelitsha, Site C, Khayelitsha	2002
	Bellville South, Bellville	2003
	Wallacedene	2006
	Atlantis	2008
	Plattekloof Reservoir, Plattekloof	2013
SALDANHA BAY MUNICIPALITY – AMBIENT AIR QUALITY MONITORING NETWORK		
SALDANHA BAY	Saldanha Bay Harbour (33° 00' 57.0" S, 17° 56' 43.3" E)	July 2014
	Louwville substation (32° 54' 30.3" S, 18° 00' 32.2" E)	July 2014
	Saldanha Bay Substation (33° 00' 03.7"S, 17° 56' 42.2" E)	*

*Decommissioned

TABLE 4-12. EDM PASSIVE SAMPLING FOR SO_2, NO_2, H_2S AND BTEX

TOWN	POLLUTANT
ALBERTINIA	SO_2/ NO_2, BTEX
MOSSEL BAY	SO_2/ NO_2
GREAT BRAK RIVER	SO_2/ NO_2
RIVERSDALE	H_2S
GEORGE	H_2S

DEA&DP WESTERN CAPE AMBIENT AIR QUALITY MONITORING NETWORK

The DEA&DP commissioned its first air quality monitoring station in 2008 as part of the Western Cape Ambient Air Quality Monitoring Network. To date, fifteen (15) locations have been monitored, with eleven (11) in operation and reporting on various air quality parameters (Figure 4-3 and Table 4-13).

The set of air quality parameters measured at each monitoring station was primarily determined by the historical air quality conditions at the location. Each set of parameters measured may include complimentary sets of parameters, i.e. SO_2, O_3 and NO_2 (vehicle emissions and combustion), PM_{10} and CO (combustion), and H_2S and CO_2 (odour and combustion), which often provides an indication of the possible causes of air pollution in an area. Meteorological parameters (wind speed and direction, ambient temperature, pressure, relative humidity) are also measured to provide the context within which the air quality is measured. The information recorded also assists in reporting on air quality that impact on the larger area, which is being monitored.

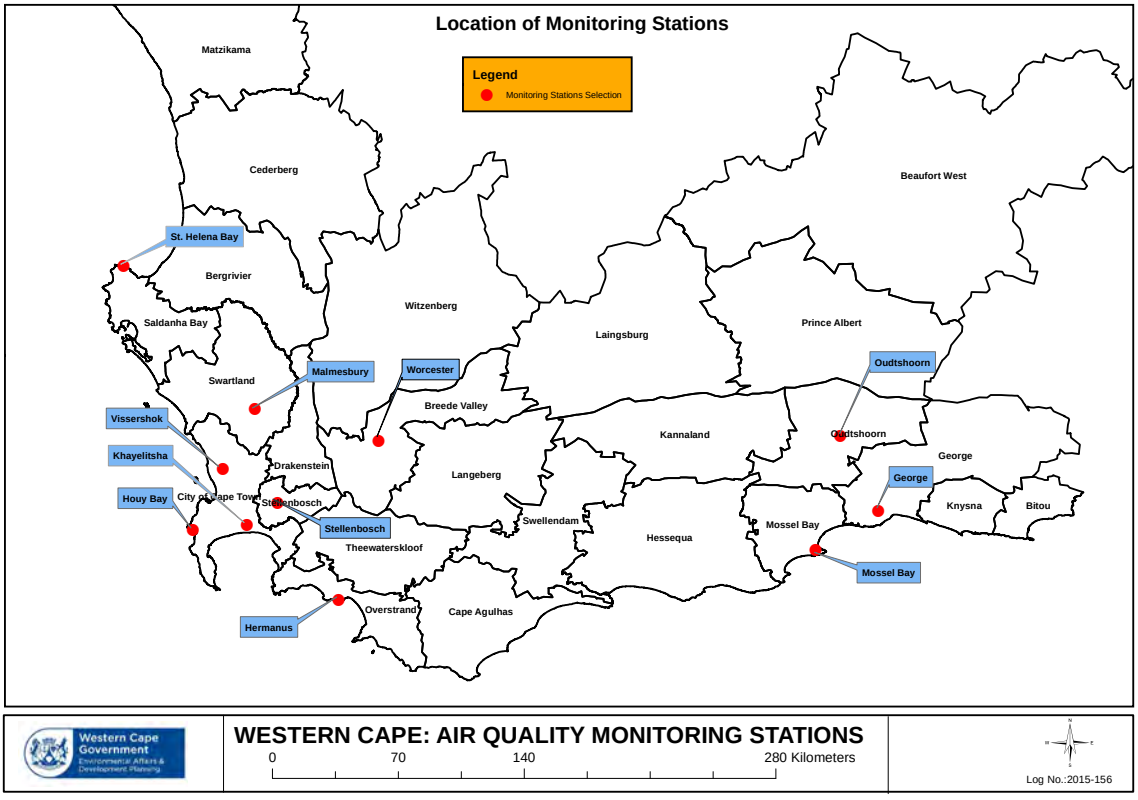

FIGURE 4-3. CURRENT LOCATIONS OF AMBIENT AIR QUALITY MONITORING STATIONS IN THE DEA&DP'S AMBIENT AIR QUALITY MONITORING NETWORK, AS AT 31 DECEMBER 2016

TABLE 4-13. LIST OF PARAMETERS MONITORED AT THE AIR QUALITY MONITORING STATIONS

STATION LOCATION	AIR QUALITY PARAMETERS MEASURED
WORCESTER	SO_2, O_3, NO_2, CO, PM_{10} and full meteorological parameters
MALMESBURY	SO_2, O_3, NO_2, CO, PM_{10} and full meteorological parameters
GEORGE	SO_2, O_3, NO_2, CO, PM_{10} and full meteorological parameters
VISSERSHOK	O_3, NO_2, CO, PM_{10}, and full meteorological parameters
ST. HELENA BAY	H_2S, CO_2, TRS and full meteorological parameters
OUDTSHOORN	H_2S, CO_2 and full meteorological parameters
STELLENBOSCH	SO_2, O_3, NO_2, CO, CO_2, PM_{10} & $_{2.5}$ and full meteorological parameters
KHAYELITSHA	SO_2, O_3, NO_2, CO, CO_2, PM_{10}, $_{2.5}$ and full meteorological parameters
MOSSEL BAY	H_2S, and full meteorological parameters
HOUT BAY	H_2S and full meteorological parameters
HERMANUS	SO_2, O_3, NO_2, CO, CO_2, PM_{10} & $_{2.5}$ and full meteorological parameters

Trend analyses of the ambient air quality, as currently monitored at each location of the DEA&DPs Ambient Air Quality Monitoring Network are provided below. The annual average concentrations of the air quality parameters measured are compared to the respective annual averages of the National Ambient Air Quality Standards (NAAQS), where applicable.

- **SULPHUR DIOXIDE**

  Sources of sulphur dioxide (SO_2) include the combustion of fossil fuels by power plants and other industrial facilities, industrial processes such as extracting metal from ore, vehicle emissions and natural sources, including volcanic plumes. All annual averages of sulphur dioxide (SO_2), as depicted for each monitoring station, are significantly below the annual NAAQS of 50 µg/m³ (Figure 4-4).

  The annual SO_2 averages for Malmesbury and Khayelitsha have remained relatively constant throughout the reporting period; while that of George and Stellenbosch have increased up until 2013, decreasing significantly thereafter. The increases in SO_2 levels seen at George is likely attributed to specific development activities, inclusive of intermittent road works and open burning activities near the monitoring stations. The increased SO_2 levels at Stellenbosch can likely be attributed to vehicular traffic emissions, as the monitoring station is located near a main road in the area.

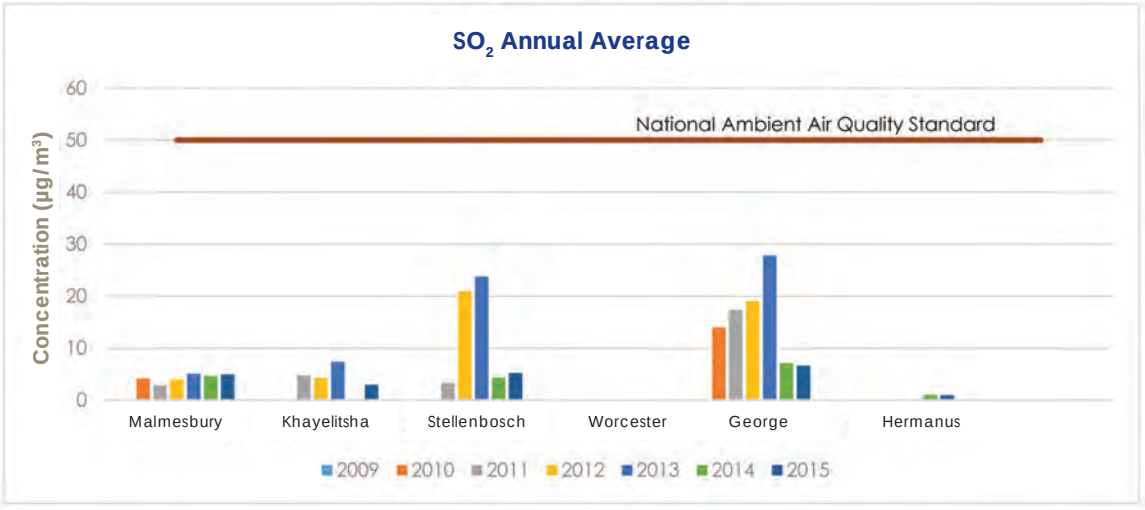

FIGURE 4-4. ANNUAL AVERAGES OF SULPHUR DIOXIDE (SO_2), AS MEASURED DURING 2009 – 2015.

- **NITROGEN DIOXIDE**

All annual averages of nitrogen dioxide (NO_2) as depicted for each monitoring station are significantly below the annual NAAQS of 40 µg/m^3 (Figure 4-5).

The annual NO_2 average for George depicts a similar trend as observed in the annual SO_2 averages, and can be attributed to the same activities during that period.

Generally, the annual NO_2 averages at all other stations showed an upward trend, except at Malmesbury where levels remained steady over time. Most atmospheric NO_2 is emitted as NO, which is oxidized by ozone to NO_2. Fuel combustion in motor vehicles, as well as industrial and chemical manufacturing processes are thus the main sources of NO_2 to the environment, and likely contributed to this increasing trend.

As the Province increasingly places priority on growth and development, it is clear that NO_2 levels will likely increase over time. In going forward, it is imperative to "flag" the increasing trend in NO_2 levels and to ensure that stringent regulation of existing and future industrial and chemical manufacturing processes in the Province, are applied.

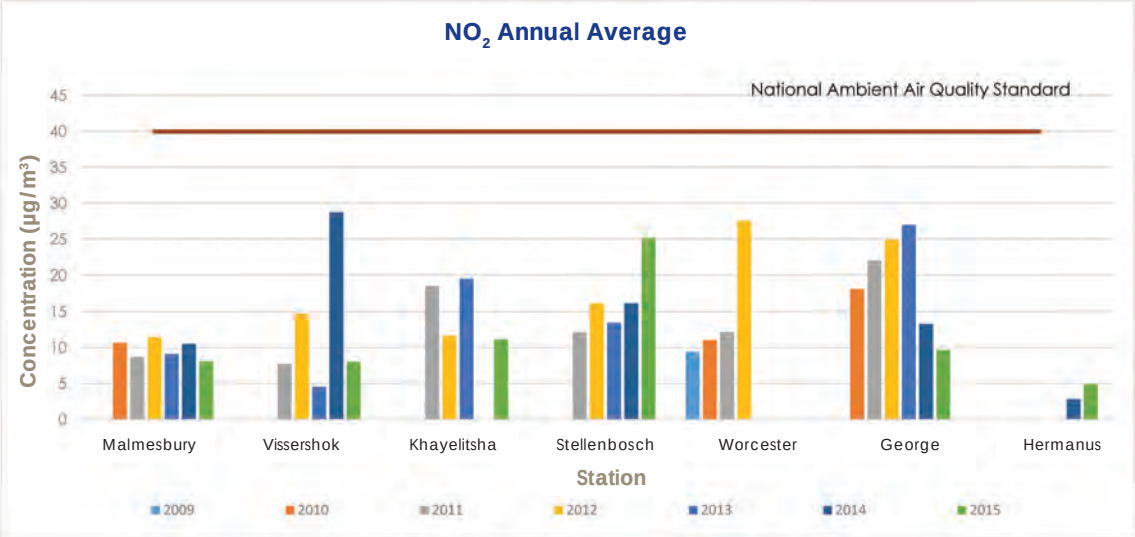

FIGURE 4-5. ANNUAL AVERAGES OF NITROGEN DIOXIDE (NO_2), AS MEASURED DURING 2009 – 2015.

- **OZONE**

Ground level ozone is formed by photochemical reactions in the presence of sunlight and precursor pollutants such as NO_x and VOC's emitted from vehicles and industrial processes.

There is currently no annual National Ambient Air Quality Standard established for O_3. It is important to note, however, that the annual average O_3 concentrations are significantly below the 8-hour standard at all monitoring locations.

The annual average concentrations for O_3 shows a distinct downward trend for George, while no discernable trend was observed at all other air quality monitoring locations (Figure 4-6).

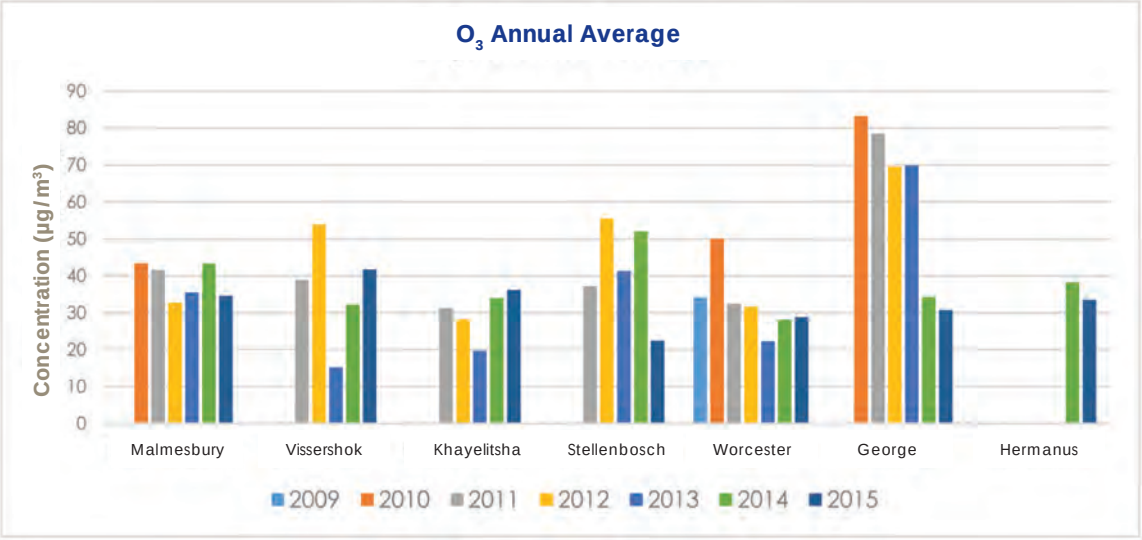

FIGURE 4-6. ANNUAL AVERAGES OF OZONE (O_3), AS MEASURED AT THE MONITORING STATIONS DURING THE PERIOD 2009 – 2015.

- **CARBON MONOXIDE**

  Carbon monoxide (CO) is primarily a product of incomplete combustion of carbon-based fuels in motor vehicles and industrial processes. There is currently no annual National Ambient Air Quality Standard established for CO. However, the annual average CO concentrations were significantly below the 8-hour standard of 10mg/m³ at all monitoring locations (Figure 4-7).

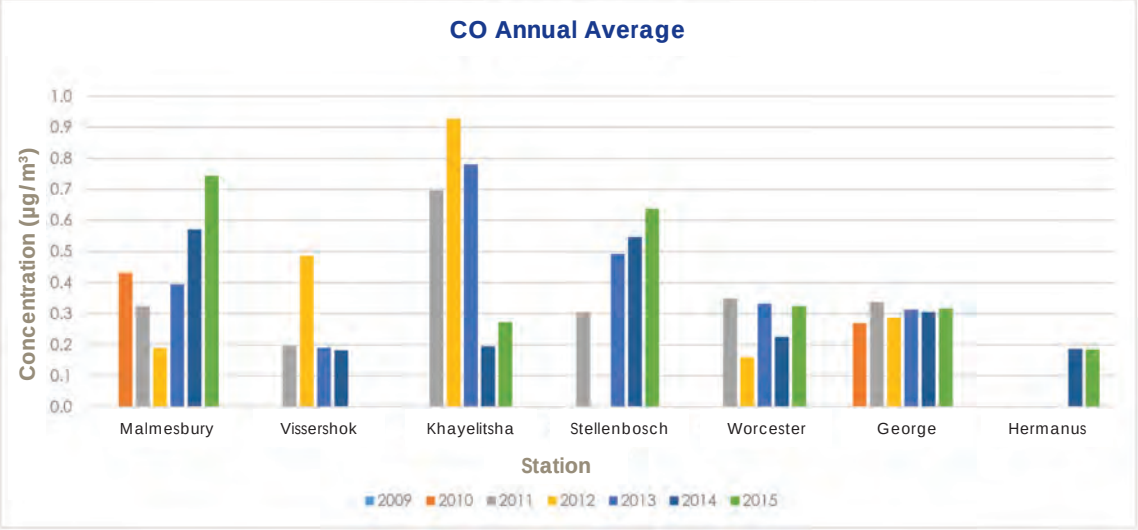

FIGURE 4-7. ANNUAL AVERAGES OF CARBON MONOXIDE (CO), AS MEASURED AT THE MONITORING

- **PARTICULATE MATTER 10**

  Particulate Matter 10 (PM_{10}) are the products resulting from the combustion of wood, coal and fossil fuels, while it is also released by automotive exhausts and windborne dust from construction sites, roads and soil erosion.

  All annual averages of PM_{10} were below the annual National Ambient Air Quality Standard of 40 µg/m³ (Figure 4-8). Windblown dust as a result of a dry climate across the Western Cape may contribute to elevated levels of PM_{10} at all monitoring locations.

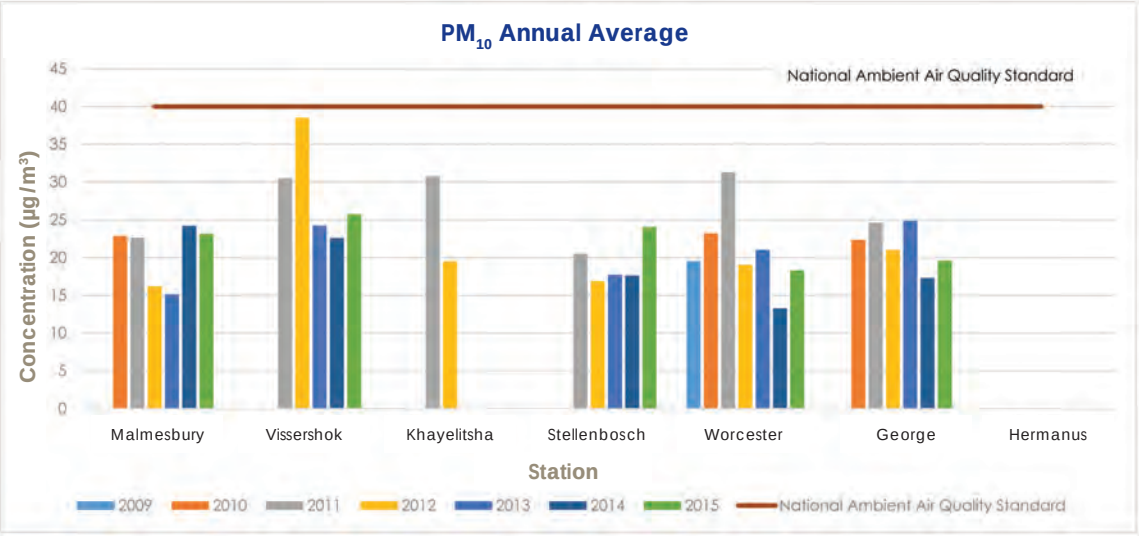

FIGURE 4-8. ANNUAL AVERAGES OF PARTICULATE MATTER (PM_{10}), AS MEASURED AT THE MONITORING STATIONS DURING THE PERIOD 2009 – 2015.

- **HYDROGEN SULPHIDE**

  The sources of hydrogen sulphide (H_2S) includes crude petroleum, natural gas, hot springs and occasionally ground water. It is also formed as a result of the breakdown of organic matter during waste water treatment and animal matter processing.

  There is currently no annual National Ambient Air Quality Standard for H_2S. However, the annual average concentrations depicted in the graph are compared against the 30-minute health guidelines of 150 µg/m³, as set out by the World Health Organisation (WHO). The annual average H_2S concentrations were all significantly below the WHO health guideline. All H_2S concentrations were below the WHO odour guideline, except for Oudtshoorn during 2013 (Figure 4-9).

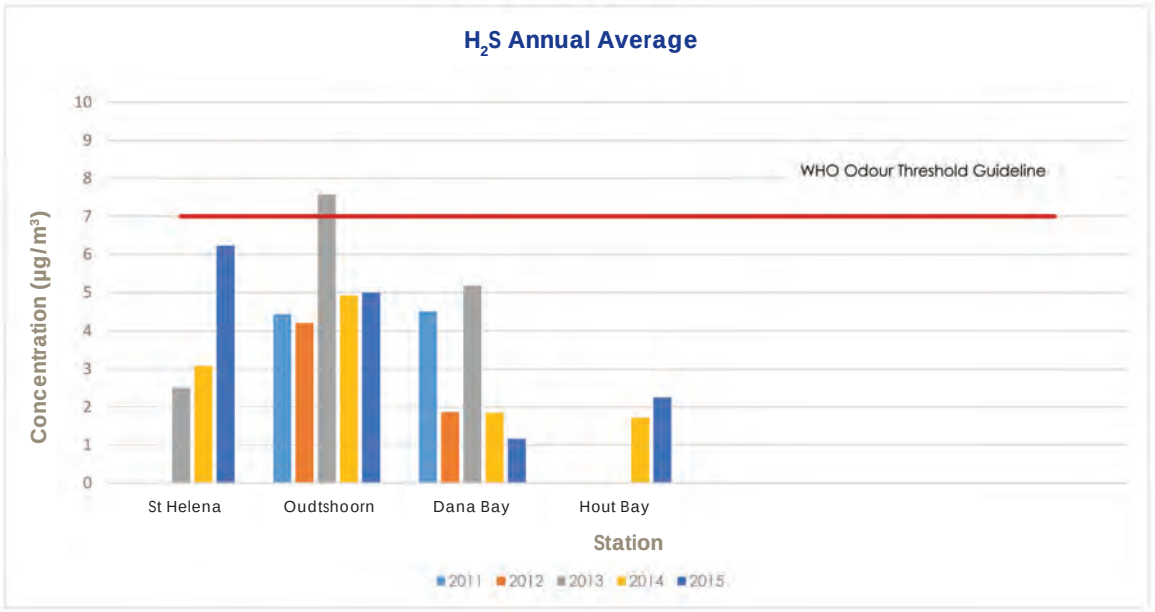

FIGURE 4-9. ANNUAL AVERAGES OF HYDROGEN SULPHIDE (H_2S), AS MEASURED AT THE MONITORING STATIONS DURING THE PERIOD 2009 – 2015.

CITY OF CAPE TOWN AMBIENT AIR QUALITY MONITORING NETWORK

The CCT is responsible for monitoring ambient air quality within the Metropolitan area. Currently, 13 air quality monitoring stations are in operation, with the Athlone monitoring station serving as a reference station for the entire city network, while the Killarney station is a fence line monitoring station for the Chevron Refinery (Figure 4-10).

Potential sources that contribute to air pollution in the Metropolitan area include industry, vehicle emissions, electricity generation and domestic fuel use (heating and cooking). A combination of local topography (mountain range forms a basin that traps pollution) and climate cause the region to be susceptible to increased air pollution during autumn and winter inversions. Early morning inversions are exacerbated by morning peak traffic, causing visible levels of air pollution in the form of a white or brown haze (CCT, 2005). Furthermore, summers are marked by a general high potential for air pollution dispersion across the Metropolitan area due to the constant South-Easter or 'Cape Doctor'.

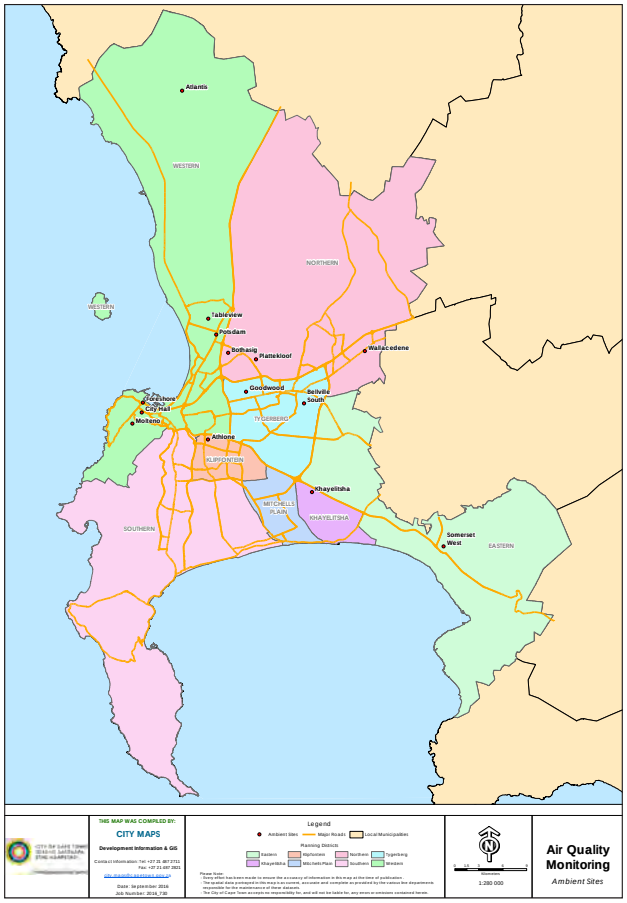

FIGURE 4-10: CITY OF CAPE TOWN AMBIENT AIR QUALITY MONITORING NETWORK

The data is processed into averages, compared to the criteria pollutant guidelines and exceedances reported on a daily basis on the CCT's Air Quality Website (www.capetown.gov.za/airqual), as well as monthly reports. A trend analysis of the air pollutants measured at the CCTs Municipal Ambient Air Quality Monitoring Network is presented below.

Annual average concentrations for Particulate Matter 10 (PM_{10}) and sulphur dioxide (SO_2) are provided in Figures 4-11 and 4-12, respectively, for the period 2009 – 2015.

- **PARTICULATE MATTER**

  The Particulate Matter 10 (PM_{10}) levels measured for all stations reviewed remain compliant with the NAAQS set for PM_{10} with a slight increase reflected in levels over 2014 (Figure 4-11). The PM_{10} levels in Khayelitsha was below the previous National Ambient Air Quality Standard of 50 µg/m^3; however, following the current National Ambient Air Quality Standard of 40 µg/m^3, the levels were exceeded. This may likely be attributed to residential wood burning, refuse burning and dust from unpaved roads, etc. Overall, the PM_{10} average for the stations was 33 µg/m^3. The higher PM_{10} levels measured at the Foreshore station during 2008 -2009 could likely be attributed to construction dust from large scale construction activities in preparation for the 2010 Soccer World Cup.

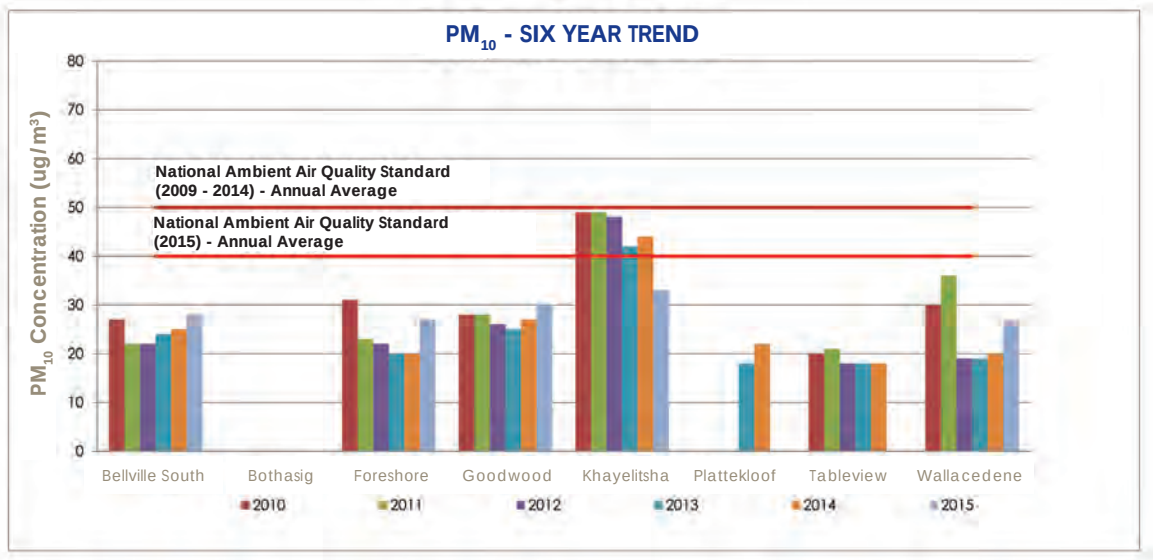

FIGURE 4-11. ANNUAL PARTICULATE MATTER 10 (PM_{10}) LEVELS, AS MEASURED BY THE CITY OF CAPE TOWN

- **SULPHUR DIOXIDE**

  The sulphur dioxide (SO_2) levels measured at all the stations reviewed (Figure 4-12) were well within the NAAQS set (Appendix 1).

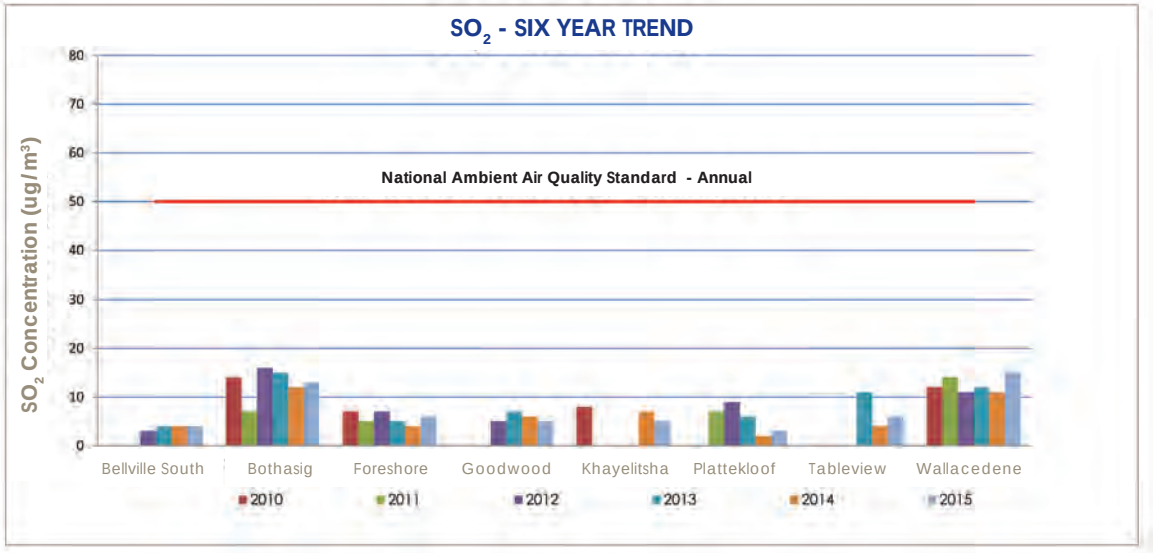

FIGURE 4-12. ANNUAL SULPHUR DIOXIDE (SO_2) LEVELS, AS MEASURED BY THE CITY OF CAPE TOWN (1ppb=2.62µg/m³)

SALDANHA BAY AMBIENT AIR QUALITY MONITORING NETWORK

The Saldanha Bay Local Municipality (SBM) has established their Ambient Air Quality Monitoring Network and commissioned two ambient air quality monitoring stations in 2014, located in Saldanha Bay and Vredenburg, respectively. The air quality monitoring site in Vredenburg is located in a residential area and measures air quality from the prevailing wind sector to detect the impact of emissions from the Saldanha Bay industrial areas; while the Saldanha Bay monitoring site is removed from the primary impact zone of Saldanha Bay industries, and ideally located to monitor changes in ambient air quality as a result of development at the Port of Saldanha Bay.

The ambient air quality monitoring stations measured SO_2, oxides of nitrogen (NO, NO_2, NO_x), O_3, PM_{10} and $PM_{2.5}$, as well as meteorological parameters. Power supply interruptions resulted in gaps in the data recorded. Overall, the NAAQS for each of the pollutants measured (Appendix 1), were not exceeded.

A summary of the ambient air quality monitoring undertaken during 2014 – 2015 is provided below:

- No exceedances of the $PM_{2.5}$ (24 – hours) NAAQS of 65µg/m³;
- The NO_2 NAAQS of 106ppb was not exceeded during the monitoring period;
- The O_3 NAAQS of 61ppb (8-hr running mean) was not exceeded during the monitoring period;
- The SO_2 NAAQS of 191ppb (10 minute mean) was not exceeded during the monitoring period; and
- There were no exceedances of the PM_{10} (24 – hours) NAAQS of 75µg/m³.

In addition to the two ambient air quality monitoring stations located in Vredenburg and Saldanha Bay, seven dust fallout monitors are located at various sites in the Saldanha Bay municipal area (Figure 4-13). The dust fallout monitoring stations were commissioned during May 2014. The results of the dust fallout monitoring shows that all levels were below the residential and non-residential limits specified in the National Dust Control Regulations (Figure 4-14).

FIGURE 4-13. LOCATION OF THE DUST FALLOUT MONITORS IN THE SALDANHA BAY MUNICIPALITY

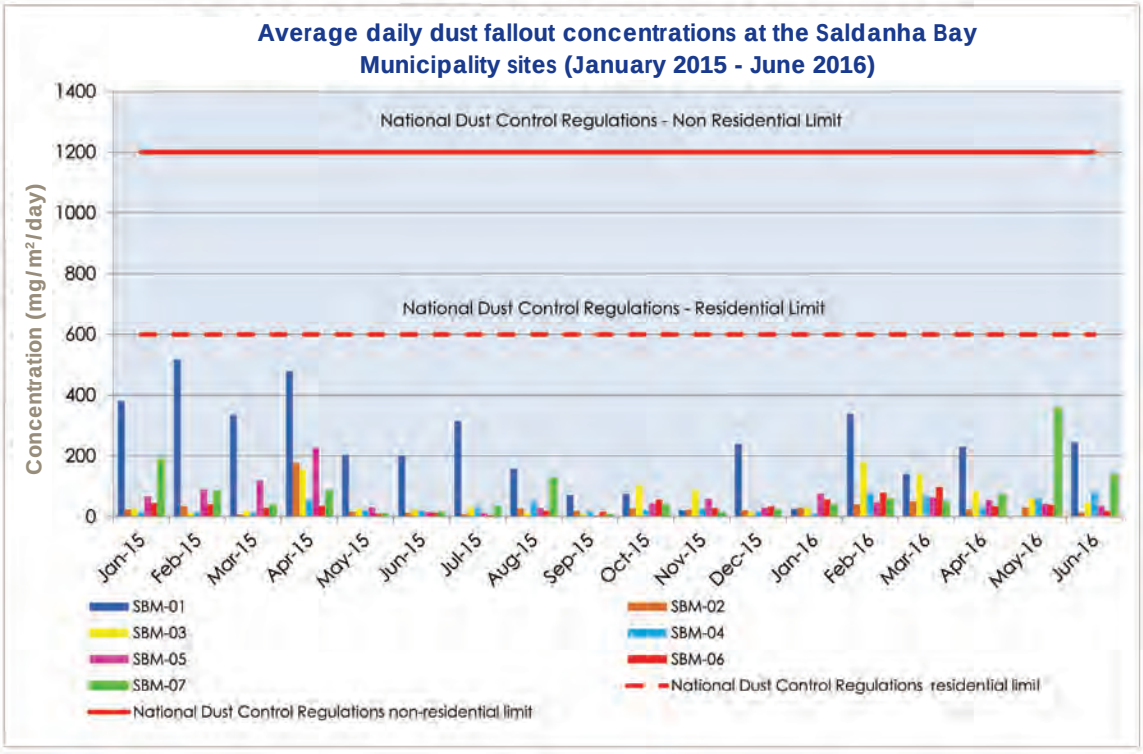

FIGURE 4 –14. DUST FALLOUT MEASURED BY THE SALDANHA BAY MUNICIPALITY

Photograph sourced from www.pixabay.com

5

GAPS AND RECOMMENDATIONS

5.1 GAPS IDENTIFIED

5.2.1 INSTITUTIONAL FUNCTIONS

- The Western Cape Provincial Government plays a significant role in terms of the implementation of the NEM: AQA, as well as its oversight role with Municipalities in respect of air quality management. This oversight role is to ensure that all Municipalities within the Province fully accept their roles and responsibilities in terms of implementing the NEM: AQA.
- While the Metropolitan and all District Municipalities have appointed Air Quality Officers (AQOs), this function is often shared with other duties associated with Environmental Health. Further, at Local Municipal level, only the Oudtshoorn Local Municipality have not designated their AQO.
- All Municipalities, except Oudtshoorn, Breede Valley, Beaufort West and Langeberg Local Municipalities have adopted their Air Quality Management Plans (AQMPs), which have been included as sector plans in their Integrated Development Plans (IDPs).
- The roles and responsibilities in terms of implementing the NEM: AQA were often not fully understood, due to what were often perceived as "overlapping" functions. Furthermore, there is often limited financial and other resource provision made for air quality management, due to the current social and economic climate.
- Air quality management is extremely complex and require highly skilled individuals; as a result, it is also a scarce skill. The availability of suitably skilled human resources therefore remains a challenge.

5.2.2 EMISSIONS FROM MOBILE SOURCES

- Emissions from motor vehicles have been identified as a major air quality concern. Motor vehicles are sources of CO, NO_2, PM_{10} and VOC emissions, particularly during peak periods of idling and acceleration, which is consistent with the stop-start style of driving, as experienced in urban congested areas.
- The control and reduction of vehicle emissions is a Provincial and National challenge that needs to be addressed.

5.2.3 RESIDENTIAL AIR POLLUTION

- Poor indoor and ambient air quality often occurs in low-income and informal settlements throughout the Province. Major sources are domestic fires and fuel burning, fires from informal meat trading, refuse burning, dust from unpaved roads and windblown dust from denuded areas. The burning of wood and paraffin is a common practice and produces SO_2, PM_{10} and VOCs.
- The low level of community awareness and its impacts, associated remedial measures and alternative cleaner fuel options, is a short-coming that needs to be addressed.

5.2.4 MINING ACTIVITIES

- The Central Karoo District Municipality is highly rich in minerals such as uranium, as well as shale gas. There has been increasing interest in mining of these minerals in the area recently, as is evident by the increase in the number of prospecting applications.
- Both prospecting and mining are associated with various environmental impacts, if not managed. The extraction of shale gas has been a matter of great controversy, both nationally and internationally due to the potential environmental impacts associated with it.
- Activities associated with mining will need to be managed, with clear goals and objectives to be identified in the 2nd Generation AQMP.

5.2.5 LICENSING OF LISTED ACTIVITIES

- Complexities between the AEL licensing function and the Environmental authorisation processes exist. The integration of environmental authorisations, AELs and waste management licenses will need to be resolved and implemented, as well as linked to climate change response and spatial planning.

5.2.6 AMBIENT AIR QUALITY MONITORING AND CLIMATE CHANGE RESPONSE

- The financial costs associated with the purchasing, commissioning, operating and maintaining ambient monitoring equipment remains a challenge, particularly when competing with social priorities such as housing, education and health.

  In addition, the linkage between air quality management (monitoring and modelling) and climate change response needs to be made more explicit and addressed through identified activities in the 2nd Generation Western Cape AQMP, e.g. in airshed planning.

5.2.7 EMISSION INVENTORY AND CLIMATE CHANGE RESPONSE

- The emission inventories are limited to the NEM: AQA Section 21 Listed Activities. Emissions from landfill sites, wastewater treatment works, transport and diffuse sources, such as emissions from residential and agricultural areas, as well as the total pollutant load from the various point, area and mobile sources needs to be identified and analysed.

  Emission inventories provide invaluable information that can be used for identifying activities linked to climate change response. Airshed planning can provide information on whether facilities would increase GHG emissions in an area, for example.

5.2.8 TOWN (REGIONAL AND SPATIAL) AND TRANSPORT PLANNING

- Town and transport planning do not always consider the impact of developments on the air quality of an area, e.g. the siting of developments in areas bordering industries and other sources of pollution.

  Such planning needs to be linked to airshed planning, which the 2nd Generation Western Cape AQMP will need to address.

5.2.9 AGRICULTURE

- Pesticide use in agriculture, particularly through aerial crop spraying, results in spray drift, which can distribute organo-chemicals in the vicinity and downwind of the spray area. Burning of crop residue, general waste and tyres to prevent frost damage on farms generates smoke and emissions, which may contribute to atmospheric particulate loading.

  Crop spraying will also need to be addressed in terms of reducing its impacts on the environment and human health. The Department of Agriculture, Fisheries and Forestry will need to be engaged in terms of identifying interventions in respect of implementing sustainable agricultural practices.

5.2.10 TRANS-BOUNDARY AIR POLLUTION

- Air pollutants can traverse over long distances via long-range transport. As such, trans-boundary air pollution is a factor that could influence the air quality of Municipalities in the Western Cape. The declaration of transboundary priority areas would need to be considered as a potential avenue to resolve any such matters, if required.

5.2 RECOMMENDATIONS

5.2.1 INSTITUTIONAL FUNCTIONS

- Communicate the roles and responsibilities of all three spheres of government, as per the NEM: AQA and the National Framework on Air Quality Management 2012, with Municipalities and the public;
- Participate in events and large public gatherings to raise air quality management awareness through campaigns;
- Update the DEA&DP's website with appropriate air quality management information and awareness raising campaigns;
- Engage with Municipal Managers and Councillors to further discuss and agree on the roles and responsibilities of Municipalities with regards to implementing the NEM: AQA and also to ensure that the associated implementation cost is motivated through the Municipal IDPs;
- Ensure sound co-operative governance in the implementation of the NEM: AQA within the respective District and Local Municipal jurisdictions;
- Emphasise the importance of air quality management through awareness raising campaigns to dispel the perception that "the air is clean, so why is air quality management necessary?";
- Motivate for the implementation of AQMPs and the associated cost through the Municipal IDPs to ensure adequate funding for air quality management and air quality monitoring;
- Promote clear responsibilities and functions for air quality management at the District and Local Municipalities, based on the requirements of the NEM: AQA and the National Framework for Air Quality Management 2012;
- Ensure good co-operative governance between District and Local Municipalities, at operational and top management levels;
- Explore and implement opportunities for Service Level Agreements / Memorandum of Understanding between the District and Local Municipalities;
- Acknowledge and support the role of the DEA&DP, including its oversight function, at the Municipal level;
- Capacitate all officials involved with administering the AQM functions within the Municipalities in terms of air quality management, air quality monitoring and the Atmospheric Emission Licensing (AEL) function; and
- Appoint and designate Environmental Management Inspectors at the relevant Municipalities to ensure that compliance and enforcement of legislation is effectively carried out within their areas of jurisdiction.

5.2.2 EMISSIONS FROM MOBILE SOURCES

- Consolidate the Western Cape Pollutant and Greenhouse Gas Emissions Inventory in the DEA&DP, inclusive of the following:
- a regular emission testing program, in line with an Atmospheric Emission Licensing Renewal Programme;
- legislation that supports roadside vehicle emission testing;
- strategies to control vehicle emissions, in line with the National Ambient Air Quality Standards; and
- strategies to effectively control VOC emissions.

5.2.3 RESIDENTIAL AIR POLLUTION

- Investigate and evaluate air pollution levels in all low-income residential areas across the Province;
- Apply lessons from the City of Cape Town's Khayelitsha Air Pollution Study on the control of particulate emissions at sources, throughout the Province, e.g. paving of unsurfaced areas to reduce windblown dust, regulations to control tyre burning and improved service delivery to reduce waste burning; and
- Conduct a survey and compile emission inventories at Municipal level, to determine the pollution levels within disadvantaged residential areas, inclusive of a Strategy to control emissions from identified sources.

5.2.4 MINING ACTIVITIES

- Address air quality related matters associated with all mining activities, across the Province; and
- Focus on the air quality related matters associated with uranium and shale gas mining activities, proposed in the Central Karoo area.

5.2.5 LICENSING OF LISTED ACTIVITIES

- Train officials with regards to air quality management and Atmospheric Emission Licensing;
- Streamline the atmospheric emission licensing process with the environmental authorization processes;
- Motivate for financial resources to administer the atmospheric emission licensing function; and
- Map Section 21 Listed Activities in relation to airshed planning, to inform climate change response and spatial planning.

5.2.6 AMBIENT AIR QUALITY MONITORING AND CLIMATE CHANGE RESPONSE

- Expand the passive sampling screening programmes, as conducted originally by the DEA&DP, and repeat the process at least every second year to facilitate the monitoring of air quality changes;
- Use the results from the passive sampling screening programme to identify areas of possible pair quality exceedances, where continuous monitoring should be implemented;
- Expand the current continuous ambient air quality monitoring undertaken by the DEA&DP to include potential areas of concern and areas that are identified in the passive screening programme to obtain a long-term record of air quality in the District Municipalities;
- Coordinate data obtained from all continuous air quality monitoring stations in the Province so as to provide a Provincial perspective on air quality;
- Perform aished planning on all air quality data monitored, and link this to climate change response and spatial planning; and
- Develop a Provincial web-site where all information can be accessed via links, which then feeds into the South African Air Quality Information System (SAAQIS).

5.2.7 EMISSIONS INVENTORY AND CLIMATE CHANGE RESPONSE

- Expand the initial DEA&DP emissions inventory on fuel burning equipment to include all point sources in the Western Cape, as well as other key area and mobile sources, including greenhouse gases;
- Establish a linkage between the Provincial Emissions Inventory and that of all Municipalities in the Province, in order to better address and understand the cumulative effects of emission sources;
- Update the emissions inventory annually so as to ensure that the data remains current; and
- Link the emissions inventory to activities associated with climate change response.

5.2.8 TOWN (REGIONAL AND SPATIAL) AND TRANSPORT PLANNING

- Establish and foster sustainable relationships and communication channels between officials at all levels of government to address air quality and planning matters;
- Train town and regional planning officials in basic air quality management practices and create awareness to the synergies that exist between planning and air quality management; and
- Link airshed planning to town (regional and spatial) and transport planning.

5.2.9 AGRICULTURE

- Participate in agricultural union meetings to promote air quality on their agendas and to identify opportunities to address emissions control issues, within the respective District or Local Municipalities;
- Pursue greater co-operation with agricultural authorities to address shared environmental priorities that are related to air quality management;
- Encourage the Department of Agriculture to actively promote air quality management in their interaction with the farming community; and
- Train agricultural authorities in basic air quality management practices and create awareness to the synergies that exist between agriculture and air quality management.

5.2.10 TRANS-BOUNDARY AIR POLLUTION

- Intensify the role of National and Provincial Government and District Municipalities in terms of trans-boundary air pollution and explore efforts to reduce emissions from the contributing sources;
- Examine mechanisms at National, Provincial and Municipal level to manage trans-boundary air pollution; and
- Evaluate the merits of Priority Area declarations to manage trans-boundary air pollution impacts at both Provincial and Municipal level, where required.

Photograph by: Avanah De Villiers | DEA&DP Competition 2016/17

6

AIR QUALITY MANAGEMENT PLAN ACTION PLAN

6.1 VISION

"Clean and healthy air for all in the Western Cape"

6.2 MISSION

"To ensure the effective and consistent implementation of sustainable air quality management practices, by all spheres of government, relevant stakeholders and civil society to progressively achieve and efficiently maintain clean and healthy air in the Western Cape"

6.3 GOALS

Four goals of the AQMP support the vision and mission, with each goal addressing the different aspects of the vision and are underpinned by objectives to achieve them. These are:

6.3.1 GOAL 1: ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY MANAGEMENT, LINKED TO CLIMATE CHANGE RESPONSE

FOR MORE SEE PAGES 55-56 & 62-74

This goal aims to address the establishment of the necessary institutional arrangements, i.e. the development and maintenance of the varied systems, skills and capacity for effective air quality management.

STRENGTHEN AND BUILD CAPACITY IN AIR QUALITY MANAGEMENT AND COMPLIANCE AND ENFORCEMENT

This objective focuses on increasing human resources in air quality management through the designation of Air Quality Officers at the Provincial Department, as well as the Metropolitan, District and Local Municipalities. It furthermore focuses on strengthening the area through the appointment of officials to assist the designated Air Quality Officers. The importance of industry is further recognised through the appointment of Emission Control Officers, where required.

Skills development for a sustained air quality expertise base, as well as a sustained air quality compliance and enforcement base is recognised through development of air quality management courses linked to further training of air quality officials, the training and designation of Environmental Management Inspectors and Noise Control Officers, collating and sharing best practices in all air quality management processes and systems, and engaging with industry to implement mentorship and youth development opportunities on industrial processes linked to air emissions.

This objective continues to be one of the cornerstones of the Air Quality Management Plan in terms of investing in human resources that will develop, implement and enforce air quality policy and legislation.

PROMOTE COOPERATION AMONGST ALL SPHERES OF GOVERNMENT, BUSINESS, INDUSTRY AND CIVIL SOCIETY

Cooperative governance is a principle of environmental management and seeks to make the best use of scarce resources, through maximising available personnel, data and experience across institutions. This objective promotes cooperation through engaging on and sharing air quality management and climate change information via platforms such as the Premier's Coordinating Forum, Ministerial/Mayoral Forums, industrial forums, inter-governmental forums, as well as the Air Quality Officer's Forum and Noise Control Forum. The aim is to elevate the importance of air quality management practices and related climate change considerations in the Province.

Moreover, the objective seeks for the establishing of interim arrangements between authorities, to strengthen and implement air quality management systems.

DEVELOP INSTITUTIONAL MECHANISMS TO IMPROVE AIR QUALITY AND CLIMATE CHANGE RESPONSE

The objective focuses on developing institutional mechanisms to improve air quality management and climate change response through established air quality components in Provincial Government, as well as the Metropolitan, District and Local Municipalities.

Improved governance, with fully functional air quality institutional mechanisms and structures, are equally important aims of this objective. Transparent, efficient and effective governance will be pursued through engagements with Councillors and Municipal Managers via workshops, MEC interventions, IDP processes and Air Quality Management Planning processes at Municipalities.

This objective also focuses on the establishment and operation of effective organisational structures and Working Groups. These institutional mechanisms will ensure the implementation, monitoring, evaluation and reporting of progress of the Air Quality Management Plan at Provincial, Municipal and industry level.

DEVELOP, IMPLEMENT AND MAINTAIN AIR QUALITY MANAGEMENT SYSTEMS

An air quality management system incorporating the necessary technical elements that provide information on the status of air quality within an area is regarded as a fundamental requirement for the management of air quality. This objective focuses on developing, implementing and maintaining air quality management systems inclusive of the following: emissions inventories, air quality monitoring networks, information management and atmospheric emission licensing.

In addition, the importance of continuous research and development in air quality management and climate change response is recognised and envisages to focus on airshed planning, town (regional and spatial) and transport planning, transboundary exchange of air pollutants, priority area declaration where required and reducing regional scale ozone. Specialised research projects and cleaner production technologies, via donor-funded

programmes will be a strong focus of this objective, particularly as it relates to reducing air pollutant and greenhouse gas emissions from industrial processes, energy production, mining and proposed hydraulic fracturing in the Western Cape.

ENSURE ADEQUATE FUNDING FOR THE IMPLEMENTATION OF AIR QUALITY MANAGEMENT BY MUNICIPALITIES

Municipalities are given key responsibilities within air quality management governance and their cooperation and support is integral to the successful implementation and cascading of the Air Quality Management Plan. This objective focuses on ensuring that adequate budget is available to implement Air Quality Management Plans at all Municipalities in the Western Cape. It is envisaged that engagements with Municipal Mayors and Managers and through the Local Government Medium-Term Expenditure Commission (LGMTEC) processes, as well as donor agencies will take place to secure funding for implementing air quality management effectively in the Muncipalities.

6.3.2 GOAL 2: CONTINUALLY ENGAGE WITH STAKEHOLDERS TO RAISE AWARENESS WITH RESPECT TO AIR QUALITY MANAGEMENT AND CLIMATE CHANGE RESPONSE

FOR MORE SEE PAGES 57 & 75–78

DEVELOP COMPREHENSIVE EDUCATION AND COMMUNICATION MECHANISMS, STRATEGIES AND PROGRAMMES WITH RESPECT TO AIR QUALITY MANAGEMENT AND CLIMATE CHANGE RESPONSE

Communication channels need to be established that enable the DEA&DP to communicate air quality information to stakeholders regularly. The importance of raising awareness with respect to air quality management and climate change has been recognised through this objective. A Recognition Programme and a related "app" to promote and raise awareness on air quality and climate change response has been highlighted as the main avenues through which education and communication strategies will be shared and implemented.

A SMART-Air: 2Precious2Pollute Recognition Programme, in line with Section 31 of the NEM: AQA, will be used to not only recognise the role industry plays in reducing air pollutant and greenhouse gas emissions, but will also be used to engage with schools, communities and the general public to raise the importance of air quality and climate change response matters.

A Communications Strategy and launch of the brand "SMART-Air: 2Precious2Pollute" will form a core focus of this objective, in association with the Provincial Department's Communication unit. Moreover, the State of Air Quality Management in the Western Cape will be reported through to various National and Provincial Reports.

FOR MORE SEE PAGES 58 & 79-81

6.3.3 GOAL 3: ENSURE EFFECTIVE AND CONSISTENT COMPLIANCE MONITORING AND ENFORCEMENT

IMPROVE AIR QUALITY COMPLIANCE MONITORING AND ENFORCEMENT

Compliance monitoring and enforcement processes are an essential component of the air quality governance cycle. The effective and consistent compliance and enforcement practices in the Province will be implemented via an Air Quality Compliance and Enforcement Programme. Illegal operations that impact on air quality will be identified and investigated, followed by performing relevant administrative enforcement action, as required. Various mechanisms towards addressing compliance monitoring and enforcement includes punitive measures for non-compliance to licenses, By-laws and regulations in the Western Cape.

PROMOTE CONTINUOUS IMPROVEMENT IN RESPECT OF INDUSTRY AIR QUALITY COMPLIANCE

Voluntary compliance and the development of systems/mechanisms that promote self-regulation are an integral part of the progressive realisation of acceptable air quality throughout the Province. This objective promotes the recognition of early adoption of best practice methods and world-class standards by industry, as well as research and development programmes that will significantly add to the successful implementation of the Air Quality Management Plan.

DEVELOP AND IMPLEMENT AIR QUALITY REGULATORY PROCESSES

This objective focuses on implementing effective air quality regulatory processes through developing and setting ambient air quality or emissions standards, as well as developing and implementing relevant air quality By-laws, regulations and guidelines to manage impacts on air quality and control noise, odour and dust in the Western Cape.

FOR MORE SEE PAGES 58-59 & 82-85

6.3.4 GOAL 4: SUPPORT AIR QUALITY AND CLIMATE CHANGE RESPONSE PROGRAMMES, INCLUDING PROMOTING AND FACILITATING THE REDUCTION OF GREENHOUSE GAS EMISSIONS

REDUCE OZONE DEPLETING SUBSTANCES AND GREENHOUSE GAS EMISSIONS, IN LINE WITH NATIONAL AND INTERNATIONAL REQUIREMENTS

Air pollution, as a result of increased ozone depleting substances and greenhouse gas emissions, is integrally linked to climate change. Reducing local air pollution via technical, policy, or economic interventions leads to co-benefits that reduces regional pollutants that cause climate change (e.g. SO_2), which ultimately reduces the impact on human and environmental health.

The objective seeks to support national and international protocols on the reduction of greenhouse gases by exploring climate change co-benefits in air quality management, implementing vehicle emissions control and testing, as well as setting related standards, regulations and methodologies.

Further, eco-driving transport programmes for all transport sectors will be developed and implemented. The introduction of incentives for alternative forms of cooking and heating in informal settlements, as well as best practice in industry and the agricultural sector will be encouraged through the development and implementation of plans to reduce emissions.

6.4 ACTION PLAN

6.4.1 STAKEHOLDER ROLES AND RESPONSIBILITIES

The responsibilities of the Provincial environmental departments regarding AQM are listed in NEM: AQA and are further elaborated upon in the National Framework for AQM in the Republic of South Africa, (DEA, 2012).

The roles and responsibilities of authorities and stakeholders in the Province are clearly outlined, and education and awareness roles are highlighted, as well as the adoption of good environmental practices. Several platforms for inter-governmental, as well as other stakeholder, cooperation and collaboration exist in the Western Cape.

The three spheres of Government, together with the civic society, must ensure that sustainable and efficient air quality management measures are in place and adhered to, in order to minimise air pollution and environmental impacts. These measures need to ensure that communities are resilient enough to account for proposed climate change vulnerabilities, natural hazards and disasters.

The full implementation of the 2nd Generation Air Quality Management Action Plan is imperative for systematically implementing the NEM: AQA in the Western Cape. The Action Plan is presented in Table 6-1.

6.4.2 WORKING GROUPS

The three Working Groups, as established in the AQMP2010, will continue to be the primary mechanism that will drive the 2nd Generation Western Cape AQMP implementation, as a means to direct the activities and involve all necessary stakeholders.

The Working Groups will continue to focus their work on the goals, objectives and related activities, as stated in the Action Plan. The Working Groups may be extended or form sub-groups to facilitate the effective implementation of the AQMP. Working Group members will continue to comprise of officials from the DEA&DP, Municipalities, other authorities, industry, interested and affected parties, civil society and tertiary educational institutions, as required. Consequently, their composition and area of work may vary significantly. The Working Groups will convene as may be required. The Chairpersons of each Working Group will provide feedback to the Western Cape Air Quality Officer's Forum.

The three AQMP Working Groups that will continue to drive the implementation of the 2nd Western Cape AQMP are as follows:

- **Air Quality Management and Climate Change Working Group**
  Area of work: Governance, management with respect to air quality, climate change, town and regional planning and transport planning
- **Air Quality Awareness Raising Working Group**
  Area of work: Information management on air quality and climate change

- **Compliance Monitoring and Enforcement Working Group**
  Area of work: Technical/Control and legal

6.4.3 ACTION PLAN TIMEFRAMES:

Short-term (1-2 years); Medium-term (3-5 years); Long-term (>5years); Continuous

6.5 MONITORING, EVALUATION AND REVIEW

6.5.1 MONITORING

Monitoring and reporting on progress with regards to the implementation of the AQMP is a key factor in maintaining momentum for the roll-out of interventions, as well as providing a means to update key stakeholders. Working Groups are the preferred mechanism for monitoring, as they are the primary means for initiating activities to implement the AQMP. The outcomes of the Working Group progress meetings will be reported in the Annual State of Air Quality Management Report of the Western Cape.

Responsibility	DEA&DP, Working Groups
Method	Progress meeting/Level of completion of interventions
Timeframe	1 - 3 months

6.5.2 EVALUATION

Ongoing evaluation is an essential element of the 2nd Generation AQMP implementation as it allows for a thorough assessment of the 2nd Generation AQMP, including the shortcomings and strengths evident in implementation. Evaluation is an internal mechanism to measure the performance with regard to the implementation of the 2nd Generation AQMP.

The evaluation process will assess the 2nd Generation AQMP implementation outcomes, which are based on the 2nd Generation AQMP indicators. Indicators are an easily interpreted and meaningful method of communicating progress on implementation. These have been developed for the targets specified in the AQMP Implementation Plan.

The evaluation process will be undertaken under the auspices of the Provincial Air Quality Officer. Annual reporting of the 2nd Generation AQMP implementation is recommended as a minimum timeframe and will be incorporated into the Annual State of Air Quality Management Report of the Western Cape.

6.5.3 REVIEW

With regards to the formal review of the 2nd Generation AQMP and the implementation, a review period of every five years is suggested in the DEAs AQMP Manual (DEA, 2008), as well as by participating stakeholders. The definition of the review period is subject to funding and political cycles, as well as implementation outcomes. Therefore, an element of elasticity is necessary.

The process of a five-yearly review is anticipated to be initiated through an internal review mechanism and incorporates the annual evaluation, effectively assessing the five-year performance of the 2nd Generation AQMP and examining the successes and failures of implementation. An evaluation of the current organisational and air quality setting is necessary to complete the evaluation portion of the review. Following the comprehensive evaluation, the goals and objectives are to be amended as needed and activities updated. The internal revision is communicated to stakeholders through a limited public participation process, followed by a further iteration and publication.

Responsibility	DEA&DP, Technical Committee, Stakeholders
Method	AQMP Planning Cycle
Timeframe	5 year

The relationship between progress monitoring, evaluation and review of the AQMP is illustrated in the Air Quality Management Planning Cycle shown in Figure 6-1.

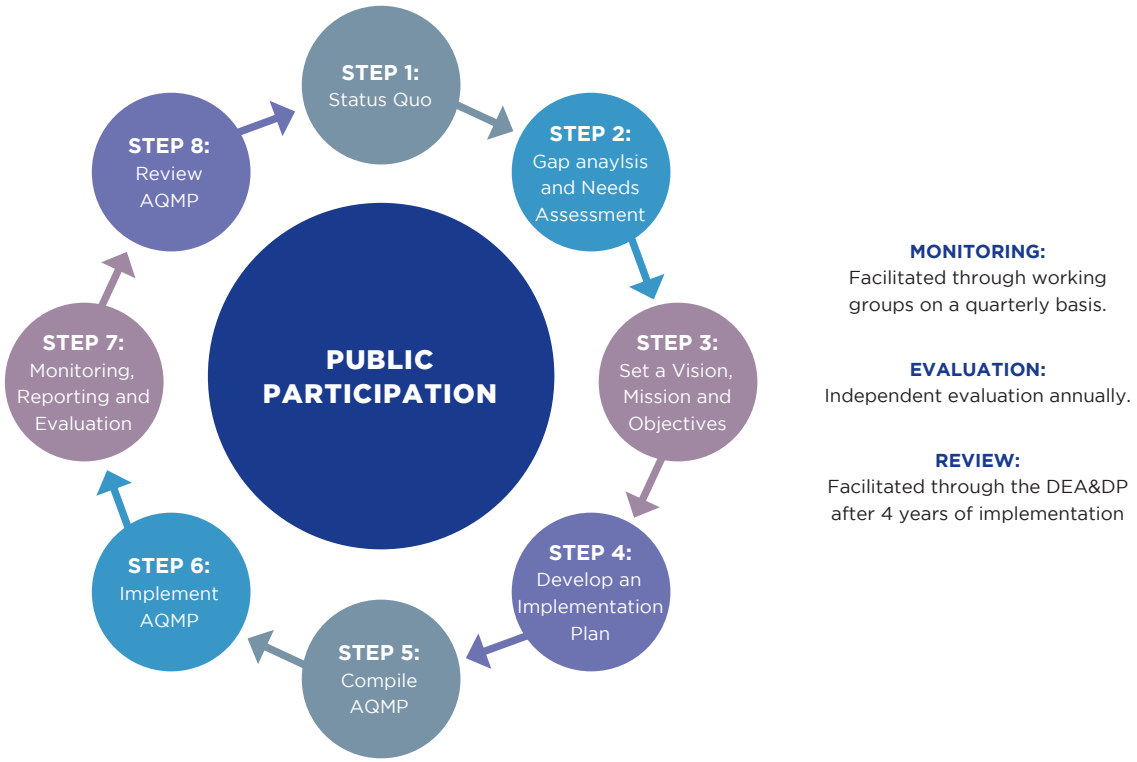

FIGURE 6-1: PROCESS FOR THE DEVELOPMENT OF AN AQMP, WHICH INCLUDES THE MONITORING, EVALUATION AND REVIEW OF THE DEVELOPED AQMP

TABLE 6-1. 2ND GENERATION WESTERN CAPE AIR QUALITY MANAGEMENT PLAN – ACTION PLAN

GOAL 1:
ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY MANAGEMENT

OBJECTIVE 1:
STRENGTHEN AND BUILD CAPACITY IN AIR QUALITY MANAGEMENT AND COMPLIANCE AND ENFORCEMENT

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAME	COST RATING
TARGET: Increased human resources in air quality management					
Designate an AQO at the Provincial level.	Number of AQOs designated at the Provincial level.	DEA&DP	DEA&DP	Short-term	Legislative requirement
Designate an AQO at the Metropolitan, District and Local Municipalities.	Number of AQOs designated at the Metropolitan, District and Local Municipalities.	Metropolitan, District and Local Municipalities	Local Municipalities	Short-term	Legislative requirement
Promote the appointment of officials to assist the AQO at Provincial Department and Municipalities.	Number of officials appointed to assist AQOs at Provincial Department and Municipalities.	DEA&DP, Metropolitan, District and Local Municipalities	DEA&DP, Metropolitan, District and Local Municipalities	Short-term	Operational requirement
Appoint Emissions Control Officers at industries with Listed Activities, where required by the AEL or PAEL.	Number of Emission Control Officers appointments at industries, with Listed Activities.	Industries with Listed Activities	Industries with Listed Activities	Short-term	Legislative requirement

GOAL 1:
ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY MANAGEMENT

OBJECTIVE 1:
STRENGTHEN AND BUILD CAPACITY IN AIR QUALITY MANAGEMENT AND COMPLIANCE AND ENFORCEMENT

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: Skills development for a sustained air quality expertise base					
Engage with SALGA and/ or academia to develop Air Quality Management Courses: Basic, Intermediate, Advanced / Specialised, for various stakeholders.	Developed Air Quality Management Courses: Basic, Intermediate, Advanced / Specialised.	SALGA, Academia, DEA, DEA&DP	DEA&DP, Donor Agencies	Short-term and Continuous	Operational costs
Train Top Management and officials (agriculture, town and regional planning, air quality) and Emission Control Officers in Air Quality Management: Basic, Intermediate, Advanced / Specialised, as identified.	Number of Top Management, officials and Emission Control Officers trained in Air Quality Management: Basic, Intermediate, Advance / Specialised.	Academia, Political Office Bearers (Councillors, Mayors), Municipal Managers, Officials (agriculture, planning, air quality), Emission Control Officers at industries with Listed Activities.	DEA&DP, Donor agencies	Short-term and Continuous	R 100 000
Engage with industries to develop a SMART-Air: Mentorship and Artisanal Programme (SMART-AMAP) on industrial processes linked to air emissions to train officials and youth.	Number of officials and youth trained on industrial processes linked to air emissions, via SMART-AMAP.	Industry, DEA&DP	Industry, DEA&DP, Donor Agencies	Short-term and Continuous	Operational costs

GOAL 1:
ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY MANAGEMENT

OBJECTIVE 1:
STRENGTHEN AND BUILD CAPACITY IN AIR QUALITY MANAGEMENT AND COMPLIANCE AND ENFORCEMENT

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: Skills development for a sustained air quality expertise base					
Collate and share Best Practice Methodologies in all air quality management processes (AELs, monitoring, compliance & enforcement).	Number of Best Practice Methodologies in AQM and AEL processes collated and shared.	DEA&DP, Metropolitan, District and Local Municipalities, Industry, Sector associations, Civil society	DEA&DP, Metropolitan, District and Local Municipalities Industry, sector associations, Civil society	Short-term and Continuous	Operating costs
TARGET: Skills development for a sustained air quality compliance and enforcement base					
Train and designate Environmental Management Inspectors (EMI) at Provincial and Municipal levels, via the National EMI Programme.	Number of AQO's trained as EMIs at Provincial and Municipal levels, via the National EMI Programme.	DEA&DP, Metropolitan, District and Local Municipalities	DEA&DP, Metropolitan, District and Local Municipalities	Short-term and Continuous	Legislative requirement
Train and designate Noise Control Officers	Number of Noise Control Officers trained at Provincial and Municipal levels.	DEA&DP, Metropolitan and Local Municipalities	DEA&DP, Metropolitan and Local Municipalities	Short-term and Continuous	Legislative requirement

GOAL 1:
ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY MANAGEMENT

OBJECTIVE 2:
PROMOTE COOPERATION AMONGST ALL SPHERES OF GOVERNMENT, BUSINESS, INDUSTRY AND CIVIL SOCIETY

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: Platforms to engage on and share air quality management and climate change information					
Engage with Councillors and Municipal Mayors at the Premier's Coordinating Forum to elevate the importance of air quality, as required.	Number of engagements on air quality and climate change at the Premier's Coordinating Forum and related Ministerial/Mayoral Forums.	DEA&DP	DEA&DP	Short-term and Continuous	Operating Costs
Establish or expand existing industrial forums that focus on or include air quality and climate change considerations.	Number of Industrial Forums established or expanded that include air quality and climate change considerations.	DEA&DP, Metropolitan, District and Local Municipalities, Industry, sector associations, Civil society	DEA&DP, Metropolitan, District and Local Municipalities, Industry sector associations	Medium-term and Continuous	Operating costs
Establish and maintain Inter-Governmental Forums to address air quality and related climate change matters in the Province	Number of Inter-Governmental Forums hosted and reported on in the Province.	DEA&DP, Metropolitan, District and Local Municipalities	DEA&DP, Metropolitan, District and Local Municipalities	Short-term and Continuous	Operating costs
Host Provincial Air Quality Officer's Forums to engage on air quality matters.	Number of Air Quality Officer's Forums hosted in the Province.	DEA&DP, DEA, Metropolitan, Local Municipalities, Relevant Provincial Departments	DEA&DP, DEA, Metropolitan, Local Municipalities, Relevant Provincial Departments	Short-term and Continuous	Operating Costs
TARGET: Platforms to engage on and share noise management information					
Host Provincial Noise Control Forums to engage on noise pollution matters.	Number of Provincial Noise Control Forums hosted in the Province.	DEA&DP, DEA, Metropolitan, District and Local Municipalities	DEA&DP, Metropolitan, District and Local Municipalities	Short-term and Continuous	Legislative requirement

GOAL 1:
ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY MANAGEMENT

OBJECTIVE 2:
PROMOTE COOPERATION AMONGST ALL SPHERES OF GOVERNMENT, BUSINESS, INDUSTRY AND CIVIL SOCIETY

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: Agreements wrt implementing air quality management systems					
Establish interim arrangements between Province and Municipalities via agreements, where required.	Number of Agreements established between Province and District Municipalities.	DEA&DP, Metropolitan and District Municipalities	DEA&DP	Short-term, where required	Legislative Requirement
Establish interim arrangements between District and Local Municipalities via service level agreements, where required.	Number ofAgreements established between District and Local Municipalities.	District and Local Municipalities	District Municipalities	Short-term, where required	Operating costs

GOAL 1:
ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY MANAGEMENT

OBJECTIVE 3:
DEVELOP INSTITUTIONAL MECHANISMS TO IMPROVE AIR QUALITY QUALITY AND CLIMATE CHANGE RESPONSE

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: An established air quality component in Provincial Government					
Continuous implementation of air quality mandate by DEA&DP's Directorate: Air Quality Management	Air Quality management budgeted and prioritised in the DEA&DP's MTEF process.	DEA&DP	DEA&DP	Short-term and Continuous	Legislative requirement
TARGET: An established air quality component in Municipalities					
Engage with Municipal Managers where required to ensure that a dedicated air quality management component is implemented to fulfil the NEM: AQA mandates.	Number of Municipalities with a dedicated air quality management component, which is budget and prioritised.	Metropolitan, District and Local Municipalities	Metropolitan, District and Local Municipalities	Short-term and Continuous	Operating costs

GOAL 1:
ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY MANAGEMENT

OBJECTIVE 3:
DEVELOP INSTITUTIONAL MECHANISMS TO IMPROVE AIR QUALITY QUALITY AND CLIMATE CHANGE RESPONSE

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: Improved governance with fully functional air quality institutional mechanisms and structures.					
Convene workshops with Councillors and Municipal Managers to promote the roles and responsibilities of the NEM: AQA at Municipalities.	Number of workshops convened with Councillors and Municipal Managers to elevate the roles & responsibilities of the NEM: AQA at Municipalities.	DEA&DP	DEA&DP	Short-term and Continuous	Operating costs
Engage Municipalities via MEC interventions at Municipalities, where air quality management implementation and systems are absent or weak.	Number of MEC interventions on air quality management implementation and systems at Municipalities.	DEA&DP	DEA&DP	Short-term and Continuous	Operating costs
Engage with relevant stakeholders to ensure that NEM: AQA mandates and applicable budgets are included in the Municipal IDPs.	Number of IDPs that include a budget to implement the NEM: AQA mandates.	DEA&DP, Metropolitan, District Municipalities, Local Municipalities	DEA&DP, Metropolitan, District Municipalities, Local Municipalities	Short-term and Continuous	Legislative requirement
Develop and update Air Quality Management Plans at Municipalities.	Number of Municipal AQMPs developed or updated.	Metropolitan, District and Local Municipalities	Metropolitan, District and Local Municipalities	Short-term and Continuous	Legislative requirement

GOAL 1:
ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY MANAGEMENT

OBJECTIVE 4:
DEVELOP, IMPLEMENT AND MAINTAIN AIR QUALITY MANAGEMENT SYSTEMS

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: Comprehensive Emissions Inventory Systems in the Western Cape					
Manage and maintain a comprehensive Provincial emissions inventory to house all air pollutant and greenhouse gas data in the Western Cape.	Managed and maintained a comprehensive Provincial emissions inventory for the Western Cape.	DEA&DP	DEA&DP	Short-term and Continuous	Operating costs
Manage and maintain Municipal emissions inventory of all sources of pollution (point, non-point and mobile sources) in each jurisdictional area.	Number of Municipal emissions inventories managed and maintained.	Metropolitan, District and Local Municipalities	Metropolitan, District and Local Municipalities	Short-term and Continuous	Operating costs
Integrate all emissions inventory data into the National Atmospheric Emissions Inventory System (NAEIS).	All emissions inventories data to report to NAEIS as per NAEIS regulations.	DEA&DP, Metropolitan, District and Local Municipalities	DEA&DP, Metropolitan, District and Local Municipalities	Short-term and Continuous	Legislative requirement

GOAL 1:
ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY MANAGEMENT

OBJECTIVE 4:
DEVELOP, IMPLEMENT AND MAINTAIN AIR QUALITY MANAGEMENT SYSTEMS

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: Comprehensive Ambient Air Quality Monitoring Networks in the Western Cape					
Establish an accredited Provincial Ambient Air Quality Monitoring Network	Established an accredited Provincial Ambient Air Quality Monitoring Network.	DEA&DP	DEA&DP	Medium-term and Continuous	Capital cost: R2 million per station (once off)
Establish, operate and maintain at least one accredited ambient air quality monitoring station in each District region.	Number of accredited ambient air monitoring stations operated per District region.	DEA&DP, Metropolitan, District and Local Municipalities	DEA&DP, Metropolitan, District and Local Municipalities	Medium-term and Continuous	Capital cost: R2 million per station (once off)
Establish Municipal air quality screening programmes in jurisdictional areas.	Number of Municipal air quality screening programmes conducted.	DEA&DP, Metropolitan and District Municipalities	DEA&DP, Metropolitan and District Municipalities	Medium-term and Continuous	Less than R100 000
Engage with industry to establish industrial air quality monitoring systems, as required by Atmospheric Emissions Licence conditions.	Number of industrial air quality monitoring systems in operation.	Industry, Municipalities	Industry	Long-term and Continuous	Legislative requirement

GOAL 1:
ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY MANAGEMENT

OBJECTIVE 4:
DEVELOP, IMPLEMENT AND MAINTAIN AIR QUALITY MANAGEMENT SYSTEMS

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: Ambient Air Quality Information Systems in the Western Cape					
Manage and maintain Provincial ambient air quality information that is reported to SAAQIS.	Managed and maintained Provincial ambient air quality information that is reported to SAAQIS.	DEA&DP	DEA&DP	Short-term and Continuous	Operating costs
Upload ambient air quality monitoring data for the Western Cape to SAAQIS.	Ambient air quality monitoring data uploaded to SAAQIS.	DEA&DP, Metropolitan, District and Local Municipalities	DEA&DP, Metropolitan, District and Local Municipalities	Short-term and Continuous	Legislative requirement
Manage and maintain air quality complaints handling databases at Provincial and Municipal level in the Western Cape.	Managed and maintained air quality complaints handling databases.	DEA&DP, Metropolitan, District and Local Municipalities	DEA&DP, Metropolitan, District and Local Municipalities	Medium-term and Continuous	Operating costs
Promote and maintain a more user-friendly platform for public to lodge air quality complaints to relevant authorities.	Number of complaints lodged and addressed through user-friendly platform(s).	DEA&DP, Metropolitan, District and Local Municipalities	DEA&DP, District, Metropolitan and Local Municipalities	Medium-term and Continuous	Operating costs

GOAL 1:
ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY MANAGEMENT

OBJECTIVE 4:
DEVELOP, IMPLEMENT AND MAINTAIN AIR QUALITY MANAGEMENT SYSTEMS

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: Effective Atmospheric Emissons Licensing System in the Western Cape					
Process Atmospheric Emissions License applications received by the Provincial Department.	Number of Atmospheric Emission Licenses issued by the Provincial Department.	DEA&DP	DEA&DP	Short-term and Continuous	Legislative requirement
Process Atmospheric Emissions License applications received by the Metropolitan Municipality.	Number of Atmospheric Emission Licenses issued by the Metropolitan Municipality.	Metropolitan Municipality	Metropolitan Municipality	Short-term and Continuous	Legislative requirement
Process Atmospheric Emissions License applications received by the District Municipalities.	Number of Atmospheric Emission Licenses issued by the District Municipalities.	District Municipalities	District Municipalities	Short-term and Continuous	Legislative requirement
TARGET: Continuous research and Development					
Conduct air quality health risk assessment studies, linked to air quality-related diseases for identified areas of the Western Cape.	Number of air quality health risk assessment studies undertaken in the Western Cape.	DEA&DP, Health sector professionals, Universities	DEA&DP, Metropolitan, District and Local Municipalities, Health sector professionals, Universities	Short-term and Continuous	Less than R5 million

GOAL 1:
ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY MANAGEMENT

OBJECTIVE 4:
DEVELOP, IMPLEMENT AND MAINTAIN AIR QUALITY MANAGEMENT SYSTEMS

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: Continuous research and Development					
Conduct spatial and temporal trend analyses and modelling of air pollutants to inform airshed planning, as well as town (regional and spatial) and transport planning in the Western Cape.	Airshed Planning implemented in the Western Cape.	DEA&DP, Metropolitan and District Municipalities	DEA&DP, Metropolitan and District Municipalities	Medium-term and Continuous	Less than R1 million
Quantify the transboundary exchange of air pollutants in the Western Cape, where required.	Quantified transboundary exchange of air pollutants, as required.	DEA&DP	DEA&DP	Medium-term and Continuous	Less than R1 million (costs part of above study on contribution of different pollutant sources)
Declare Provincial Priority Areas and develop associated Air Quality Management Plans, where required.	Number of Provincial Priority Area declared. Number of Priority Area Air Quality Management Plans developed.	All spheres of government	DEA&DP	Long-term and Continuous	Less than R1 million (costs part of above study on contribution of different pollutant sources)
Develop and implement an integrated plan to manage precursors to reduce regional scale ozone.	An integrated plan to manage precursors to reduce regional scale ozone.	DEA&DP	DEA&DP, DoTransport, SAPIA DoAgriculture, Metropolitan and District Municipalities	Medium-term and Continuous	Less than R1 million
Identify and implement specialised research projects and cleaner production technologies in air quality and climate change response, via donor-funded programmes.	Number of specialised research projects and cleaner production technologies implemented, via donor-funded programmes.	Donor Agencies, DEA&DP	Donor Agencies, DEA&DP	Short-term and Continuous	R20 million

GOAL 1:
ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY MANAGEMENT

OBJECTIVE 5:
ENSURE ADEQUATE FUNDING FOR THE IMPLEMENTATION OF AIR QUALITY MANAGEMENT BY MUNICIPALITIES

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: Adequate budget to implement Air Quality Management Plans					
Engage with Municipal Mayors and Managers to secure funding available for air quality management systems in Municipalities.	Number of engagements with Municipal Mayors and Managers to secure funding for air quality management systems in Municipalities.	DEA&DP, Metropolitan, District and Local Municipalities	DEA&DP, Metropolitan, District and Local Municipalities	Short-term	Operational costs
Include Air Quality Management Plans as a Sector Plan of Municipal IDPs and budget for the function.	Number of Municipal IDPs that include Air Quality Management Plans functions and budgets.	Metropolitan, District and Local Municipalities	Metropolitan, District and Local Municipalities	Short-term and Continuous	Legislative requirement
Engage with donor agencies to fund specialised training and projects via donor-funded programmes.	Number donor-funded programmes implemented.	Donor Agencies, DEA&DP	Donor Agencies, DEA&DP	Medium-term	Operational Costs

GOAL 2: CONTINUALLY ENGAGE WITH STAKEHOLDERS TO RAISE AWARENESS WITH RESPECT TO AIR QUALITY MANAGEMENT AND CLIMATE CHANGE RESPONSE

OBJECTIVE 1: DEVELOP COMPREHENSIVE EDUCATION AND COMMUNICATION MECHANISMS, STRATEGIES AND PROGRAMMES WITH RESPECT TO AIR QUALITY MANAGEMENT AND CLIMATE CHANGE RESPONSE

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: A Recognition Programme to promote air quality and climate change response, linked to awareness raising					
Develop and implement a SMART-Air: 2Precious2Pollute Recognition Programme to promote air quality management.	Developed and implemented the SMART-Air: 2Precious2Pollute Recognition Programme.	DEA&DP	DEA&DP	Medium-term and Continuous	Legislative requirement
Develop a Communications Strategy for the SMART-Air: 2Precious2Pollute Recognition Programme, in association with the Provincial Communications unit.	Develop a Communications Strategy for the SMART-Air: 2Precious2Pollute Recognition Programme.	DEA&DP	DEA&DP	Medium-term and Continuous	R 250 000
Launch the brand "SMART-Air: 2Precious2Pollute" Recognition Programme, in association with the Provincial Department's Communication unit.	Developed and launched brand "SMART-Air: 2Precious2Pollute".	DEA&DP	DEA&DP	Medium-term and Continuous	R 100 000

GOAL 2: CONTINUALLY ENGAGE WITH STAKEHOLDERS TO RAISE AWARENESS WITH RESPECT TO AIR QUALITY MANAGEMENT AND CLIMATE CHANGE RESPONSE

OBJECTIVE 1: DEVELOP COMPREHENSIVE EDUCATION AND COMMUNICATION MECHANISMS, STRATEGIES AND PROGRAMMES WITH RESPECT TO AIR QUALITY MANAGEMENT AND CLIMATE CHANGE RESPONSE

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: A Recognition Programme to promote air quality and climate change response, linked to awareness raising					
Develop and maintain an online SMART-Air: 2Precious2Pollute Recognition Programme website, in association with the Provincial Department's Communication unit.	Developed and maintained SMART-Air: 2Precious2Pollute website.	DEA&DP	DEA&DP	Medium-term and Continuous	Operational costs
Develop and activate a SMART-Air: 2Precious2Pollute APP for the public and authorities to raise awareness on air quality and climate change matters.	Developed and activated a SMART-Air: 2Precious2Pollute APP for the public to raise air quality and climate change matters.	DEA&DP, DoEducation, Educational institutions, Metropolitan, District and Local Municipalities, Industry sector associations	DEA&DP, DoEducation, Educational Institutions Metropolitan, District and Local Municipalities, Industry sector associations	Long-term and Continuous	Less than R500 000
Produce air quality and climate change educational and awareness raising materials, as part of the SMART-Air: 2Precious2Pollute Recognition Programme.	Number of educational and awareness raising materials developed.	DEA&DP, DoEducation, Educational institutions, Metropolitan, District and Local Municipalities, Industry sector associations	DEA&DP, DoEducation, Educational Institutions Metropolitan, District and Local Municipalities, Industry sector associations	Medium-term and Continuous	Less than R100 000

GOAL 2: CONTINUALLY ENGAGE WITH STAKEHOLDERS TO RAISE AWARENESS WITH RESPECT TO AIR QUALITY MANAGEMENT AND CLIMATE CHANGE RESPONSE

OBJECTIVE 1: DEVELOP COMPREHENSIVE EDUCATION AND COMMUNICATION MECHANISMS, STRATEGIES AND PROGRAMMES WITH RESPECT TO AIR QUALITY MANAGEMENT AND CLIMATE CHANGE RESPONSE

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: A Recognition Programme to promote air quality and climate change response, linked to awareness raising					
Engage with the media in respect of press releases to raise awareness on air quality and climate change response.	Number of press releases drafted and published to raise awareness on air quality and climate change response.	DEA&DP, Media, Metropolitan, District and Local Municipalities, Industry Sector associations	DEA&DP, Media, Metropolitan, District and Local Municipalities, Industry Sector associations	Medium-term and Continuous	Less than R100 000
Engage with the Department of Education to include air quality and climate change in their curriculum.	Number of school programs that include air quality and climate change in their curriculum.	DEA&DP, Department of Education, Metropolitan, District and Local Municipalities, Industry Sector associations	DEA&DP, Department of Education, Metropolitan, District and Local Municipalities, Industry Sector associations	Medium-term and Continuous	Less than R100 000
Host an Annual SMART-Air: 2Precious2Pollute Awards event to recognise the contribution of industry to reduce air emissions through their processes.	Number of industries recognised for their contribution to reduce air emissions through their processes.	DEA&DP	DEA&DP	Medium-term and Continuous	Less than R100 000

GOAL 2: CONTINUALLY ENGAGE WITH STAKEHOLDERS TO RAISE AWARENESS WITH RESPECT TO AIR QUALITY MANAGEMENT AND CLIMATE CHANGE RESPONSE

OBJECTIVE 1: DEVELOP COMPREHENSIVE EDUCATION AND COMMUNICATION MECHANISMS, STRATEGIES AND PROGRAMMES WITH RESPECT TO AIR QUALITY MANAGEMENT AND CLIMATE CHANGE RESPONSE

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: Reporting on air quality management and climate change response in the Province					
Integrate air quality and climate change response, via Working Groups on Air Quality and Climate Change engagements.	Strengthened the link between air quality and climate change response.	DEA&DP, Metropolitan and District Municipalities	DEA&DP, Metropolitan and District Municipalities	Short-term and Continuous	Operating costs
Provide inputs to the National Air Quality Officer's Report.	Inputs submitted ot the National Air Quality Officers Reports.	DEA&DP, Metropolitan and District Municipalities	DEA&DP, Metropolitan and District Municipalities	Short-term and Continuous	Operating Costs
Provide inputs to the Provincial Quarterly Performance Reports.	Inputs submitted to the Provincial Quarterly Performance Reports.	DEA&DP, Metropolitan and District Municipalities	DEA&DP, Metropolitan and District Municipalities	Short-term and Continuous	Operating Costs
Develop the Provincial Annual State of Air Quality Management Report.	Developed the Provincial Annual State of Air Quality Management Report.	DEA&DP, Metropolitan and District Municipalities	DEA&DP	Short-term and Continuous	R 500 000 every 5 years

GOAL 3:
ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY COMPLIANCE MONITORING AND ENFORCEMENT

OBJECTIVE 1:
IMPROVE AIR QUALITY COMPLIANCE MONITORING AND ENFORCEMENT

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: Air Quality Compliance and Enforcement Programme in the Western Cape					
Develop and implement a Western Cape Air Quality Compliance and Enforcement Programme.	Developed and implemented a Western Cape Air Quality Compliance and Enforcement Programme.	DEA&DP, Metropolitan, District and Local Municipalities	DEA&DP, Metropolitan, District and Local Municipalities	Short-term and Continuous	Legislative requirement
Identify and investigate illegal operations that impact on air quality.	Number of illegal operations identified and investigated.	DEA&DP, Metropolitan and District Municipalities	DEA&DP, Metropolitan and District Municipalities	Short-term and Continuous	Legislative requirement
Perform relevant administrative enforcement action in respect of air quality, as required.	Number of compliance notices, directives, or S22A fines issued in respect of air quality.	DEA&DP, Metropolitan and District Municipalities	DEA&DP, Metropolitan and District Municipalities	Short-term and Continuous	Legislative requirement

GOAL 3:
ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY COMPLIANCE MONITORING AND ENFORCEMENT

OBJECTIVE 2:
PROMOTE CONTINUOUS IMPROVEMENT IN RESPECT OF INDUSTRY AIR QUALITY COMPLIANCE

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: A compliance-driven and self-regulated industry					
Promote self-regulation by facilitating the development of incentives and other measures for industries.	Number of measures developed to promote compliance and self-regulation by industry.	DEA&DP, Metropolitan and District Municipalities	DEA&DP, Metropolitan and District Municipalities	Long-term and Continuous	Legislative requirement

GOAL 3:
ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY COMPLIANCE MONITORING AND ENFORCEMENT

OBJECTIVE 3:
DEVELOP AND IMPLEMENT AIR QUALITY REGULATORY PROCESSES

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: Effective air quality regulatory processes					
Develop and set Provincial Ambient Air Quality or Emissions Standards for the Western Cape, where required.	Developed and set Provincial Ambient Air Quality Standards or Guidelines, where required.	DEA&DP	DEA&DP	Long-term and Continuous	Less than R1 million
Develop By-laws, Regulations and Guidelines to manage air quality, odour and dust.	Number of By-laws/ Regulations adopted and implemented.	DEA&DP, Metropolitan, District and Local Municipalities	DEA&DP, Metropolitan, District and Local Municipalities	Long-term and Continuous	Legislative requirement
Implement the Provincial Noise Control Regulations or By-laws on noise control.	Number of noise control matters regulated via the Provincial Noise Control Regulations or By-laws.	DEA&DP, Metropolitan, District and Local Municipalities	DEA&DP, Metropolitan, District and Local Municipalities	Short-term and Continuous	Legislative requirement
Implement Regulations, By-laws and Guidelines to manage air quality, odour and dust.	Implemented Regulations, By-laws and Guidelines to manage air quality.	DEA&DP, Metropolitan, District and Local Municipalities	DEA&DP, Metropolitan, District and Local Municipalities	Short-term and Continuous	Legislative requirement

GOAL 4: SUPPORT AND IMPLEMENT AIR QUALITY AND CLIMATE CHANGE RESPONSE PROGRAMMES, INCLUDING PROMOTING AND FACILITATING THE REDUCTION OF GREENHOUSE GASES

OBJECTIVE 1: REDUCE GREENHOUSE GAS EMISSIONS IN LINE WITH NATIONAL AND INTERNATIONAL REQUIREMENTS

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: Support of national and international protocols on the reduction of greenhouse gases					
Explore climate change co-benefits in air quality management.	Number of Municipal AQMP's that include opportunities for climate change co-benefits; Number of interventions with co-benefits.	DEA&DP, Metropolitan, District and Local Municipalities and Industry	DEA&DP, Metropolitan, District and Local Municipalities and Industry	Medium-term and Continuous	Operating costs (Support other Programmes and initiatives)s
Support the Provincial programme to reduce greenhouse gases and its associated carbon footprint.	Supported the Provincial programme to reduce greenhouse gases and its associated carbon.	DEA&DP, Metropolitan, District and Local Municipalities and Industry	DEA&DP, Metropolitan, District and Local Municipalities and Industry	Short-term and Continuous	Operating costs (Support other programmes and initiatives)
Support the awareness raising of greenhouse gas and carbon footprint reduction strategies to industries.	Number of greenhouse gas and carbon footprint reduction strategies and awareness raising supported.	DEA&DP, Metropolitan, District and Local Municipalities and Industry	DEA&DP, Metropolitan, District and Local Municipalities and Industry	Short-term and Continuous	Operating costs (Support other Programmes and initiatives)
TARGET: Reduction of emissions related to transport					
Establish and operate diesel vehicle emission testing programmes for testing at roadsides and weighbridges.	Number of diesel vehicle emission testing sites.	DEA&DP, DoTransport, Metropolitan, District and Local Municipalities	DEA&DP, DoTransport, Metropolitan, District and Local Municipalities	Long-term and Continuous	Legislative requirement (capital costs less than R250 000, Operating Costs R250 000 p.a.)
Develop a methodology for petrol vehicle emissions testing.	Methodology for petrol vehicle emissions testing developed.	Academia, DEA&DP, DoTransport	Academia, DEA&DP, DoTransport, Metropolitan, District and Local Municipalities	Long-term and Continuous	Less than R1.5 million

GOAL 4: SUPPORT AND IMPLEMENT AIR QUALITY AND CLIMATE CHANGE RESPONSE PROGRAMMES, INCLUDING PROMOTING AND FACILITATING THE REDUCTION OF GREENHOUSE GASES

OBJECTIVE 1: REDUCE GREENHOUSE GAS EMISSIONS IN LINE WITH NATIONAL AND INTERNATIONAL REQUIREMENTS

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: Reduction of emissions related to transport					
Contribute to the setting of standards, and development of regulations and methodologies for emissions testing of all other modes of transport, where required.	Number of standards and regulations contributed to, in respect of all other modes of transport.	Medium-term	Metropolitan, District and Local Municipalities, DoTransport	Long-term and Continuous	Less than R1.5 million
Support the development and implementation of eco-driving transport programmes for all transport sectors.	Number of eco-driving transport programmes supported.	DEA&DP, DoTransport	DEA&DP, DoTransport Metropolitan, District and Local Municipalities	Short-term and Continuous	No costs (Support other programmes and initiatives)
Collaborate with national initiatives for emission control for all forms of transport.	Number of national initiatives for emission control participated or initiated.	DEA&DP, Metropolitan, District and Local Municipalities, Ports of Cape Town and Saldanha Bay, CTIA, Metrorail, DoTransport, DEA	DEA&DP, Metropolitan, District and Local Municipalities, Ports of Cape Town and Saldanha Bay, CTIA, Metrorail, DoTransport, DEA	Medium-term and Continuous	No costs (Support other Programmes and initiatives)
Explore training opportunities for officials to perform vehicle emission tests.	Number of staff trained to perform vehicle emission tests.	DEA&DP, Metropolitan, District and Local Municipalities, DoTransport	DEA&DP, Metropolitan, District and Local Municipalities, DoTransport	Medium-term and Continuous	No costs (Support other Programmes and initiatives)

GOAL 4: SUPPORT AND IMPLEMENT AIR QUALITY AND CLIMATE CHANGE RESPONSE PROGRAMMES, INCLUDING PROMOTING AND FACILITATING THE REDUCTION OF GREENHOUSE GASES

OBJECTIVE 1: REDUCE GREENHOUSE GAS EMISSIONS IN LINE WITH NATIONAL AND INTERNATIONAL REQUIREMENTS

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: Reduction of PM_{10} emissions related to residential fuel burning					
Promote the use of alternative forms of heating and cooking in informal areas.	Number engagements held to promote the use of alternative forms of heating and cooking in informal areas.	DEA&DP, Metropolitan, District and Local Municipalities	DEA&DP, Metropolitan, District and Local Municipalities, Donor funding	Medium-term and Continuous	Less than R1 million
TARGET: Reduction of SO_2, PM_{10}, VOC's, NO_2, greenhouse gases and odour emissions related to industrial operations					
Engage with industries to adopt environmental best practice and develop and implement action plans to reduce industrial emissions.	Number of industries engaged with to adopt environmental best practice and developed and implemented industrial action plans to reduce emissions.	Industries, DEA&DP Metropolitan, District and Local Municipalities	Industries	Short-term and Continuous	Legislative Requirement

GOAL 4: SUPPORT AND IMPLEMENT AIR QUALITY AND CLIMATE CHANGE RESPONSE PROGRAMMES, INCLUDING PROMOTING AND FACILITATING THE REDUCTION OF GREENHOUSE GASES

OBJECTIVE 1: REDUCE GREENHOUSE GAS EMISSIONS IN LINE WITH NATIONAL AND INTERNATIONAL REQUIREMENTS

ACTIVITIES	INDICATORS	RESPONSIBILITY	FUNDING	TIMEFRAMES	COST RATING
TARGET: Reduction of PM_{10}, and greenhouse gas and chemical emissions related to pesticides.					
Engage with the Department of Agriculture to adopt environmental best practice and implement programmes/agencies (fire protection)/registers (chemicals) to reduce pesticide and crop spraying.	Number of engagements with the Department of Agriculture to reduce pesticide and crop spraying.	DoAgriculture, DoHealth, DEA&DP, Metropolitan, District and Local Municipalities	DoAgriculture, DoHealth, DEA&DP, Metropolitan, District and Local Municipalities Donor funding	Short-term and Continuous	Operational costs
Support the Department of Agriculture with their initiatives in respect of implementing environmental best practice and programmes/agencies (fire protection)/ registers (chemicals) to reduce pesticide and crop spraying.	Number of initiatives or programmes supported to reduce pesticide / crop spraying.	DoAgriculture, DoHealth, DEA&DP, Metropolitan, District and Local Municipalities	DoAgriculture, DoHealth, DEA&DP, Metropolitan, District and Local Municipalities Donor funding	Short-term and Continuous	Operational costs

Photograph by: Muneeb Baderoon | DEA&DP Competition 2016/17

7

APPENDICES

7.1 APPENDIX 1

NATIONAL AMBIENT AIR QUALITY STANDARDS (DEA, 2009)

SULPHUR DIOXIDE (SO_2)			
Averaging period	**Concentration**	**Frequency of Exceedence**	**Compliance date**
10 minutes	500 µg/m³ (191 ppb)	526	Immediate
1 hour	350 µg/m³ (134 ppb)	88	Immediate
24 hours	125 µg/m³ (48 ppb)	4	Immediate
1 year	50 µg/m³ (19 ppb)	0	Immediate

The reference method for the analysis of sulphur dioxide shall be ISO 6767

NITROGEN DIOXIDE (NO_2)			
Averaging period	**Concentration**	**Frequency of Exceedence**	**Compliance date**
1 hour	200 µg/m³ (106 ppb)	88	Immediate
1 year	40 µg/m³ (21 ppb)	0	Immediate

The reference method for the analysis of nitrogen dioxide (NO_2) shall be ISO 7996

PARTICULATE MATTER (PM_{10})			
Averaging period	**Concentration**	**Frequency of Exceedence**	**Compliance date**
24 hours	120 µg/m³	4	Immediate – 31 December 2014
24 hours	75 µg/m³	4	1 January 2015
1 year	50 µg/m³	0	Immediate – 31 December 2014
1 year	40 µg/m³	0	1 January 2015

The reference method for the determination of the particulate matter fraction of suspended particulate matter shall be EN 12341

PARTICULATE MATTER ($PM_{2.5}$)			
Averaging period	**Concentration**	**Frequency of Exceedence**	**Compliance date**
24 hours	65 µg/m³	4	Immediate – 31 December 2015
24 hours	40 µg/m³	4	1 January 2016 – 31 December 2029
24 hours	25 µg/m³	4	1 January 2030
1 year	25 µg/m³	0	Immediate – 31 December 2015
1 year	20 µg/m³	0	1 January 2016 – 31 December 2029
1 year	15 µg/m³	0	1 January 2030

The reference method for the determination of $PM_{2.5}$ fraction of suspended particulate matter shall be EN 14907

OZONE (O_3)			
Averaging period	**Concentration**	**Frequency of Exceedence**	**Compliance date**
8 hour (running)	120 µg/m³ (61 ppb)	11	Immediate

The reference method for the analysis of ozone shall be UV photometric method as described in SANS 13964

BENZENE (C_6H_6)			
Averaging period	**Concentration**	**Frequency of Exceedence**	**Compliance date**
1 year	10 µg/m³ (3.2 ppb)	0	Immediate – 31 December 2014
1 year	5 µg/m³ (1.6 ppb)	0	Immediate

The reference methods for the sampling and analysis of benzene shall either be EPA compendium method TO-14A or method TO-17

LEAD (PB)			
Averaging period	**Concentration**	**Frequency of Exceedence**	**Compliance date**
1 year	0.5 µg/m³	0	Immediate

The reference method for the analysis of lead shall be ISO 9855

CARBON MONOXIDE (CO)			
Averaging period	**Concentration**	**Frequency of Exceedence**	**Compliance date**
1 hour	30 mg/m^3 (26 ppm)	88	Immediate
8 hour (calculated on 1 hourly averages)	10 mg/m^3 (8.7 ppm)	11	Immediate
The reference method for analysis of Carbon Monoxide shall be ISO 4224			

WHO AIR QUALITY GUIDELINES (WHO, 2000)

HYDROGEN SULPHIDE (H_2S)	30 minutes	7 µg/m^3 (odour threshold)
	24 hours	150 µg/m^3 (health threshold)

NATIONAL STANDARDS FOR DUST FALLOUT (DEA, 2013)

LAND USE TYPE	DUST FALLOUT RATE (D) (IN MG/M_2/DAY, 30 DAYS AVERAGE)	PERMITTED FREQUENCY OF EXCEEDANCE
Residential	D < 600	2 per annum, non-consecutive months
Non-residential	600 < D < 1200	2 per annum, non-consecutive months

7.2 APPENDIX 2

7.2.1 SUMMARY OF THE SOURCES, HEALTH AND ENVIRONMENTAL EFFECTS OF POLLUTANTS (DEA&DP, 2009)

POLLUTANT	DEFINITION	MAJOR SOURCES	HUMAN HEALTH AND/OR ENVIRONMENTAL IMPACTS
Particulate Matter Symbol: PM_{10}, $PM_{2.5}$	PM_{10}: Respirable solid or liquid particles with a diameter smaller than 10 microns $PM_{2.5}$: Fine airborne solid or liquid particles with a diameter smaller than 2.5 microns	• Products of combustion, including wood, coal and fossil fuels; automotive exhaust and windborne dust from construction sites, roads and soil erosion	• Higher risk of cardio-respiratory mortality • Irregular heartbeat • Exacerbation of existing respiratory conditions • Decreased lung function • Higher risk of chronic • respiratory disease
Sulphur Dioxide Symbol: SO_2	A colourless non-flammable gas with a distinctly detectable odour and taste	• Combustion of fossil fuels by power plants and other industrial facilities • Industrial processes such as extracting metal from ore • Vehicle emissions • Natural sources, including volcanic plumes	• Increased airway resistance • Reduction in lung function • Wheezing and shortness of breath • Long term exposure may result in chronic pulmonary impairment • Contributes to the formation of sulphuric acid rain and mist • Acidification of lakes and streams • Leaf injury and stunted growth in plants • Decrease in plant yield • Corrosion of natural and anthropogenic structures
Carbon Monoxide Symbol: CO	An odourless, colourless and tasteless gas	• Incomplete combustion of carbon-based fuels in motor vehicles and industrial boilers	• Tissue and organ hypoxia • Diminished mental alertness and vision, dizziness • Impaired coordination and manual dexterity • Unconsciousness and/or death
Ozone Symbol: O_3	A colourless or blue-ish gas	• Tropospheric ozone is formed naturally • Ground level ozone is formed in a photochemical reaction between NO_x and VOC's emitted from vehicles and industrial processes.	Exposure to ozone can trigger a variety of health problems including: • Chest pain, coughing, throat irritation, and airway inflammation • Reduction of lung function • Morphological changes in lungs in the event of prolonged exposure • Eye irritating at low concentrations • Ozone affects sensitive vegetation and ecosystems and harms sensitive vegetation during the growing season. • Contributes to urban smog

POLLUTANT	DEFINITION	MAJOR SOURCES	HUMAN HEALTH AND/OR ENVIRONMENTAL IMPACTS
Nitrogen Dioxide Symbol: NO_2	A reddish-brown gas with a highly detectable odour, a highly corrosive and oxidising agent	• Fuel combustion in motor vehicles • Industrial and c hemical manufacturing processes	• Increased airway resistance • Nose, eye and throat irritation, coughing, dyspnoea, headache and nausea • Exacerbation of existing respiratory disease, such as emphysema and bronchitis • Exacerbation of existing heart disease • Corrosion and stunted growth in plants
Benzene Symbol: C_6H_6	A colourless, clear liquid readily evaporating at room temperature	• Combustion of petroleum products, service stations, and motor vehicle exhaust fumes • Unvented wood fires • Cigarette smoke • Vapours from products such as glues, paints, furniture waxes and detergents	Acute effects include: • Narcosis • Headaches • Dizziness • Tiredness • Confusion • Unconsciousness Effects following chronic exposure: • Higher risk to carcinogenic effects • Aplastic anaemia • Loss of red and white blood cells • Stunted growth in plants
Hydrogen Sulphide Symbol: H_2S	A colourless and flammable gas with a characteristic rotten egg odour	• Crude petroleum • Natural gas • Formed as the result of the breakdown of organic matter	• Headache • Skin complications • Respiratory and mucous membrane irritation • Conjunctivitis • Unconsciousness and/or death at high concentrations

Photograph by: Scott N Ramsay | Robberg Nature Reserve

8

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