



Western Cape  
Government



Department of Environmental Affairs and Development Planning

# Western Cape Air Quality Management Plan

2021



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Cover Image:

Aerial view of Cape Town city centre, with Table Mountain,  
Cape Town Harbour, Lion's Head and Devil's Peak

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# ACKNOWLEDGMENTS

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## THE FOLLOWING INDIVIDUALS AND GROUPS MADE INVALUABLE INPUT THROUGH THEIR PARTICIPATION IN THE DEVELOPMENT OF THE 3<sup>RD</sup> GENERATION WESTERN CAPE AIR QUALITY MANAGEMENT PLAN

The DEA&DP Senior Management and officials, Local Municipal officials, Industry and the Public, who participated very actively in the Public Participation Process during 2020 and 2021, are acknowledged for their invaluable comments provided.

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# ACRONYMS

- 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 Officers' Forum
- CCT** City of Cape Town
- CKDM** Central Karoo District Municipality
- CH<sub>4</sub>** Methane
- COP** Conference of the Parties
- CO** Carbon Monoxide
- CO<sub>2</sub>** Carbon Dioxide
- CO<sub>2</sub>e** Carbon Dioxide equivalent
- CWDM** Cape Winelands District Municipality
- DoE** Department of Energy
- DEA** Department of Environmental Affairs
- DEA&DP** Department of Environmental Affairs and Development Planning
- DFFE** Department of Forestry, Fisheries and the Environment
- DoT** Department of Transport
- EMI** Environmental Management Inspector
- GHG** Greenhouse Gas
- GN** Government Notice
- GRDM** Garden Route District Municipality
- GSB-IGTT** Greater Saldanha Bay Inter-Governmental Task Team
- H<sub>2</sub>S** 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<sub>2</sub>O** Nitrous Oxide
- NO<sub>2</sub>** Nitrogen Dioxide
- NOX** Nitric Oxides
- O<sub>3</sub>** Ozone

- ODM** Overberg District Municipality
- PAEL** Provisional Atmospheric Emission Licence
- PERO** Provincial Economic Review and Outlook
  - PM** Particulate Matter
  - PM<sub>10</sub>** Particulate matter with an aerodynamic diameter of 10µm and smaller
  - PM<sub>2.5</sub>** Particulate matter with an aerodynamic diameter of 2.5µm and smaller
  - PPP** Public Participation Process
- SAELIP** 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<sub>2</sub>** 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
- WC SDF** Western Cape Spatial Development Framework
- WHO** World Health Organization



Photography by: Jean Tresfon

## MINISTER'S FOREWORD



It has been 12 years since the Province's very first Air Quality Management Plan (AQMP) was adopted in 2010, with 2020 marking the year of its 2<sup>nd</sup> review. The past few months since March 2020 have not been easy on everyone, as we experienced unprecedented times due to the Covid-19 pandemic.

We have had to learn to do things differently, and so for the first time ever, the review of the Western Cape AQMP was completed using a virtual platform. This virtual review was successfully run and reminded all of the vision of the Western Cape AQMP, viz. "Clean and healthy air for all in the Western Cape".

Ever since its promulgation, the Province has gone above and beyond to fulfill its mandate in terms of the National Environmental Management: Air Quality Act (Act 39 of 2004; NEM: AQA). There has been a host of legislative reform in air quality management in the country. Authorities in the Western Cape have continued to implement the atmospheric emission licensing system, the air quality monitoring system and perform all air quality management functions, as mandated by the NEM: AQA.

As sustainable economic growth and development is important in the Western Cape, in contributing to an enabling environment to achieve this, it is important that all Municipalities fulfil its obligation to NEM: AQA and align their AQMPs to the Western Cape AQMP. At this time, it is important for Municipalities to focus their actions to assist in our recovery from the devastating economic impacts of the COVID-19 pandemic, and to ensure that our air quality, as well as the health and well-being of the citizens in our Province, are not compromised.

The air quality management fraternity in the Western Cape continues to go from strength to strength because of the reciprocal support and engagement between all authorities in the Province. We have seen the designation of all Air Quality Officers (AQOs) over the years, as well as the adoption and effective implementation of 29 Municipal AQMPs in the Province. Together, the AQOs have done a tremendous job in managing air quality and have continued to regulate the licensed facilities in the Province; complex air pollution challenges have been addressed through the formation of Inter-Governmental Task Teams.

The AQOs have also worked closely with authorities on climate change, as these are integrally linked. In particular, air quality legislative reform has reflected a shift towards responding to climate change. Authorities, industry as well as communities are encouraged to play their part in managing and reducing air pollution in the Province, thereby indirectly contributing to reducing the effect of climate change.

In order to protect the air that we breathe, which is a local, regional, national and international asset and public good, the Western Cape Government and the Municipalities in the Province aims to always strive to prioritise air quality management by investing significantly in human resource capacity, as well as ambient air quality monitoring infrastructure.

The Western Cape continues to enjoy good air quality, and as authorities, we commit to ensuring that our citizens will continue to breathe good quality air. This 3<sup>rd</sup> Generation Western Cape AQMP sets the course for air quality management in the Province for the next five (5) years. It is indeed a pleasure to present this plan to you.

A handwritten signature in black ink, appearing to read 'Anton Bredele', written in a cursive style.

**ANTON BREDELE**

Western Cape MEC: Local Government,  
Environmental Affairs and Development Planning

## MESSAGE FROM THE HEAD OF DEPARTMENT



In the Western Cape, the Department of Environmental Affairs and Development Planning (DEA&DP) implements and provides an oversight role with regards to air quality management in the Province. The air quality management fraternity has made significant strides in managing air quality in the Western Cape and hence, continues to safeguard the quality of the air that we breathe in the Province.

Authorities have embraced the changes to the legislation and have been implementing air quality management functions, as well as the Atmospheric Emission Licensing System. As at 31 December 2021, a total of 13 Provisional Atmospheric Emission Licenses and 124 final Atmospheric Emission Licenses were regulated by the Licensing Authorities in the Western Cape. Moreover, a total of 17 Municipal By-laws were published to assist Municipalities to further regulate air quality in their areas of jurisdiction.

Since the Western Cape Noise Control Regulations were published on 20 June 2013 (P.N. 200/2013), the DEA&DP together with Municipalities, have actively regulated and managed noise pollution in their areas.

All Municipalities in the Western Cape had designated AQOs at the beginning of 2021, while all but one (1) Municipality has adopted its Air Quality Management Plan (AQMP). The Beaufort West Municipality envisages to adopt its AQMP within the near future.

The DEA&DP commissioned its first ambient air quality monitoring station in 2008 as part of the Western Cape Ambient Air Quality Monitoring Network. The Network currently has 12 monitoring stations in operation and reporting on various air quality parameters.

During the past decade, since the development of the 1<sup>st</sup> and 2<sup>nd</sup> Generation Western Cape AQMP in 2010 and 2016, respectively, the DEA&DP has made significant progress to share knowledge, assist and guide Municipalities in air quality management across the Province.

Air Quality Officers have done a sterling job to ensure that the air that we breath in the Province remain good! Where there were complexities to be addressed in air quality management, authorities at all three spheres of government have joined forces to ensure a positive outcome, that supports the principles of good governance in the Province and country.

I encourage all to continue providing support to the Province and Municipalities. I eagerly look forward to another successful five (5) years of joint efforts by the authorities in managing air quality, as this 3<sup>rd</sup> Generation Western Cape AQMP is implemented throughout the Province.

A handwritten signature in black ink, appearing to read 'Piet van Zyl', written in a cursive style.

**PIET VAN ZYL**

Head of Department: Environmental Affairs and Development Planning

## MESSAGE FROM THE PROVINCIAL AIR QUALITY OFFICER: WESTERN CAPE



The Western Cape Government's Department of Environmental Affairs and Development Planning (DEA&DP) ensures that air quality management is comprehensively addressed in the Province through coordinated, integrated and cohesive air quality governance.

Significant progress in air quality management has been made since the adoption and implementation of the 1<sup>st</sup> and 2<sup>nd</sup> Generation Western Cape AQMPs. The Western Cape Province's ambient air quality monitoring networks currently has 12 monitoring stations in operation, the City of Cape Town has 11 monitoring stations in operation, the West Coast District Municipality has one (1) monitoring station in operation, while two (2) monitoring stations are operated by the Saldanha Bay Municipality. A few municipalities are also making use of passive and portable monitoring equipment to monitor the ambient air quality in their jurisdictions.

The DEA&DPs Directorate: Air Quality Management has successfully hosted quarterly Air Quality Officers' Forums since 2006. These forums provide a platform for Air Quality Officers to deliberate on matters pertaining to air quality management such as training, legislative reform, atmospheric emission licensing and the development and implementation of Air Quality Management Plans at Provincial and Municipal level.

The adoption of the 3<sup>rd</sup> Generation Western Cape AQMP comes at a time where the effects of climate change around the world has been amplified. As climate change is integrally linked to air pollution, we will continue to work closely with climate change counterparts at all spheres of government in order to strengthen climate change mitigation and adaptation in the Province and the country.

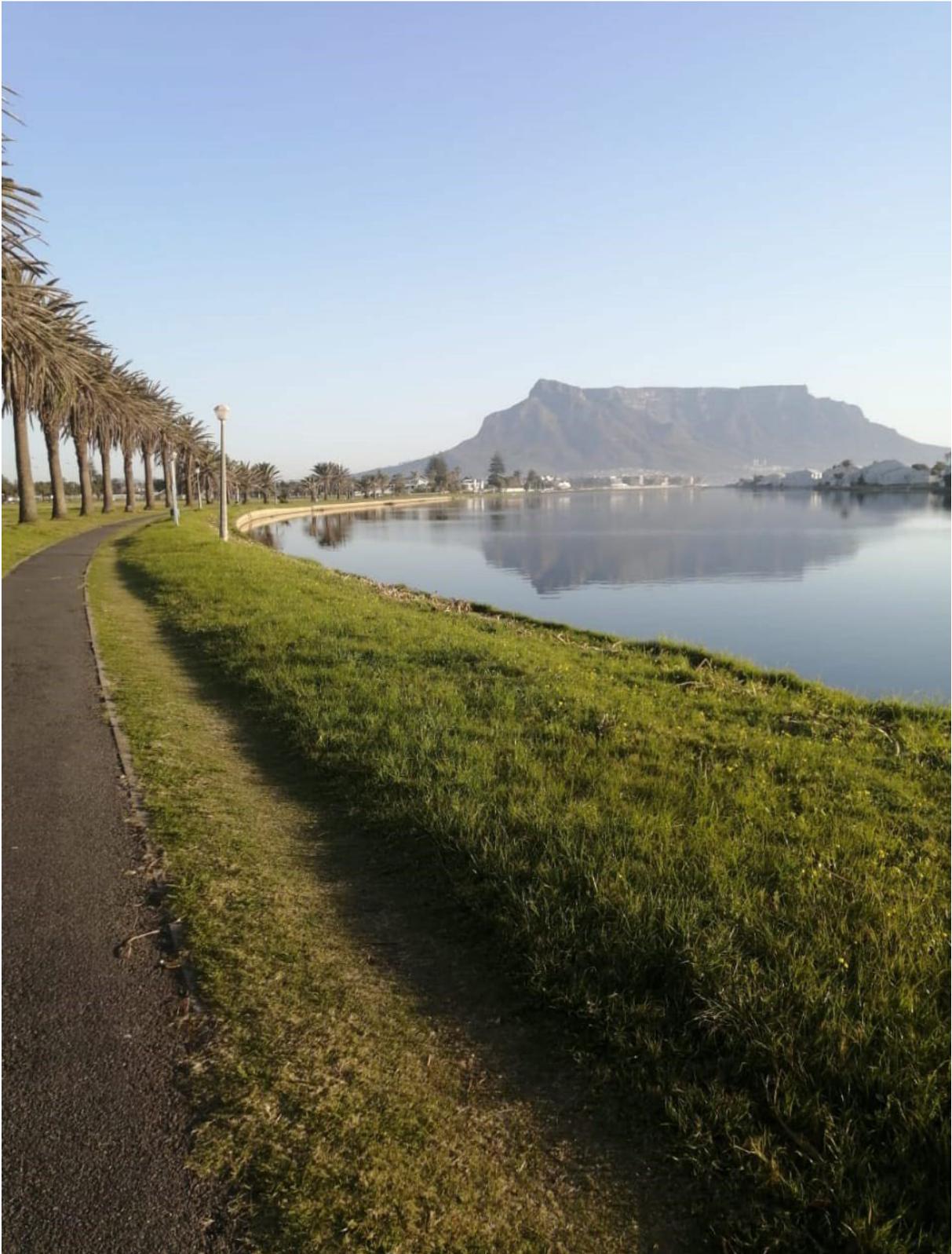
The successful implementation of the 1<sup>st</sup> and 2<sup>nd</sup> Generation Western AQMPs was made possible by the strong partnership between the Provincial Government and the Metropolitan, District, and Local Municipalities of the Western Cape.

Partnerships between authorities, communities and industries continue to be an important aspect of managing air quality in the Province. We anticipate that these partnerships will strengthen over the next five (5) years, as will our collective commitment to ensure good air quality in the Western Cape.

A handwritten signature in black ink, appearing to read 'Joy Leaner'. The signature is fluid and cursive, with a long horizontal line extending from the end.

**JOY LEANER (PhD)**

Provincial Air Quality Officer: Western Cape



Photography by: Portia Rululu

## EXECUTIVE SUMMARY

The Department of Environmental Affairs and Development Planning's (DEA&DP) Directorate Air Quality Management provides a supportive and oversight role to municipalities with respect to air quality management in the Western Cape.

The DEA&DP co-ordinates and ensures that integrated air quality management takes place across the Western Cape Province. The functions entail, amongst others, capacity building and the formulation of policies, legislation, guidelines, norms and standards, as well as air quality management plans.

The National Environmental Management: Air Quality Act, Act No. 39 of 2004 (NEM: AQA) has an objectives-based legislative approach that is aligned to section 24 (b) of the Constitution of the Republic of South Africa. The aim of the NEM: AQA is to regulate and manage air quality, thereby securing an environment that is not harmful to the health and well-being of people.

Provinces and Municipalities are required to develop Air Quality Management Plans (AQMPs) to manage air quality in their regions, as per the requirements of Section 15(1) of the NEM: AQA. The AQMPs need to be implementable and effective. In terms of the National Framework for Air Quality Management 2017 (DFFE, 2018), their efficacy is required to be reviewed every five (5) years, to determine whether the AQMP goals and targets have been implemented, and to assess if these are still valid and relevant, taking into consideration any new developments and economic growth, where implemented.

In compliance with the requirements of Section 15(1) of the NEM: AQA, the DEA&DP has developed the Western Cape AQMP. The 1<sup>st</sup> Generation AQMP was developed and adopted in 2010/2011, and the 2<sup>nd</sup> Generation AQMP was developed and adopted in 2016/2017. Following five years of implementation and a review process during 2020/21, this 3<sup>rd</sup> Generation AQMP was developed.

Stakeholder involvement forms an integral component of the AQMP review process. As a result of the meeting and travelling restrictions due to the COVID-19 pandemic, online survey questionnaires were developed for both Phase 1 and Phase 2 of the 2020/21 AQMP review. Phase 1 entailed assessing the status of air quality management in the Province by assessing progress made in terms of air quality management in the Province and to establish whether goals and targets have been effectively implemented. Phase 2 used the findings of the assessment and the online survey results to determine whether the vision, mission, goals, and targets were still relevant in terms of legislative reform, new developments and/or economic growth in the Province.

This 3<sup>rd</sup> Generation AQMP (2021/2022) was compiled by officials in the DEA&DP, with the support from officials in the Metropolitan, District and Local Municipalities in the Western Cape.

### Air Quality Governance

Sections 14 and 15 of the NEM: AQA mandates all three (3) spheres of government to appoint AQOs and establish AQMPs in their areas of jurisdiction. Thus, all Provinces and Municipalities are required to develop and implement approved AQMPs, as per the NEM: AQA. As at 31 December 2021, a total of 29 Municipalities have adopted and implemented their AQMP's, and a total of 30 Municipalities have designated AQOs in their jurisdictional areas over the years, with changes to these when officials retire or resign from their institutions. The Beaufort West Local Municipality AQMP is currently in draft form (**Table EXEC-1**) and it is envisaged to be adopted by their Council in the near future. See Chapter 4 for more information on the status of AQMPs and AQO designation in the Province.

**WESTERN CAPE AIR QUALITY MANAGEMENT PLAN 2021**

**Table EXEC-1: Status of AQMP's and Designated AQO's in the Municipalities of the Western Cape during 2021**

<b>AUTHORITY</b>	<b>YEAR ADOPTED &amp; IMPLEMENTED</b>	<b>SECOND GENERATION AQMP</b>	<b>THIRD GENERATION AQMP</b>	<b>AIR QUALITY OFFICER DESIGNATED</b>
City of Cape Town	2009	in progress		✓
Cape Winelands	2009	2018		✓
DEA&DP	2010	2016	2021	✓
Drakenstein	2011	2020		✓
West Coast	2011	2019		✓
Garden Route	2011	2013	2019	✓
Overberg	2012			✓*
Bergrivier	2012	2019		✓
Matzikama	2012	2020		✓
Saldanha	2012	2020		✓
Swartland	2012	2019		✓
Central Karoo	2012	2016		✓
Cape Agulhas	2013	2019		✓
Overstrand	2013	2017		✓
Witzenberg	2013	2014		✓
George	2013	2019		✓
Hessequa	2013	2019		✓
Bitou	2013	2019		✓
Knysna	2013	2019		✓
Kannaland	2013	2021		✓
Mossel Bay	2013	2019		✓
Oudtshoorn	2013	2019		✓
Theewaterskloof	2014	2015		✓
Prince Albert	2014			✓
Swellendam	2015			✓
Stellenbosch	2015	2018		✓
Cederberg	2016	2019		✓
Laingsburg	2016			✓
Breede Valley	2017			✓
Langeberg	2017			✓
Beaufort West	draft			✓

\*The designated Air Quality Officer retired in 2021; the designation of a new Air Quality Officer is pending

## Air Quality Officers' Forum and Air Quality Management Planning

The DEA&DP co-ordinates and hosts quarterly AQOFs that allow for air quality officials to develop, enhance and / or refine their air quality management interventions towards the implementation of the NEM: AQA, as well as share experiences, challenges and plans for the coming year.

The Provincial Noise Control Forum forms part of the Western Cape Provincial AQOF to ensure and improve the co-ordination of noise control in the Province. Participants are informed of achievements and challenges with regards to noise management in the Western Cape.

The Western Cape Air Quality Officers' and Noise Forum is generally held in each of the Provinces' five (5) District Municipalities and the Metropolitan Municipality. Special forums are also held to co-ordinate the responses of all AQOs in the Province to air quality-related issues, as well as engage in legislation and policy development with the National Department of Forestry, Fisheries and the Environment (DFFE), as required. As a result of the COVID-19 pandemic constraints in 2020, however, the Provincial AQOFs are hosted virtually via MS Teams.

To implement and fulfill the goals outlined in the Western Cape AQMP, the three (3) Provincial AQMP Working Groups that were established also share the same MS Teams platform on the same day. The Working Group meetings took place in parallel with the Western Cape AQOFs and were held during the period 2010 – 2021.

The Working Groups discussed and reported on the following matters at the Western Cape AQOFs:

- **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.

Each Working Group identified initial priorities for implementation in the Province. A summary of the priorities is outlined below.

### **WORKING GROUP I: AIR QUALITY MANAGEMENT AND CLIMATE CHANGE**

Working Group I emphasized the importance of the link between air quality and climate change. The DEA&DP's Directorate: Climate Change regularly provides updates at the AQOFs on climate change matters as it relates to air quality. Collaboration with other fields of expertise, such as the spatial development and transportation sectors, is still required to guarantee that future ideas address any air quality issues that arise in these and other sectors.

Progress was evaluated with respect to the development of emissions inventories and the status of integrating AQMPs as sector plans into IDPs. The Working Group also facilitates the development of Municipal AQMPs and the designation of AQOs.

### **WORKING GROUP II: AIR QUALITY EDUCATION AND AWARENESS RAISING**

This Working Group serves to encourage the District, Metropolitan and Local Municipalities to facilitate various awareness raising events. The implementation of Working Group II has identified the need for all municipalities to develop awareness-raising programmes and to

establish various forums. Below is a summary of the awareness-raising activities in the various regions.

#### ● **CAPE WINELANDS DISTRICT MUNICIPALITY (CWDM)**

The CWDM has continued their environmental awareness-raising programmes, which include interactive theatre performances at schools, the development of educational material on a variety of environmental health topics, and the "Greening Cape Winelands Programme", which involves the planting of indigenous trees and shrubs, raising environmental awareness and educating on global warming within the communities. The interactive theatre production "Jorden Goes Green" was launched on 03 February 2020 and reached 9 318 learners at 24 schools in the CWDM, before it was suspended due to COVID-19 restrictions.

#### ● **CITY OF CAPE TOWN (CCT)**

The CCT facilitates a number of projects with local communities to raise awareness about air quality matters. The CCT collaborated with the Big Fish Documentary Film School in 2018 to create a DVD to be used in education and awareness initiatives focusing on the informal meat (braai) trading sector. With the help of their air quality mascot "Sniffles, the air pollution sniffing cat," the CCT continues to spread the message of clean air to young students. The COVID-19 pandemic had a significant impact on the CCT's usual education and awareness raising activities. The CCT, however, hosted "World Environmental Health Day" events at Gugulethu Mall and Hadji Ebrahim Informal Settlement and had informal traders' presentation on air quality in the Delft Community Library during 2020.

#### ● **GARDEN ROUTE DISTRICT MUNICIPALITY (GRDM)**

Since 2011, the GRDM has successfully implemented its Garden Route Clean Fires Campaign (previously called the Eden Clean Fires Campaign). This project entails training Peer Educators to educate communities on proper fire-making techniques as well as the impact/danger of air pollution. The GRDM funded a Life Skills Workshop, focusing on pollution education for Grade 3 teachers in George and Mossel Bay in 2017. These educators were entrusted with the knowledge, skills, and resources needed to raise awareness of pollution issues among students. Unfortunately, the GRDM Clean Fires Campaign had to be halted due to the COVID-19 pandemic. In 2019, the GRDM continued to distribute public awareness pamphlets about air pollution. Throughout 2020, the GRDM provided extensive NAEIS training to industry. The Garden Route industries also attended the annual NAEIS completion workshop, where the Municipality assisted industries in completing their NAEIS reports. The GRDM's industries all submitted their reports by the deadline of March 31, 2020. NAEIS training and reporting sessions were held on the 4th, 6th, 17th, and 25th February 2020. In addition, the GRDM collaborated with a service provider on an energy efficiency and pollution reduction project. The project has, however, been delayed due to the COVID-19 pandemic.

#### ● **WEST COAST DISTRICT MUNICIPALITY (WCDM)**

The WCDM's awareness-raising is conducted through the establishment of Working Groups and Environmental Stakeholder's Forums. Industries that potentially impact on the health and wellbeing of people residing in receptor areas are required to establish communication platforms and meet with residents at agreed-upon intervals. During these meetings, the public is informed of industrial processes and the implementation of measures to control emissions. Air Quality Officers from the Local Municipalities within the WCDM also attend these meetings. During 2020, one (1) West Coast Air Quality meeting was held between the WCDM, industries and the Local Municipal Air Quality Officers of the WCDM, two (2) Joint

Municipal Air Quality Working Group meetings were held between the WCDM and the Local Municipal Air Quality Officers and three (3) industrial stakeholder forums were attended by the WCDM air quality officials. Due to the COVID-19 restrictions, awareness raising was done via inspections and emails.

#### ● **CENTRAL KAROO DISTRICT MUNICIPALITY (CKDM)**

The CKDM educates and raises awareness about air quality through the publication of articles in the local newspaper, "The Courier," as well as through regular services related to pollution management in the District.

### **WORKING GROUP III: COMPLIANCE MONITORING AND ENFORCEMENT**

The Western Cape Province continues to advocate for the appointment of Environmental Management Inspectors (EMI). Most of the Municipalities have trained and appointed EMIs. In the Province, 24 EMIs have to date been officially designated and 10 officials have completed the EMI course and are awaiting official EMI designation.

The Working Group encourages Municipalities to develop Municipal By-Laws. Since 2007, a total of 17 Municipal By-laws that govern air quality management, have been gazetted in the Western Cape (See Chapter 4, Table 4-4).

The Western Cape's Licensing Authorities have accepted the AEL function and have successfully carried out their mandate. More information on the licensing of Section 21 Listed Activities of NEM: AQA in the Western Cape can be found in Chapter 4 (Table 4 -6).

Municipalities have identified capacity building in air quality management as a critical requirement. Authorities received NAEIS refresher training, SAAEILP training, NAEIS facility emission report training, and noise control training, among others.

## **Compliance and Enforcement**

The District and Metropolitan Municipal Air Quality Officers are the Licensing Authorities within their respective jurisdictions. A total of 13 Provisional Atmospheric Emission Licences and 124 final Atmospheric Emission Licences are regulated by the Licensing Authorities in the Western Cape, as at 31 December 2021 (Table EXEC-2). Moreover, a total of 17 Municipal by-laws were published to assist Municipalities to further regulate air quality in their areas of jurisdiction.

As per the NEM: AQA, the DEA&DP has the responsibility of facilitating compliance monitoring and implementation, with respect to Atmospheric Emission Licensing of facilities with Section 21 Listed Activities. These facilities are regulated through the review of records, inspection, and compliance monitoring.

During the reporting period, joint AEL compliance inspections were conducted across the Province, focusing on the various activities within the Province, such as Sub-Category 8.2: Crematoria and Veterinary Waste Incineration activities and Sub-Category 5.3: Clamp Kilns for brick production, Subcategory 1.2: Liquid Fuel Combustion Installation activities and Category 10: Animal Matter Processing. The compliance monitoring methodology is to assess compliance with conditions in the AEL and with relevant legislative provisions by way of interviews, document review and on-site monitoring activities. To date, 36 compliance inspections have been undertaken as part of the Western Cape AEL Compliance Monitoring Programme (Table EXEC-3).

Table EXEC-2: SUMMARY OF THE AELS AND PAELS ISSUED BY LICENSING AUTHORITIES IN THE WESTERN CAPE DURING 2010 – 2021

Licensing Authority		REGULATED AS AT 31 DECEMBER																							
		2010		2011		2012		2013		2014		2015		2016		2017		2018		2019		2020		2021	
		PAEL	AEL	PAEL	AEL	PAEL	AEL	PAEL	AEL	PAEL	AEL	PAEL	AEL	PAEL	AEL	PAEL	AEL	PAEL	AEL	PAEL	AEL	PAEL	AEL	PAEL	
WCDM		0	0	5	1	1	1	6	1	7	9	12	9	12	12	12	13	12	15	11	17	10	18	2	20
GRDM		5	0	4	0	7	2	2	14	3	6	2	23	0	26	0	27	0	26	0	27	0	30	2	26
ODM		0	0	0	0	0	0	1	0	2	0	5	0	1	4	0	5	0	5	0	5	0	5	0	5
CKDM		0	0	0	0	0	0	0	0	0	0	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	16	31	18	32	26	6	19	42	14	50	15	52	9	56
CWDM		0	0	1	0	0	0	0	0	4	11	5	10	6	9	6	8	6	8	4	10	1	13	0	14
DEA&DP		0	0	0	0	0	0	0	0	1	0	3	0	1	3	0	3	0	3	0	3	0	3	0	3
TOTAL		5	0	12	1	9	6	12	17	31	45	43	73	38	86	44	62	37	99	29	112	26	121	13	124

Due to the limited available human resource capacity in the DEA&DP Directorate: Air Quality Management, the number of compliance inspections undertaken and completed is limited to four (4) per annum. Compliance monitoring of facilities will continue to be restricted, pending the availability of human resource capacity.

**Table EXEC-3: SUMMARY OF THE AEL COMPLIANCE INSPECTION PROGRAMME UNDERTAKEN IN THE WESTERN CAPE SINCE 2013**

MUNICIPAL AREA	YEAR	SECTION 21 LISTED ACTIVITY	NO. OF FACILITIES INSPECTED
CAPE WINELANDS	2013	Category 10. Animal Matter Processing	1
WEST COAST	2013	Category 10. Animal Matter Processing	2
WEST COAST	2013	Sub-Category 5.4. Cement Production	1
CITY OF CAPE OF TOWN	2013	Category 10. Animal Matter Processing	1
CITY OF CAPE OF TOWN	2014	Sub-Category 2.4. Storage and Handling of Petroleum Products & Sub- Category 2.5. Installations Used to Recycle or Recover Oil from Waste Oils	1
GARDEN ROUTE	2014	Category 10. Animal Matter Processing	3
OVERBERG	2014	Sub-Category 5.6. Lime Production	1
WEST COAST	2014	Sub-Category 4.7. Electric Arc Furnaces & Sub- Category 5.2. Drying	1
CITY OF CAPE OF TOWN	2015	Sub-Category 8.2. Crematoria and Veterinary Waste Incineration	1
GARDEN ROUTE	2015	Sub-category 4.22. Hot Dip Galvanizing	1
WEST COAST	2015	Sub-Category 5.1. Storage and Handling of Ore and Coal	1
WEST COAST	2015	Sub-Category 5.6. Lime Production	1
CAPE WINELANDS	2015	Sub-Category 5.6. Lime Production	1
CAPE WINELANDS	2016	Sub-Category 7.2. Production of Acids & Sub-Category 8.3. Burning Grounds	1
OVERBERG	2016	Category 10. Animal Matter Processing	1
CITY OF CAPE TOWN	2016	Sub-Category 8.1. Thermal treatment of Hazardous & General Waste	1
WEST COAST	2016	Sub-Category 5.1. Storage and Handling of Ore and Coal	1
GARDEN ROUTE	2017	Subcategory 2.4: Petroleum product storage tanks and product transfer facilities, except those used for liquefied petroleum gas.	1
CAPE WINELANDS	2017	Sub-Category 5.3: Clamp Kilns for brick production	1
OVERBERG	2017	Sub-Category 5.3: Clamp Kilns for brick production	1
CITY OF CAPE TOWN	2017	Sub-Category 8.2: Crematoria and Veterinary Waste Incineration	1
CITY OF CAPE TOWN	2018	Sub-Category 8.2: Crematoria and Veterinary Waste Incineration	1
CAPE WINELANDS	2018	Sub-Category 8.2: Crematoria and Veterinary Waste Incineration	1
GARDEN ROUTE	2018	Sub-Category 8.2: Crematoria and Veterinary Waste Incineration	1

**WESTERN CAPE AIR QUALITY MANAGEMENT PLAN 2021**

<b>MUNICIPAL AREA</b>	<b>YEAR</b>	<b>SECTION 21 LISTED ACTIVITY</b>	<b>NO. OF FACILITIES INSPECTED</b>
<b>OVERBERG</b>	2018	Sub-Category 5.3: Clamp Kilns for brick production	1
<b>CITY OF CAPE TOWN</b>	2019	Sub-Category 8.2: Crematoria and Veterinary Waste Incineration	1
<b>CITY OF CAPE TOWN</b>	2019	Subcategory 1.2: Liquid Fuel Combustion Installation	2
<b>OVERBERG</b>	2019	Category 10. Animal Matter Processing	1
<b>CITY OF CAPE TOWN</b>	2020	Sub-Category 8.2: Crematoria and Veterinary Waste Incineration	1
<b>CITY OF CAPE TOWN</b>	2020	Subcategory 1.2: Liquid Fuel Combustion Installation	2
<b>CAPE WINELANDS</b>	2020	Sub-Category 5.3: Clamp Kilns for Brick Production	1
<b>TOTAL</b>			<b>36</b>

**INTER-GOVERNMENTAL TASK TEAMS – IGTTS**

During the period 2010 – 2021, the DEA&DP convened various Inter-Governmental Task Teams (IGTTs) in order to investigate and resolve complaints related to complex air quality matters. This approach has proven to be advantageous with regard to the handling and resolving of air pollution complaints and activities.

Table EXEC-4 summarises the areas where IGTTs were established, the nature of the complaints that required investigation and the actions that were undertaken to resolve the complaints.

**Table EXEC-4: SUMMARY OF INTER- GOVERNMENTAL TASK TEAMS FORMED IN THE WESTERN CAPE**

<b>AREA</b>	<b>NATURE OF COMPLAINT</b>
<b>LOUDTSHOORN</b>	The IGTT was formed in February 2010 due to various complaints received as a result of the industries in the GRDM. The GRDM has actively investigated and worked closely with industries to reduce odour from its processes. The GRDM undertook routine inspections to ensure that industries comply with AEL conditions.
<b>ALBERTINIA</b>	
<b>MOSSEL BAY</b>	
<b>ST. HELENA BAY</b>	Complaints of alleged odours emanating from the fishmeal processing has continued. Shelley Point residents have requested that the IGTT continue to address odour management in the area.
<b>SALDANHA BAY</b>	The Greater Saldanha Bay IGTT (GSB) chaired by the DEA&DP, discusses various topics inclusive of dust from iron and manganese ore handling. A Task Team was established to undertake inspections when required, in consultation with the Directorate: Law Enforcement of the DEA&DP, WCDM, and the Saldanha Bay Municipality. Complaint investigations are still ongoing and reported at the GSB IGTT.

## Complaints Management

### ● GARDEN ROUTE DISTRICT MUNICIPALITY

The Garden Route District Municipality (GRDM) is actively involved in handling complaints and assists Local Municipalities in this respect. All complaints are recorded on a computerized database and addressed within specific time periods.

Offensive odour has still been the predominant complaint in the GRDM. This is followed by smoke complaints and dust. There was a noticeable decline in odour-related complaints from 2019 – 2020, which could be attributed to the closure of an animal matter processing facility in Mossel Bay.

### ● WEST COAST DISTRICT MUNICIPALITY

The West Coast District Municipality (WCDM) continues to address complaints through investigations, daily observations, site inspections and meetings held with the complainants and facility representatives.

Odour complaints continued in the WCDM, alleged to be mainly from fishmeal processes in the area. The WCDM remains hopeful that conditions will improve through continuous engagement, good public communication and continuous plant improvements. The majority of the odour complaints received were from the Saldanha Bay Municipal area.

Complaints were lodged with the WCDM, DEA&DP and the Saldanha Bay Local Municipality in terms of iron and manganese storage and handling in the Saldanha Bay Municipal area. The WCDM, has compiled a guideline on the transport, storage and handling of manganese and other potentially hazardous ore concentrates to provide guidance on how best the quality of the air can be protected in the region. The Greater Saldanha Bay IGTT continues to assist in resolving complaints and meets on a quarterly basis to address these matters.

### ● CAPE WINELANDS DISTRICT MUNICIPALITY

The Cape Winelands District Municipality (CWDM) captures complaints on the CWDM Municipal Health Services electronic database and resolves them within defined time frames. The CWDM actively assists Local Municipalities within the District. The more complex complaints were addressed through intergovernmental interactions between the DEA&DP, Local Municipality AQOs and the CWDM.

Odour related complaints, particularly in the Breede Valley Municipal region required that the CWDM and DEA&DP set up an IGTT to investigate the conditions of authorization for a Category 10: Animal Matter Processing listed activity; which has since been resolved.

There was a noticeable reduction in odour nuisance complaints. The reduction could have been as a result of industries implementing mitigation measures from compliance conditions set by the CWDM. Non-listed activities account for the majority of the air quality complaints received. This suggests that the AEL's restrictions and requirements aids the prevention and management of pollution in the receiving environment.

Air quality complaints in the CWDM have been mostly offensive odour, industrial dust and agricultural (dust, crop spraying, smoke from farmland / waste burning) related. The increase in dust related complaints as received on farming activities and listed activities such as clay brick manufactures, could be attributed to the Western Cape drought.

- **CENTRAL KAROO DISTRICT MUNICIPALITY**  
 Complaints received by the Central Karoo District Municipality (CKDM) 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**  
 The Overberg District Municipality (ODM) received complaints comprising 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**  
 Noise have mostly been the dominant complaint in the City of Cape Town (CCT). A dedicated and specialized Noise Control Unit was established to investigate complaints in accordance with the Western Cape Noise Control Regulations, with considerable success. Complaints regarding fume emissions are the second most significant source of complaints in the CCT, with informal spray-painting activities in residential areas being a significant contributor. Smoke emissions from residential and industrial activities contributed to a significant number of complaints. Dust complaints, mainly from construction related projects and odour related complaints, are also received and investigated.

## Emissions Inventories

The DEA&DP developed the Western Cape Emissions Inventory during 2006, which was limited to fuel burning equipment. The DEA&DP has since expanded the inventory to include GHGs, as the Western Cape Air Pollutant and Greenhouse Gas Emissions Inventory during 2011, which included data from the City of Cape Town's scheduled and non-scheduled source of emissions. The inventory houses data on point, non-point and mobile sources of air pollution in the Province.

A full Greenhouse Gas (GHG) Inventory was compiled and is maintained by the DEA&DP Directorate: Climate Change. This information was subsequently made available to the National Department of Environmental of Forestry, Fisheries and the Environment (DFFE) for developing and populating the National Atmospheric Emissions Inventory System, in respect of GHG.

In 2019, the DEA&DP initiated the review of the existing Western Cape Air Pollutant and Greenhouse Gas Emission Inventory. Through this, sectors of interest such as petrol stations, spray-painting booths etc., were identified. Updating the Emissions Inventory is ongoing, to improve the information available to manage air quality in the Western Cape.

The Western Cape Province's maximum pollutant load in kilograms per annum for 2019 is shown in Chapter 4, Table 4-9. The maximum pollutant loads were extracted from the online National Atmospheric Emission Inventory System (NAEIS), submitted by facilities that undertake Section 21 Listed Activities. The totals per pollutant are a summation of all the active data provider's (facilities) submissions for the year 2019.

It is evident that SO<sub>2</sub>, PM<sub>2.5</sub>, PM<sub>10</sub>, NO<sub>x</sub>, CO and VOC's are amongst the most prevalent pollutants emitted in the Province, with SO<sub>2</sub> being the highest emitted pollutant at a total of 8 762 422.95 kg per annum in 2019, whilst, benzene, NH<sub>3</sub> and H<sub>2</sub>S were among the lowest emitted pollutants, with NH<sub>3</sub> being the lowest at 2 912.36 kg per annum.

## Ambient Air Quality Monitoring

Provinces and Municipalities are mandated to monitor ambient air quality in terms of Section 8 of the NEM: AQA. In the Western Cape, the DEA&DP's Directorate: Air Quality Management (D: AQM), the City of Cape Town Metropolitan Municipality (CCT), the West Coast District Municipality (WCDCM) and the Saldanha Bay Municipality (SBM) have installed ambient air quality monitoring equipment within their jurisdictions, as part of the Western Cape Ambient Air Quality Monitoring Network (Table EXEC - 5).

The ambient air quality monitoring stations of the DEA&DP, CCT, SBM and WCDCM are operated in accordance with the United States Environmental Protection Agency (US EPA) ambient air quality monitoring methods (Quality Assurance Handbook for Air Pollution Measurement Systems, Vol II), ISO/IEC 17025:2005 standards and SANAS TR-07-03 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 quality assured prior to producing 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). Great strides have been made to have the Network report in real-time to SAAQIS. To date, only three (3) of the DEA&DP stations are not reporting in real-time, mostly due to sim card or software challenges. Data from stations not reporting in real-time to SAAQIS is uploaded manually on a monthly or quarterly basis to SAAQIS.

In 2008, the DEA&DP's Ambient Air Quality Monitoring Network commissioned its first ambient air quality monitoring station. To date, 18 locations have been monitored, with 12 monitoring stations in operation and reporting on various air quality parameters. The Network's ambient air quality monitoring stations are aging and have been prioritized for incremental replacement of infrastructure, in line with the DEA&DP's Strategic Asset Management Plan. The replacement of analysers at selected locations has resulted in a significant improvement of data recovery during 2021. This AQMP reports on data during the period 2010 – 2020, as data for the 2021 period is currently undergoing AQ/QC processes.

The results show that the Province's air quality is generally good as all the criteria pollutants measured were below the National Ambient Air Quality Standards, except for PM<sub>10</sub> (Particulate Matter with particle size less than 10 micrometers) at a low-income residential area namely, Khayelitsha. These PM<sub>10</sub> exceedances measured at Khayelitsha are likely attributed to local influences such as windblown dust from unpaved roads and smoke from household fires, where wood and other fuels are used for cooking and spatial heating.

**Table EXEC-5: THE AMBIENT AIR QUALITY MONITORING NETWORKS IN THE WESTERN CAPE**

MUNICIPAL AREA	LOCATION	DATE COMMISSIONED
<b>DEA&amp;DP's WESTERN CAPE AMBIENT AIR QUALITY MONITORING NETWORK</b>		
<b>CAPE WINELANDS</b>	Meirings Park, Worcester	July 2009 - present
	Municipal Vehicle Testing Station, Paarl	March 2008 – May 2009, August 2018 - present
	CWDM, Stellenbosch	October 2011 - present
<b>WEST COAST</b>	Vredenburg High School, Vredenburg	April 2008 – March 2010*
	Malmesbury Central, Malmesbury	April 2010 - present
	Stompneus Bay, St Helena Bay	April 2011 – May 2021*
	Saldanha Bay IDZ	December 2021 - present
<b>CITY OF CAPE TOWN</b>	Panther Park, Berkeley Rd, Maitland	August 2010 – March 2011*

MUNICIPAL AREA	LOCATION	DATE COMMISSIONED
	Khayelitsha Training Centre, Khayelitsha	May 2011 – 2017*
	Morningstar Small Holdings, Vissershok	September 2011 – March 2019*
	Driftsands Nature Reserve, Blue Downs	April 2019 – November 2020*
	Sentinel, Hout Bay	March 2014 – present
	Khayelitsha District Hospital, Khayelitsha	May 2017 – present
	Maitland Crematorium, Maitland	April 2021 – present
<b>GARDEN ROUTE</b>	Voorbaai, Mossel Bay	August 2008 – February 2010*
	Dana Bay Reservoir, Dana Bay	November 2011 – October 2016*
	Conville, George	July 2010 – present
	Bongolethu, Oudtshoorn	April 2011 – present
	Garden Route DM, Mossel Bay	November 2016 – present
<b>OVERBERG</b>	Mount Pleasant, Hermanus	March 2014 – present
<b>CITY OF CAPE TOWN's AMBIENT AIR QUALITY MONITORING NETWORK</b>		
<b>CITY OF CAPE TOWN</b>	City Hall	2020*
	Molteno	1992
	Goodwood	1993
	Athlone	1993
	Tableview	1994
	Foreshore	1995
	Bothasig	1995
	Khayelitsha	2002
	Bellville-South	2003
	Wallacedene	2006
	Atlantis	2008
	Somerset-West	2008
	Platteklouf	2013
	Potsdam	2013
<b>SALDANHA BAY MUNICIPALITY's AMBIENT AIR QUALITY MONITORING NETWORK</b>		
<b>SALDANHA BAY</b>	Saldanha Bay Substation	2014*
	Saldanha Bay Harbour	July 2014
	Louwville, Vredenburg	July 2014
<b>WEST COAST DISTRICT MUNICIPALITY's AMBIENT AIR QUALITY MONITORING NETWORK</b>		
<b>Velddrif</b>	Velddrif Municipal vehicle testing station	June 2017

\*Decommissioned

## Summary

Overall, there has been significant progress made in terms of managing the ambient air quality in the Western Cape to ensure that the air that we breathe in the Province is of a relatively good quality. The positive strides achieved in the Western Cape's air quality management can be attributed to the reciprocal support and engagement between the DEA&DP and the Municipalities on the designation of AQOs, as well as the effective and efficient implementation of their adopted Municipal AQMPs.

All AQOs have been designated in the Province over the years (viz. 1 Provincial and 30 Municipal). The DEA&DP has always engaged with Municipalities by encouraging them to designate new AQOs in instances where their AQOs have retired or resigned. In the Western

Cape, 30 AQMPs have been adopted, with the Beaufort West AQMP, outstanding. The latter is currently in final draft form, awaiting adoption by its Municipal Council. The DEA&DP D: AQM supported and provided guidance and oversight during the drafting of the Beaufort West Local Municipality AQMP.

Over the past few years, the success of the Western Cape Ambient Air Quality Monitoring Network has been severely hampered by aging infrastructure due to economic constraints and hence limited budgets, placing the Network at risk. However, efforts have been made to ensure that the Network is maintained, with the replacement of aged infrastructure and procurement of new analysers were prioritised. Repairing of analysers has in the past resulted in data loss at various ambient air quality monitoring stations located across the Province. Thus, ongoing repair of aged infrastructure is not a viable solution.

To protect the air that we breathe, which is both a national and international asset, the single most important step is for authorities to prioritise air quality management by investing significantly in human resource capacity and ambient air quality monitoring infrastructure in the Western Cape.



Photography by: Zanele Jam-Jam

# OUTLINE

## **3<sup>RD</sup> 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 2016**

Chapter three provides an overview of the Public Participation Process, which the DEA&DP has conducted as part of the review of the Western Cape AQMP2016.

### **CHAPTER 4: AIR QUALITY IN THE WESTERN CAPE: A PROVINCIAL, NATIONAL AND INTERNATIONAL 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 Western Cape AQMP2016 and those of the Municipal Air Quality Management Plans (AQMPs), where adopted; Air Quality Officer designation in the Province; the quarterly Western Cape Provincial Air Quality Officers' 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 3<sup>rd</sup> Generation Western Cape AQMP.

### **CHAPTER 6: 3<sup>RD</sup> GENERATION WESTERN CAPE AIR QUALITY MANAGEMENT PLAN**

Chapter six provides the Vision, Mission, Goals and Action Plan of the 3<sup>rd</sup> Generation Western Cape AQMP.

### **CHAPTER 7: APPENDICES**

This chapter provides information that are pertinent to the 3<sup>rd</sup> Generation Western Cape AQMP.

### **CHAPTER 8: REFERENCES**

This chapter provides the references included in the 3<sup>rd</sup> Generation Western Cape AQMP.



Photography by: Zanele Jam-Jam

# 1. INTRODUCTION

Section 24 of the South African Constitution enshrines everyone's right to an environment that is not harmful to their health and wellbeing and to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development (RSA, 1996).

The promulgation of the National Environmental Management: Air Quality Act (Act 39 of 2004) (NEM: AQA) aims to uphold Section 24 of the Constitution and to protect the environment by managing the country's air quality.

The Western Cape Province has fully embraced and implemented the roles and responsibilities of air quality management as assigned to it by the NEM: AQA and as outlined in the National Air Quality Management Framework 2007, as amended in 2012 and 2017 (DEA, 2018). With the full implementation of the NEM: AQA, various regulations and policies have been developed, while various amendments to the NEM: AQA have been made. This has placed South Africa and the Provinces on a good trajectory towards managing air quality in the country.

According to the World Health Organization (WHO), an estimated 7 million deaths per annum are attributed to air pollution worldwide, making air pollution one of the greatest risks to human health (WHO, 2018). With the increasing impact of climate change on people and the environment, the relationship between air pollution and climate change is becoming more evident. An increase in criteria pollutants (viz. Nitrogen Dioxide, Sulphur Dioxide, Ozone, Particulate Matter, Benzene and Carbon Monoxide) and greenhouse gas (viz. Methane, Volatile Organic Compounds and Carbon dioxide; GHGs) emissions has a direct impact on air quality and climate change.

Developing countries such as South Africa are in particular very vulnerable to the impacts of climate change due to socio-economic and environmental conditions. In order to address the climate change risks, South Africa has committed to numerous international climate change policies and treaties.

In December 2009, South Africa declared its commitment to decreasing GHG emissions during the United Nations Framework Convention on Climate Change (UNFCCC) COP15 negotiations. 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 has submitted its National Determined Contribution to the UNFCCC in September 2021, after the adoption of the Paris Agreement in December 2015, committing to keeping GHG emissions within a range from 350 – 420 Mt CO<sub>2</sub>-eq (incl. LULUF) by 2030 (RSA, 2021).

In response to its commitments, South Africa has implemented the National Climate Change Response White Paper which forms the foundation of South Africa's current landscape of climate-related policies, strategies, regulations and institutions (Averchenkova et al., 2019).

In 2012, South Africa adopted the National Development Plan (NDP) intending to guide and frame all policy and planning processes up to 2030. Climate change is an important component of the NDP, which recognizes the need for an 'equitable transition to a low-carbon economy (CAT, 2020).

The South African government released a draft Climate Change Bill in June 2018 for public comment. An updated draft of the Climate Change Bill was published for public comment on 11 October 2021. The purpose is to provide for a coordinated and integrated response to climate change and establish the legal framework for setting carbon budgets, Sectoral Emissions Targets (SETs), and a national emissions reduction trajectory.

In September 2020, the Cabinet approved the establishment of the Presidential Climate Change Coordination Commission (PCCCC) and submitted the country's 2050 Low Emissions Development Strategy (LEDS) to the UNFCCC, which ensures that the country moves towards a low carbon growth trajectory (CAT, 2020).

*"Air pollution and climate change are two sides of the same coin: both are largely caused by the same sources and have similar solutions. Ambitious climate action has the potential to both safeguard our health and future, and to reduce the yearly seven million premature deaths from air pollution (WHO, 2019)."*

All spheres of government, i.e. national, provincial and local, have acknowledged the integral link between air quality management and climate change. The national DFFE is mandated with both air quality management and climate change matters, with the function of developing and implementing legislation. The Western Cape Government, through the DEA&DP, implements systems and provides an oversight role with respect to air quality management and climate change.

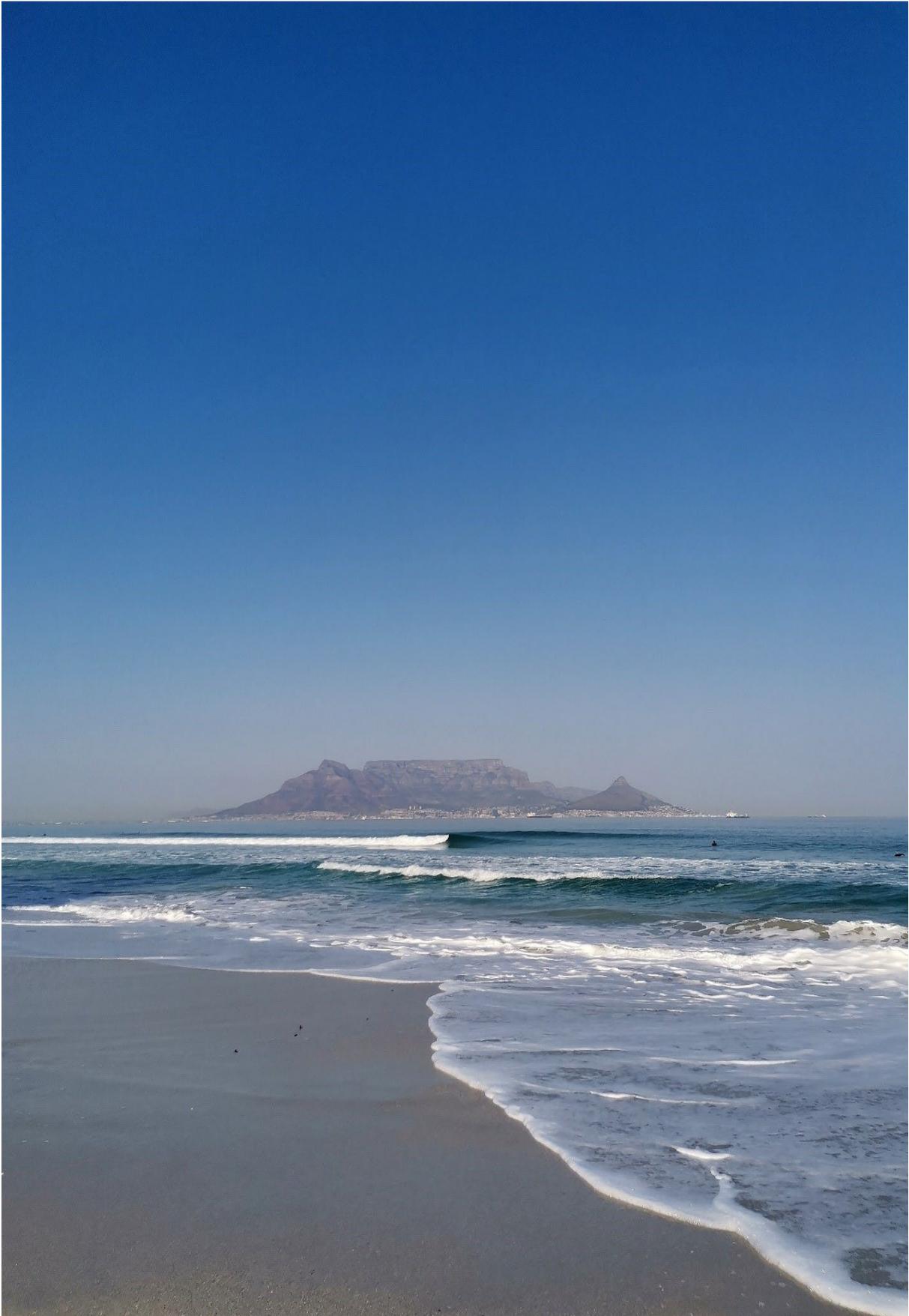
Within the DEA&DP, the Directorate: Air Quality Management (D: AQM) is responsible for air quality management, which includes air quality planning, monitoring and regulatory services; while the Directorate: Climate Change (D: CC) facilitates and enables the implementation of climate change mitigation and adaptation responses, as well as mainstreaming climate change in all government departments in the Province. Both Directorates continue to work cooperatively to achieve air quality and climate change targets in an integrated manner. The 30 Local Municipalities within the Western Cape are tasked with air quality management and climate change matters through the NEM: AQA and the Municipal Systems Act (Act No. 32 of 2000).

Great strides have been made in air quality management and climate change since the adoption and the implementation of the 1<sup>st</sup> and 2<sup>nd</sup> Generation Western Cape Air Quality Management Plans (AQMP). The review of the 2<sup>nd</sup> Generation Western Cape AQMP was informed by two (2) stages of Public Participation Processes (PPP). The COVID-19 pandemic, declared on 11 March 2020, however, resulted in the PPP taking place through online surveys. Members of the general public, as well as authorities, were requested to complete the online surveys as part of the review process of air quality management in the Western Cape Province.

This 3<sup>rd</sup> Generation Western Cape AQMP comes at a time when the COVID-19 pandemic has resulted in widespread restrictions on economic activities and drastic changes in human

behaviour. In addition, the pandemic has brought to light the serious effects of poor air quality on human health, making the need for clean air even more important.

The 3<sup>rd</sup> Generation Western Cape AQMP strives to minimise air pollutant emissions that pose a threat to human health and the environment by implementing interventions and strategies that would contribute towards communities becoming resilient to climate change vulnerabilities, natural hazards and disasters. In addition, it makes particular reference to and includes a focus on Gender Mainstreaming in Air Quality Management. This is particularly relevant, as women often bear the brunt of poor air quality, particularly indoors when cooking or heating in their homes.



Source: Joy Leaner, Western Cape

## 2. AIR QUALITY MANAGEMENT AND CLIMATE CHANGE

### 2.1 NATIONAL LEGISLATIVE AND POLICY DEVELOPMENTS

#### 2.1.1 AIR QUALITY MANAGEMENT

The atmosphere is the earth's largest single shared resource, which protects and supports life through the absorption of dangerous ultraviolet solar radiation, warming the surface and regulating temperature (DEA, 2012). However, these vital roles are under serious threat due to human-driven activities that result in the introduction of pollutants into the atmosphere (Hunter et al., 2002). These activities or drivers include industrialization, urban growth, population growth and changing consumption patterns. Air pollution and health impact studies in South Africa reflect that air pollution exposure results in numerous health problems in the general population, with the effects more pronounced among the elderly and young (DEA, 2012). The vulnerability to air pollution is also more evident in people of low-income status. This vulnerability has also been increased by poor land use planning, which has resulted in the location of heavy industrial developments in proximity to high density residential areas (DEA, 2012).

One of the reasons why air pollution is such a threat to human health is that we have no choice over the air we breathe (Koenig, 2000). Thus, in their homes, the outdoors and workplaces, people often breathe air that is not as clean as they would prefer. Inhalation is a route of entry into the body for toxic chemicals, resulting in respiratory illnesses such as asthma, increased susceptibility to acute respiratory infections, cancer, heart and lung diseases (DFFE, 2012). Air pollution can cause a variety of environmental effects, which include acid rain that can damage forests and crops, or acidify soil and water bodies, and eutrophication, a condition in a water body where high concentrations of nutrients, such as nitrogen, stimulates blooms of algae leading to the death of fish (Koenig, 2000).

One of the global environmental challenges with local significance to South Africa is climate change. The impacts of climate change extend to both, the developed and developing countries. The impacts, however, can be felt more intensely by developing countries (Bank and Karsten, 2017). Developing countries often do not have the means to cope with the hazards associated with climate change. The economies of developing countries have a dependence on climate sensitive sectors, for example, agriculture, mining, water and other sectors. For developing countries, climate change adaptation must remain at the forefront of sustainable development.

Before the promulgation of the National Environmental Management: Air Quality Act (Act No. 39 Of 2004; NEM: AQA), the management of air quality in South Africa was governed by the Atmospheric Pollution Prevention Act (Act No. 45 of 1965; APPA) from 1965 to 2004. During the period 1965-2004, the management of air quality focused on industrial pollution, as industries were identified as significant sources of air pollution. The APPA used a traditional "command and control" approach with respect to emissions permitting for industries. The APPA did not ensure effective and efficient protection of air quality and was later repealed as part of the National Environment Laws Amendment Act (Act No. 44 of 2008). The NEM: AQA came into full effect in September 2005 to, amongst others, prioritise the receiving environment and to increase compliance monitoring and enforcement.

The NEM: AQA is a Specific Environmental Management Act (SEMA), promulgated on 24 February 2005 under the NEMA, to address air quality management in South Africa. It provides for “the protection of the environment by providing reasonable measures for the protection and enhancement of the quality of air in the Republic; the prevention of air pollution and ecological degradation; and securing ecologically sustainable development while promoting justifiable economic and social development; and to give effect to Section 24(b) of the Constitution in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and well-being of people” (NEM: AQA, 2004). Under the NEM: AQA, 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 DFFE (then 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).

According to Section 7 of the NEM: AQA, the National Department of Environmental Affairs published the 2007 National Framework for Air Quality Management (DEA, 2007) in order to ensure the efficient and effective implementation of the NEM: AQA. Following five years of implementation of the NEM: AQA, the National Framework was reviewed in 2012. The 2012 National Framework for Air Quality Management commenced on 29 November 2013. Following a further five years of implementation, the 2012 National Framework was reviewed, after which the 2017 National Framework for Air Quality Management commenced on 26 October 2018 (DEA, 2018). The National 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 2004 – 2021**

DESCRIPTION / PURPOSE	COMMENCEMENT DATE
Section 21 Listed Activities of the National Environmental Management: Air Quality Act.	09 March 2010 (GN 248 of in Government Gazette No. 33064
National Environmental Management: Air Quality Act: Proposed regulations regarding the phasing-out and management of ozone-depleting substances.	14 January 2011 (GN 12 in Government Gazette No. 33925)
Draft Atmospheric Emission License Processing Fee Regulations in terms of National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).	08 March 2013 (GN 171 in Government Gazette No. 36207)
Regulations Prescribing the Format of the Atmospheric Impact Report	11 October 2013 (GN 747 in Government Gazette 36904) and amended on 02 April 2015 (GN 284 in Government Gazette No. 38633)

**WESTERN CAPE AIR QUALITY MANAGEMENT PLAN 2021**

Draft Declaration of Small Boilers as Controlled Emitters. The purpose of this notice by the National Minister is to declare small boilers as controlled emitters under Section 57(1) (a) and Section 23 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).	1 November 2013 (GN 831 in Government Gazette No. 36973)
National Dust Control Regulations, read with Section 32 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).	1 November 2013 (GN 827 in Government Gazette No. 36974)
Proposed Declaration of temporary Asphalt Plants as Controlled Emitters.	28 March 2014 (GN 201 in Government Gazette No. 37461)
Air Dispersion Modelling in the Republic of South Africa as contemplated in Section 53(p) of the National Environmental Management: Air Quality Act 39 of 2004;	11 July 2014 (GN 533 in Government Gazette No. 37804)
Regulations regarding Appeals in the Republic of South Africa as contemplated under Section 41(a) read with Section 43(4) of the National Environmental Management Act, Act no 107 of 1998.	8 December 2014 (GN 993 in Government Gazette No. 38303)
Draft National Atmospheric Emissions Inventory System (NAEIS) Regulations.	2 April 2015 (GN 283 in Government Gazette No. 38633)
National Atmospheric Emission Reporting Regulations	02 April 2015 (GN 283 in Government Gazette No. 38633)
Declaration of Smallscale Char and Smallscale Charcoal Plants as Controlled Emitters and Establishment of Emission Standards	18 September 2015 (GN. 602 in Government Gazette No. 39220)
Regulations Prescribing the Atmospheric Emission License Processing Fee	11 March 2016 (GN. 250 in Government Gazette 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 Government Gazette 39833)
Air Quality Offsets Guideline	18 March 2016 (GN. 333 in Government Gazette No. 37461)
National Greenhouse Gas Emissions Reporting Regulations, 2016	3 April 2017 (GN275 in Government Gazette No. 40762)
Declaration of Greenhouse Gases as Priority Air Pollutants	21 July 2017 (GN 710 in Government Gazette No. 40996)
National Pollution Prevention Plans Regulations, 2017	21 July 2017 (GN 712 in Government Gazette 40996)
Regulations regarding Pollution Prevention Plans in the Republic of South Africa as contemplated under Section 29(3), 53(o) and (p) of the National Environmental Management: Air Quality Act 39 of 2004.	21 July 2017 (GN 712 in Government Gazette No. 40996)

**WESTERN CAPE AIR QUALITY MANAGEMENT PLAN 2021**

Notice of intention to amend the 2012 National Framework for Air Quality Management	25 May 2018 (GN 518 in Government Gazette No. 41650)
The 2017 National Framework for Air Quality Management	26 October 2018 (GN 1144 in Government Gazette No. 41996)
National Greenhouse Gas Emission Reporting Regulations Notice of procedure to be followed by Category A data providers for registration and reporting as a category a data provider.	1 February 2019 (GN 71 in Government Gazette 42203) dated.
National Environmental Management: Air Quality Act, 2004 (Act No.39 of 2004) Notice of intention to amend 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	22 May 2019 (GN 686 in Government Gazette No. 42472)
National Environmental Management: Air Quality Act, 2004 (Act No.39 of 2004): Consultation on the intention to repeal the regulations relating to the inspection of premises in a dust control area made in terms of Section 33(1) (b) of the Atmospheric Pollution Prevention Act, 1965 and the dust control areas declared in terms of Section 27(1) of The Atmospheric Pollution Prevention Act, 1965	30 August 2019 (GN 1115 in Government Gazette No. 42669)
National Environmental Management: Air Quality Act, 2004 (Act No.39 of 2004): Consultation on the intention to repeal the regulations regarding fuel burning appliances in dwelling houses made in terms of Section 44(1) (dA) of the Atmospheric Pollution Prevention Act, 1965	30 August 2019 (GN 1113 in Government Gazette No. 42669)
Regulations to Phase-Out the Use of Persistent Organic Pollutants	10 September 2019 (GN 1150 in Government Gazette 42693)
Strategy to address air pollution in dense low-income settlements	17 May 2019 (GN 666 in Government Gazette 42464)
Submission of "subsequent pollution prevention plans" under the act: National Pollution Prevention Plans regulations as published under Government Notice No. R. 712 in Government Gazette No. 40996 of 21 July 2017 and the proposed process to manage carbon budgets for the period 01 January 2021 to 31 December 2022	22 October 2020 (GN 580 in Government Gazette 43827)
National Environmental Management: Air Quality Act, 2004 (Act No.39 of 2004): Consultation on the intention to repeal the smoke control regulations made in terms of Section 18 of the Atmospheric Pollution Prevention Act, 1965 and the smoke control zone orders made in terms of Section 20 of the Atmospheric Pollution Prevention Act, 1965	30 August 2021 (GN 1114 in Government Gazette No. 42669)

## 2.1.2 THE AIR QUALITY AND CLIMATE CHANGE NEXUS

Climate change is probably one of the most significant threats to mankind today. South Africa is extremely vulnerable and exposed to the impacts of climate change due to its socio-economic and environmental context (DEA, 2011). As such, South Africa is playing an important role in international climate change negotiations and has responded to climate change and air pollution in various ways, which include the legislative reform. The country is a contributor to global climate change, with GHG's mostly being emitted by its energy-intensive, fossil fuel electricity generation (DEA, 2011).

It is clear that air quality plays a major role in adapting to and mitigating climate change (UNEP, 2019). With the ever-increasing linkages between the two areas, 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 pollution and GHG emissions are essential, as GHG's pose serious risks to both human health and the environment (McMichael et al., 2006). 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 (SEP, 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 (Kinney, 2018).

One particular focus area for immediate attention is the emission or release of 'short-lived climate forcers' (SLCFs) - compounds such as methane and sulphate aerosols that affect the climate over shorter time scales – from days to years. Reducing the release of SLCFs in the near-term will have a significant impact on the overall global effort of mitigating GHGs, and bring GHG mitigation targets for 2030 within reach. At the same time, the polluting effect of these substances will be neutralized, bringing about co-benefits such as improved respiratory health (IPCC, 2021).

### 2.1.2.1 NATIONAL POLICY DEVELOPMENT

To actively address climate change, South Africa is a signatory to the Kyoto Protocol and the Paris Agreement. Policies have been developed nationally to contribute towards South Africa meeting its emission reduction obligations.

Other instruments that have been developed by National departments to further address climate change include the following:

- Sectoral Emission Targets (SETs)
- Integrated Resource Plan (IRP)
- National Climate Change Adaptation Strategy
- The National Green Transport Strategy (2018 – 2050)

Table 2-2 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 2-2: REGULATORY LEGISLATIVE AND POLICY DEVELOPMENTS AND INTERNATIONAL COMMITMENTS TO ADDRESS CLIMATE CHANGE (2004 – 2020)**

LEGISLATION	DESCRIPTION OF AMENDMENTS	DATE PUBLISHED FOR COMMENT / COMMENCEMENT
<b>Carbon Tax Act</b>	The Act is promulgated to provide for the imposition of a tax on the carbon dioxide (CO <sub>2</sub> ) equivalent of greenhouse gas emissions; and to provide for matters connected therewith. The Act must be read with the Customs and Excise Amendment Act, 2019.	22 May 2019 (GN 800 in Government Gazette No. 42483)
<b>Green Transport Strategy for South Africa (2018 – 2050)</b>	Published as South Africa's commitment to making a significant impact in reducing GHG emissions and contributing to the reduction of South Africa's total GHG emissions by committing to a 5 % reduction of emission in the Transport Sector by 2050.	July 2019
<b>Electricity Regulation Act, 2006: Integrated Resource Plan 2019</b>	The IRP is an electricity infrastructure development plan based on least-cost electricity supply and demand balance, taking into account security of supply and the environment (minimize negative emissions and water usage).	18 October 2019
<b>Carbon Tax Act: The Carbon Offset Regulations</b>	The government's flexibility mechanism that will enable industry to deliver least cost mitigation, being mitigation at a lower cost to what would be achieved in their own operations, and thereby lower their tax liability.	29 November 2019 (GN 653 in Government Gazette No. 42873)
<b>South Africa First Nationally Determined Contribution under the Paris Agreement</b>	South Africa updates and enhances its nationally determined contribution (NDC) under the Paris Agreement, meeting its obligation under Article 4.9 to communicate NDCs every five years,	September 2021
<b>The Climate Change Bill</b>	It's stated objectives are the following:  1. Provide for the coordinated	11 October 2021 (Out for public comments)

LEGISLATION	DESCRIPTION OF AMENDMENTS	DATE PUBLISHED FOR COMMENT / COMMENCEMENT
	<p>and integrated response to climate change and its impacts by all spheres of government in accordance with the principles of cooperative governance;</p> <p>2. Provide for the effective management of inevitable climate change impacts through enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to building social, economic, and environmental resilience and an adequate national adaptation response in the context of the global climate change response;</p> <p>Make a fair contribution to the global effort to stabilise greenhouse gas concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe and in a manner that enables economic, employment, social and environmental development to proceed in a sustainable manner.</p>	

**2.1.2.2 PROVINCIAL POLICY DEVELOPMENTS**

Climate Change has been identified as a policy priority of the Western Cape Government. As such, policy developments and initiatives have been implemented to address climate change in the Province. These also indirectly benefits and contributes to the management of air quality in the country.

A summary of the policy developments and initiatives that have been developed in the Western Cape is provided.

#### ● 2014 WESTERN CAPE CLIMATE CHANGE RESPONSE STRATEGY

A review of the Western Cape Climate Change Response Strategy (WCCCRS) was initiated in 2019 and it was being updated with the latest scientific evidence and to realign and address the critical timelines to 2030, and ultimately planning a trajectory for strategic outcomes in 2050 (Western Cape - 2050 Emissions Pathways). The Draft Western Cape Climate Change Response Strategy was published for public review in December 2021.

The currently approved Western Cape Climate Change Response Strategy was adopted by the Western Cape Government in 2014 (WCG, 2014a). The Strategy provided a coordinated response to climate change and aimed 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. The following nine focus areas were highlighted in the Strategy:

- Energy efficiency
- Renewable energy
- Built environment – critical infrastructure, disaster management, integrated waste management, human settlements
- Sustainable transport
- Water security and efficiency
- Biodiversity and ecosystem goods and services, Coastal and estuary management
- Food security, and Healthy communities.

#### ● 2014 WESTERN CAPE CLIMATE CHANGE RESPONSE IMPLEMENTATION FRAMEWORK

The Western Cape Climate Change Response Implementation Framework was published in August 2014 (WCG, 2014) but is currently under review and will be aligned with an updated document envisaged to be finalized in 2022. The Directorate: Climate Change is also working on a more detailed implementation plan that will guide key actions across the sectors and ensure alignment with the sector operational plans.

The 2014 Framework outlined 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 finalize a set of indicators that could be used to contribute to the National Climate Change Monitoring and Evaluation Report.

Currently, there are no timeframes attached to the Western Cape Climate Change Response Strategy and the Western Cape Climate Change Response Implementation Framework. As guiding documents, each sector is responsible for identifying key actions that are aligned with their operational plans, as well as long-term planning.

#### ● ECONOMIC RISKS AND OPPORTUNITIES OF CLIMATE CHANGE RESILIENCE IN THE WESTERN CAPE

In addition to the above-mentioned, the WCG has recognised the risks posed by climate change to its economy, population, ecosystems and infrastructure. These risks are being experienced as escalating costs to the public and private sector for remediation and repair of damage resulting from more frequent and intense storms, floods, droughts and wildfires. For the Western Cape,

climate change is also predicted to compound these pressures not only on environmental systems, but on social and economic systems too, escalating social inequality due to the disproportionately high impacts on the poor and their limited capacity to adapt.

The WCG therefore commissioned the “*Assessment of Economic Risks and Opportunities of Climate Resilient Investment*” study (WCG, 2018) to evaluate the economic costs of climate change and the potential economic benefits of investing in climate resilience. The study sought to generate information that could assist the WCG in directing investment towards climate change responses that reduce climate change related risks and increase resilience to increased short-term climate variability and long-term change, while simultaneously driving inclusive economic growth and development.

The study reported that ten modelling simulations of the potential future state of the Western Cape economy by 2040 were produced, with each using a unique set of assumptions regarding the level of climate change impact experienced in the Western Cape, the level of adaptation response of the WCG, and the level of adaptation response in the other provinces. Furthermore, the study reported that there were significant economic and social risks associated with climate change in the Western Cape, and that there were significant economic and social advantages associated with investing in climate adaptation.

A critical aspect that emerged from the study was the impact that climate adaptation investment will have on households, confirming the link between social well-being and economic growth and / or stability in the Province (WCG, 2018). This aspect links appropriately to the Western Cape AQMP in the sense that it too, seeks to ensure that there is minimal impact on households caused by GHGs and criteria pollutant emissions from various domestic and industrial sources. Through managing and regulating the domestic and industrial emission sources, the Western Cape AQMP can also contribute to the mitigation and other minor adaptation-based climate change responses.

#### ● DEPARTMENT OF AGRICULTURE CLIMATE CHANGE RESPONSE STRATEGY: SMARTAGRI PLAN

The WCG Department of Agriculture’s SmartAgri Plan builds on the WCCCRS 2014 and its Implementation Framework. It also informs the development of the updated WCCCRS, as reviewed during 2021, and has a special focus in the area of “Food Security” (source: <https://www.greenagri.org.za/smartagri-2/smartagri-plan/>).

The SMARTagri Plan sets out a roadmap to combat the impact of extreme weather events on the Province’s agriculture sector. It further aligns closely with the five-year Provincial Strategic Plan and its “Vision-inspired Priorities” (specifically VIP2: Economy and Jobs), as well as the Provincial Minister of Agriculture’s priorities, as it relates to Climate Change: Innovation, Technology and Partnerships.

The WCG: Agriculture Strategic Outcome “*Increased agricultural production in a sustainable manner*” depends on the enhancement of climate change resilience of the sector. Owing to its position as a highly vulnerable sector, the agricultural sector is the first sector in the Province to benefit from a sectoral Climate Change Response Framework and Plan.

The mitigation of air pollution through implementing the actions of the Western Cape AQMP and other air quality regulatory tools, may assist with reducing greenhouse gases to the air. Such actions will complement the SmartAgri Plan’s objectives and vision, which is to lead the way to a Climate-Resilient Agricultural Future for the Western Cape.

**● PROVINCIAL STRATEGIC PLAN (2019 – 2024): VISION-INSPIRED PRIORITIES (VIPs)**

The Provincial Strategic Plan (2019 – 2024) (WCG, 2019) has identified five (5) Vision-Inspired Priorities (VIPs) that measure the Province’s commitment to finding ways to improve the lives, livelihoods and experiences of its residents. This Provincial Strategic Plan details how, over the years from 2019 to 2024. Accordingly, the Western Cape Government (WCG, 2019) will:

- 1) build safe and cohesive communities;
- 2) boost the economy and job creation;
- 3) empower its people;
- 4) promote mobility and spatial transformation; and
- 5) drive innovation within a culture of a truly competent state.

**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 PLANS AND STRATEGIES OF RELEVANCE TO THE WESTERN CAPE 3rd GENERATION AQMP**

2030 NATIONAL DEVELOPMENT PLAN	20 YEAR PLAN
<p><b>Objectives and actions</b></p> <p>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</p>	

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

OUTCOME 10 DELIVERY AGREEMENT	5 YEAR PLAN
<p><b>Environmental assets and natural resources that are valued, protected and continually enhanced.</b></p>	
<p><b>Sub-outcome: An effective climate change mitigation and adaptation response</b></p> <p>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.</p>	
<p><b>Sub-outcome: Enhanced governance systems and capacity</b></p> <p><b>Main outputs and measures:</b></p> <p>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.</p> <p><b>Sub-outcome:</b></p> <p>Sustainable Human Communities                      Renewable energy deployed off-grid, solar home systems (PV) installed,                      Reduced total emissions of CO<sub>2</sub>                      Reduced vulnerability and risks associated with climate change impacts.</p>	

**2.2.2 PROVINCIAL PLANS AND STRATEGIES OF RELEVANCE TO THE WESTERN CAPE 3<sup>RD</sup> GENERATION AQMP**

ONE CAPE 2040	30 YEAR PLAN
<p>5 year definition of strategic objectives and mandate of government</p>	
<p><b>Relevant Priority Actions</b></p> <p>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</p>	

WESTERN CAPE PROVINCIAL STRATEGIC PLAN 2019 – 2024	5 YEAR PLAN
<p><b>Provincial Strategic Goals</b></p> <p>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</p>	

2018 WESTERN CAPE STATE OF THE ENVIRONMENT OUTLOOK REPORT	5 YEAR PLAN
<p><b>Priorities for Green Growth</b></p> <p>Natural gas and renewables                      Green jobs                      Financial infrastructure (attract capital and investment into green innovation)</p>	
<p><b>Green Drivers</b></p> <p>Smart living and working Smart mobility                      Smart eco-systems Smart agri-production                      Smart enterprise</p>	
<p><b>Actions</b></p> <p>Promote innovation                      Create an enabling environment Grow / develop the market</p>	

2021 DRAFT WESTERN CAPE CLIMATE CHANGE RESPONSE STRATEGY: VISION 2050	5 YEAR PLAN
<p>The Western Cape Climate Change Response Strategy: Vision 2050 responds to the urgency of the global climate change response amidst the dramatic global events. It also incorporates the latest science and overwhelming evidence supporting the need for a green and low carbon economic recovery. The strategy also aims to address critical timelines to 2030, ultimately planning a trajectory for strategic outcomes in 2050.</p>	
<p><b>Vision</b></p> <p>In responding to the unfolding climate emergency, the Western Cape contributes to a prosperous, equitable, and inclusive South African society enabled through a just transition to a low-carbon and climate resilient economy, which is achieved by protecting and investing in our natural capital and rapidly accelerating the green growth trajectory by 2030. The aspiration is to be a net zero emissions province by 2050, resulting in a resilient economy and society that will thrive despite the shocks and stresses posed by climate change.</p>	

**Guiding Objectives**

- Effective response to the climate emergency
- Equitable and inclusive economic and social transition to net zero emissions by 2050
- Investment in natural capital to reduce climate risks and increase socio-economic resilience
- Exemplary governance to lead a Just Transition

**2013 WESTERN CAPE GREEN ECONOMY STRATEGY FRAMEWORK**

**5 YEAR PLAN**

**The 2013 Western Cape Green Economy Strategy Framework is currently being reviewed.** The primary areas of focus of the Western Cape Green Economy Strategy Framework are on Resource efficiency, including;

- Energy,
- Water and waste,
- Sustainable Public Procurement (SPP),
- Land-use management,
- Biodiversity, and
- Communications.

**2014 WESTERN CAPE PROVINCIAL SPATIAL DEVELOPMENT FRAMEWORK**

**5 YEAR PLAN**

**The 2013 Western Cape PSDF is currently being reviewed.**

The PSDF builds on the OneCape 2040's vision of a highly skilled, innovation driven, resource efficient, connected, high opportunity and collaborative society. However, 2014 Western Cape Provincial Spatial Development Framework is due for review, and work is currently underway for its updates which will include the latest available information.

**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

**2.2.3 LOCAL PLANS AND STRATEGIES OF RELEVANCE TO THE WESTERN CAPE 2<sup>ND</sup> GENERATION AQMP**

CENTRAL KAROO DISTRICT AQMP	5 YEAR PLAN
<p><b>Vision</b></p> <p>To maintain air quality to such a standard that economic and social development will flourish without jeopardizing the environment.</p>	
<p><b>Mission</b></p> <p>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.</p>	

CITY OF CAPE TOWN AQMP	5 YEAR PLAN
<p><b>Vision</b></p> <p>To be the city with the cleanest air in Africa.</p>	
<p><b>Mission</b></p> <p>To reduce the adverse health effects of poor air quality on the citizens of Cape Town especially during 'brown haze' episodes.</p>	

CAPE WINELANDS DISTRICT AQMP	5 YEAR PLAN
<p><b>Vision</b></p> <p>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.</p>	
<p><b>Mission</b></p> <p>To implement sustainable air quality management practices throughout the District to progressively achieve air quality goals.</p>	

OVERBERG DISTRICT AQMP	5 YEAR PLAN
<p><b>Vision</b></p> <p>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.</p>	
<p><b>Mission</b></p> <p>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.</p>	

GARDEN ROUTE DISTRICT AQMP	5 YEAR PLAN
<p><b>Vision</b></p> <p>To have air quality worthy of the name "the Garden Route" please check if this is still the same</p>	
<p><b>Mission</b></p> <p>To minimise the impact of air pollutant emissions on the population and the natural environment of the Eden Municipal District.</p>	

WEST COAST DISTRICT AQMP	5 YEAR PLAN
<p><b>Vision</b></p> <p>Attainment and maintenance of good air quality for the benefit of all inhabitants and natural environmental ecosystems within the West Coast District Municipality.</p>	
<p><b>Mission</b></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• To ensure that future developments (transportation, housing etc.) incorporate strategies to minimise air quality impacts.</li> <li>• To reduce the potential for damage to sensitive natural environmental systems from air pollution, both in the short and long-term.</li> <li>• To facilitate intergovernmental communication at the Local, Provincial and National levels in order to ensure effective air quality management and control in the WCDM.</li> </ul>	



Photography by: Portia Rululu

### 3. REVIEW OF THE WESTERN CAPE AIR QUALITY MANAGEMENT PLAN 2016

Provinces and Municipalities are required to develop Air Quality Management Plans (AQMPs) to manage air quality in their regions, as per the requirements of Section 15(1) of the NEM: AQA. The AQMPs need to be implementable and effective. In terms of the National Framework for Air Quality Management 2017 (DFFE, 2018), their efficacy is required to be reviewed every five (5) years, to determine whether the AQMP goals and targets have been implemented, and to assess if they are still valid and relevant, taking into consideration any new developments and economic growth, where implemented.

In compliance with the requirements of Section 15(1) of the NEM: AQA, the DEA&DP has developed the Western Cape AQMP. The first generation AQMP was developed and adopted in 2010/2011, and the second generation AQMP was developed and adopted in 2016/2017.

The Public Participation Process (PPP) during each AQMP review period resolved that the vision and the mission of the 2<sup>nd</sup> Generation Western Cape AQMP were still relevant and are as follows:

**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 Western Cape AQMP has Goals, Objectives, Activities and Roles and Responsibilities that give clear direction in respect of air quality management in the Province. Co-operative governance promotes the alignment of the roles and responsibilities of the three (3) spheres of government in the realms of the air quality management sector, and it is taken into account during the AQMP development. In this regard, the Provincial Department of Environmental Affairs and Development Planning (viz. DEA&DP) both implements systems and provides an oversight role in the Province, in respect of air quality management.

Following five (5) years of implementing the Western Cape Air Quality Management Plan 2016 (AQMP2016), its review process was initiated in 2020, which included amongst others:

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

### 3.1 PUBLIC PARTICIPATION PROCESS

During 2020 and 2021, members of the public and authorities were invited to participate in the review of the AQMP2016. The aim of the review was to assess progress made in terms of implementing the Western Cape AQMP, while identifying potential air quality risks and interventions that can be translated into air quality management goals and objectives in going forward. Furthermore, the PPP was also used to gather views on whether the AQMP goals were still relevant.

Due to the novel COVID-19 Pandemic and the National Lockdown declared and implemented from 26 March 2020, the PPP could not be undertaken through the known conventional methods. In compliance with the National Disaster Management Regulations, which prohibited social gatherings, the following approaches were used to solicit comments from the public and authorities:

**PHASE 1:** The PPP was conducted during 03 August until 03 September 2020, via two (2) sets of survey online questionnaires to the public and authorities, respectively. Access to the Background Document and survey questionnaires were made available on the WCG Website (<https://www.westerncape.gov.za/>), Facebook, LinkedIn and Twitter, as well as on the DEA&DP Twitter.

**PHASE 2:** The second PPP phase was undertaken during 03 to 31 May 2021, via two (2) sets of online survey questionnaires to the public and authorities, respectively. Access to the Background Document and survey questionnaires were made available on the WCG Website (<https://www.westerncape.gov.za/>), Facebook, LinkedIn and Twitter, as well as on the DEA&DP Twitter.

During both phases, the PPP survey questionnaire took into consideration the various gender categories that the respondents may identify with. Therefore, the survey questionnaires included the categories to obtain disaggregated information in relation to gender, viz. Male, Female, Lesbian, Gay, Bisexual, Transgender, Queer and Intersex (viz. LGB TQI +) communities.

During Phase 1 of the PPP surveys, the survey questionnaire showed that 57.3 % of the respondents were aware that an AQMP existed in their respective Municipalities, whilst during Phase 2 of the review, 68 % indicated that they have heard about the AQMP. Thus, there still needs to be a great deal of effort towards public awareness in terms of raising the public's knowledge and awareness of air quality management and all associated instruments.

The authorities, in both phases of the PPP indicated that they still need to be upskilled in their air quality management knowledge, as well as in the technical aspects that relates to responding to air quality and noise complaints.

### 3.2 GENDER REVIEW: 2ND GENERATION AIR QUALITY MANAGEMENT PLAN

The DEA&DP Gender Mainstreaming Forum (GMF) undertook a review of the Western Cape AQMP2016 to ensure that it was gender inclusive, as well as gender sensitive. The review determined that the Western Cape AQMP2016 was gender neutral and did not consider issues targeted at the gender sensitive population such as women, the gender non-conforming, the young, and the disabled. Policies and planning documents that address air quality management were determined to be gender neutral and failed to realize and highlight that poor air quality bears more load on women and children. The GMF quoted numerous examples whereby air quality issues adversely affect women, children, youth, the disabled and elderly. An example of how pesticides could potentially affect pregnant women, children, and the elderly, or any other vulnerable groups, e.g. disabled persons, as well as other scenarios sourced from epidemiological studies, were identified. The review quoted the

World Health Organisation report; “Burning Opportunity”, which showed that women are more susceptible to the negative effects of air pollution than men.

Thus, in the development of the AQMP2021, the shortcomings related to gender mainstreaming. The five principles of gender mainstreaming are to be addressed by the following:

- Gender-sensitive language: The text referring to or addressing Air Quality Officers is gender neutral in that both, male and female AQO's are addressed as Air Quality Officers. Projects of an air quality nature will also be mindful of using gender-sensitive language.
- Gender-specific data collection and analysis: In the data collected through the online surveys, participants were required to indicate their gender preference. Future communication with the public participants will take into consideration vulnerable groups, viz. women, children, youth, the disabled and elderly, as well as the LGBTQI+ community.
- Equal access to and utilisation of services: Both male and female Air Quality Officers have access to exactly the same sources of information. Similarly, air quality projects to be undertaken will particularly focus on providing equal access and the utilisation by vulnerable groups, viz. women, children, youth, the disabled and elderly, as well as the LGBTQI+ community.
- Women and men are equally involved in decision making: Both male and female Air Quality Officers are equally involved in decision making. So too will air quality management projects be gender-sensitive, inclusive of all gender categories, particularly with regards to decision making processes.
- Equal treatment is integrated into steering processes: Service providers that were appointed to develop the SMART-air Status Quo Report and the SMART-air Strategy and Implementation Plan had qualified female academics that developed them. Future projects will consider including in the specifications, requirements that are gender inclusive.

Increased effort went into ensuring that gender mainstreaming was incorporated into all routinely functions of the Directorate. In 2017, the D: AQM started to include the “male/female” gender identification categories on the AQOF attendance registers. In addition, during September 2019, the youth was targeted as part of air quality awareness raising undertaken in schools.

During the 2020/21 years, in the AQMP2016 PPP, the D: AQM expanded on the gender identification categories to include, further to male and female, the LGBTQI+ community. During the AQMP2016 review, the online survey questionnaires also allowed for people to not state their gender preference if they wished so.

It was noted that there was a lack of women representation in the RAC sector. The D: AQM then promoted the participation of women in the RAC project. During 2019 two female candidates were selected from the RAC sector, and they completed the RAC Cool Training Programme in Bavaria. Furthermore, consulting companies that were appointed to assist with the SMART-air projects were led and managed by female directors.

During 2021, the GRDM encouraged women to chair meetings during August, also known as Women's Month. The CCT AQO indicated that within the petroleum refining sector in the City, the majority of Emission Control Officers were female. The GRDM AQO also indicated that in the District, more than 50 % of Emission Control Officers were female.

Currently, the Western Cape has 11 female AQO's which includes the Provincial AQO and the WCDM AQO and AQOs from nine (9) Local Municipalities.

Given the review, gender will be incorporated in the 3<sup>rd</sup> Generation Western Cape AQMP, to ensure that all actions taken in respect of air quality management in the Province takes into account the gender identification categories, as indicated above. Further to this, human rights matters in terms of air quality have also been identified as an area that is to be addressed the 3<sup>rd</sup> Generation Western Cape AQMP.

A summary of the outcomes of review process, in respect of the four (4) goals of the Western Cape AQMP2016, is provided below.

### **GOAL 1: TO ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY MANAGEMENT**

In respect of Goal 1, the respondents had varying opinions which were premised from their experiences. The opinions and suggestions focused strongly on recommending public awareness in terms of air quality management through public education, and especially in areas that are more affected by air pollution. The respondents also called for more integration between climate change and air quality management.

Respondents also added suggestions intended to improve Goal 1, which included a mixture of air quality awareness raising, as well as strengthening and improving on air quality monitoring and enforcement.

In terms of air quality monitoring and enforcement, some notable recommendations included the visibility of AQOs, and a plea for authorities to raise awareness, especially in areas where air pollution is allegedly experienced. Additional continuous monitoring was suggested, particularly near industries bordering residential areas, and that monitoring reports be made available to the public to enable transparency between industrial operations and regulations.

Additional actions were called to reduce climate change, which were recommended to be implemented in a top-down approach, whereby National policies get adjusted to be suitable for the Western Cape. Respondents proposed to include measures to monitor implementation in order to assist decision making.

There was also a call for actions towards getting as many vehicles off the roads, as well as improving public transport in many major towns and in the CCT. The Province was urged to be at the forefront for advocating a balanced work arrangement that would include working from home, as well as in the office; this was suggested to reduce vehicle emissions in the CCT. Further actions suggested included vehicle emissions testing and fining vehicles that emit significant fumes. Concerns were also raised, in that buffer zones close to residential areas should be enforced.

Respondents agreed that there has been work done towards the achievement of Goal 1, but more is still required to be done. Councils throughout the Province need to allocate adequate budget for the implementation of the AQMP, and more support needs to be provided to AQOs in the Province to ensure that they perform their tasks effectively and that Municipal AQO roles and responsibility not be blurred by other Municipal responsibilities.

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

In terms of Goal 2, respondents suggested that awareness raising at the Local Municipal level must include awareness raising at ward level, as air pollution is one of the biggest challenges in communities. Respondents also recommended air quality awareness raising in schools and tertiary institutions, through innovative platforms, such as social media.

The majority of respondents indicated that Goal 1 has been achieved satisfactorily, with some indicating that it has been achieved exceptionally.

Municipalities were urged to assist in encouraging a shift from the use of wood for cooking and heating to other climate and health friendly alternatives, especially in informal settlements. Municipalities were also urged to use their existing communication channels, such as Municipal By-law. Municipalities were also advised to teach their residents about air pollution and also give them tips on improving air quality, as well as highlight their air quality management related projects, including their challenges and successes.

Awareness raising, community engagements and educational campaigns were also emphasized. It was noted that awareness raising needs to be an interactive process; the suggested platforms were billboards, radio, TV, and social media. The issue of gender mainstreaming was also raised as the vulnerable, mainly women and children were said to bear the brunt of air pollution and consequently climate change. Respondents recommended that capacity building and awareness raising should be aimed at Municipal Authorities, especially for linking air quality to climate change and then drafting adequate policies and plans to address these issues.

A concern was raised with regards to stakeholder forums, as the respondents felt that these do not assist in managing air quality and do hold those who pollute, accountable. It was felt that there was a need to shift focus onto actions and to include the public community stakeholders into these in order to define and develop the narrative for the future that is envisioned.

Public engagement with industry were suggested as a means to ensuring that industries become self-regulating and consequently tighten up on raising awareness. Respondents also requested that complaints be dealt with accordingly at all spheres of government. Some respondents, however, also believed that air quality and climate change were separate issues, and that in combining them, it confuses the efforts to reduce air pollution.

## **GOAL 3: TO ENSURE EFFECTIVE AND CONSISTENT COMPLIANCE MONITORING AND ENFORCEMENT**

Respondents largely indicated that Goal 3 has been achieved. The respondents requested that appropriate reporting channels for environmental incidents be shared widely in the communities. The prioritization and strengthening of the integration of climate change considerations into compliance monitoring, authorisations and enforcement were also called for.

Respondents requested more environmental compliance "blitz" operations to ensure that industries comply with legislation continuously. Sectors such as landfill sites and smaller/light industrial operations were also suggested to be monitored continuously, as these were perceived to already pose environmental problems.

Respondents also recommended that Municipalities invest in equipment and/or systems that would assist with complaints management and ensure that law enforcement action be taken. Respondents further indicated that air quality standards were limited to a few pollutants; whereas several other issues also need to be addressed, e.g. odours, for which air quality standards do not exist, and which may severely impact on their quality of life, even if not necessarily posing a health risk.

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

A large majority of the respondents (93.4 %) acknowledged that there was a link between climate change and air pollution. Respondents cited the known scientific explanation of global warming, such as an increase in GHGs, and how deteriorating air quality accelerates global warming. Examples of climate change causes included refrigerant gas, which contributes to the depletion of the ozone layer, exacerbating global warming and climate change. Respondents listed impacts, such as temperature fluctuations and weather extremes, that also exacerbates air pollution.

In contrast, a few respondents indicated that there was no scientific and credible evidence to indicate that air pollution affects climate change; and that air pollution and climate change were separate issues, with certain overlaps, such as the undertaking of activities that release GHGs, that cause air pollution and also contribute to climate change.

A large majority of respondents (86.8%) were aware of alternative forms of heating and cooking that could reduce GHG emissions. They cited energy efficient appliances, as well as the use of Liquefied Petroleum Gas (LPG) and solar and photovoltaic cookers.

A large majority of respondents indicated that the residential burning of waste, burning of tyres, as well as diesel operated vehicles contributes to air pollution and climate change.

Some respondents called for government to ensure that climate change initiatives were effective and sustainable, inclusive of incentives and financial assistance to big businesses that are willing to change to more climate friendly operations. Government was also urged to introduce gas as an energy source, and to subsidize those who make that shift.

Respondents suggested that there should be more linkages between Climate Change and Air Quality Management, whereby mitigation projects across all spheres of government are implemented. Joint efforts with Municipal Climate Change Forums were also suggested to ensure that programmes and projects align.

#### **SUMMARY**

Overall, the review of the Western Cape AQMP2016 showed that the management of air quality was extremely relevant and needed to be prioritized throughout the Province. Further, the need to emphasize and integrate air quality management and climate change was also highlighted. The gender review indicated that the Western Cape AQMP2016 was "gender neutral" and required to be addressed in the 3<sup>rd</sup> Generation Western Cape AQMP, going forward. The gaps and recommendations, in respect of developing the 3<sup>rd</sup> Generation AQMP, are further elaborated in Chapter 5.

Buffer zones were recommended to be earmarked for industrial establishment and expansion close to existing, new and planned residential areas to protect receiving communities from nuisance and or harmful fugitive emissions. It was suggested that Air Quality Management By-laws address these gaps, and where needed, further air quality legislative tools are to be developed and/or implemented.

Capacity building of both authorities and industries was suggested, as well as providing technical assistance to the smaller and more rural Municipalities. Some respondents agreed that support from Air Quality Management authorities has been adequate.

In terms of gender, the review by the DEA&DP Gender Mainstreaming Forum indicated that the Western Cape AQMP2016 was gender neutral, and that this area, as well as human rights of those affected, be fundamentally addressed, particularly since women, youth and children, as well as the vulnerable groups such as the disabled and aged, often bear the brunt of poor air quality.

In summary, the surveys and review showed that the existing Goals of the Western Cape AQMP2016 were being addressed and were still relevant. Thus, the Goals were not required to be amended, nor were new ones required to be added. The Western Cape AQMP2016 only needed to be improved upon, in terms of its implementation across the Western Cape, by all authorities. New recommendations were to be included in the 3<sup>rd</sup> Generation Western Cape AQMP, to give effect to the latter.



Photography by: Marlé Kunneke

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

The wind disperses air pollutants and enables it to travel long distances. Air Pollution can therefore have an impact on the air quality of neighbouring towns, regions, and even other countries.

Although the air quality in the Western Cape is among the best in South Africa, it is not only a natural asset, but is also a public good, which is of provincial, national and international importance and which must continue to be protected and managed.

The Western Cape Province has one (1) Metropolitan Municipality, the City of Cape Town and five (5) District Municipalities which are the West Coast, Cape Winelands, Central Karoo, Garden Route and Overberg District Municipalities (Figure 4-1), which are further comprised of 24 Local Municipalities.

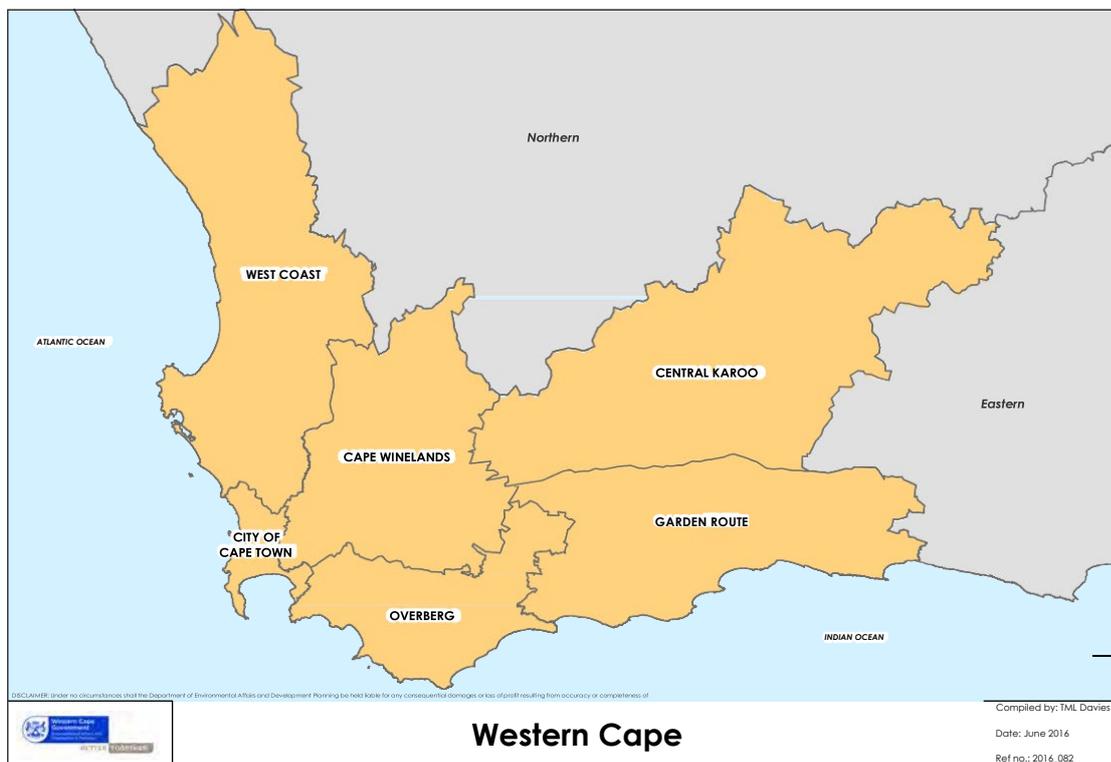


Figure 4-1: Locality map of the Western Cape Province

The Western Cape is South Africa's third most populous Province, accounting for 11.8 % of the country's total population. The City of Cape Town Metropolitan Municipality is home to 66 % of the Western Cape's population, followed by the District Municipalities of Cape Winelands (13 %), Garden Route (9 %), West Coast (7 %), Overberg (4 %), and the Central Karoo (1 %) (PT, 2020a). The Western Cape's growing population puts an increasing strain on housing, transportation, energy, and water services. Although the population growth coincides with economic growth, it will very certainly be accompanied by an increase in air pollutants from sources such as vehicles and industries, among others.

The Province generally has good air quality, with the exception of a few areas where multiple sources of air pollution and inherently poor atmospheric dispersion, particularly in winter, likely result in exceedances of the National Ambient Air Quality Standards (NAAQS). Such exceedances have been prevalent in areas where residential wood burning, refuse burning and dust from unpaved roads etc. are the main emission sources.

The following provides a summary of the situational analysis of air quality, as 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 has increased from 3.7 million in 2011 to 4.6 million in 2020 and is expected to increase by an average annual rate of 1.8 % per annum between 2020 and 2024 (PT, 2020b). Finance, insurance, real estate and business services constitute 27 % of economic activity in the CCT, followed by wholesale and retail trade, catering and accommodation (17 %), manufacturing (15 %) and general government (13 %) (PT, 2020b).

#### **CENTRAL KAROO DISTRICT MUNICIPALITY – CKDM**

The CKDM is the largest District Municipality in the Western Cape but is also the least populous, with a population of 74 662. The largest proportion of the CKDM population resides in Beaufort West followed by Prince Albert and Laingsburg (PT, 2020b).

The prominent economic activities in the CKDM are general government (22 %), wholesale and retail trade, catering and accommodation (15 %) and transport storage and communication (15 %), with smaller contributions from the finance, insurance, real estate and business services (10 %), community, social and personal services (10 %) and electricity, gas and water services (6 %) (PT, 2020b).

Uranium mining and shale gas development have been identified as potential catalysts for economic development in CKDM, specifically in Beaufort West, and are likely to occur in the future. These proposed developments are of significance because of the likelihood of environmental impacts, including air quality impacts, in the region.

#### **WEST COAST DISTRICT MUNICIPALITY – WCDM**

The WCDM's population grew from 410045 in 2014 to 456052 in 2019, making it the 3<sup>rd</sup> largest district within the Western Cape. The WCDM is comprised of five (5) Local Municipalities namely Saldanha Bay, Swartland, Matzikama, Bergrivier and Cederberg (PT, 2020b).

The WCDM boasts a long coastline, wildflowers and vast farmlands making the region a drawing card for tourists. The WCDM is also well known for its heavy industry sector, which includes iron, steel and cement industries and also being the location of the Saldanha Bay Integrated Development Zone (IDZ) (DEA&DP, 2018a).

### **GARDEN ROUTE DISTRICT MUNICIPALITY – GRDM**

The GRDM (formerly known as Eden District Municipality) population was estimated at 616 034 in 2019 and is expected to increase by 24 689 people or 0.8 % per annum to 640 723 by 2024. The GRDM accounted for 9 % of the total population of the Western Cape making it the 3<sup>rd</sup> most populous Municipality after the CCT and Cape Winelands District Municipality. The Kannaland, Oudtshoorn and Hessequa Local Municipalities are estimated to experience a decline in population whilst George and Bitou Local Municipalities are likely to see an increase in their population growth (PT, 2020b). The largest economic contributors to the GRDM's service sector was the finance, insurance, real estate and business sector (25 %), followed by the wholesale and retail trade, catering and accommodation sector (18 %) and the manufacturing sector (16 %) (PT, 2020b).

### **CAPE WINELANDS DISTRICT MUNICIPALITY – CWDM**

The CWDM's population has grown from 787 490 inhabitants in 2014 to 926 619 inhabitants in 2019. The population of the CWDM is estimated to reach 1 million inhabitants by 2024, increasing by an average annual growth of 1.7 % between 2020 and 2024. The Drakenstein is the most populous Local Municipality within the CWDM and it is anticipated that its population will increase by an average annual growth rate of 1.5 % between 2020 and 2024 (PT, 2020b).

Agricultural activities form the backbone of the CWDM's economy, with approximately 80 000 hectares of cultivated and irrigated areas dedicated to the production of mostly deciduous fruit, table grapes, wine grapes and vegetables. The leading agricultural contribution to the District's economy originates from the Witzenberg and Drakenstein Municipalities (WESGRO, 2019).

### **OVERBERG DISTRICT MUNICIPALITY – ODM**

The ODM has a population of approximately 294 391 inhabitants and it is estimated that the population will increase to 322 372 inhabitants in 2024. The Overstrand is expected to have the highest population growth rate in the ODM over the next five (5) years, with a population growth rate of 1.8 % year, while the populations of the Theewaterskloof and Swellendam Local Municipalities are expected to grow at an average annual rate of 1.2 % and 1.0 %, respectively, between 2020 and 2024. The Municipality of Cape Agulhas continues to have the smallest proportion of the ODM's population (PT, 2020b).

The ODM is characterized by its agricultural landscapes and shoreline, which serve as the primary sources of economic activity and draw huge numbers of tourists to the region. The ODM has a competitive advantage in agriculture, forestry, and fishing, and these industries are critical to the local economy in terms of production, employment, and trade. In 2018, the main contributors to the ODM economy were the financial, insurance, real estate, and business services sectors, as well as the wholesale and retail trade, catering, and housing services (PT, 2020b).

#### 4.1.2. PRIMARY ECONOMIC ACTIVITIES AND EMERGING RISKS

The contribution of the economic sectors, as reported in the Western Cape Provincial Economic Review and Outlook Reports (PERO; PT, 2019a, 2020a, 2021a), the Municipal Economic Review and Outlook Reports (MERO; PT, 2019b, 2020b) and the Western Cape Spatial Development Framework (DEA&DP, 2018b) 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 (PT, 2021a) indicates that the manufacturing sector contributed 15 % towards the GDP in the Western Cape. In the Province, a mixture of electricity, coal and diesel is used in various manufacturing processes, resulting in greenhouse gas emissions. The bulk of the Western Cape's manufacturing activities are concentrated in the Cape Town area, making it the biggest energy user of all the municipal areas. The CCT accounts for nearly 60 % of all energy used in the province, followed by the WCDM with the second largest energy use of 21 % in the Province. The GRDM and CWDM are the next highest consumers of energy at 12 % and 7 %, respectively. The ODM contributed 2 % and the CKDM contributed 1 % to the total energy consumption in the Western Cape (DEA&DP, 2018a). The iron and steel, as well as the cement industries, are generally regulated through the atmospheric emission licensing system, in terms of section 21 List of Activities (NEM: AQA).

##### **OIL, GAS AND MARINE SECTOR TRENDS**

The oil, gas and marine service industry is strategically important to the Western Cape as the Province is located on the tip of Africa where over 30 000 ships pass each year. The ports of Cape Town, Mossel Bay and Saldanha Bay cater for containers, oil and gas supply and transport, repair and maintenance, and mineral export. PetroSA, the national oil company, maintains six (6) oil storage tanks in Saldanha Bay; whilst the Port of Mossel Bay hosts PetroSA's gas to liquid refinery (DOE, 2018). These facilities are regulated in terms of section 21 List of Activities (NEM: AQA).

##### **SALDANHA BAY INDUSTRIAL DEVELOPMENT ZONE – IDZ**

The Saldanha Bay area has natural and geographical characteristics that allow for opportunities to compete for investment and development on a global scale. Furthermore, its location is ideal to serve the thriving African offshore oil and gas sector, through marine manufacturing, which includes ship and rig repair, refurbishment and boatbuilding (SBM, 2018).

The Saldanha Bay region is an essential part of the South African government's larger strategic framework, which is guided by the National Development Plan and the National Growth Plan. The Greater Saldanha Bay area is designated as a special intervention area in the National Development Plan, owing to the natural deep-water harbour and industrial development possibilities that support its classification as a national growth management zone (SBM, 2018).

The region is included in two Strategic Integrated Projects (SIPs) resulting from the Government's National Infrastructure Plan of 2012, both of which have direct relevance to Saldanha Bay Municipality, viz.

- SIP 5: development of the Saldanha-Northern Cape Corridor through rail and port expansion, industrial capacity, and strengthening maritime support capacity; and
- SIP 8: support for green energy initiatives on a national scale.

The region also plays an important role in Operation Phakisa (specifically the Small Harbours and Aquaculture workstreams), a presidentially led government programme to aid in the implementation and acceleration of the National Development Plan (SBM, 2018).

On 31 October 2013, the Saldanha Bay Industrial Development Zone (SBIDZ) was formally inaugurated, and is South Africa's first Special Economic Zone (SEZ). It is the only sector-specific SEZ in the country, catering particularly to the oil and gas, maritime fabrication and repair sectors, and associated support services (WESGRO, 2019).

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 (3) spheres of government in November 2014. The purpose of the GSB-IGTT is to facilitate a coordinated 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, to serve as a platform to allow meaningful and dedicated engagements with civil society and industry. The GSB-IGTT meets at a minimum twice a year and as part of its Terms of Reference and proposed tasks, the committee is specifically discussing the identification and development of priority interventions to assist with environmental decision making. The interventions include actions in protecting our water, environment and quality of air in the GSB and therefore require the collaborative efforts of all sector departments and mandates.

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 (2) years. The Saldanha Bay AQMP, as well as the Western Cape's AQMP, is to emphasize measures to manage air quality in the greater Saldanha Bay region (e.g. airshed planning). The management of the regulated and non-regulated industries require that the authorities work closely with each other to ensure that the environmental right of people in the area are upheld. The management of the regulated and non-regulated industries require that the authorities work closely with each other to ensure that the environmental right of people in the area is upheld.

### **ATLANTIS SPECIAL ECONOMIC ZONE – SEZ**

In the Western Cape, WESGRO has coordinated the application for the Atlantis Special Economic Zone (SEZ) designation, since 2019 (source: <https://www.greencape.co.za/content-2/sector/atlantis-sez>).

The Atlantis SEZ is located about 40km from Cape Town, on the West Coast of the Western Cape. With its designation, the entire Atlantis Industrial area was declared as a Special Greentech Economic Zone.

The advancement of the Atlantis SEZ benefits from the Province's already booming renewable energy and green technology sector. It aims to support the manufacturing sectors to become suppliers and component manufacturers for the renewable energy sector, and in particular the independent power producers in the government's Renewable

Energy Independent Power Producers Programme (REIPPP). The objective of the Atlantis SEZ is to unlock the underlying economic value of existing and underutilized infrastructure through the creation of the Greentech manufacturing hub. Wind turbines, solar panels, insulation, biofuels, electric vehicles, materials recycling and green building materials are all examples of future planned initiatives. (source: <https://www.investcapetown.com/opportunities/atlantis-greentech-special-economic-zone/>).

The Free State of Bavaria and Western Cape Government's Refrigeration and Air-Conditioning (RAC) Partnership Project, initiated in 2017 following a signed agreement between the partners, complements the development of the Greentech manufacturing hub in the Atlantis SEZ, and bodes well for air quality management in the Province. The first Phase of the RAC Partnership Project enabled the training of nine (9) RAC experts in Maintall Germany. The Partnership was expanded to include a TVET college, viz. West Coast College, during the second Phase, which saw the opening of a Hydrocarbon Training Laboratory in December 2021, as part of the college's RAC Training Facility located in the Atlantis SEZ.

The aim of the Hydrocarbon Training Laboratory is to upskill technicians on the safe handling and use of natural refrigerants in the RAC sector, in line with the Kigali Amendment to the Montreal Protocol to phase down hydrofluorocarbons (HFCs). These potent greenhouse gases contribute to global warming. Thus, the trained RAC technicians will apply their skills to transition the country to climate friendly RAC refrigerant use, which supports the aims of the declared Special Greentech Economic Zone.

## **PUBLIC TRANSPORT, MOBILITY AND SPATIAL TRANSFORMATION**

The Province has a well-developed transport network that includes airports, roads, ports and rail lines. The Western Cape has three (3) major seaports, viz. Cape Town, Mossel Bay and Saldanha Bay and 13 smaller ports, which are also known as fishing harbours. The Western Cape has about 90 airports-airstrips-helipads, including airstrips and helicopter landing pads with Cape Town International Airport, George Airport and the Ysterplaat Aerodrome having the highest aircraft movement frequency. The national roads, viz. N1, N2 and N7, provide links from the Western Cape to Gauteng, Gqeberha (previously Port Elizabeth) and Durban, as well as Namibia, respectively. The transport sector accounts for the largest share of energy consumption in the Western Cape. The Energy Consumption and CO<sub>2</sub>e Emissions Database for the Western Cape show that the transport sector is the second-largest contributor to the emissions profile in the Western Cape (DEA&DP, 2018a).

During recent years, however, the Province has seen a decline in rail infrastructure due to ongoing vandalism of electric cables and supporting infrastructure. The upgrading of rail infrastructure and networks can contribute to improved air quality, particularly in the greater Cape Metropolitan area, where traffic congestion contributes to increased air emissions, which impacts on air quality.

Traffic congestion contributes to brown haze or smog because of the increased time that vehicles are on the roads. The consequent harmful emissions from vehicles impacts on the health of our people (e.g. respiratory disease). Improved rail networks can play a positive role in respect of air quality mitigation, particularly in terms of a bi-modal shift to passenger and goods rail.

Although public transport is a large component of spatial transformation, as it is critical for access to shops, social services (such as clinics, schools, and government departments), and economic opportunities (WCG, 2019), the direct benefit of such is reduced air pollution from private vehicles when traffic congestion is reduced and hence the impact on human health is also reduced. There have been positive steps by PRASA recently in terms of restoring the Southern Metro Line, as well as Cape Town's busiest Central Line, which mostly serves low-income areas.

### **AGRICULTURE**

Although the agriculture sector only contributes 4 % of the GDP in the Western Cape, it underpins the economics of all the districts outside of Cape Town due to its manufacturing sector's role in processing agricultural products (WCG, 2014b).

From 2015 to 2018, the Western Cape was hit by a severe drought that devastatingly affected the agriculture industry. Parts of the CKDM and WCDM still lack adequate grazing capacity and are receiving fodder support to keep the animals alive. Climate change has emerged as one of the most pertinent challenges faced by farmers and agri-businesses (PT, 2019a).

Similarly, the concomitant effects of poor air quality linked to climate change, also need to be addressed, where required.

### **FISHERIES**

The Western Cape Province's coastal waters have the highest concentration of fishing activity in South Africa. These coastal waters are commercially significant due to the richness of inshore and offshore marine resources. Approximately 90 % of people directly employed in the commercial sector in South Africa are located within the Western Cape.

The 12 fishing harbours in the Western Cape include; Stilbaai, Lambertsbaai, St. Helena Bay, Saldanha Bay, Gansbaai, Arniston, Kleinmond, Hermanus, Struisbaai, Gordons Bay, Kalk Bay and Hout Bay (DEA&DP, 2018b).

Fishmeal processing plants are often located in close proximity to these harbours, which bears the brunt of odour complaints that air quality officials in the Province address through the formation of IGTTs, where required. Alternative ways to minimize odour from fishmeal factories will need to be investigated in the Province.

### **MINING AND QUARRYING**

Mining in the Western Cape is not as prominent when compared to the rest of the country; however, it does include limestone, dolomite, sand, salt, diamond mining (marine diamond mining is located near Vanrhynsdorp and Vredendal in the WCDM), and quarrying are increasing in the Province. Sand mines, in particular, are growing throughout the Western Cape (DEA&DP, 2018c). These activities have significant implications for air quality management in the Province.

Large scale or regional development proposals such as shale gas development, uranium-molybdenum mining, and renewable energy development have been identified as potential economic development drivers for the CKDM and may take place in the future.

## SHALE GAS DEVELOPMENT (SGD) IN THE KAROO

There has been much debate about the proposed uranium mining and SGD in the CKDM since it first came to light. While these proposed developments are potentially significant in the economy of the country, there are also an array of possible detrimental effects on the natural environment, to consider. The potential risks and opportunities related to onshore SGD and the effect thereof on the Karoo environment must be addressed strategically.

Significant progress has been made in this regard through establishing a regulatory framework for hydraulic fracturing (DEA&DP, 2015). A Strategic Environmental Assessment (SEA) for SGD in the Karoo was initiated in 2015 and completed in 2017. The project team driving this initiative comprised of the Council for Scientific and Industrial Research (CSIR), the South African National Biodiversity Institute (SANBI), and Council for Geoscience (CGS).

The purpose of the SEA was to provide a science-based assessment that serves as a decision-making framework that will enable South Africa to establish effective policy, legislation, and sustainability conditions under which shale gas development could occur. The study area for the SEA was informed by the areas where applications for Exploration Rights were being sought. It spans over the three (3) Provinces, viz. Western Cape, Eastern Cape, and Northern Cape and includes 27 Local Municipalities and encompasses 171 811 km<sup>2</sup>. The SEA can be accessed on the website of the National Department of Forestry, Fisheries and the Environment.

In 2017, the Central Karoo District Municipality coordinated a workshop where the need was identified to investigate the readiness of government to deal with the potential increase in demand for on municipal and government services that will arise from the implementation of large-scale developments such as shale gas development, uranium-molybdenum mining and renewable energy developments in the Central Karoo. Since then, the development of the Karoo Readiness Action Plan has drafted through intergovernmental cooperation that involved all three spheres of government. Based on the possible roll-out of large-scale development, the Karoo Readiness Action Plan contribute to proactively planning to improve intergovernmental readiness should such large development come to fruition. It is a consolidation of various actions/interventions that are needed to improve our state of readiness. The Karoo Readiness Action Plan was finalised in March 2021. However, it is a dynamic document that will continuously be improved upon through a whole-of-society approach.

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 3<sup>rd</sup> Generation Western Cape AQMP takes these activities into account when it sets targets or interventions to manage air quality in the Province (Chapter 6).

### 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) mandates all three (3) spheres of government to appoint Air Quality Officers (AQOs) and establish Air Quality Management Plans (AQMPs) in their areas of jurisdiction. All Provinces and Municipalities are required to adopt AQMPs, as per the NEM: AQA. As at 31 December 2021, a total of 29 Municipalities have adopted their AQMP's, and a total of 30 Municipalities have designated AQOs in their jurisdictional areas. The Beaufort West Local Municipality AQMP is currently in draft format (Table 4-1).

The DEA&DP continues to work closely with the Municipalities to ensure that the roles and responsibilities are understood and implemented by all and that AQMPs are developed and implemented, while AQOs are designated at all Municipalities in the Province. The aim is to always have 31 AQOs designated in the Western Cape.

The DEA&DP Directorate: Air Quality Management provides oversight, support and guidance to Municipalities in respect of their AQMPs to ensure alignment with the requirements of Section 16 of the NEM: AQA. The DEA&DP also encourages Municipalities to designate AQOs, where AQOs retire and / or resign.

TABLE 4-1: STATUS OF AQMPs AND DESIGNATED AQOS IN THE MUNICIPALITIES OF THE WESTERN CAPE AS DURING 2021

AUTHORITY	YEAR ADOPTED & IMPLEMENTED	2 <sup>ND</sup> GENERATION REVIEW	3 <sup>RD</sup> GENERATION REVIEW	AIR QUALITY OFFICER DESIGNATION
CITY OF CAPE TOWN	2009	in progress		✓
CAPE WINELANDS	2009	2018		✓
DEA&DP	2010	2016	in progress	✓
DRAKENSTEIN	2011	2020		✓
WEST COAST	2011	2019		✓
GARDEN ROUTE	2011	2013	2019	✓
OVERBERG	2012			✓*
BERGRIVIER	2012	2019		✓
MATZIKAMA	2012	2020		✓
SALDANHA	2012	2020		✓
SWARTLAND	2012	2019		✓
CENTRAL KAROO	2012	2016		✓
CAPE AGULHAS	2013	2019		✓
OVERSTRAND	2013	2017		✓
WITZENBERG	2013	2014		✓
GEORGE	2013	2019		✓
HESSEQUA	2013	2019		✓
BITOU	2013	2019		✓
KNYSNA	2013	2019		✓
KANNALAND	2013	2021		✓
MOSSSEL BAY	2013	2019		✓
THEEWATERSKLOOF	2014	2015		✓
OUDTSHOORN	2013	2019		✓
PRINCE ALBERT	2014			✓
SWELLENDAM	2015			✓
STELLENBOSCH	2015	2018		✓
CEDERBERG	2016	2019		✓
LAINGSBURG	2016			✓
BREEDE VALLEY	2017			✓
LANGEBERG	2017			✓
BEAUFORT WEST	in progress			✓

\*The Air Quality Officer retired in 2021; the designation of a new Air Quality Officer is pending

#### 4.1.4. GOVERNANCE: AIR QUALITY OFFICERS' FORUM

The Western Cape DEA&DP hosts quarterly Air Quality Officers' Forum (AQOF) that allows air quality officials to develop, enhance and / or refine their air quality management interventions towards the implementation of the NEM: AQA, as well as share experiences, challenges, and plans for the coming year.

The Provincial Noise Control Forum forms part of the Western Cape Provincial AQOF to ensure and improve the coordination of noise control in the Province. Participants are informed of achievements and challenges with regard to noise management in the Western Cape.

Special AQOFs are held to allow for a more in-depth discussion of potential air quality management legislation and policy development in the country. Table 4-2 provides an inventory of the Western Cape Air Quality Officers' and Noise Control Forums held since 2010.

**TABLE 4-2: AIR QUALITY OFFICERS' AND NOISE CONTROL FORUMS HELD SINCE 2010**

YEAR	DATE	LOCATION
2010	09 – 11 February	George, GRDM
	13 – 14 May	Beaufort West, CKDM
	05 – 06 August	Woodstock, CCT
2011	09 – 11 February	George, GRDM
	13 May	Witsand, CWDM
	12 August	Sea Point, CCT
2012	10 February	Langebaan, WCDM
	10 – 11 May	Knysna, GRDM
	23 – 24 August	Robertson, CWDM
2013	07 – 08 February	Arniston, ODM
	09 – 10 May	Matjiesfontein, CKDM
	29 – 30 August	Klapmuts, CWDM
2014	13 – 14 February	Citrusdal, WCDM
	15 – 16 May	Cape Town, CCT
	14 – 15 August	Calitzdorp, GRDM
	01 – 02 November	Cape Town, CCT – Special AQOF
2015	13 – 14 February	Caledon, ODM
	14 – 15 May	Beaufort West, CKDM
	13 – 14 August	Paarl, CWDM
	03 – 04 November	Driftsands, CCT – Special AQOF
2016	10 – 11 February	Langebaan, WCDM
	12 – 13 May	Driftsands, CCT
	11 – 12 August	Mossel Bay, GRDM
	21 October	Tygerberg Nature Reserve, CCT – Special AQOF
2017	02 – 03 February	Arniston, ODM
	18 – 19 May	Laingsburg, CKDM
	03 – 04 August	Worcester, CWDM
	28 November	Driftsands, CCT – Special AQOF
2018	08 – 09 February	Langebaan, WCDM
	31 May – 01 June	Driftsands, CCT
	14 – 17 August	George, GRDM
	08 November	McGregor, CWDM – Special AQOF
2019	07 – 08 February	Bredasdorp, ODM
	16 – 17 May	Laingsburg, CKDM
	01 – 02 August	McGregor, CWDM
	27 November	Brackenfell, CCT – Special AQOF

<b>2020</b>	20 – 21 February 14 May 25 August 04 November	Vredendal, WCDM Virtual via MS TEAMS Virtual via MS TEAMS Virtual via MS TEAMS
<b>2021</b>	17 February 12 May 04 August 13 October	Virtual via MS TEAMS Virtual via MS TEAMS Virtual via MS TEAMS Virtual via MS TEAMS

### WESTERN CAPE AIR QUALITY MANAGEMENT PLAN WORKING GROUPS I – III

Three (3) Provincial AQMP Working Groups were established to achieve and meet the goals set in the Western Cape AQMP. The Working Group meetings took place in parallel with the Western Cape AQOFs and were held during the period 2010 – 2021, as outlined in Table 4-2. The Working Groups discussed and reported on the following matters at the Western Cape AQOFs:

- 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

Working Group I emphasized the importance of the link between air quality and climate change. The DEA&DP's Directorate: Climate Change regularly provides updates at the AQOFs on climate change matters as it relates to air quality. Collaboration with other fields of expertise, such as the spatial development and transportation sectors, is still required to guarantee that future ideas address any air quality issues that arise in these and other sectors. During September 2021, the DEA&DP Directorate: Air Quality Management shared some case studies on the impacts of spatial planning on air quality management, in particular noise pollution.

Progress was evaluated with respect to the development of emissions inventories and the status of integrating AQMPs, as sector plans into IDPs. The Working Group also facilitates the development of Municipal AQMPs and the designation of AQOs, the status of which is indicated in Table 4-1.

Working Group II serves to encourage the District, Metropolitan and Local Municipalities to facilitate various awareness-raising events; these are presented in Table 4-3. The COVID-19 pandemic has, however, had a significant impact on the Municipality's education and awareness-raising activities during 2020 and 2021.

Working Group III encourages Municipalities to develop Municipal By-Laws. Since 2007, a total of 17 Municipal By-laws governing air quality management have been gazetted in the Western Cape (Table 4-4).

The Western Cape Province continues to advocate for the appointment of Environmental Management Inspectors (EMI). Most of the Municipalities have trained and appointed EMIs. Between 2016 and 2020, 24 EMIs have been officially designated and a further 10 Municipal officials have completed the EMI course and are awaiting official designation.

All five (5) District Municipalities in the Province have established Municipal forums, which are conducted quarterly within their respective areas. The WCDM, GRDM, ODM and CWDM Municipal forums are attended by industries that are regulated in terms of the NEM: AQA Section 21 Listed Activities, the Local Municipalities, as well as Provincial DEA&DP D: AQM officials. The forums serve as a platform to communicate air quality matters with stakeholders. The WCDM has civil society bodies incorporated into its forums. The CKDM established an

Environmental Forum, which meets to discuss matters pertaining to air quality management, waste management, and water quality management, among others.

TABLE 4-3: AWARENESS RAISING PROGRAMMES AND ACTIVITIES IN THE REGIONS

MUNICIPALITIES	ACTIVITIES
CAPE WINELANDS DISTRICT MUNICIPALITY	Environmental awareness-raising programmes include interactive theatre performances at schools, the development of educational material on a variety of environmental health topics, and the "Greening Cape Winelands Programme which involves the planting of indigenous trees and shrubs.
CITY OF CAPE TOWN	Continues to spread the message of clean air to young students with the help of their air quality mascot "Sniffles, the air pollution sniffing cat,". The CCT facilitates a number of projects with local communities to raise awareness about air quality issues.
GARDEN ROUTE DISTRICT MUNICIPALITY	The Garden Route Clean Fires Campaign is still ongoing since 2011 and various other air quality awareness raising projects have been implemented.
WEST COAST DISTRICT MUNICIPALITY	Awareness-raising is conducted through the establishment of Working Groups and Environmental Stakeholder's Forums.
CENTRAL KAROO DISTRICT MUNICIPALITY	Educates and raises awareness about air quality through the publication of articles in the local newspaper, "The Courier," as well as through regular services related to pollution management in the District.

TABLE 4-4: LIST OF MUNICIPAL BY-LAWS PROMULGATED, IN RESPECT OF AIR QUALITY MANAGEMENT IN THE WESTERN CAPE

MUNICIPALITY	BY-LAW	GAZETTE NO.	DATE
HESSEQUA	Air Pollution Control By-Law	6588	19 December 2008
GEORGE	Air Pollution Control By-Law	6816	30 November 2010
GARDEN ROUTE	Air Quality Management By-Law	7043	12 October 2012
WEST COAST	Air Quality Management By-Law	7170	06 September 2013
MOSSEL BAY	Air Quality Control By-Law	7184	04 October 2013
SWELLENDAM	Air Quality Control By-Law	7338	05 December 2014
OVERBERG	Air Quality Management By-Law	7389	15 May 2014
SWARTLAND	Air Quality By-Law	7394	22 May 2014
THEWATERSKLOOF	Air Quality Management By-Law	7488	11 September 2015
CITY OF CAPE TOWN	Air Quality Management By-Law	7662	17 August 2016
SALDANHA BAY	Air Quality By-Law	7912	09 April 2018
CENTRAL KAROO	Air Quality Management By-Law	8023	14 December 2018

MUNICIPALITY	BY-LAW	GAZETTE NO.	DATE
STELLENBOSCH	Air Quality By-Law	8038	08 February 2019
LANGEBERG	Air Quality By-Law	8261	24 January 2020
CEDERBERG	Air Quality By-Law	8237	13 May 2020
BERGRIVIER	Air Pollution By-Law	8261	03 July 2020
DRAKENSTEIN	Air Quality Management By-Law	8425	07 May 2021

#### 4.1.5. ATMOSPHERIC EMISSION LICENSING

The Licensing Authorities in the Western Cape have embraced the Atmospheric Emission Licensing process and as at 31 December 2021, a total of 13 PAELs and 124 AELs were being regulated within the Province. Table 4-5 provides a summary of the AELs and PAELs issued annually during the period 2010 – 2021.

The DFFE has successfully developed and implemented the South African Atmospheric Emission Licensing and Inventory Portal (SAAELIP). This is an online system for managing Atmospheric Emissions Licenses (AELs) and centrally gathering atmospheric emission inventories. SAAELIP comprises of two (2) parts namely, of the System for National Atmospheric Emission Licensing (SNAEL) and the National Atmospheric Emission Inventory System (NAEIS).

The main goals of the SNAEL are to standardize the processing and issuance of AELs and to lessen the administrative burden associated with them.

The NAEIS' principal goal is to administer online emission inventory reporting, as required by the National Atmospheric Emission Reporting Regulations (G.N. 38633 of 2015). Facilities that have been issued AELs or PAELs must submit and manage their emission inventory reports online. The NAEIS provides the public with a summary of the National Emission Inventory Report of significant pollutants.

To date, a total of 192 facilities in the Western Cape have registered on the NAEIS. Table 4-6 provides a summary of the number of facilities registered on the NAEIS, as per the different Licensing Authorities in the Western Cape.

#### 4.1.6. AIR QUALITY COMPLIANCE AND ENFORCEMENT

The DEA&DP is responsible for facilitating compliance monitoring and implementation, with respect to Atmospheric Emission Licensing of controlled facilities in the Western Cape. These facilities are monitored through record reviews, inspections, and compliance monitoring.

In 2013, the DEA&DP's Directorate: Air Quality Management initiated an AEL Compliance Inspection Programme and applied strategic enforcement action on targeted sectors that are likely to have a significant environmental burden in the Province (Table 4-7).

Compliance inspections of facilities with Section 21 Listed Activities were conducted throughout the Western Cape by the DEA&DP's Air Quality Officers, Environmental Management Inspectors and the Metropolitan, District, and Local Municipalities.

4-5: SUMMARY OF THE AELS AND PAELS ISSUED BY LICENSING AUTHORITIES IN THE WESTERN CAPE DURING 2010 – 2021

Licensing Authority		REGULATED AS AT 31 DECEMBER																							
		2010		2011		2012		2013		2014		2015		2016		2017		2018		2019		2020		2021	
		PAEL	AEL	PAEL	AEL	PAEL	AEL	PAEL	AEL	PAEL	AEL	PAEL	AEL	PAEL	AEL	PAEL	AEL	PAEL	AEL	PAEL	AEL	PAEL	AEL	PAEL	AEL
WCDM	0	0	5	1	1	1	1	6	1	7	9	12	9	12	12	12	13	12	15	11	17	10	18	2	20
GRDM	5	0	4	0	7	2	2	14	3	3	6	2	23	0	26	0	27	0	26	0	27	0	30	2	26
ODM	0	0	0	0	0	0	1	0	2	0	0	5	0	1	4	0	5	0	5	0	5	0	5	0	5
CKDM	0	0	0	0	0	0	0	0	0	0	0	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	16	31	16	18	32	26	6	19	42	14	50	15	52	9	56
CWDM	0	0	1	0	0	0	0	0	4	11	5	10	6	6	9	8	6	8	8	4	10	1	13	0	14
DEA&DP	0	0	0	0	0	0	0	0	1	0	3	0	0	1	3	3	0	3	3	0	3	0	3	0	3
TOTAL	5	0	12	1	9	6	12	17	31	45	43	73	38	86	44	62	37	99	29	112	26	121	13	124	

TABLE 4-6: NUMBER OF FACILITIES IN THE WESTERN CAPE, AS REGISTERED ON THE NAEIS, AS AT 31 DECEMBER 2021

LICENSING AUTHORITY	NUMBER OF REGISTERED FACILITIES
CCT	88
CWDM	25
GRDM	37
ODM	10
WCDM	29
DEA&DP	3
<b>TOTAL</b>	192*

\*Total number includes mines and quarries

Interviews, document reviews, and on-site activities are used as part of the compliance inspection process to determine compliance with the AEL's requirements and related legislative provisions.

TABLE 4-7: SUMMARY OF THE AEL COMPLIANCE INSPECTION PROGRAMME UNDERTAKEN IN THE WESTERN CAPE SINCE 2013

MUNICIPAL AREA	YEAR	SECTION 21 LISTED ACTIVITY	NO.
CAPE WINELANDS	2013	Category 10. Animal Matter Processing	1
WEST COAST	2013	Category 10. Animal Matter Processing	2
WEST COAST	2013	Sub-Category 5.4. Cement Production	1
CITY OF CAPE OF TOWN	2013	Category 10. Animal Matter Processing	1
CITY OF CAPE OF TOWN	2014	Sub-Category 2.4. Storage and Handling of Petroleum Products & Sub- Category 2.5. Installations Used to Recycle or Recover Oil from Waste Oils	1
GARDEN ROUTE	2014	Category 10. Animal Matter Processing	3
OVERBERG	2014	Sub-Category 5.6. Lime Production	1
WEST COAST	2014	Sub-Category 4.7. Electric Arc Furnaces & Sub- Category 5.2. Drying	1
CITY OF CAPE OF TOWN	2015	Sub-Category 8.2. Crematoria and Veterinary Waste Incineration	1
GARDEN ROUTE	2015	Sub-category 4.22. Hot Dip Galvanizing	1
WEST COAST	2015	Sub-Category 5.1. Storage and Handling of Ore and Coal	1
WEST COAST	2015	Sub-Category 5.6. Lime Production	1
CAPE WINELANDS	2015	Sub-Category 5.6. Lime Production	1
CAPE WINELANDS	2016	Sub-Category 7.2. Production of Acids & Sub-Category 8.3. Burning Grounds	1
OVERBERG	2016	Category 10. Animal Matter Processing	1
CITY OF CAPE TOWN	2016	Sub-Category 8.1. Thermal treatment of Hazardous & General Waste	1
WEST COAST	2016	Sub-Category 5.1. Storage and Handling of Ore and Coal	1
GARDEN ROUTE	2017	Subcategory 2.4: Petroleum product storage tanks and product transfer facilities, except those used for liquefied petroleum gas.	1
CAPE WINELANDS	2017	Sub-Category 5.3: Clamp Kilns for brick production	1

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<b>OVERBERG</b>	2017	Sub-Category 5.3: Clamp Kilns for brick production	1
<b>CITY OF CAPE TOWN</b>	2017	Sub-Category 8.2: Crematoria and Veterinary Waste Incineration	1
<b>CITY OF CAPE TOWN</b>	2018	Sub-Category 8.2: Crematoria and Veterinary Waste Incineration	1
<b>CAPE WINELANDS</b>	2018	Sub-Category 8.2: Crematoria and Veterinary Waste Incineration	1
<b>GARDEN ROUTE</b>	2018	Sub-Category 8.2: Crematoria and Veterinary Waste Incineration	1
<b>OVERBERG</b>	2018	Sub-Category 5.3: Clamp Kilns for brick production	1
<b>CITY OF CAPE TOWN</b>	2019	Sub-Category 8.2: Crematoria and Veterinary Waste Incineration	1
<b>CITY OF CAPE TOWN</b>	2019	Subcategory 1.2: Liquid Fuel Combustion Installation	2
<b>OVERBERG</b>	2019	Category 10. Animal Matter Processing	1
<b>CITY OF CAPE TOWN</b>	2020	Sub-Category 8.2: Crematoria and Veterinary Waste Incineration	1
<b>CITY OF CAPE TOWN</b>	2020	Subcategory 1.2: Liquid Fuel Combustion Installation	2
<b>CAPE WINELANDS</b>	2020	Sub-Category 5.3: Clamp Kilns for Brick Production	1
<b>TOTAL</b>			<b>36</b>

**4.1.6.1. INTER-GOVERNMENTAL TASK TEAMS – IGTTs**

During the period 2010 – 2020, the DEA&DP convened various Inter-Governmental Task Teams (IGTTs) in order to investigate and resolve complaints related to complex air quality matters. This approach has proven to be advantageous with regard to the handling and resolving of air pollution complaints and activities. Table 4-8 summarises the areas where the IGTTs were formed, the nature of the complaints that required investigation and the actions that were undertaken to resolve the complaints.

**TABLE 4-8: SUMMARY OF INTER- GOVERNMENTAL TASK TEAMS FORMED IN THE WESTERN CAPE**

<b>AREA</b>	<b>NATURE OF COMPLAINT</b>
<b>LOUDSBOORN</b>	The IGTT was formed in February 2010 due to various complaints received as a result of the industries in the GRDM. The GRDM has actively investigated and worked closely with industries to reduce odour from its processes. The GRDM undertook routine inspections to ensure that industries comply with AEL conditions.
<b>ALBERTINIA</b>	
<b>MOSSEL BAY</b>	
<b>ST. HELENA BAY</b>	Complaints of alleged odours emanating from the fishmeal processing continues to be a challenge. Shelley Point residents have requested that the IGTT continue to address odour management in the area.
<b>SALDANHA BAY</b>	The Greater Saldanha Bay IGTT (GSB) headed by DEA&DP, discusses various topics inclusive of dust from iron and manganese ore handling. A Task Team was established to undertake inspections when required, in consultation with the Directorate: Law Enforcement of the DEA&DP, WCDM, and the Saldanha Bay Municipality. Complaint investigations are still ongoing and reported at the SBM IGTT.

#### 4.1.6.2. COMPLAINTS MANAGEMENT

##### ● GARDEN ROUTE DISTRICT MUNICIPALITY

The Garden Route District Municipality (GRDM) is actively involved in handling complaints and assists Local Municipalities in this respect. All complaints are recorded on a computerized database and addressed within specific time periods.

Offensive odour has still been the predominant complaint in the GRDM. This is followed by smoke complaints and dust. There was a noticeable decline in odour-related complaints from 2019 – 2020, which could be attributed to the closure of an animal matter processing facility in Mossel Bay.

##### ● WEST COAST DISTRICT MUNICIPALITY

The West Coast District Municipality (WCDM) continues to address complaints through investigations, daily observations, site inspections and meetings held with the complainants and facility representatives.

Odour complaints continued in the WCDM, alleged to be mainly from fishmeal processes undertaken in the area. The WCDM remains hopeful that conditions will improve through continuous engagement, good public communication and continuous plant improvements. The majority of the odour complaints received were from the Saldanha Bay Municipal area.

Complaints were lodged with the WCDM, DEA&DP and the Saldanha Bay Local Municipality in terms of iron and manganese storage and handling in the Saldanha Bay Municipal area. The WCDM, has compiled a guideline on the transport, storage and handling of manganese and other potentially hazardous ore concentrates to provide guidance on how best the quality of the air can be protected in the region. The Greater Saldanha Bay IGTT continues to assist in resolving complaints, and meets on a quarterly basis to address these matters.

##### ● CAPE WINELANDS DISTRICT MUNICIPALITY

The Cape Winelands District Municipality (CWDM) captures complaints on the CWDM Municipal Health Services electronic database, which they resolve within defined timeframes. The CWDM actively assists Local Municipalities within the District. The more complex complaints were addressed through intergovernmental interactions between the DEA&DP, Local Municipality AQOs and the CWDM.

Odour related complaints, particularly in the Breede Valley Municipal region required that the CWDM and 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.

There was a noticeable reduction in odour nuisance complaints. The reduction could have been as a result of industries implementing mitigation measures from compliance conditions set by the CWDM. Non-listed activities account for the majority of the air quality complaints received. This suggests that the AEL's restrictions and requirements aids the prevention and management of pollution in the receiving environment.

Air quality complaints in the CWDM have been mostly offensive odour, industrial dust and agricultural (dust, crop spraying, smoke from farmland / waste burning) related. The increase in dust related complaints as received on farming activities and listed activities such as clay brick manufactures, could be attributed to the Western Cape drought.

#### ● CENTRAL KAROO DISTRICT MUNICIPALITY

Complaints received by the CKDM comprises 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

The Overberg District Municipality (ODM) received complaints comprising 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

Noise have mostly been the dominant complaint in the CCT. A dedicated and specialised Noise Control Unit was established to investigate complaints in accordance with the Western Cape Noise Control Regulations, with considerable success.

Complaints regarding fume emissions are the second most significant source of complaints in the Municipality with informal spray-painting activities in residential areas being a significant contributor. Smoke emissions from residential and industrial activities contributed to a significant number of complaints. Dust complaints mainly from construction related projects and odour related complaints are also received and investigated.

### 4.1.7. EMISSIONS INVENTORIES

The DEA&DP developed the Western Cape Emissions Inventory during 2006, which was limited to fuel burning equipment. The DEA&DP has since expanded the inventory to include GHGs, as the Western Cape Air Pollutant and Greenhouse Gas Emissions Inventory during 2011, which included data from the City of Cape Town's scheduled and non-scheduled source of emissions. The inventory houses data on point, non-point and mobile sources of air pollution in the Province.

A full Greenhouse Gases Inventory was compiled and is maintained by the DEA&DP Directorate: Climate Change. This information was subsequently made available to the National Department of Environmental of Forestry, Fisheries and the Environment (DFFE) for developing and populating the National Atmospheric Emissions Inventory System.

In 2019, the DEA&DP initiated the review of the existing Western Cape Air Pollutant and Greenhouse Gas Emission Inventory. Through this, sectors of interest such as petrol stations, spray-painting booths etc. were identified. Updating of the Emissions Inventory will be ongoing, as means to improve on the information available to manage air quality in the Western Cape.

Table 4-9 shows the Western Cape Province's maximum pollutant load in kilograms per annum for 2019, this excludes pollutants from non-listed activities that people may be exposed to. The maximum pollutant loads were extracted from the online National Atmospheric Emission Inventory System (NAEIS), submitted by facilities that undertake Section 21 Listed Activities. The totals per pollutant are a summation of all the active data provider's (facilities) submissions for the year 2019. Table 4-9 only

It is evident that SO<sub>2</sub>, PM<sub>2.5</sub>, PM<sub>10</sub>, NO<sub>x</sub>, CO and VOC's are amongst the most prevalent pollutants emitted in the Province, with SO<sub>2</sub> being the highest emitted pollutant at a total of 8 762 422.95 kg per annum in 2019, whilst, benzene, NH<sub>3</sub> and H<sub>2</sub>S were among the lowest emitted pollutants, with NH<sub>3</sub> being the lowest at 2 912.36 kg per annum (Table 4-9).

TABLE 4-9: WESTERN CAPE MAXIMUM POLLUTANT LOAD IN KILOGRAMS PER ANNUM FOR 2019

MAJOR POLLUTANTS	POLLUTANT LOAD (kg/annum)
Particulate Matter 10 (PM <sub>10</sub> ) Primary	2 035 179.01
Particulate Matter 2.5 (PM <sub>2.5</sub> ) Primary	5 522 947.41
Lead (Pb)	255 616.44
Sulphur Dioxide (SO <sub>2</sub> )	8 762 422.95
Nitric Oxides (NO <sub>x</sub> )	6 844 361.99
Total Suspended Particulate (TSP_)	3 566 182.80
Carbon Monoxide (CO)	3 866 478.60
Volatile organic Compounds (VOC)	1 233 155.59
Benzene (C <sub>6</sub> H <sub>6</sub> )	3 589.20
Ammonia (NH <sub>3</sub> )	2 912.36
Hydrogen Sulphide (H <sub>2</sub> S)	3 014.51
Mercury (Hg)	43 981.42
<b>Total</b>	<b>32 139 842.28</b>

In terms of the Western Cape Province's GHG inventory, the latest iteration of the Western Cape Energy Consumption and CO<sub>2</sub> emissions database was completed in 2018, based on 2015/16 data (DEA&DP, 2018a). This is the 3<sup>rd</sup> iteration of the database with the first using 2009 data and the 2<sup>nd</sup> using 2012/13 data. It is only the Energy Sector emissions that are currently included in the data. These are demand-side emissions calculations, based on the consumption of different fuels by the identified sectors.

The inventory, is updated every two to three years, depending on the ease of accessing the data. However, as part of the 2050 Emissions Pathway process, the DEA&DP Directorate: Climate Change will be undertaking the development of a full GHG Inventory, aligned with the national GHG Inventory and focused on the sectors relevant to South Africa.

#### 4.1.8. WESTERN CAPE AMBIENT AIR QUALITY MONITORING NETWORK

Ambient air quality monitoring is an integral part of an effective air quality management system hence it is mandatory that Provinces and Municipalities monitor ambient air quality in terms of Section 8 of the NEM: AQA. In the Western Cape, the DEA&DP's Directorate: Air Quality Management, the City of Cape Town Metropolitan Municipality (CCT), the West Coast District Municipality (WCDM) and the Saldanha Bay Municipality (SBM) have installed air quality monitoring equipment within their jurisdiction, as part of the Ambient Air Quality Monitoring Network in the Province (Table 4-10).

The ambient air quality monitoring stations of the DEA&DP, CCT, SBM and WCDM 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 TR-07-03 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 quality assured prior to producing 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). Great strides have been made to have the Network report in real-time to SAAQIS (<http://saaqis.environment.gov.za>).

TABLE 4-10: WESTERN CAPE AMBIENT AIR QUALITY MONITORING NETWORK - 2021

MUNICIPAL AREA	LOCATION	DATE COMMENCED
<b>DEA&amp;DP's AMBIENT AIR QUALITY MONITORING NETWORK</b>		
<b>CAPE WINELANDS</b>	Meirings Park, Worcester	July 2009 - present
	Municipal Vehicle Testing Station, Paarl	March 2008 – May 2009, August 2018 - present
	CWDM, Stellenbosch	October 2011 - present
<b>WEST COAST</b>	Vredenburg High School, Vredenburg	April 2008 – March 2010*
	Malmesbury Central, Malmesbury	April 2010 - present
	Stompneus Bay, St Helena Bay	April 2011 – present
<b>CITY OF CAPE TOWN</b>	Panther Park, Berkeley Rd, Maitland	August 2010 – March 2011*
	Khayelitsha Training Centre, Khayelitsha	May 2011 – 2017*
	Morningstar Small Holdings, Vissershok	September 2011 – March 2019*
	Driftsands Nature Reserve, Blue Downs	April 2019 – November 2020*
	Sentinel, Hout Bay	March 2014 – present
	Khayelitsha District Hospital, Khayelitsha	May 2017 - present
	Maitland Crematorium, Maitland	April 2021 - present
<b>GARDEN ROUTE</b>	Voorbaai, Mossel Bay	August 2008 – February 2010*
	Dana Bay Reservoir, Dana Bay	November 2011 – October 2016*
	Conville, George	July 2010 - present
	Bongolethu, Oudtshoorn	April 2011 - present
	GRDM, Mossel Bay	November 2016 - present
<b>OVERBERG</b>	Mount Pleasant, Hermanus	March 2014 – present
<b>CITY OF CAPE TOWN's AMBIENT AIR QUALITY MONITORING NETWORK</b>		
<b>CITY OF CAPE TOWN</b>	City Hall	2020*
	Molteno	1992
	Goodwood	1993
	Athlone	1993
	Tableview	1994
	Foreshore	1995
	Bothasig	1995
	Khayelitsha	2002
	Bellville-South	2003
	Wallacedene	2006
	Atlantis	2008
	Somerset-West	2008
	Platteklouf	2013
	Potsdam	2013
<b>SALDANHA BAY MUNICIPALITY's AMBIENT AIR QUALITY MONITORING NETWORK</b>		
<b>SALDANHA BAY</b>	Saldanha Bay Substation	2014*
	Saldanha Bay Harbour	July 2014
	Louwville, Vredenburg	July 2014
<b>WEST COAST DISTRICT MUNICIPALITY's AMBIENT AIR QUALITY MONITORING NETWORK</b>		
<b>VELDRIF</b>	Velddrif Municipal vehicle testing station	June 2017

\*Decommissioned

To date, only a few stations are not reporting in real-time, mostly due to sim card or software challenges. Data from stations not reporting in real-time to SAAQIS is uploaded manually on a monthly or quarterly basis to SAAQIS.

**4.1.8.1. WESTERN CAPE GOVERNMENT: DEA&DP**

In 2008, the DEA&DP's Ambient Air Quality Monitoring Network commissioned its first ambient air quality monitoring station. To date, 18 locations have been monitored, with 12 monitoring stations in operation and reporting on various air quality parameters (Figure 4-2 and Table 4-10).

The set of air quality parameters measured at each monitoring station was primarily determined by the historical air quality conditions at the location and based on complaints received in the 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.

The Network's ambient air quality monitoring stations are aging and have been prioritized for incremental replacement of infrastructure, in line with the DEA&DP's Strategic Asset Management Plan. The replacement of analysers at selected locations has resulted in a significant improvement of data recovery during 2021. This AQMP reports on data collected during the period 2010 – 2020, as data is still being collected and verified for the 2021 period.

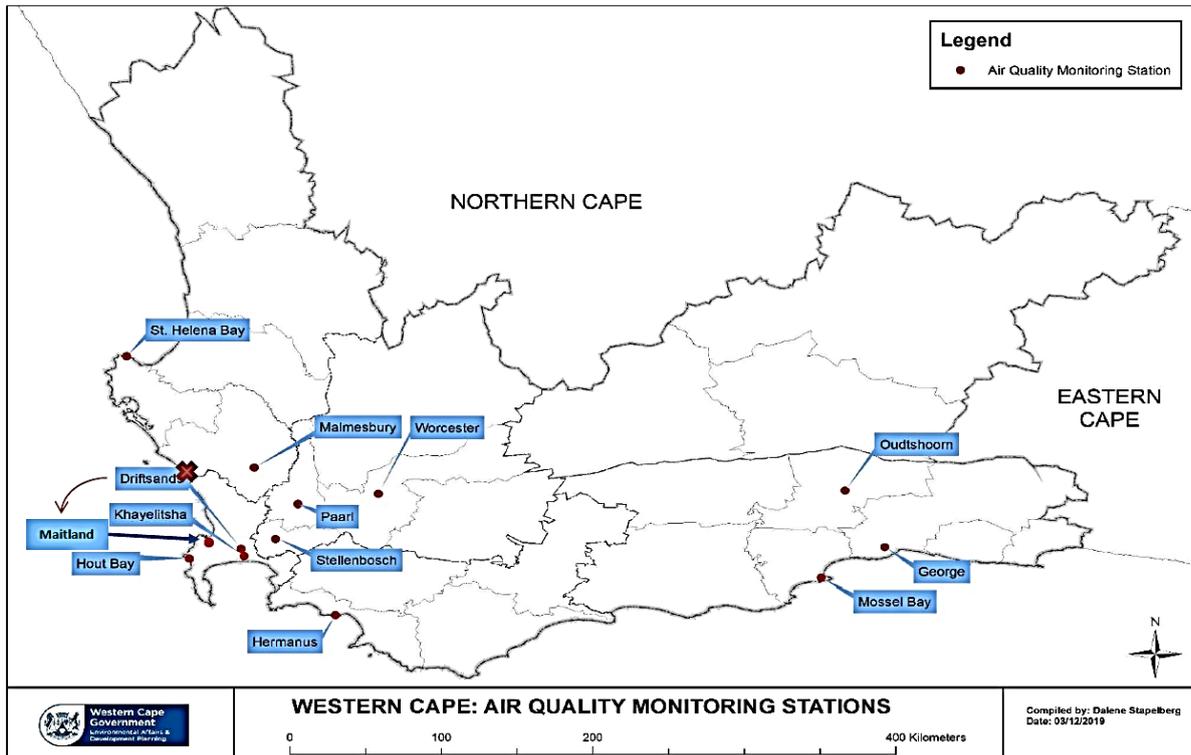


Figure 4-2: Locations of the ambient air quality monitoring stations operated in the DEA&DP's Ambient Air Quality Monitoring Network

TABLE 4-10: LIST OF PARAMETERS MONITORED AT THE AIR QUALITY MONITORING STATIONS

STATION LOCATION	AIR QUALITY PARAMETERS MEASURED
WORCESTER	SO <sub>2</sub> , O <sub>3</sub> , NO <sub>2</sub> , CO, PM <sub>10</sub> , meteorological parameters
PAARL	SO <sub>2</sub> , O <sub>3</sub> , NO <sub>2</sub> , CO, meteorological parameters
STELLENBOSCH	SO <sub>2</sub> , O <sub>3</sub> , NO <sub>2</sub> , CO, CO <sub>2</sub> , PM <sub>10</sub> & PM <sub>2.5</sub> , VOC's (BTEX), meteorological parameters
ST HELENA BAY	H <sub>2</sub> S, CO <sub>2</sub> , meteorological parameters
MALMESBURY	SO <sub>2</sub> , O <sub>3</sub> , NO <sub>2</sub> , CO, PM <sub>10</sub> , meteorological parameters
HOUT BAY	H <sub>2</sub> S and meteorological parameters
KHAYELITSHA	SO <sub>2</sub> , O <sub>3</sub> , NO <sub>2</sub> , CO, CO <sub>2</sub> , PM <sub>10</sub> , & PM <sub>2.5</sub> , VOC's (BTEX), meteorological parameters
MAITLAND	CO, NO <sub>2</sub> , PM <sub>10</sub> , SO <sub>2</sub> , meteorological parameters
OUDTSHOORN	H <sub>2</sub> S, CO <sub>2</sub> , meteorological parameters
GEORGE	SO <sub>2</sub> , O <sub>3</sub> , NO <sub>2</sub> , CO, PM <sub>10</sub> , meteorological parameters
MOSEL BAY	H <sub>2</sub> S, VOC's (BTEX), meteorological parameters
HERMANUS	SO <sub>2</sub> , O <sub>3</sub> , NO <sub>2</sub> , CO, CO <sub>2</sub> , PM <sub>10</sub> & PM <sub>2.5</sub> , VOC's (BTEX), 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 (Figures 4-3 to 4-8). The annual average concentrations of the air quality parameters measured during the period 2010 – 2020 are compared to the respective annual averages of the National Ambient Air Quality Standards (NAAQS), where applicable.

**SULPHUR DIOXIDE**

Sulphur dioxide (SO<sub>2</sub>) is a colourless non-flammable gas with a distinctly detectable odour and taste. Sources of SO<sub>2</sub> 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 SO<sub>2</sub>, as depicted for each monitoring station, are significantly below the annual NAAQS of 50 µg/m<sup>3</sup> (Figure 4-3).

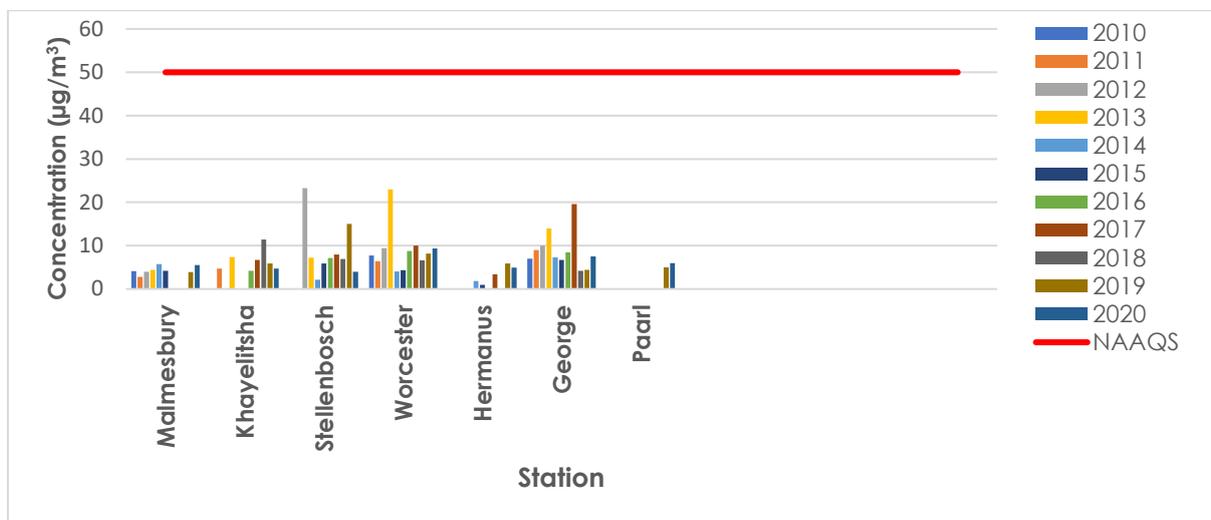


Figure 4-3: Annual averages of SO<sub>2</sub>, as measured during 2010 – 2020

**NITROGEN DIOXIDE**

Nitrogen dioxide (NO<sub>2</sub>) is a reddish-brown gas that has a detectable odour and is a highly corrosive and oxidising agent. The sources of NO<sub>2</sub> include fuel combustion in motor vehicles and can also be found in industrial and chemical manufacturing processes. All annual averages of NO<sub>2</sub>, as depicted for each monitoring station are significantly below the annual NAAQS of 40 µg/ m<sup>3</sup> (Figure 4-4).

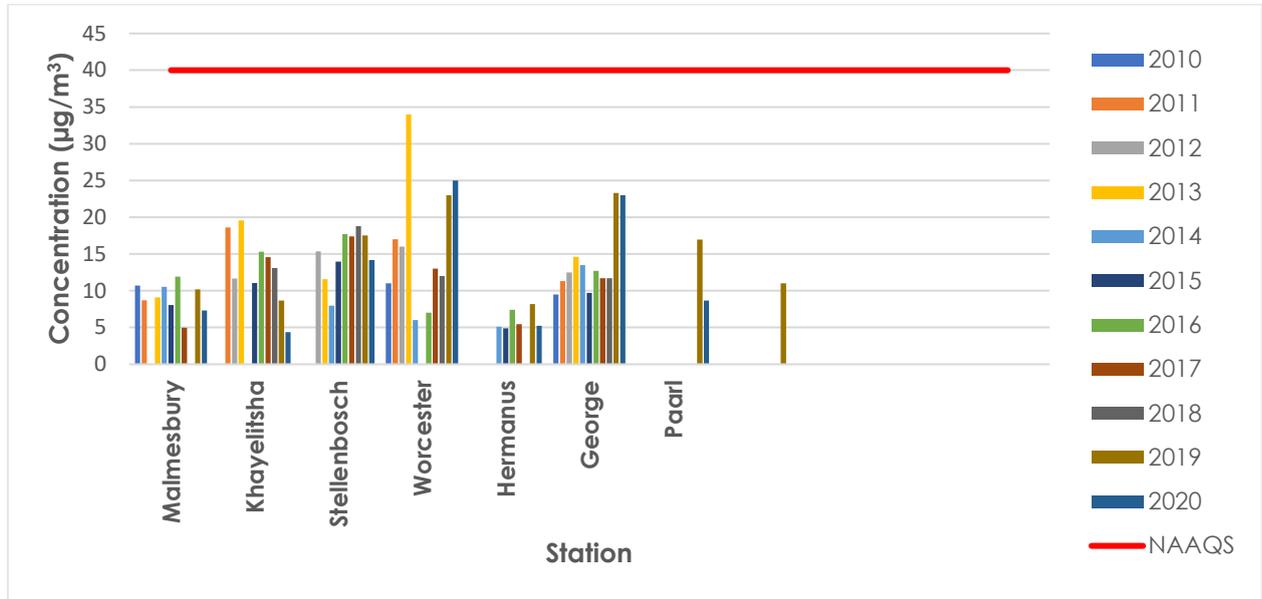


Figure 4-4: Annual averages of NO<sub>2</sub>, as measured during 2010 – 2020

**OZONE**

Ozone (O<sub>3</sub>) is a colourless gas and is formed by photochemical reactions in the presence of sunlight and precursor pollutants such as NO<sub>x</sub> and VOC's emitted from vehicles and industrial processes.

There is no annual NAAQS established for O<sub>3</sub>. It is important to note, however, that the annual average O<sub>3</sub> concentrations are significantly below the 8-hour standard of 120 µg/m<sup>3</sup> at all monitoring locations.

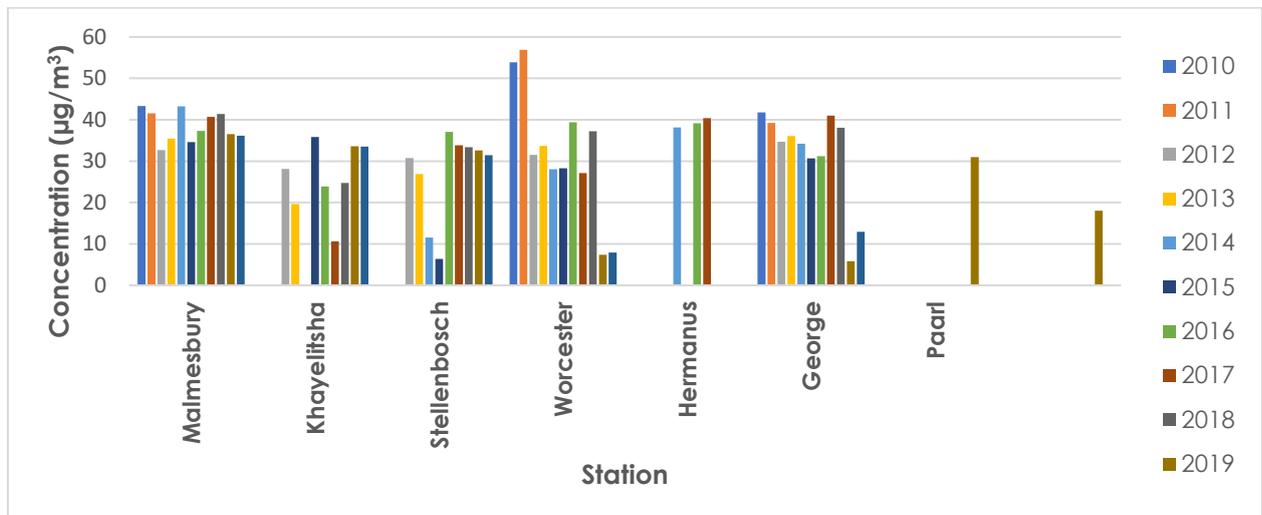


Figure 4-5: Annual averages of O<sub>3</sub>, as measured during 2010 – 2020

**CARBON MONOXIDE**

Carbon monoxide (CO) is an odourless, colourless and tasteless gas and 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 10 mg/ m<sup>3</sup> at all monitoring locations (Figure 4-6).

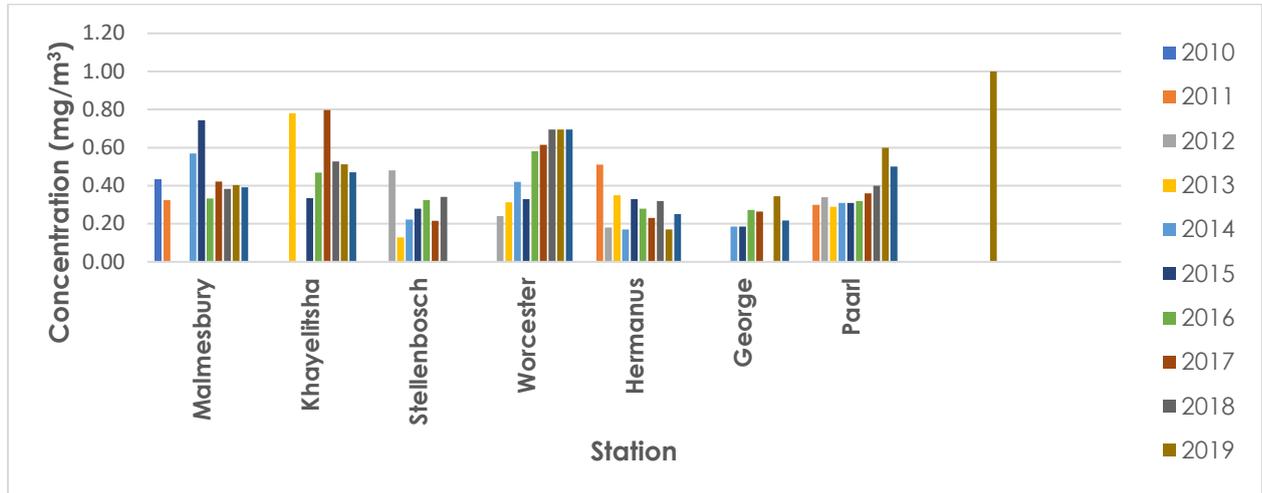


Figure 4-6: Annual averages of CO, as measured during 2010 – 2020

**PARTICULATE MATTER 10**

Particulate Matter 10 (PM<sub>10</sub>) is respirable solid or liquid particles with a diameter smaller than 10 microns and are the products resulting from the combustion of wood, coal and fossil fuels. It is also released by automotive exhausts and windborne dust from construction sites, roads and soil erosion. All annual averages of PM<sub>10</sub> were below the annual NAAQS of 40 µg/m<sup>3</sup> (Figure 4-7).

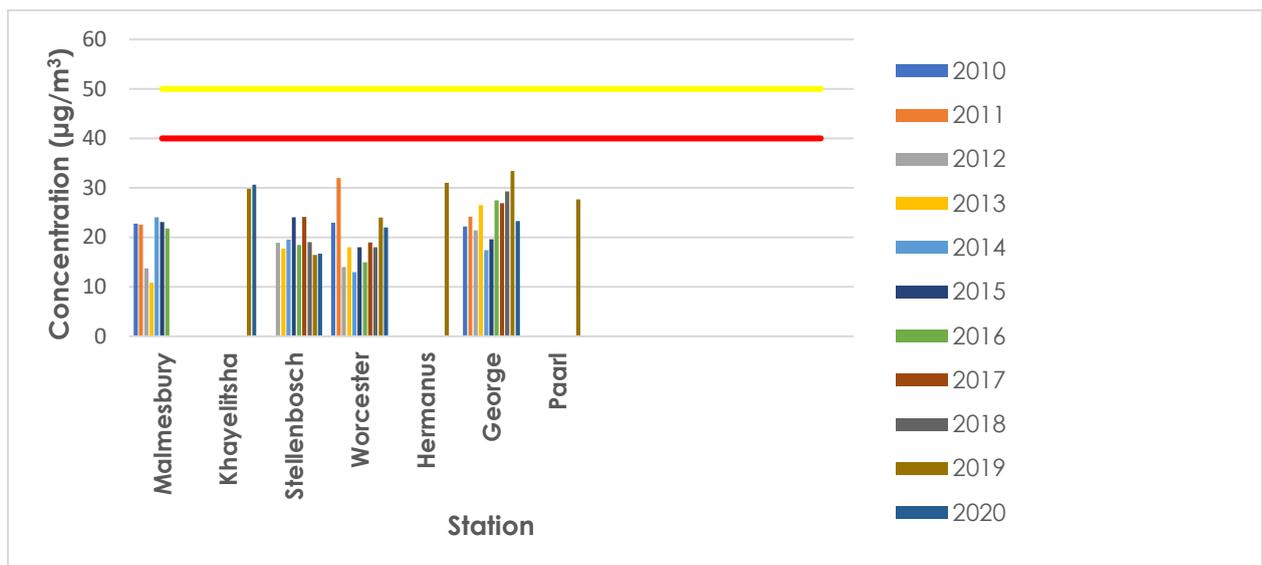


Figure 4-7: Annual averages of PM<sub>10</sub>, as measured during 2010 – 2020

## ● HYDROGEN SULPHIDE

Hydrogen Sulphide ( $H_2S$ ) is a colourless and flammable gas with a distinct rotten egg odour. The sources of  $H_2S$  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 wastewater treatment and animal matter processing.

South Africa does not currently have  $H_2S$  standards; hence, the World Health Organization (WHO) guideline for  $H_2S$  is used when comparing  $H_2S$  concentrations measured at Hout Bay, Oudtshoorn, Mossel Bay and St. Helena Bay. The annual average concentrations depicted in Figure 4-8 are compared against the 30-minute odour guideline of  $7 \mu\text{g}/\text{m}^3$ , and the health guidelines of  $150 \mu\text{g}/\text{m}^3$ , as set out by the WHO (WHO, 2000). The annual average  $H_2S$  concentrations were all below the WHO odour threshold of  $7 \mu\text{g}/\text{m}^3$  (Figure 4-8).

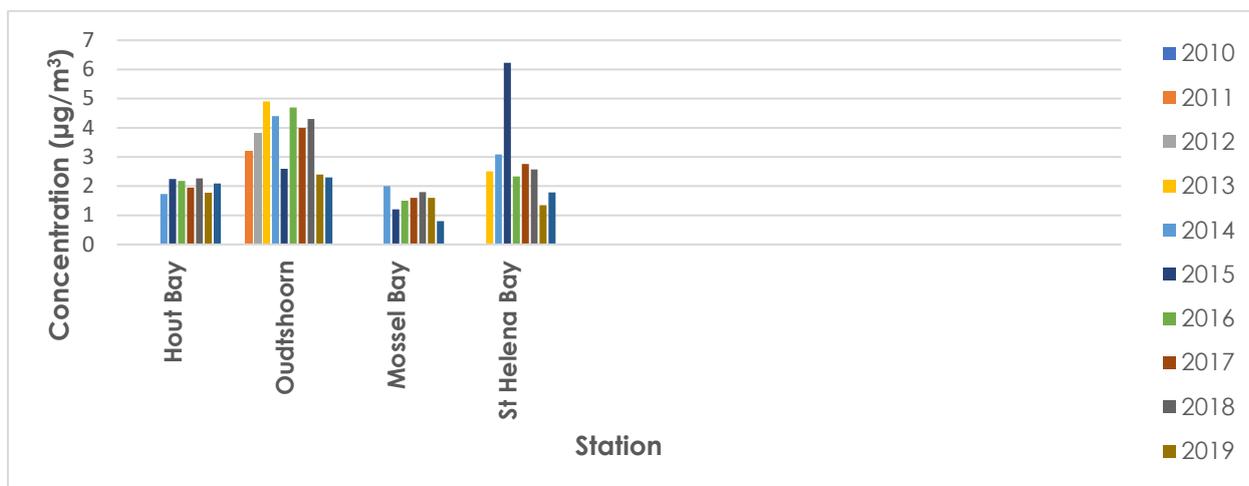


Figure 4-8: Annual averages of  $H_2S$ , as measured during 2010 – 2020

### 4.1.8.2 CITY OF CAPE TOWN AMBIENT AIR QUALITY MONITORING NETWORK

The City of Cape Town's Air Quality Monitoring Network consists of 14 ambient air quality monitoring stations (Figure 4-9). The Network is complemented by two (2) additional continuous ambient air quality monitoring stations, which are operated by the DEA&DP, as presented in section 4.8.1.1.

Numerous and widespread regional sources including industry, road traffic, power generation and the domestic use of fuels by a large sector of the population contribute to the air pollution over Cape Town. The summer south-easter wind or 'Cape Doctor' plays a role in the dispersion of pollutants in the area, but it also contributed to increased dust levels in summer.

The ambient air is measured on a continuous basis every 10 seconds and all data are collected on a central server at the CCT's Scientific Services Department. The data is processed daily to 1-minute, 10-minute, 15-minute, 1-hour, 8-hour and daily averages. These averages are compared against guidelines and guideline exceedances are reported daily on the CCT's Air Quality Website ([www.capetown.gov.za/airqual](http://www.capetown.gov.za/airqual)), as well as monthly reports.



Figure 4-9: City of Cape Town Ambient Air Quality Monitoring Network (Source:CCT)

**SULPHUR DIOXIDE (SO<sub>2</sub>)**

The SO<sub>2</sub> concentrations measured in the CCT for the period 2010 - 2020 are shown in Figure 4-10. The NAAQS SO<sub>2</sub> annual average of 50 µg/m<sup>3</sup> was not exceeded during the period under review.

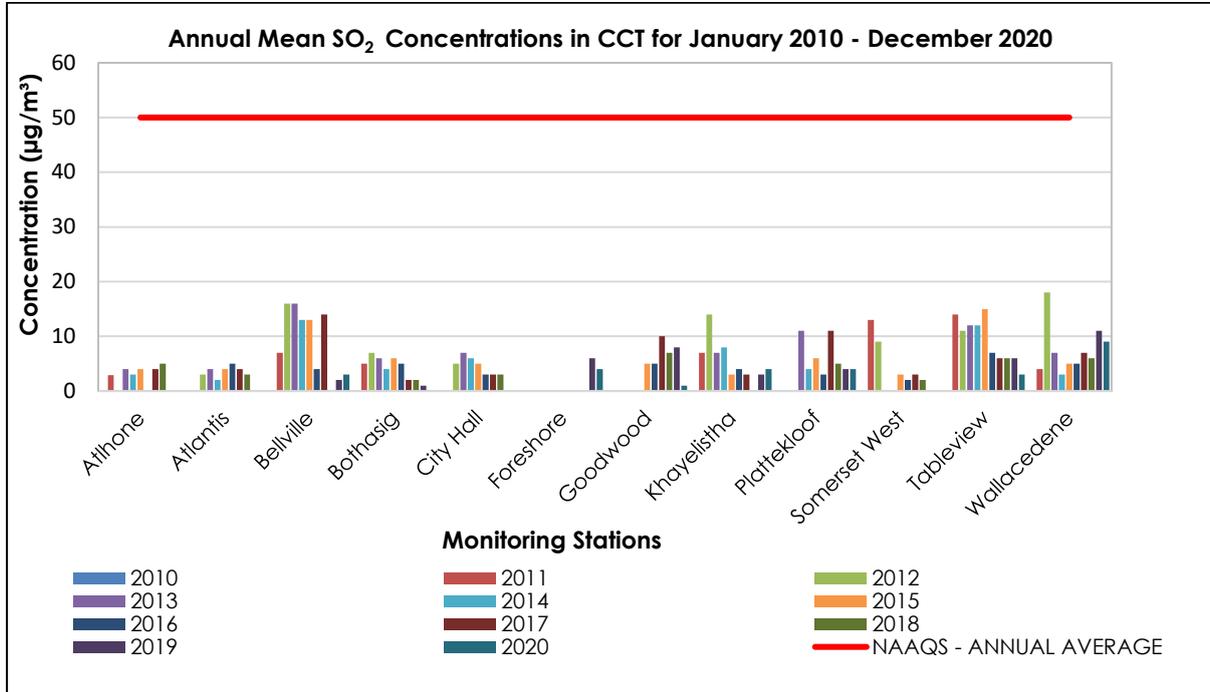


Figure 4-10: Annual mean SO<sub>2</sub> concentrations in City of Cape Town during 2010 – 2020

**NITROGEN DIOXIDE (NO<sub>2</sub>)**

The NO<sub>2</sub> concentrations measured in the CCT are shown in Figure 4-11. The NAAQS NO<sub>2</sub> annual average of 40 µg/m<sup>3</sup> was not exceeded during the period under review.

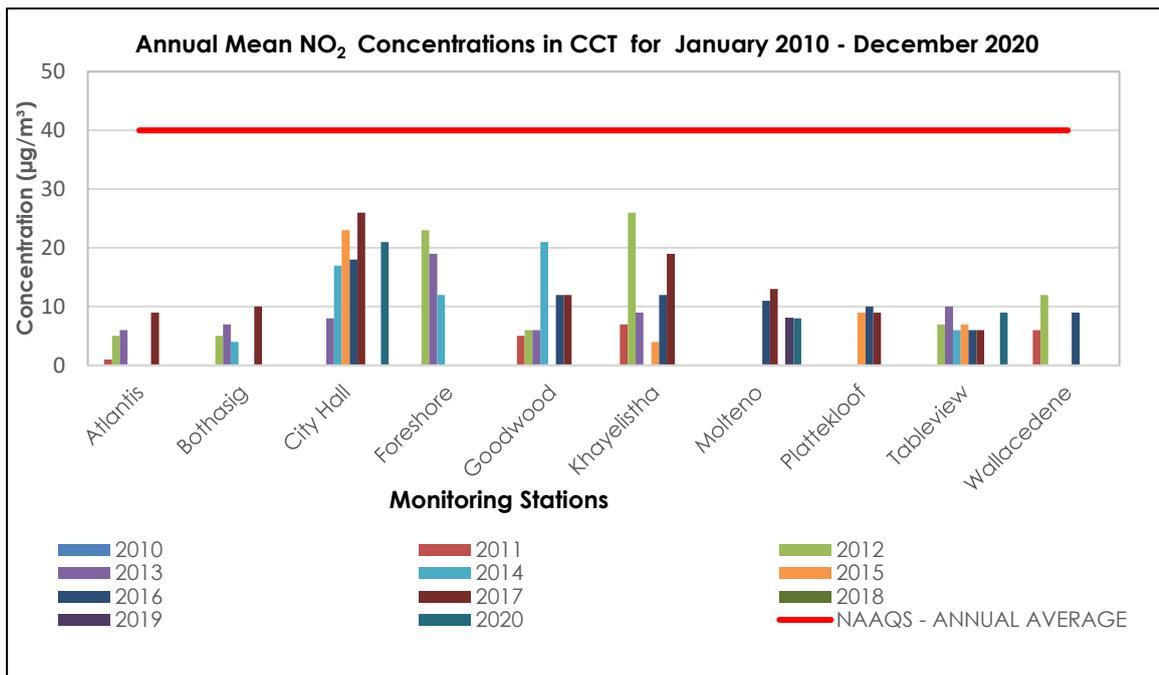


Figure 4-11: Annual mean NO<sub>2</sub> concentrations in City of Cape Town during 2010 – 2020

**OZONE (O<sub>3</sub>)**

The O<sub>3</sub> concentrations measured in the CCT from January 2010 to December 2020 are shown in Figure 4-12. Ozone has no prescribed annual average standard.

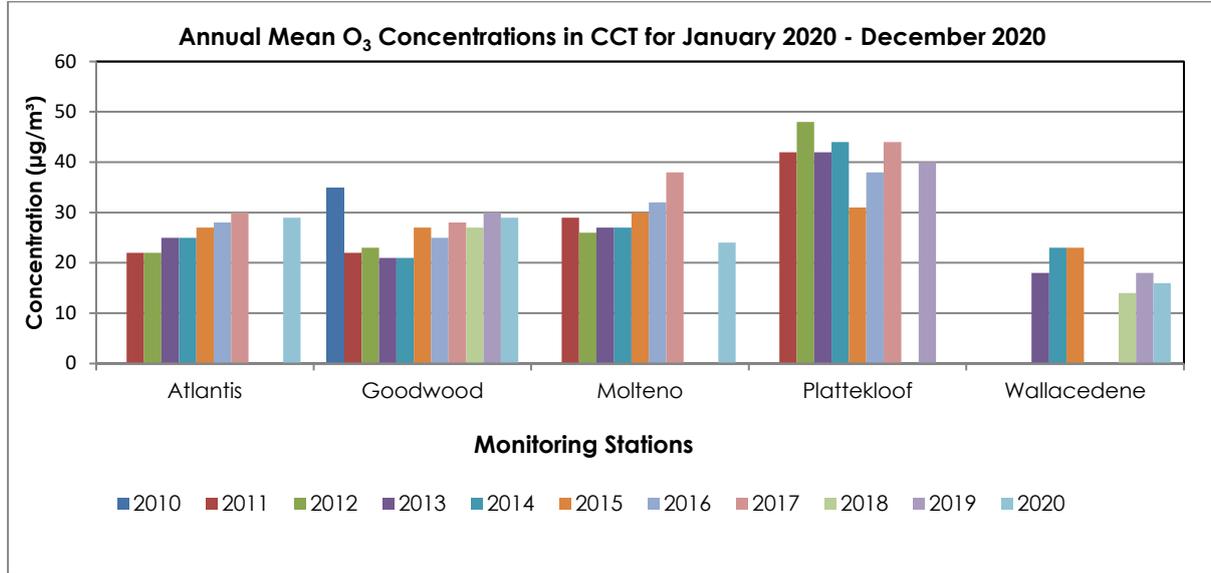


Figure 4-12: Annual mean O<sub>3</sub> concentrations in City of Cape Town during 2010 – 2020

**PARTICULATE MATTER 10 (PM<sub>10</sub>)**

The PM<sub>10</sub> concentrations measured in the CCT are shown in Figure 4-13. The PM<sub>10</sub> annual average of 40 µg/m<sup>3</sup>, which was effective from 1 January 2015 was exceeded in 2017 and 2019 at Khayelitsha. This was likely attributed to wind-blown dust during the dry, windy summer months and due to smoke from household fires primarily for cooking and spatial heating. The PM<sub>10</sub> annual average concentrations prior to 01 January 2015 were below the NAAQS of 50 µg/m<sup>3</sup>, which was in place until 31 December 2014.

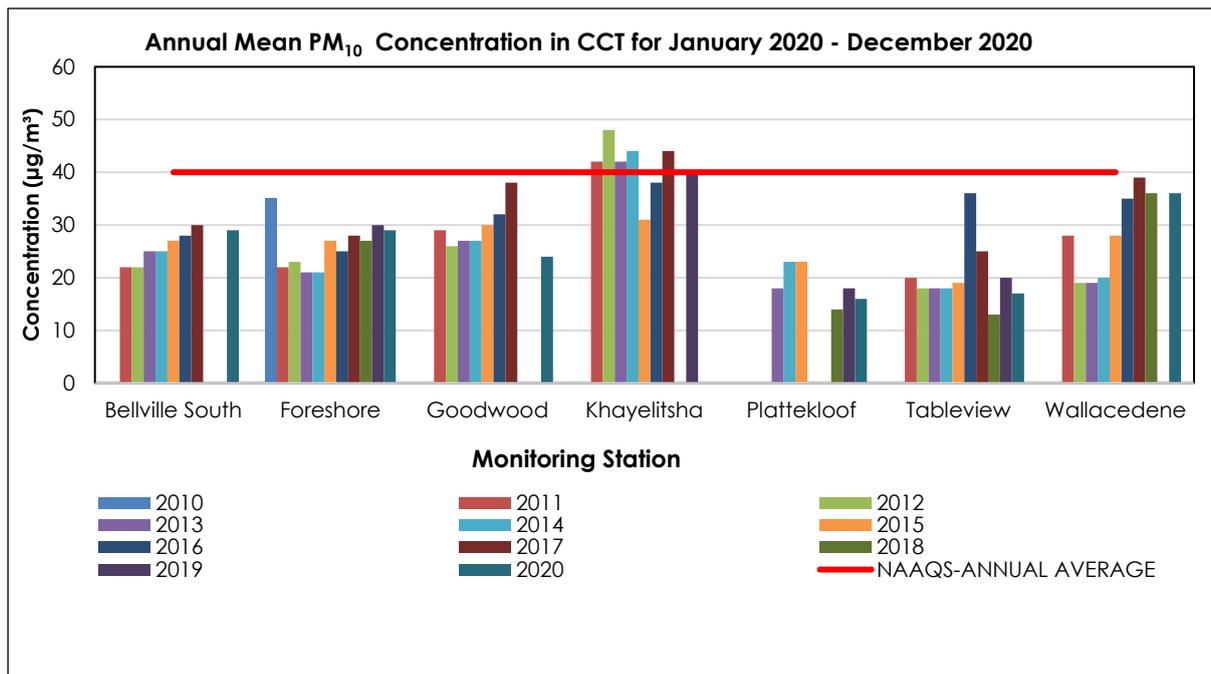


Figure 4-13: Annual mean PM<sub>10</sub> concentrations in City of Cape Town during 2010 – 2020

**PARTICULATE MATTER 2.5 (PM<sub>2.5</sub>)**

The PM<sub>2.5</sub> concentrations measured in the CCT are shown in Figure 4-14. The NAAQS PM<sub>2.5</sub> annual average of 20 µg/m<sup>3</sup>, which was effective from 1 January 2016, was exceeded at Tableview in 2016. This was likely attributed to wind-blown dust generated from local building activities.

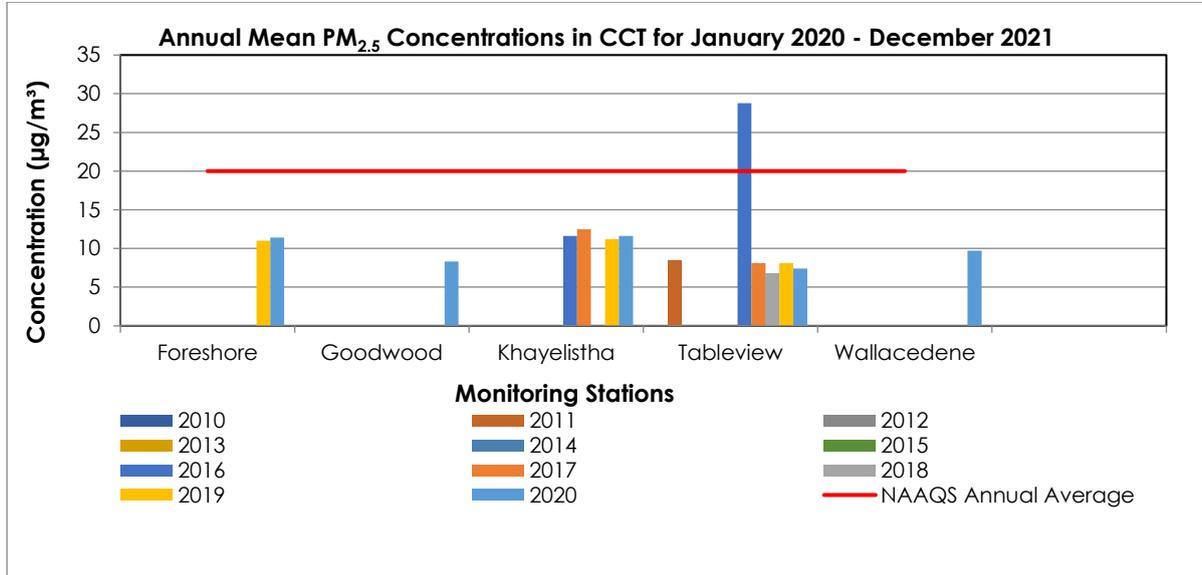


Figure 4-14: Annual mean PM<sub>2.5</sub> concentrations in City of Cape Town during 2010 – 2020

**BENZENE (C<sub>6</sub>H<sub>6</sub>)**

The C<sub>6</sub>H<sub>6</sub> concentrations measured in the CCT are shown in Figure 4-15. The NAAQS C<sub>6</sub>H<sub>6</sub> annual average of 1.6ppb, which was effective from 1 January 2015, was exceeded in 2018 and 2019 at Potsdam. Improvements in operating conditions and a strengthening of conditions of authorisation in Atmospheric Emissions Licences has resulted in an observed improvement in ambient C<sub>6</sub>H<sub>6</sub> levels recorded at the Potsdam site for 2020. The Khayelitha C<sub>6</sub>H<sub>6</sub> monitor was removed due to technical/mechanical problems.

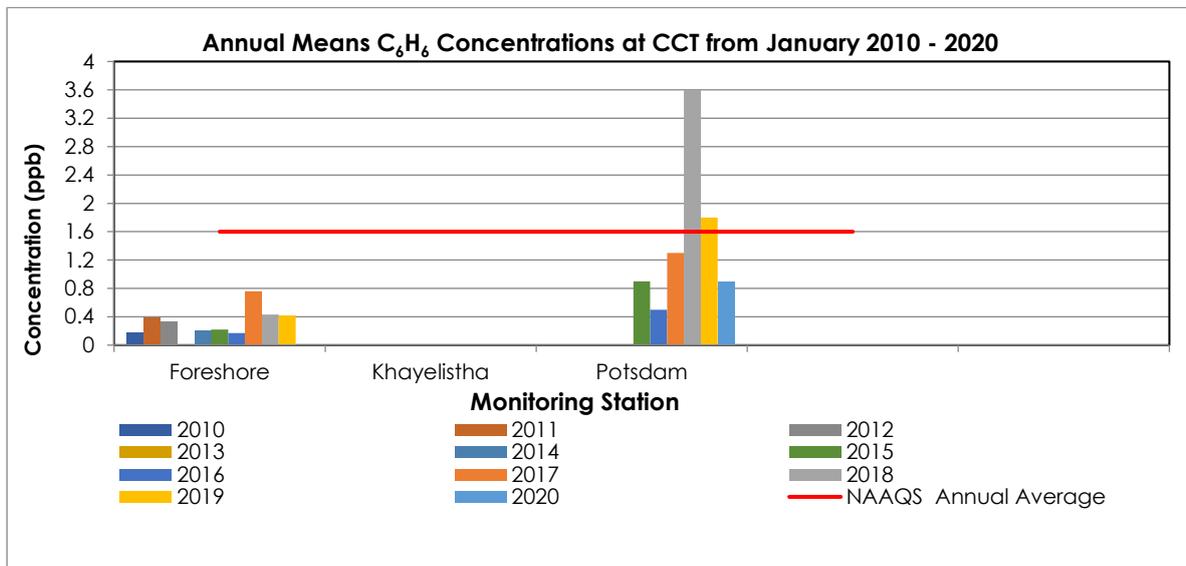


Figure 4-15: Annual mean C<sub>6</sub>H<sub>6</sub> concentrations in City of Cape Town during 2010 – 2020

**4.1.8.3. WEST COAST DISTRICT MUNICIPALITY**

The West Coast District Municipality (WCDM) commissioned an ambient air quality monitoring station in Velddrif in June 2017, the station is located in Velddrif (Figure 4-16). Hydrogen Sulphide (H<sub>2</sub>S) is the only parameter measured at the station and was established due to odour-related complaints received from residents living in Port Owen and next to the fishmeal plant. Other possible sources of H<sub>2</sub>S that were identified include; the estuary, the salt works, guano from birds, red tide, rotting seaweed, and the sewerage plant.

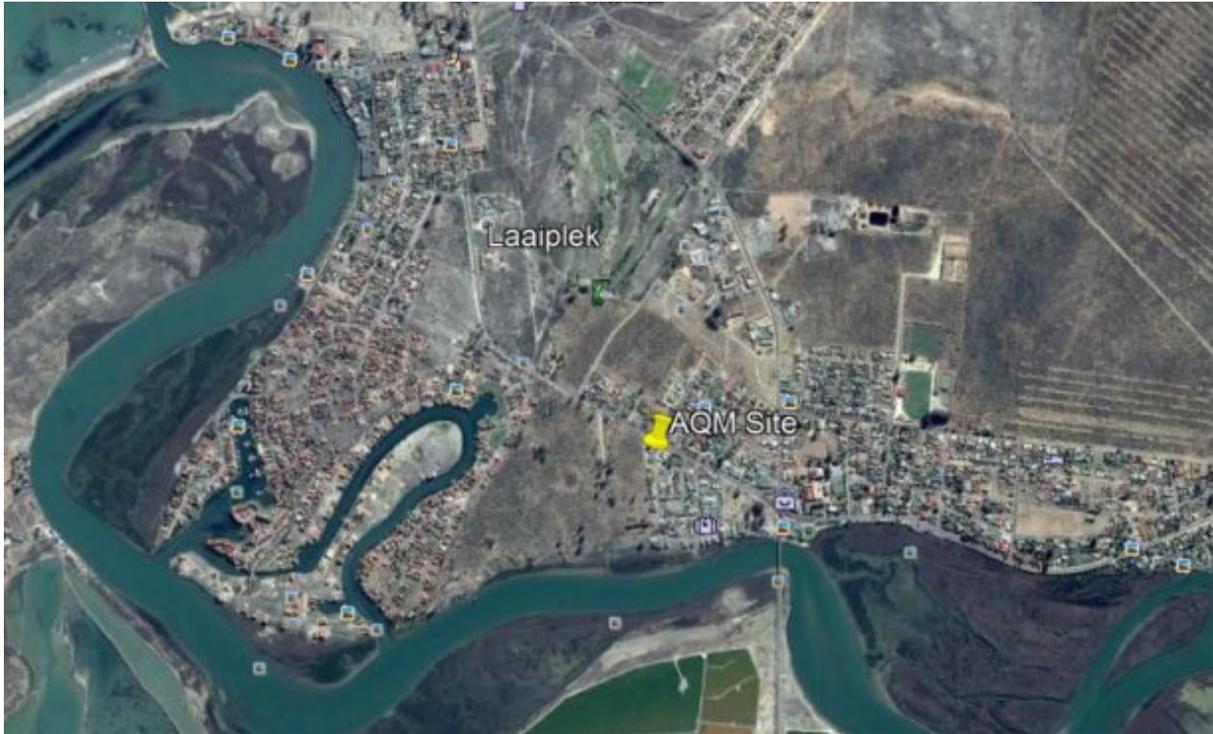


Figure 4-16: Location of the WCDM air quality monitoring station in Velddrif

The long term H<sub>2</sub>S concentrations measured at the Velddrif ambient air quality monitoring station from June 2017 to December 2020 are shown in Figure 4-17. There have been no exceedances of the WHO Guideline of 150 µg/m<sup>3</sup>.

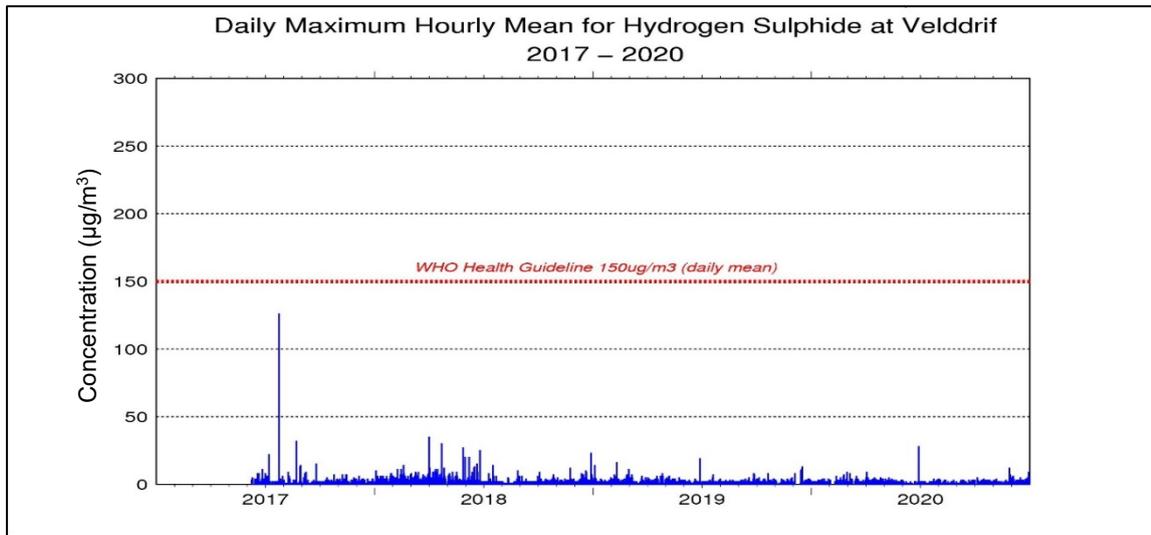


Figure 4-17: Daily maximum hourly mean for H<sub>2</sub>S at Velddrif (June 2017 – December 2020)

#### 4.1.8.4. SALDANHA BAY AMBIENT AIR QUALITY MONITORING STATION

The Saldanha Bay Municipality (SBM) commissioned two (2) ambient air quality monitoring stations in 2014, located in Saldanha Bay and Vredenburg. These sites are designed to measure SO<sub>2</sub>, NO, NO<sub>2</sub>, NO<sub>x</sub>, O<sub>3</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>, and meteorological parameters. The site selected at Vredenburg is ideally located on the prevailing wind vector to detect the impact of industrial emission in Saldanha Bay on the residential areas in Vredenburg. 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 location of the monitoring stations is illustrated in Figure 4-18.

The SBM Ambient Air Quality Monitoring Network also comprises of seven (7) dust fallout monitoring sites which was commissioned in May 2014 and is located at various sites in the Saldanha Bay Municipal area.

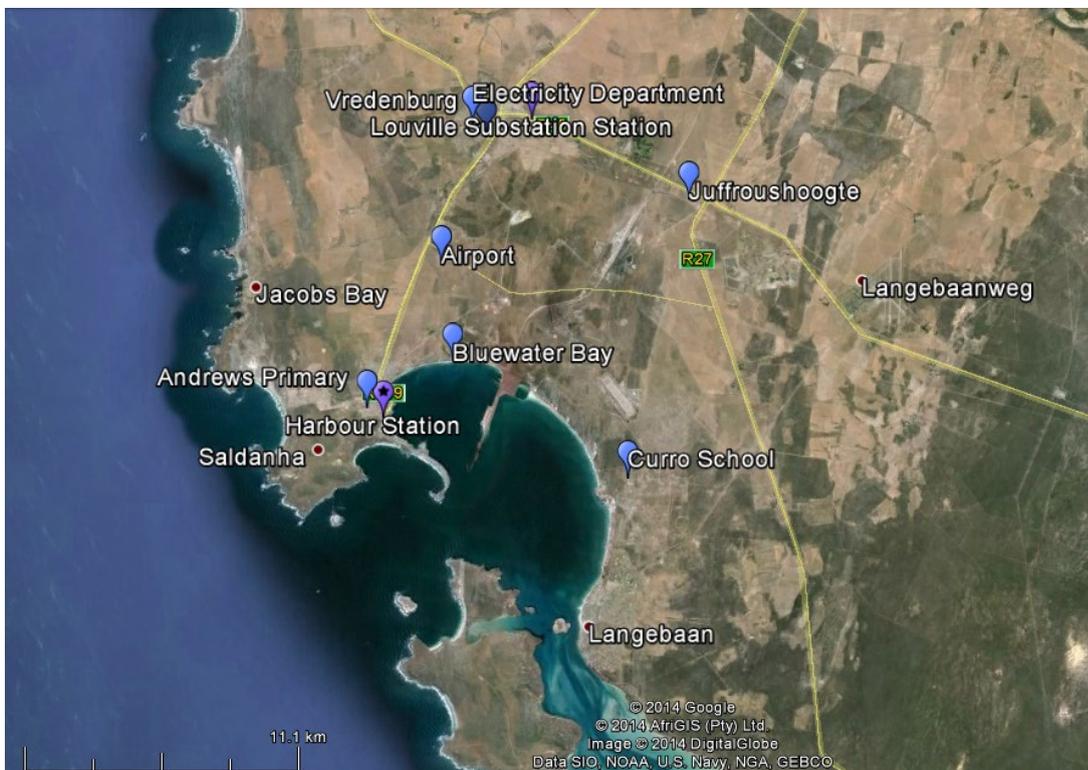


Figure 4-18: Aerial map showing location of the monitoring stations in Saldanha Bay

The long term PM<sub>2.5</sub>, NO<sub>2</sub>, O<sub>3</sub>, SO<sub>2</sub>, and PM<sub>10</sub> concentrations measured at the Saldanha Bay ambient air quality monitoring stations from 2015 to 2020 are shown in Figure 4-19 to Figure 4-23.

Overall, all pollutants monitored were below the respective NAAQS (DEA, 2009), except for some exceedances of the daily mean PM<sub>10</sub> NAAQS during 2016. The exceedances were within the NAAQS limit of four (4) legally acceptable exceedances of 75 µg/m<sup>3</sup> within a 24-hour period.

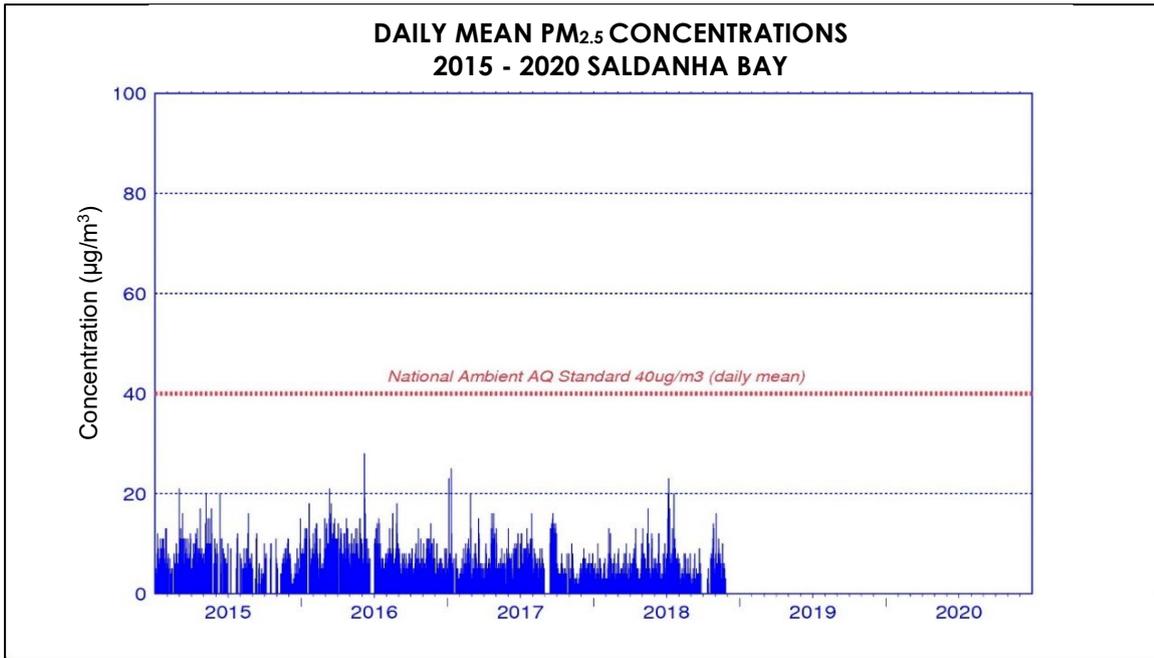


Figure 4-19: Long term trend Saldanha Bay PM<sub>2.5</sub> daily mean concentrations (2015-2020)

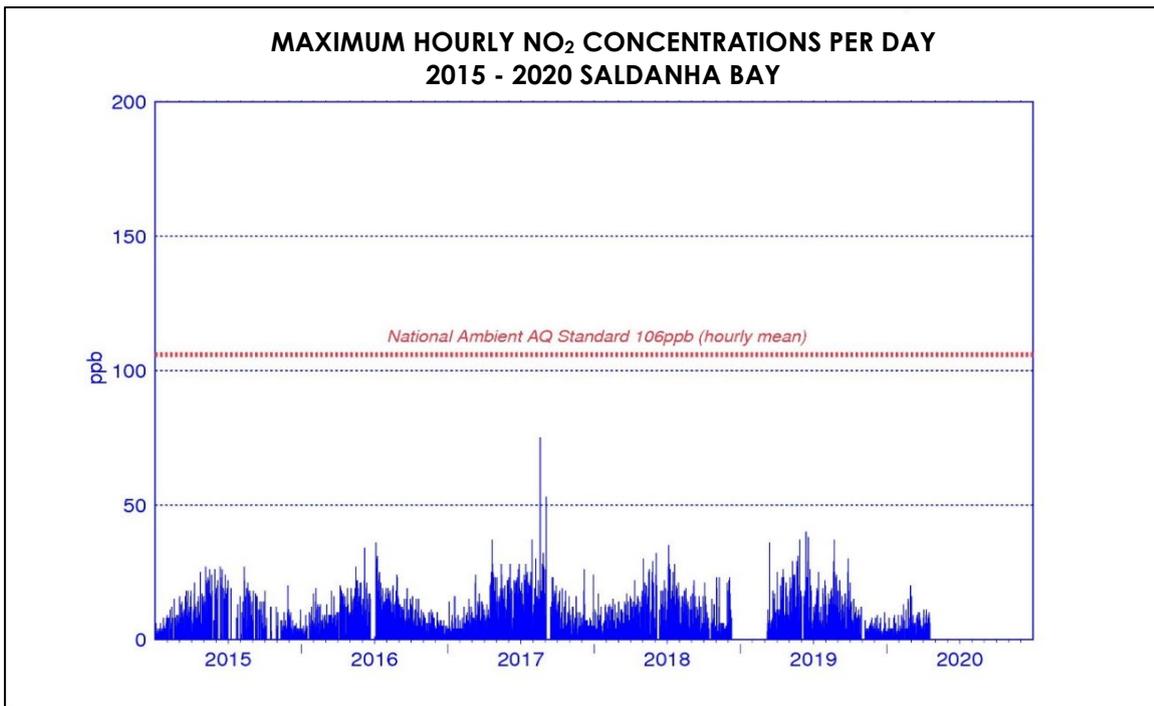


Figure 4-20: Long term trend Saldanha Bay NO<sub>2</sub> hourly mean concentrations (2015-2020)

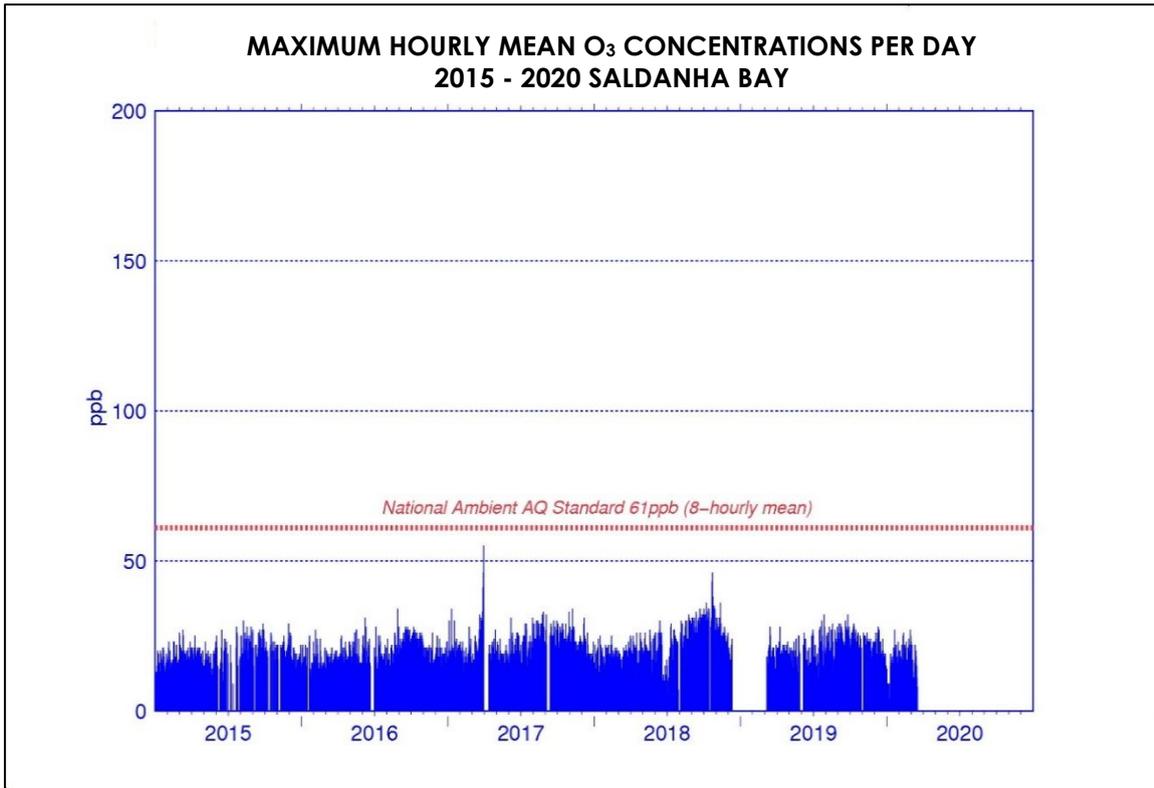


Figure 4-21: Long term trend Saldanha Bay O<sub>3</sub> hourly mean concentrations (2015-2020)

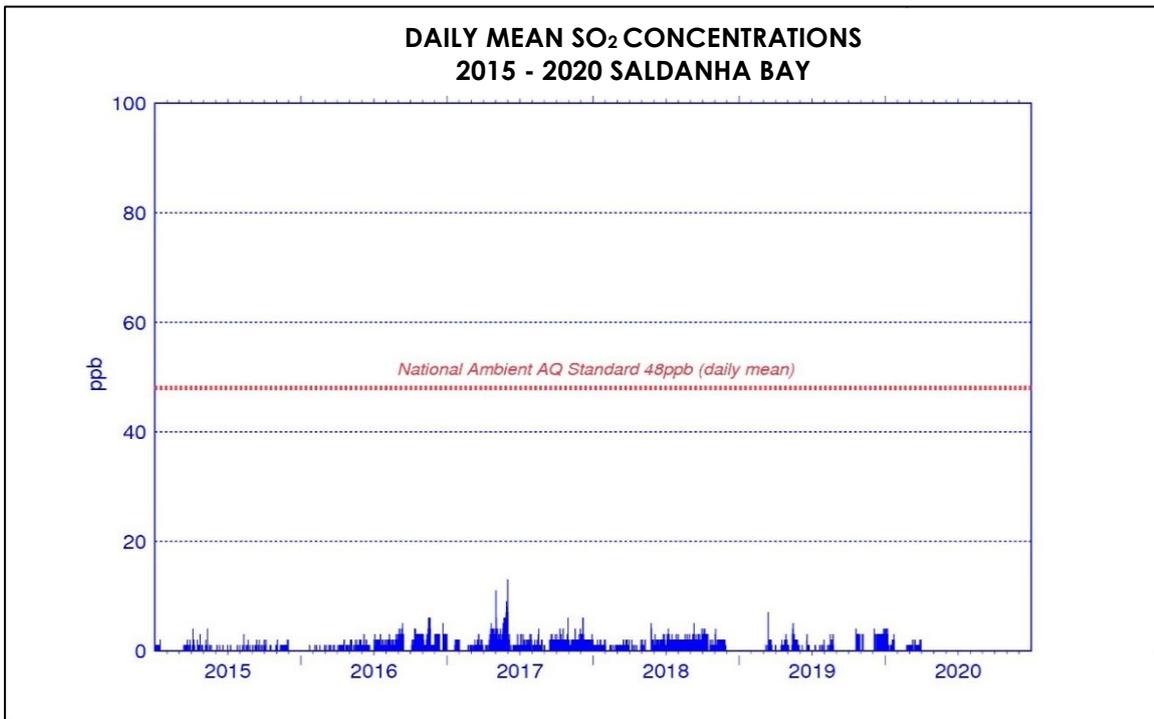


Figure 4-22: Long term trend Saldanha Bay SO<sub>2</sub> hourly mean concentrations (2015-2020)

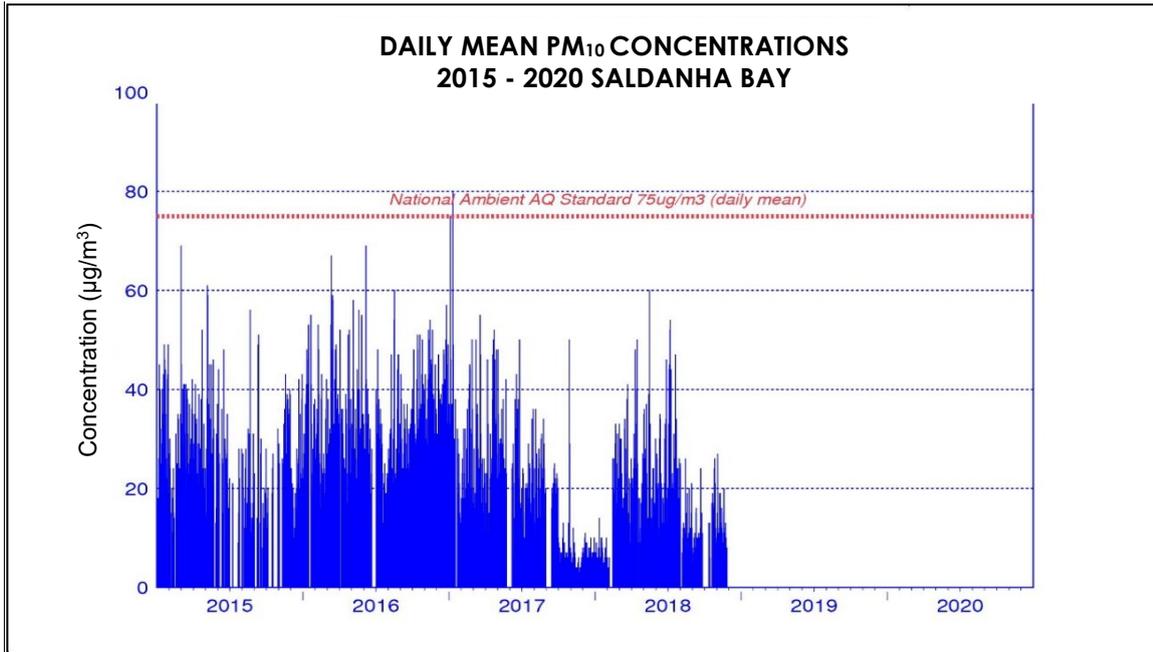


Figure 4-23: Long term trend Saldanha Bay PM<sub>10</sub> daily mean concentrations (2015-2020)

The long-term dust fallout concentrations measured at the seven (7) Saldanha Bay Municipality’s dust fallout sites for the period 2015 to 2020 are shown in Figure 4-24.

In 2017, the National Dust Control Regulations – Residential limit of  $D < 600$  (dust fall out rate in mg/m<sup>2</sup>/day, 30 days average) was exceeded once, this was likely due to fouling of birds.

During 2018 there were two (2) exceedances of the National Dust Control Regulations – Residential limit of  $D < 600$  (dust fall out rate in mg/m<sup>2</sup>/day, 30 days average). Bird fouling most likely caused the exceedances.

There was one (1) exceedance of the National Dust Control Regulations – Non-Residential limit of  $600 < D < 1200$  (dust fall out rate in mg/m<sup>2</sup>/day, 30 days average), during 2019. The reason for this is unknown.

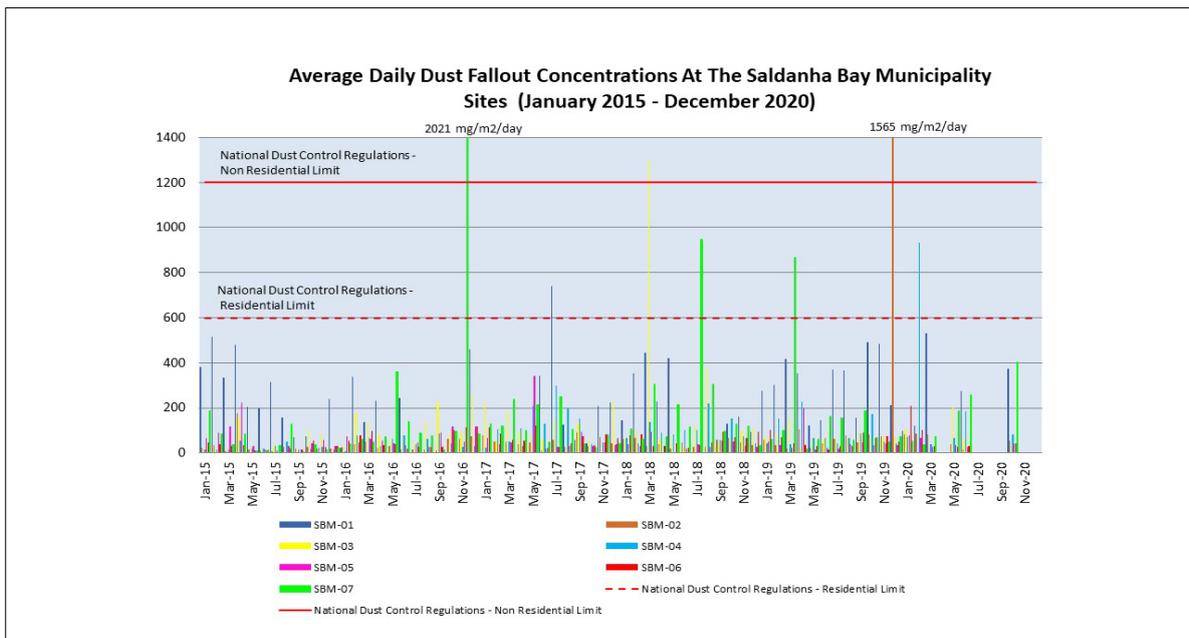


Figure 4-24: Saldanha Bay average daily dust fallout concentrations (2015-2020)

## 4.1.9 SPECIAL PROJECTS IN AIR QUALITY MANAGEMENT

### 4.9.1.1 HUMAN HEALTH RISK ASSESSMENT

During 2010, the DEA&DP conducted a Human Health Risk Assessment (HHRA) Needs Analysis. The goal of this needs assessment was to inform the identification and prioritization of study areas in the Western Cape where the effects of potentially poor air quality on human health of vulnerable population groups are of growing concern, as well as to develop a detailed protocol to guide the commissioning of HHRA studies in the prioritized areas.

The HHRA Needs Analysis identified the locations listed in Table 4-11, where a possible Human Health Risk Assessment on Air Quality should be undertaken. The main objective of the study was to determine the impacts of air quality on human health in the Western Cape.

**TABLE 4-11: AREAS IN WHICH THE WESTERN CAPE PROVINCE HHRA WAS UNDERTAKEN**

MUNICIPALITY	TYPE OF STUDY	
	EPIDEMIOLOGICAL STUDY	HHRA
CAPE TOWN	1. Milnerton/Milnerton Ridge including Phoenix and Joe Slovo 2. Nyanga, Philippi, including Khayelitsha 3. Noordhoek (control)	1. Bluedowns and Elsie's River 2. Fisantekraal 3. Table View, Bothasig and Richwood
GARDEN ROUTE	4. Oudtshoorn	4. Mossel Bay
WEST COAST	N/A	5. St Helena Bay 6. Saldanha Bay
OVERBERG	N/A	7. Grabouw
CAPE WINELANDS	N/A	8. Paarl and Wellington

The study was divided into specific packages which included an emission and air quality modelling assessment, a HHRA study conducted in selected areas, three (3) cross-sectional epidemiological studies and control location (including information on household emissions), an epidemiological cohort study of school children investigating asthma and of adults investigating cardiopulmonary outcomes, and a final section quantifying the economic cost of air pollution.

The HHRA report was finalised at the end of 2016. Various recommendations were made to further assess air quality in the Western Cape Province. It was not possible to implement all recommendations due to various constraints (e.g. budget limitations). Phase 2 of the HHRA, which was conducted during 2017, focused on the identification, formulation and structuring of the air quality measures required to inform human health risk in the Province, based on the recommendations. A summary of recommendations implemented are shown in Table 4-12.

### 4.1.9.2 WESTERN CAPE SMART-air PROGRAMME

The vision of the Western Cape Air Quality Management Plan is "clean and healthy air for all in the Western Cape". In line with this, the Western Cape Government through the 2016 AQMP, introduced a recognition programme for air quality management in the Province, viz. the SMART-air Programme.

The SMART-air Programme serves as the main vehicle through which emission reduction best practice in industry, commerce and communities are recognised, while also raising awareness on air quality matters linked to climate change international commitments, as well as facilitating training on industrial processes that not only reduce air pollutant and greenhouse gas emissions but also provide skilling opportunities to government officials and youth in the Province.

The various objectives of the programme are highlighted below:

- Raise awareness regarding air quality & climate change.
- Facilitate & promote the use of emission abatement & mitigation (cleaner) technologies.
- Target the youth and the unemployed for capacity building and skills development.
- Facilitate adoption of and skills development in the use of emissions abatement and mitigation (cleaner) technologies by industry.

The objectives were implemented through five (5) thematic areas, namely:

- **SMART-air Emission Abatement and Mitigation Technologies**

Recognises the role that industry plays in reducing air pollutant and greenhouse gas emissions through the emission abatement and mitigation technologies they use.

- **SMART-air Training, Skills Development and Mentorship**

Engage with industry, tertiary education institutions, etc. to train youth, government officials and unemployed.

- **SMART-air 2Precious2Pollute Recognition**

Awards Ceremony where industries are recognised for their emission abatement and emission reduction technology implemented.

- **SMART-air Emissions Inventory**

Air pollutant and greenhouse gas Emissions Inventory.

- **SMART-air Awareness Raising**

Awareness-raising with regards to air quality management to schools, industries and stakeholders.

The SMART-air Programme has three (3) phases, as outlined in Figure 4-25. During the 2017/18 financial year a SMART-air Status Quo Report was developed to gather information on the status of the five thematic areas. The recommendations from the SMART-air Status Quo Report were used to develop the SMART-air Strategy and Implementation Plan during the 2018/19 financial year. The Strategy provides a breakdown of the vision and objectives of each thematic area; while the Implementation Plan provides detailed actions required to achieve the objectives. Table 4-13 provides a summary of the SMART-air Strategy and Implementation Plan.

TABLE 4-12: SUMMARY OF THE HHRA PHASE 1 KEY RECOMMENDATION AND ASSOCIATED AIR QUALITY MEASURES/ACTIONS

RECOMMENDATION	AIR QUALITY MEASURES/ ACTION
<p>Increasing the number of air quality monitoring stations across the Western Cape Province</p>	<p>It was recommended that air quality in the Cape Winelands District needs to be monitored due to the increasing economic development in the Drakenstein Local Municipality. A monitoring station was commissioned in Paarl at the Drakenstein Traffic Department to monitor O<sub>3</sub>, NO<sub>x</sub> and meteorological data. The monitoring station is situated close to the expanding landfill site, industrial areas, as well close to a proposed incinerator considered in the area.</p>
<p>Mobile air quality monitoring units to rapidly assess air quality</p>	<p>Mobile air quality monitoring units prove useful to monitor air quality where continuous monitoring is not possible, and to rapidly assess air quality in areas where it may be poorly understood or where dispersion models indicate likely elevated pollutant values. A portable AQM unit was deployed in the WCDM (Shelley Point) to assess air quality. The portable monitor was deployed in mid-2017 to measure H<sub>2</sub>S due to odour complaints received in the area. The monitor was, however, removed in May 2020 for maintenance and repair.</p> <p>A Portable Air Sampling Laboratory Unit, with associated software and chemical sensors, to measure and collect viable in-situ data on identified criteria pollutants (H<sub>2</sub>S; NO<sub>2</sub>; SO<sub>2</sub>; PM<sub>2.5</sub> &amp; PM<sub>10</sub>) was acquired. The Unit has an onboard data logging system that can store data pertaining to pollutant concentrations, GPS coordinates, temperature, altitude, date and time. It also includes a Ground Station System comprising of a Wi-Fi module with antenna and software for drone control, for data acquisition and analysis. During 2018, "test measurements" of air quality were performed in selected areas of the HHRA.</p> <p>Three (3) officials from the D: AQM were also trained and obtained their Remote Pilot Licences (RPL). It is further anticipated that the portable air sampling unit and the drone will be used for screening of air quality throughout the Western Cape Province.</p> <p>The DEA&amp;DP has established a Drone Task Team to investigate the way forward for drone usage by the Department.</p>
<p>Develop emissions inventory for air quality modelling and exposure</p>	<p>The need for a more detailed emissions inventory was identified for the integration of air quality monitoring and dispersion modelling.</p> <p>The DEA&amp;DP facilitated the hosting of a three-day Emissions Inventory Development Training Course during December 2017. The course focused on the theoretical aspects of Emissions Inventory Development, as well as the practical aspects relating to the interpretation of data from all sources (mobile, area and point). The course focused on the governance of emissions inventory; emission sources and tools calculating emissions factors and data interpretation.</p>

The timeframes for implementing the SMART-air Programme are specified, viz. short term (1 to 3 years), medium-term (3 to 5 years) and long term (greater than 5 years). Milestones and indicators to be used for monitoring of implementation are also included to track the Strategy's progress towards achieving its ultimate vision. Roll-out and implementation of the SMART-air Programme (Phase 3) is carried out through the Western Cape AQMP Working Groups.

The current economic environment and Covid-19 pandemic has significantly impacted the roll-out of the SMART-air Programme. The DEA&DP has initiated a Refrigeration and Air Conditioning (RAC) Partnership Project with the Free State of Bavaria, to reduce HFCs emissions to the environment (see below).

**SMART-air Programme Phases**

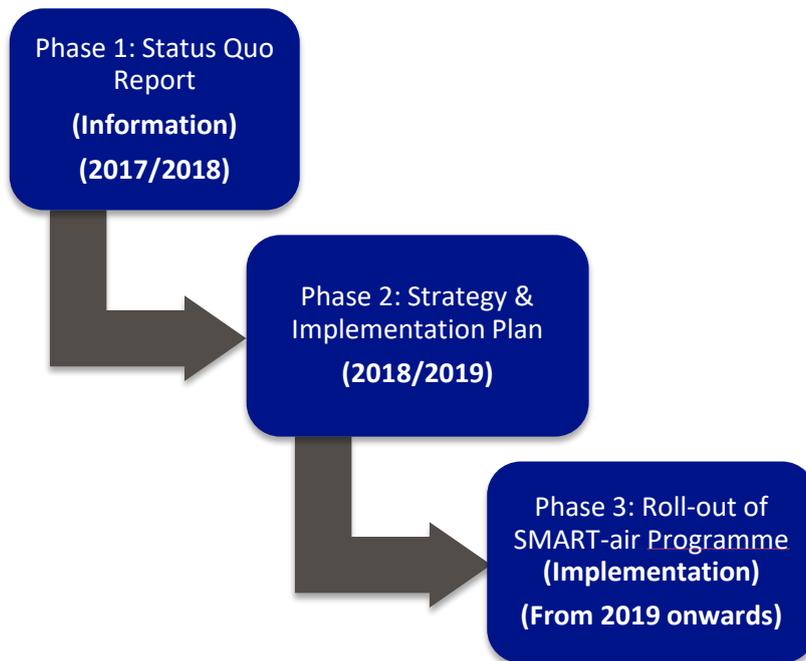


Figure 4-25: Phases of the SMART-air programme

**4.1.9.3 REFRIGERATION AND AIR CONDITIONING (RAC) PROJECT**

Currently, most refrigeration and air conditioning appliances use fluorinated gases like hydrochlorofluorocarbons (HCFCs) or hydrofluorocarbons (HFCs). When these substances leak, they have a high global warming potential (GWP) and are up to several thousand times more potent than CO<sub>2</sub>. With rising temperatures, the demand for refrigeration and air conditioning equipment is predicted to increase dramatically. Without any serious interventions, the refrigeration and air conditioning sector could be responsible for 13% of global GHG emissions by 2030. It is important for the RAC sector to consider "leapfrogging" from using the high GWP HFCs to natural refrigerants such as CO<sub>2</sub>, ammonia or propane, which have low GWP. In this way, there would be significant savings in terms of waste and energy, when combining energy-efficient appliances with natural refrigerant systems.

TABLE 4-13: SUMMARY OF THE SMART-air STRATEGY & IMPLEMENTATION PLAN

THEMATIC AREA	VISION	OBJECTIVES
<b>SMART-air Emission Abatement and Mitigation Technologies</b>	Accelerated uptake of emission abatement and mitigation technologies across the Province.	<ul style="list-style-type: none"> <li>• Identify industries/facilities to target for air emissions abatement and mitigation, as well as the abatement technologies relevant to those industries/facilities.</li> <li>• Identify industries/facilities to target for GHG mitigation, as well as the mitigation technologies relevant to those sectors and sub-sectors.</li> <li>• Facilitate engagements between AQOs and facilities on mitigation.</li> <li>• Facilitate engagements between technology service providers and AQOs.</li> <li>• Monitor and support the uptake of mitigation technologies.</li> </ul>
<b>SMART-air Training, Skills Development and Mentorship</b>	Highly trained and engaged AQOs; micro, small and medium-size operators; and graduates.	<ul style="list-style-type: none"> <li>• Continuous AQO training on emissions sources and the types of emission abatement and mitigation technologies and alternatives relevant to emitters in their jurisdictions, as well as the requirements for implementation.</li> <li>• Increase the focus on air emissions abatement and mitigation considerations in courses at tertiary institutions and technical colleges.</li> <li>• Skills development on implementing measures for reducing emissions from micro and small facilities.</li> <li>• Establish platforms and learning networks for peer-to-peer and expert mentorship and lessons sharing.</li> </ul>
<b>SMART-air 2Precious2Pollute Recognition</b>	An established recognition programme for leaders in emissions mitigation and abatement.	<ul style="list-style-type: none"> <li>• Establish and maintain a high profile, well-respected recognition programme for leaders in the field of emissions mitigation and abatement.</li> <li>• Establish a system of 2Precious2Pollute champions to drive the programme and keep it relevant.</li> <li>• Establish and maintain collaboration with NACA and the associated recognition programme for leaders in the field of emissions mitigation and abatement.</li> </ul>
<b>SMART-air Emissions Inventory</b>	A complete and detailed emissions inventory at the Municipal, District and Provincial level, covering both air pollutants and greenhouse gas emissions, to enhance emissions management and tracking.	<ul style="list-style-type: none"> <li>• Obtain a comprehensive list of point, non-point and mobile sources in each Local Municipality.</li> <li>• Establish and implement a data collection, management and analysis system to supplement the data collected in NAEIS, towards the preparation of a comprehensive emissions inventory.</li> <li>• Establish a systematic approach to monitoring, reporting and verification (MRV) of emissions outside of NAEIS.</li> <li>• Establish a comprehensive education, awareness and communication strategy surrounding the inventory.</li> </ul>
<b>SMART-air Awareness Raising</b>	Increased awareness of the needs and opportunities for mitigating emissions across the Province.	<ul style="list-style-type: none"> <li>• Establish an awareness-raising strategy that focuses on different target groups.</li> <li>• Roll out the strategy on a continuous basis, continually updating it as appropriate.</li> <li>• Disseminate DEA&amp;DP publications on air quality.</li> <li>• Develop and disseminate communication materials aimed at emitters to increase their knowledge about emission abatement and mitigation technologies.</li> </ul>

The Western Cape Government and the Free State of Bavaria in Germany signed a Memorandum of Agreement Action Plan (2016 – 2018; 2019 - 2021) that entailed collaborative work on Climate-Friendly Refrigeration and Air Conditioning (RAC) in the Western Cape, South Africa.

The DEA&DP launched the international Climate-Friendly RAC Project in 2017, in collaboration with the Bavarian State Ministry of the Environment and Consumer Protection, the Bavarian Environment Agency and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

The RAC project is implemented as part of the SMART-air Programme of the Western Cape AQMP, in response to climate change. The aim is to implement interventions to reduce ozone-depleting substances and GHG emissions, in line with national and international requirements.

The following activities formed part of achieving the objectives of the RAC Partnership Project:

- A special session on South Africa was hosted at the IFAT Trade Fair on 16 May 2018, which was chaired by Professor Rupel of Stellenbosch University. The special session focused on South Africa and Trade, and a special presentation on the RAC Programme was made during this special session on South Africa.
- Multiple “train-the-trainer cool-training events”, which targeted teachers, instructors and experts of refrigeration and air conditioning technologies from the Western Cape were held in Bavaria. The aim was to have RAC experts trained to act as “multipliers for information” on climate-friendly natural refrigerant technologies in the Western Cape. Nine (9) RAC specialists were trained in Bavaria during 2018 and 2019.
- During Phase 1 of the RAC Project, a Technical Workshop on “Green Cooling Solutions – Unlocking the South African market uptake” took place on 20-21 June 2019 at Elsenburg, Stellenbosch. Workshop delegates were tasked to identify and discuss the initial concept for a RAC Pilot Project to be undertaken in the Western Cape during Phase 2. At the workshop, three (3) potential RAC Pilot Project initiatives were identified by the delegates that attended the workshop. The delegates were requested to submit feasibility studies on each of the proposed RAC Pilot Projects. Two (2) RAC Pilot Project proposals were received by end January 2020. After careful consideration and assessment of the two (2) proposals by the DEA&DP, the StMUV, the LfU and the GIZ, the proposal to identify a RAC training facility in the Western Cape Province that could link training on natural refrigerants to their existing training program for RAC professionals, was chosen. On 16 September 2020 the Western Cape Government and the Bavarian State Government inaugurated the RAC Pilot Project with the West Coast College being identified as the RAC Pilot Training Facility. The launch of the West Coast College RAC “Green Laboratory” is imminent.

#### **4.1.9.4 GENDER MAINSTREAMING WITHIN AIR QUALITY MANAGEMENT**

“Gender mainstreaming includes a process of assessing the implications of any planned action, legislation, policies, budgets and programmes, in all areas and at all levels, for women, men, boys and girls. It involves the integration of gender considerations into all structures; systems and processes; organisational decisions and activities; implementation of corrective measures for prevention and alleviation of prejudice, removal of barriers, and reduction of disparities between women and men, boys and girls, and ultimately achieving gender equality, not just in equity, but in lived experience,” (DoW, 2015).

South Africa's National Framework for Women Empowerment and Gender Equality, 2000, (hereafter "Policy Framework") was implemented to be used as a tool to mainstream gender in every sphere and sector of government. As a means to achieve gender equality the Policy Framework is aimed at creating an enabling environment for the development of policies and strategies to ensure equality of opportunities and treatment for men and women in terms of access to and share of employment opportunities, services and resources. As a result, the Policy Framework provides a structure for the development of integrated and coordinated women's empowerment and gender equality programmes in South Africa (DEA, 2016).

According to the Policy Framework, women are the most affected by environmental consequences, and also that relatively few women are involved in decision-making for the development of programmes that will promote sustainable and safe settings for economic growth, particularly in rural areas. The Policy also recognizes that women are the most reliant on a clean and healthy environment for daily nutrition and survival, particularly in impoverished areas (DEA,2016).

The DFFE made a decision during the 2013/2014 fiscal year to comply with the provisions of the National Framework for Women Empowerment and Gender Equality (2000), the Constitution (Act No. 108 of 1996), the Sector Gender Framework for the Environment Sector, the Women's Charter for Effective Equality (1994), and the Strategic Framework for Gender Equality within the Public Service (2006). The aim of the Strategy Towards Gender Mainstreaming in the Environment Sector is to promote a gender-sensitive management approach; to ensure that initiatives in the environment sector are aimed to support the creation of policies that support gender mainstreaming, and to ensure gender analysis and mainstreaming during the development of new projects and including a gender perspective into the whole project cycle management (DEA, 2016).

In 2017, the DEA&DP established a Gender Mainstreaming Forum with the following purposes:

- To instill genuine gender mainstreaming;
- To fulfil relevant policy requirements;
- To deal with issues in which gender and gender stereotypes play a key role; and
- To encourage inclusivity.

An internal assessment of the 2<sup>nd</sup> Generation AQMP was undertaken, with a specific gender focus. The assessment revealed the gender specific shortcomings of the 2<sup>nd</sup> Generation AQMP. In response a commitment was made to actively incorporate gender mainstreaming in all air quality management policies (e.g. 3<sup>rd</sup> Generation AQMP) and projects in the Department.

In 2020, the Western Cape had 10 (ten) female AQOs, which includes the Provincial AQO and the WCDM AQO. The RAC project promotes the participation of women in the project. During 2019 one (1) female candidate was selected and completed the RAC Cool Training Programme in Bavaria. An assessment of women in the air quality sector is also planned.

On a socio-economic front, it is also important to note that women and children bear the brunt of poor air quality in informal settlements, as fires are used for household purposes such as cooking and heating. As a result, the DEA&DP has considered to facilitate the process of expanding the Garden Route Clean Fires Campaign to other Districts. The Garden Route Clean Fires Programme is a GRDM initiative, where Peer Educators are trained to teach the community on the dangers of air pollution. Training also includes using dry wood and chopping the wood into smaller pieces instead of using huge wet logs of wood that smolder the whole day and causing lots of smoke. The use of "Rocket Stoves" for cooking will be investigated, as

very little wood is used for fuel and it gives a lot of heat. These types of projects will specifically focus on women, as they are often the ones who are negatively exposed to harmful indoor air pollution.

The World Health Organization indicates that around 2.6 billion people around the world still make use of solid fuels such as biomass (wood, animal dung and crop waste), coal and kerosene for cooking and heating. These fuels are typically used indoors by means of open fires and/ or inefficient stoves where ventilation is often not adequate. Indoor air pollution may lead to stroke, chronic obstructive pulmonary disease, lung cancer, ischaemic heart disease and pneumonia (WHO, 2021).



Photography by: Zanele Jam-Jam

## 5. PROGRESS, GAPS AND RECOMMENDATIONS

### 5.1 PROGRESS

#### 5.1.1 INSTITUTIONAL FUNCTIONS

- The Western Cape Government plays a significant role in terms of the implementation of the NEM: AQA, as well as its oversight role of 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.
- The Western Cape Government hosted quarterly Air Quality Officers' and Noise Control Forums to serve as a platform where AQOs and officials in the Province can discuss and exchange ideas, provide feedback, build capacity and monitor progress made on air quality management matters and initiatives undertaken, in line with the Western Cape AQMP and Municipal AQMPs, in terms of the NEM: AQA.
- The WCDM and GRDM have established Forums where they meet regularly with Section 21 Listed Activity Facilities within their jurisdiction for information sharing and capacity building. The CKDM has no Listed Activities; and has established an Environmental Forum in 2019 to provide a platform for authorities to discuss air, waste, water, and other related issues.
- Between 2016 and 2020 the Oudtshoorn, Breede Valley, and Langeberg Local Municipalities have adopted their AQMPs and included it as a Sector Plan in its respective Integrated Development Plans (IDPs). To date, 29 out of 30 Municipalities have adopted AQMPs in the Western Cape. The Beaufort West Local Municipality has a draft AQMP that needs to follow a public participation process before it can be adopted.
- Twenty-four District and Local Municipal officials that are involved with air quality management have been designated as Environmental Management Inspectors (EMI's).
- During 2019, the WCDM and the GRDM reviewed its AQMPs. The 2nd Generation WCDM AQMP and the 3rd Generation GRDM AQMP was adopted in 2019.

#### 5.1.2 EMISSIONS FROM MOBILE SOURCES

- Emissions from motor vehicles have been identified as a major air quality concern. Motor vehicles are sources of CO, NO<sub>2</sub>, PM<sub>10</sub> 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 CCT and GRDM have established diesel vehicle testing programmes that are being implemented in partnership with the relevant Traffic Departments.
- The DEA&DP is working closely with the Provincial Department of Transport and Public Works on a project to estimate emissions from motor vehicles in the different regions of the Province. The results and outputs from the project will be used to feed into the Province's Emissions Inventory.

### 5.1.3 RESIDENTIAL AIR POLLUTION

- Poor indoor and ambient air quality are often associated with low income and informal settlements. Sources of emissions in the Western Cape's informal settlements are domestic fires and fuel burning appliances, 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<sub>2</sub>, PM<sub>10</sub> and VOCs.
- Education and awareness raising programmes, such as the GRDM's Clean Fires campaign, play a pivotal role in educating the community about "cleaner" fire making methods and the dangers of air pollution. The main emphasis is using small pieces of dry wood instead of large pieces of "wet" or green wood that causes large amounts of smoke.

### 5.1.4 MINING ACTIVITIES

- The CKDM is potentially rich in minerals such as uranium and 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 DEA&DP took a proactive approach by initiating the development of Readiness Action Plans for all foreseeable major issues regarding the proposed mining developments in the CKDM.
- The WCDM has also seen an increase in mining activities during the past five (5) years. The DEA&DP is actively engaged in all regular processes with regards to mining activities along the West Coast of the Province.

### 5.1.5 LICENSING OF LISTED ACTIVITIES

- Regular capacity building takes place through information sharing at the Quarterly Provincial AQOF's with regards to issues concerning the licensing of listed activities.
- There has been substantial progress in the capacity of both the Provincial and the District Municipal AQO's regarding their role as Licensing Authorities for Section 21 Listed Activities.
- The SAAELIP, which comprises of SNAEL and NAEIS, is an online portal where applications are submitted for Atmospheric Emission Licenses, as well as the reporting of emissions data to inform the development of the National Emissions Inventory. The portal was developed and hosted by the DFFE since 2015. The DFFE often provides virtual refresher training sessions for air quality officials across the country.

### 5.1.6 AMBIENT AIR QUALITY MONITORING AND CLIMATE CHANGE RESPONSE

- The Western Cape Ambient Air Quality Monitoring Network comprises of ambient air quality monitoring stations operated by the CCT (commissioned in 1993), DEA&DP (commissioned in 2008), Saldanha Bay Municipality (commissioned in 2014), and West Coast District Municipality (commissioned in 2017).

- The networks are aging and are to be prioritized to prevent its collapse.
- Municipalities are also required to prioritize the establishing of monitoring networks, to fulfil their mandate of air quality monitoring in their areas.

### **5.1.7 EMISSIONS INVENTORY AND CLIMATE CHANGE RESPONSE**

- Emissions 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.
- The GRDM and CCT have made progress in developing and expanding their emissions inventories. This information will feed into the Provincial Emissions Inventory, which is currently being updated and expanded. Local Municipalities have expressed an interest to assist the D: AQM with updating the Provincial Emissions Inventory.

### **5.1.8 TOWN (REGIONAL AND SPATIAL) AND TRANSPORT PLANNING**

- The DEA&DP has endeavored to ensure that air quality is considered in town and regional planning by engaging on the Spatial Development Frameworks and other projects such as the Saldanha Bay IDZ.

### **5.1.9 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 generate smoke and emissions, which may contribute to atmospheric particulate loading.
- The DEA&DP has been working at strengthening partnerships with the Provincial Department of Agriculture, by inviting and engaging officials at the AQOF & SMART-air Programme: RAC events, to address the air quality issues in the agricultural sector in a co-operative manner

### **5.1.10 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 Western Cape Government has conducted air quality modelling that can be used to quantify the transboundary exchange of air pollutants in the Western Cape, where required; this is ongoing.

### **5.1.11 GENDER MAINSTREAMING**

- The DEA&DP Gender Mainstreaming Forum (GMF) was established in 2017, with the purpose to instill genuine gender mainstreaming, fulfil relevant policy requirements, deal with issues in which gender and gender stereotypes play a key role, as well as encourage inclusivity. The DEA&DP has made a special effort to actively

incorporate gender mainstreaming within the Department's commitments. In 2017, the GMF reviewed the Western Cape AQMP 2016 and determined that the latter policy document was "gender neutral".

- As part of bringing gender into air quality management, the DEA&DP included "male/female" gender identification as categories on the AQOF attendance registers from 2017 onwards.
- During the 2020 to 2021, the DEA&DP expanded on the gender identification categories to include, further to male and female, the LGBTQI+ community. During the AQMP2016 review, the online survey questionnaires also allowed for respondents to have the option to not disclose their gender preference.
- The RAC Partnership Project with the Free State of Bavaria (2016 – 2021) also promoted the participation of women, since the project's inception. A concerted effort was made to include females in the RAC Cool Training in Bavaria. Hence, two female candidates were selected from the RAC sector and completed the RAC Cool Training Programme in Maintall, Frankfurt Germany, during 2019.
- During 2021, the GRDM encouraged women to Chair meetings during Women's Month in August. Moreover, more than 50 % of Emission Control Officers in the GRDM were female during that period.
- The CCT AQO indicated that the majority of Emission Control Officers within the petroleum refining sector in their Municipal area were female.
- Currently, the Western Cape has 11 female AQO's, which includes the Provincial AQO, the WCDM AQO and AQOs from nine (9) Local Municipalities.

## 5.2 GAPS IDENTIFIED

### 5.2.1 INSTITUTIONAL FUNCTIONS

- 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.
- The DEA&DP initiated the review of the Western Cape AQMP in 2020, as part of developing the 3rd Generation Western Cape AQMP.
- All Municipalities, except Beaufort West, have adopted their Air Quality Management Plans (AQMPs), which have been included as Sector Plans in their Integrated Development Plans (IDPs). The Beaufort West Municipality's AQMP is in draft form and is pending approval by the Council.
- The roles and responsibilities in terms of implementing the NEM: AQA were often not fully understood at Local Municipal level. Therefore, the limited financial and other resources do not adequately provide for air quality management. The current social and economic climate has placed further pressure on municipal budgets and resources.
- Air quality management is extremely complex and requires highly skilled individuals. Therefore, the availability of suitably skilled human resources remains a challenge.

### **5.2.2 EMISSIONS FROM MOBILE SOURCES**

- The control and reduction of vehicle emissions require focused attention.
- Vehicle emissions testing programmes are needed throughout the Province.

### **5.2.3 RESIDENTIAL AIR POLLUTION**

- Citizen science is an important process that is required to engage communities in air quality management.

### **5.2.4 MINING ACTIVITIES**

- Activities associated with the proposed uranium mining and shale gas development is required to be managed. In addition, proposed mining where identified require active engagement with DMR.
- The DEA&DP is working very close with the Local Municipalities to ensure that there are clear goals and objectives to manage mining activities in their jurisdictions.

### **5.2.5 LICENSING OF LISTED ACTIVITIES**

- Complexities between the AEL licensing function and the Environmental Authorization processes exist. The linkage between AELs and climate change response and spatial planning are required.

### **5.2.6 AMBIENT AIR QUALITY MONITORING AND CLIMATE CHANGE RESPONSE**

- The financial costs associated with the purchasing, commissioning, operating and maintaining of ambient air quality 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 3rd Generation Western Cape AQMP.

### **5.2.7 EMISSION INVENTORY AND CLIMATE CHANGE RESPONSE**

- 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 analyzed. The current emission inventories are limited to the NEM: AQA Section 21 Listed Activities.

### **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 needs to be taken further in the action plan of the 3rd Generation Western Cape AQMP.

## 5.2.9 AGRICULTURE

- The Department of Agriculture needs to be engaged in terms of identifying interventions in respect of implementing sustainable agricultural practices, as opposed to conventional practices such as crop spraying.

## 5.2.10 TRANS-BOUNDARY AIR POLLUTION

- Transboundary air pollution is needed to be considered when managing air quality in the Province.

## 5.2.11 GENDER MAINSTREAMING

- Women and children bear the brunt of poor air quality in informal settlements from fires that are used for household purposes such as cooking and heating. Yet, women and children are often excluded from lifestyle or household decision-making processes.
- There is a lack of women representation in the RAC sector.
- Gender issues are required to be addressed and/or elevated in air quality management in the Province.

## 5.3 RECOMMENDATIONS

### 5.3.1 INSTITUTIONAL FUNCTIONS

#### 5.3.1.1 INSTITUTIONAL FUNCTIONS: PROVINCE

- Communicate the roles and responsibilities of all three (3) spheres of government, as per the NEM: AQA and the National Framework on Air Quality Management 2017, with Municipalities and the public.
- Participate in events and large public gatherings to raise air quality management awareness through campaigns.
- Utilize awareness raising platforms such as billboards, radio, TV, and social media.
- Incorporate gender mainstreaming in air quality management, as the vulnerable, mainly women and children, bear the brunt of air pollution and consequently climate change.
- Update the DEA&DP's website with appropriate air quality management information and awareness raising campaigns.
- Engage with Municipal Managers and Councilors 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.
- Allocate an adequate budget for the implementation of the AQMP and supporting the AQO.
- Undertake more compliance blitz operations to ensure that industries comply continuously.

- Monitor sectors such as landfill sites and smaller/light industrial operations as they have been recently identified as problem sectors.
- Undertake research on air quality standards, where required.

### 5.3.1.2 INSTITUTIONAL FUNCTIONS: MUNICIPALITIES

- Ensure sound co-operative governance in the implementation of the NEM: AQA within the respective District and Local Municipal jurisdictions.
- Ensure the visibility of AQOs.
- Emphasize 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?”
- Utilize awareness raising platforms such as billboards, radio, TV, and social media.
- Incorporate gender mainstreaming as the vulnerable, mainly women and children were said to bear the brunt of air pollution and consequently climate change.
- Motivate for the implementation of AQMPs 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 2017.
- Ensure good co-operative governance between District and Local Municipalities, at operational and top management levels.
- 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.
- 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.
- Undertake more compliance blitz operations to ensure that industries comply continuously.
- Establish forums and task teams that are inclusive of public representatives to ensure that accountability is being seen to be done.
- Regulate industry as means of ensuring that industries are self-regulating to avoid being exposed and consequently tighten up on raising awareness.
- Monitor sectors such as landfill sites and smaller/light industrial operations as they have been recently identified as problem sectors.
- Allocate an adequate budget for the implementation of the AQMP and supporting the AQOs.

- Increase Municipal investment in equipment and/or systems that would assist to follow-up on complaints and ensure that the required law enforcement action is applied.

### 5.3.2 EMISSIONS FROM MOBILE SOURCES

- Investigate 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.
- Employers to explore the options to have employees work from home for non-essential office work as this will contribute to less vehicles on the road; thus reducing vehicle emissions.
- Develop policies for undertaking vehicle exhaust emissions testing initiatives and also encourage municipalities to incorporate such testing requirements into their By-laws in order to introduce a fining system for vehicles that emit significant fumes.

### 5.3.3 RESIDENTIAL AIR POLLUTION

- Investigate and evaluate air pollution levels in all low-income residential areas across the Province.
- Apply lessons from the CCT's Khayelitsha Air Pollution Study (KAPS) 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.
- Urge Municipalities to assist in encouraging a shift from the use of wood for cooking and heating to other climate and health friendly alternatives, especially in informal settlements.
- 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.

### 5.3.4 MINING ACTIVITIES

- Address air quality related matters associated with all mining activities, across the Province.
- Focus on the air quality related matters associated with uranium and shale gas mining activities, proposed in the CKDM and other areas where mining is increasing (e.g. WCDM).

### 5.3.5 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.
- Map Section 21 Listed Activities in relation to airshed planning, to inform climate change response and spatial planning.

### 5.3.6 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 change.
- Use the results from the passive sampling screening programme to identify areas of possible air 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 Province.
- Coordinate data obtained from all continuous air quality monitoring stations in the Province so as to provide a Provincial perspective on air quality.
- Perform airshed planning on all air quality data monitored, and link this to climate change response and spatial planning.
- Develop a Provincial website where all information can be accessed, which then feeds into the South African Air Quality Information System (SAAQIS).
- Strengthen linkages between Climate Change and Air Quality Management, whereby mitigation projects across all spheres of government are implemented. Joint efforts with the municipal Climate Change Forums were also suggested to ensure that programmes and projects align.

### 5.3.7 EMISSION INVENTORY AND CLIMATE CHANGE RESPONSE

- Continue to update and 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 Provincial Emissions Inventory annually so as to ensure that the data remains current.
- Link the Provincial Emissions Inventory to activities associated with climate change response.

### **5.3.8 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 of the synergies that exist between planning and air quality management.
- Link airshed planning to town (regional and spatial) and transport planning.
- Introduce and enforce buffer zone around residential areas in close proximity to current and future industrial areas

### **5.3.9 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.
- Train agricultural authorities in basic air quality management practices and raise awareness of the synergies that exist between agriculture and air quality management.

### **5.3.10 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.
- Evaluate the merits of Priority Area declarations to manage trans-boundary air pollution impacts at both Provincial and Municipal level, where required.

### **5.3.11 GENDER MAINSTREAMING**

- Roll out programmes similar to the Garden Route Clean Fires Campaign in other districts. The Garden Route Clean Fires Programme is a GRDM initiative, where Peer Educators are trained to teach the community on the dangers of air pollution. Training also includes using dry wood and chopping the wood into smaller pieces

instead of using huge wet logs of wood that smolder the whole day and causing lots of smoke. This may aid in reducing the impacts of air pollution in low-income settlement areas.

- Promote awareness-raising of women and youth in the RAC sector by raising awareness of the importance of RAC technicians at schools.
- Seek the assistance of NGO's and CBO's focused on youth, women, the disabled and/or other gender target groups in raising awareness on air quality management.
- Encourage and focus on raising awareness of the impacts of poor quality on women and children, with the aim to reduce such impacts.

## 5.4 Summary

The above-mentioned progress and gaps identified during the review of the AQMP2016 indicates that air quality management needs to be prioritized in the Western Cape, particularly at Municipal level. Although the Western Cape has relatively good quality air, a concerted effort is needed to ensure that citizens of the Province continue to breath good quality air today and in the future generations. There is still much to be done in terms of all gaps identified.

The recommendations provide the collective actions that are required for authorities to improve on air quality management initiatives and implementation in the Province. These recommendations will be further articulated in the 3<sup>rd</sup> Generation Western Cape AQMP.



Photography by: Zanele Jam-Jam

## 6. WESTERN CAPE AIR QUALITY MANAGEMENT PLAN 2021

### 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

The AQMP has four (4) goals that support its vision and mission, with each goal addressing the different aspects of the vision. These Goals are underpinned by objectives to achieve them. The Goals are:

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

The aim of this goal is 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 in the Province. All activities take cognizance of and link to climate change response.

##### 6.3.1.1 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. The objective further focuses on strengthening the appointment of officials to assist the designated Air Quality Officers and capacitating them to be proficient in air quality management. Industry also plays a huge role in air quality management, whereby the appointment of Emission Control Officers is legislatively recognised and is implemented, where required.

The training and designation of Environmental Management Inspectors (EMIs) and Noise Control Officers, as well as the development of training courses related to air quality management, linked to further training of air quality officials, collating and sharing best practices in all air quality management processes and systems, as well as and engaging with industry to implement mentorship and youth development opportunities adds to the development of skills for a sustained air quality expertise base. Investing in human resources towards the development, implementation and enforcement of air quality policies and legislation remains one of the key fundamentals of the Air Quality Management Plan. The implementation of this plan will assist in incrementally reducing emissions to the atmosphere, such as greenhouse gases, which are enablers of climate change.

Officials from the Directorate: Climate Change also attend the Western Cape Air Quality Officers Forum and also take part in the capacity building sessions. Furthermore, officials also attend the Working Group 1 sessions, which focuses on governance as it relates to air quality, climate change, town and regional planning, as well as transport planning.

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

One of the cornerstone principles in environmental management is cooperative governance, as it seeks to make the best use of scarce resources across government, through maximising available personnel, data and experience across institutions.

This objective encourages cooperation between the various spheres of government through engagement, collaboration and the sharing of air quality management and climate change information. With the aim to elevate the importance of air quality management practices and related climate change considerations in the Province, an enabling environment for engagement has been identified to be through platforms such as the Premiers' Coordinating Forum, Ministerial/Mayoral Forums, industrial forums, inter-governmental forums, as well as the Air Quality Officers' and Noise Control Forum. The DEA&DP Directorates: Air Quality Management (D: AQM) and Climate Change (D: CC) also meet on an ad-hoc basis to engage on matters pertaining to air quality management and climate change in the Province.

Through this objective, the establishment of interim arrangements between authorities to strengthen and implement air quality management systems is also sought.

### **6.3.1.3 DEVELOP INSTITUTIONAL MECHANISMS TO IMPROVE AIR QUALITY AND CLIMATE CHANGE RESPONSE**

The development of institutional mechanisms to improve air quality management and climate change response through established air quality components is recognised through this objective, and the focus is on the Provincial Government, as well as the Metropolitan, District and Local Municipalities.

The success of achieving this objective rests on improved governance, with fully functional air quality institutional mechanisms and structures. Engagements with Councilors and Municipal Managers via workshops, MEC interventions, IDP processes and Air Quality Management Planning processes at Municipalities ensure that governance is transparent, efficient and effective.

Efficient and effective institutional mechanisms and organizational structures such as Working Groups are also important because they ensure that cooperative governance is practiced in a manner that will yield positive outcomes. These institutional mechanisms also ensure the implementation, monitoring, evaluation and reporting of the progress of the Air Quality Management Plan at Provincial, Municipal and industry levels. This objective ensures that the latter is wholly achieved. Both D: AQM and D: CC take part in these structures and undertake an oversight role on Municipalities to ensure that various air quality management and climate change policies are effectively implemented. The D: AQM and D: CC have also developed AQMP activities that will be jointly undertaken and implemented. These activities relate to the development of the Greenhouse Gas Monitoring and Mitigation Strategy, as well as the Strategy to Monitor and Mitigate Short-lived Climate Forcings.

### **6.3.1.4 DEVELOP, IMPLEMENT AND MAINTAIN AIR QUALITY MANAGEMENT SYSTEMS**

A crucial requirement for the management of air quality includes the incorporation of the necessary technical elements of an air quality management system that provides information on the status of air quality within an area. This objective focuses on developing, implementing and maintaining air quality management systems inclusive of the following: air quality monitoring networks, emissions inventories, information management and atmospheric emission licensing.

Continuous research and development in air quality management and climate change response is very important, to inform airshed planning, town (regional and spatial) and transport planning, transboundary exchange of air pollutants, priority area declaration, where required, and reducing regional scale ozone. In the country's current economic climate, donor-funding for specialised research projects and cleaner production technologies should be sought and secured for the Western Cape Province. Where donor-funding has been received, project roll-out should prove to be beneficial with positive outcomes to secure and maintain good relations to ensure eligibility for funding extension and renewal; or use current or completed projects as cases for new funding applications.

A strong focus of this objective includes programmes, particularly focusing on the reduction of air pollutant and greenhouse gas emissions from industrial processes, energy production, mining and the proposed hydraulic fracturing in the Western Cape.

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

The National Framework for Air Quality Management in South Africa (2017) clarifies the key responsibilities of Municipalities and Provinces in terms of air quality management governance and integrates the successful implementation and cascading of the Air Quality Management Plan in the Province.

As an objective to ensure that Air Quality Management as a sector is prioritized and receives due attention, all Municipalities in the Western Cape are to ensure that adequate budget is available to implement their Air Quality Management Plans. Engagements with Municipal Mayors and Managers and through the Local Government Medium-Term Expenditure Commission (LGMTEC) processes are envisaged, as well as with donor agencies in order to secure funding for implementing air quality management effectively in the Municipalities.

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

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

Communication plays an integral role in the dissemination of vital information. Far-reaching and effective communication channels need to be established that enable the DEA&DP to communicate air quality information to stakeholders, who are the interested and affected parties, regularly.

This objective underpins the importance of raising awareness with respect to air quality management and climate change. Innovative approaches such as the utilisation of social and digital media linked to institutional public platforms where the audience is inter-generational are needed to be employed. Print media, where deemed effective and appropriate, should also be explored.

#### **6.3.2.2 GENDER MAINSTREAMING WITHIN AIR QUALITY MANAGEMENT**

The DEA&DP Gender Mainstreaming Forum (GMF) was established in 2017 with the purpose to instill gender mainstreaming, fulfil relevant policy requirements, deal with issues in which gender and gender stereotypes play a key role, as well as encourage inclusivity. The 3<sup>rd</sup> Generation AQMP is to actively incorporate gender mainstreaming within the Departments' commitments.

In the future, awareness-raising of women and youth in the RAC sector, as RAC technicians will be promoted during awareness-raising at schools. Authorities are to roll out similar programmes such as the Garden Route Clean Fires Campaign in other districts. The Garden Route Clean Fires Programme is an initiative, where Peer Educators are trained to teach the community on the dangers of air pollution, and techniques to reduce smoke emissions during cooking. This may aid in reducing the impacts of air pollution in low-income settlement areas. Programmes such as these are required to be expanded across the Province, with an emphasis towards incorporating gender in it.

Authorities are to target and seek the assistance of NGOs and CBOs focused on youth, women, the disabled and/or other gender target groups in raising awareness on air quality management. One of the recommendations made in Chapter 3 of the AQMP2016 was for the development of an Air Quality Communications Strategy. The development of such a strategy will provide an ideal opportunity for dedicated gender-specific considerations for air quality management stakeholder engagement.

The 3<sup>rd</sup> Generation AQMP aims to include Gender Mainstreaming as a key aspect of air quality management in the Western Cape. Special projects, with a focus on gender mainstreaming, is included for the first time since the AQMP was adopted in 2010.

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

#### **6.3.3.1 IMPROVE AIR QUALITY COMPLIANCE MONITORING AND ENFORCEMENT**

The effective and consistent compliance and enforcement practices in the Province will continue to be implemented via an Air Quality Compliance and Enforcement Programme, as compliance monitoring and enforcement processes are an essential component of the air quality governance cycle. Further to the Programme, the identification and investigation of illegal activities that impact air quality are also to take place, and where necessary, followed by performing relevant administrative enforcement action.

Various mechanisms towards addressing compliance monitoring and enforcement exist in the Western Cape, and includes measures for non-compliance to licenses, By-laws and regulations. The implementation of administrative correction and rehabilitation actions will assist in deterring transgressors.

#### **6.3.3.2 PROMOTE CONTINUOUS IMPROVEMENT IN RESPECT OF INDUSTRY AIR QUALITY COMPLIANCE**

The promotion of self-regulation and voluntary compliance is vital as it will lessen the load on the Competent Authorities and enable them to focus on matters relating to air quality management. Self-regulation systems/mechanisms in the Province should be maintained and also strengthened.

Part of this objective also promotes the recognition of the 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 3<sup>rd</sup> Generation AQMP.

### **6.3.3.3 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.

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

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

The anthropogenic precursors of climate change stem from air pollution, which includes the increased ozone-depleting substances and greenhouse gas emissions. In order to reduce the negative impacts on human and environmental health borne by climate change as a consequence of air pollution, technical, policy, or economic interventions that reduce local and regional air pollution should be adopted and implemented.

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

Further, eco-driving transport programmes linked to the National Green Transport Strategy (2019) for all transport sectors are required to 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 continue to be encouraged through the development and implementation of plans to reduce emissions in those sectors.

Air quality management and climate change programmes must be integrated to ensure that programmes that address air quality and climate change response are undertaken and receive adequate support across the Province.

### **6.3.4.2 HUMAN HEALTH RISK ASSESSMENT**

The DEA&DP completed a comprehensive Human Health Risk Assessment Study (HHRA) in selected areas of the Western Cape during 2013 – 2016. The HRA included epidemiological studies to determine the human health risk associated with exposure to air pollutants.

Although all measured criteria pollutants were below the National Ambient Air Quality Standard thresholds, from a cost-benefit analysis perspective, the HHRA Study suggested that air pollution could potentially have a large impact on human health and the economy of the Western Cape. The Total Economic Cost was estimated at approximately R8.7 billion per annum, using particulate matter with a diameter less than 10µm (PM<sub>10</sub>) as a proxy indicator for air pollution in the study areas. This provided an indication of the potential economic impact, which amongst other, include the cost of treatment, loss of income and the loss in the wider economy.

The DEA&DP will continue to implement the key HHRA Study recommendations and associated air quality measures/ actions that were identified.

#### **6.3.4.3 WESTERN CAPE SMART-air PROGRAMME**

The Western Cape Government, through the AQMP2016, introduced a Recognition Programme for reducing air pollution in the Province, viz. the SMART-air Programme.

The SMART-air Programme serves as the main vehicle through which emission reduction best practice in industry, commerce and communities are recognised, while also raising awareness on air quality matters linked to climate change international commitments.

The SMART-air Programme was rolled-out over three phases, as outlined in Figure 2-1. During the 2017/18 financial year a SMART-air Status Quo report was developed to gather information on the status of the five thematic areas. The recommendations from the SMART-air Status Quo Report were used to develop the SMART-air Strategy and Implementation Plan during the 2018/19 financial year. The Strategy provided a breakdown of the vision and objectives of each thematic area; whereas the implementation plan provided detailed actions that are required to be executed towards achieving the objectives. Phase 1 and Phase 2 of the SMART-air Programme was funded as part of the Green Economy Programme of the Province.

The responsibility for its implementation includes the Western Cape DEA&DP; District and Local AQOs and the AQMP Working Groups. Timelines for implementation are specified, viz. short term (1 to 3 years), medium-term (3 to 5 years) and long term (greater than 5 years). Milestones and indicators to be used for monitoring of implementation are also included to track the Strategy's progress towards achieving its ultimate vision. Roll-out and implementation of the SMART-air Programme (Phase 3) will continue via the Western Cape AQMP Working Groups.

#### **6.3.4.4 REFRIGERATION AND AIR CONDITIONING (RAC) PROJECT**

Currently, most refrigeration and air conditioning appliances use fluorinated gases like hydrochlorofluorocarbons (HCFCs) or hydrofluorocarbons (HFCs). When these substances leak, they have a high global warming potential (GWP) and are up to several thousand times more potent than CO<sub>2</sub>. With rising temperatures, the demand for refrigeration and air conditioning equipment is predicted to increase dramatically. Without any serious interventions, the refrigeration and air conditioning sector could be responsible for 13% of global GHG emissions by 2030. It is important for the RAC sector to consider "leapfrogging" from using the high GWP HFCs to natural refrigerants such as CO<sub>2</sub>, ammonia or propane, which have low GWP. In this way, there would be significant savings in terms of waste and energy, when combining energy-efficient appliances with natural refrigerant systems.

The Western Cape Government and the Free State of Bavaria in Germany signed a Memorandum of Agreement Action Plan (2016 – 2018; 2019 - 2021) that entailed collaborative work on Climate-Friendly Refrigeration and Air Conditioning (RAC) in the Western Cape, South Africa.

The DEA&DP launched the international Climate-Friendly RAC Project in 2017, in collaboration with the Bavarian State Ministry of the Environment and Consumer Protection, the Bavarian Environment Agency and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

The RAC project will continue to be implemented as part of the SMART-air Programme of the Western Cape AQMP's climate change response interventions to reduce ozone-depleting substances and GHG emissions, in line with national and international requirements.

## 6.4 ACTION PLAN

### 6.4.1 STAKEHOLDER ROLES AND RESPONSIBILITIES

The Provincial environmental Department's responsibilities on air quality management are listed in the NEM: AQA and are further elaborated in the 2017 National Framework for Air Quality Management in the Republic of South Africa, (DEA, 2017).

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

The three (3) spheres of Government, together with the civic society, should ensure that sustainable and efficient air quality management measures are in place and adhered to, in order to minimise air pollution and environmental impacts which may have negative effects on the lives and livelihoods of communities. The resilience of communities is paramount, and these measures have to ensure that these communities are safeguarded against the proposed climate change vulnerabilities, natural hazards and disasters.

The implementation of the 3<sup>rd</sup> Generation AQMP is imperative in terms of systematically realizing the goals and objectives of the NEM: AQA in the Western Cape. The Action Plan is presented in Table 6-1.

### 6.4.2 WORKING GROUPS

Three Working Groups that direct the activities and involve all necessary stakeholders, are the primary mechanism that drives the Western Cape Province's AQMP implementation. The configuration of these Working Groups has been a continuation from the 1<sup>st</sup> Generation AQMP, carried over to the 2<sup>nd</sup> Generation, and now the 3<sup>rd</sup> Generation.

The Working Groups will continue to focus its work on the goals, objectives and related activities, as stated in the Action Plan. The Working Groups may be extended or form Sub-Working 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 and / or Sub-Working Groups shall convene as may be required. The Chairpersons of each Working Group will provide feedback to the Western Cape Air Quality Officers' Forum.

- **Working Group 1: 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.

- **Working Group 2: Air Quality Awareness Raising Working Group**

Area of work: Information management, education and awareness on air quality and climate change.

- **Working Group 3: Compliance Monitoring and Enforcement Working Group**

Area of work: Technical/Control, compliance and enforcement, and legal.

## 6.5 MONITORING, EVALUATION AND REVIEW

### 6.5.1 MONITORING

Progress monitoring and reporting 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 have been 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.

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

### 6.5.2 EVALUATION

Ongoing evaluation of the AQMP implementation is vital as, during that process, shortcomings and strengths of implementation are identified and addressed accordingly. Evaluation is an internal mechanism to measure the performance with regard to the implementation of the 3<sup>rd</sup> Generation AQMP.

Indicators are an easily interpreted and meaningful method of communicating progress on implementation and will be used in the evaluation process that will assess the 3<sup>rd</sup> Generation AQMP implementation outcomes. These have been developed for the targets specified in the AQMP Implementation Plan.

An Independent Evaluation Committee will undertake the evaluation process. This committee will be established under the auspices of the Provincial Air Quality Officers' Forum. Annual reporting of the 3<sup>rd</sup> Generation AQMP implementation is recommended as a minimum timeframe and should be incorporated into the Annual State of Air Quality Management Report of the Western Cape.

### 6.5.3 REVIEW

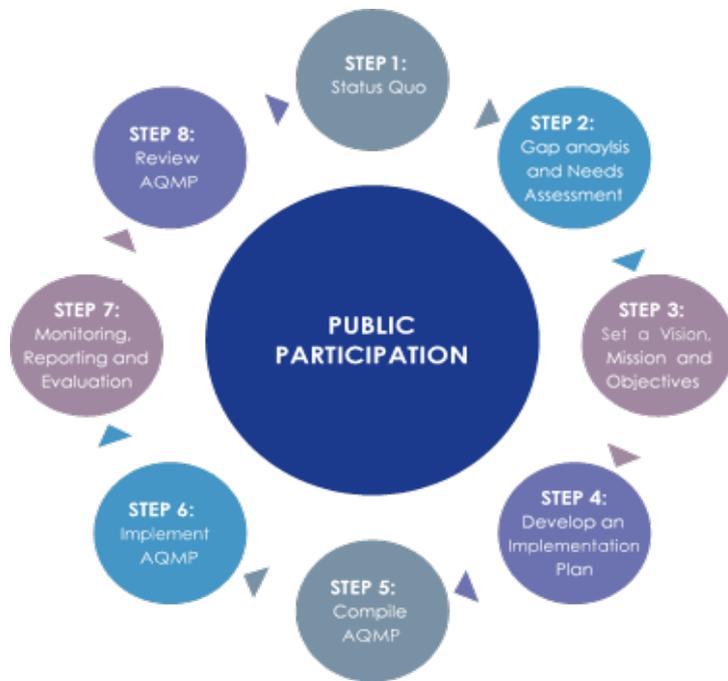
The DFFE's AQMP Manual (DEA, 2008) suggests a review period of every five years, which should also include stakeholder engagement and participation. It should however be noted that the review period is subject to funding and political cycles, as well as implementation outcomes. Therefore, an element of elasticity is necessary.

The previous two (2) AQMPs employed an internal review mechanism that incorporates the annual evaluation. Thereby, this method also effectively assesses the five-year performance of the AQMP, 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 and activities updated, if required. The internal revision is communicated to stakeholders through a limited public participation process, followed by a further iteration and publication.

<b>Responsibility</b>	DEA&DP, Technical Committee, Stakeholders
<b>Method</b>	AQMP Planning Cycle
<b>Timeframe</b>	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.



**MONITORING:**

Facilitated through Working Groups on a quarterly basis.

**EVALUATION:**

Independent evaluation annually.

**REVIEW:**

Facilitated through the DEA&DP after 5 years of implementation

Figure 6-1: Process for the development of an AQMP, which includes the monitoring, evaluation and review of the developed AQMP

TABLE 6-1. 3<sup>RD</sup> GENERATION WESTERN CAPE AIR QUALITY MANAGEMENT PLAN 2021 – 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	TIMEFRAMES	COST RATING
<b>TARGET: Skills development for a sustained air quality expertise base</b>					
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 of 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 Entrepreneurial Programme (SMART-AMEP) 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-AMEP.	Industry,DEA&DP	Industry, DEA&DP, Donor Agencies	Short-term and Continuous	Operational costs
<b>TARGET: Skills development for a sustained air quality expertise base</b>					
Collate and share Best Practice Methodologies in all air quality management processes (AELs, monitoring, compliance & enforcement).	Number of Best Practice Methodologies in AQM andAEL 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

<b>TARGET: Skills development for a sustained air quality compliance and enforcement base</b>					
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

<b>GOAL 1: ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY MANAGEMENT</b>			<b>OBJECTIVE 2: PROMOTE COOPERATION AMONGST ALL SPHERES OF GOVERNMENT, BUSINESS, INDUSTRY AND CIVIL SOCIETY</b>		
<b>ACTIVITIES</b>	<b>INDICATORS</b>	<b>RESPONSIBILITY</b>	<b>FUNDING</b>	<b>TIMEFRAMES</b>	<b>COST RATING</b>
<b>TARGET: Skills development for a sustained air quality expertise base</b>					
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 Officers' Forums to engage air quality matters.	Number of Air Quality Officers' Forums hosted in the Province.	DEA&DP, DFFE, Metropolitan, Local Municipalities, Relevant Provincial Departments	DEA&DP, DFFE, Metropolitan, Local Municipalities, Relevant Provincial Departments	Short-term and Continuous	Operating Costs

<b>TARGET: Platforms to engage on and share noise management information</b>					
Host Provincial Noise Control Forums to engage on noise pollution matters.	Number of Provincial Noise Control Forums hosted in the Province.	DEA&DP, DFFE, Metropolitan, District and Local Municipalities	DEA&DP, Metropolitan, District and Local Municipalities	Short-term and Continuous	Legislative requirement
Provide a supportive and oversight role to Municipalities with respect to AQM.	Number of Agreements established between Province and District Municipalities.	DEA&DP, Metropolitan and District Municipalities	DEA&DP	Short-term, where required	Legislative Requirement
Encourage arrangements between District and Local Municipalities via service level agreements (SLA), where required	Number of Agreements established between District and Local Municipalities.	District and Local Municipalities	District Municipalities	Short-term, where required	Operating costs

<b>GOAL 1: ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY MANAGEMENT</b>			<b>OBJECTIVE 3: DEVELOP INSTITUTIONAL MECHANISMS TO IMPROVE AIR QUALITY AND CLIMATE CHANGE RESPONSE</b>		
<b>ACTIVITIES</b>	<b>INDICATORS</b>	<b>RESPONSIBILITY</b>	<b>FUNDING</b>	<b>TIMEFRAMES</b>	<b>COST RATING</b>
<b>TARGET: Platforms to engage on and share noise management information</b>					
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

<b>TARGET: An established air quality component in Municipalities</b>					
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
Convene workshops with Councilors and Municipal Managers to promote the roles and responsibilities of the NEM:	Number of workshops convened with Councilors and Municipal Managers to elevate the roles & responsibilities of the NEM:	DEA&DP	DEA&DP	Short-term and Continuous	Operating costs

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AQA at Municipalities	AQA at Municipalities.				
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
Assist Municipalities to review and update Air Quality Management Plans.	Number of Municipal AQMPs developed or updated.	Metropolitan, District and Local Municipalities	Metropolitan, District and Local Municipalities	Short-term and Continuous	Legislative requirement

<b>GOAL 1: ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY MANAGEMENT</b>			<b>OBJECTIVE 4: DEVELOP, IMPLEMENT AND MAINTAIN AIR QUALITY MANAGEMENT SYSTEMS</b>		
<b>ACTIVITIES</b>	<b>INDICATORS</b>	<b>RESPONSIBILITY</b>	<b>FUNDING</b>	<b>TIMEFRAMES</b>	<b>COST RATING</b>
<b>TARGET: Comprehensive Emissions Inventory Systems in the Western Cape</b>					
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	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

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Atmospheric Emissions Inventory System (NAEIS).					
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
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

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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
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**TARGET: Effective Atmospheric Emissions 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
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

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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

<b>GOAL 1: ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY MANAGEMENT</b>			<b>OBJECTIVE 5: ENSURE ADEQUATE FUNDING FOR THE IMPLEMENTATION OF AIR QUALITY MANAGEMENT BY MUNICIPALITIES</b>		
<b>ACTIVITIES</b>	<b>INDICATORS</b>	<b>RESPONSIBILITY</b>	<b>FUNDING</b>	<b>TIMEFRAMES</b>	<b>COST RATING</b>
<b>TARGET: Adequate budget to implement Air Quality Management Plans</b>					
Through the annual IDP process, 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
Ensure all Municipal AQMPs are included as a Sector Plan of Municipal IDPs and budget is	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

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allocated air quality management.					
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

<b>GOAL 2: CONTINUALLY ENGAGE WITH STAKEHOLDERS TO RAISE AWARENESS WITH RESPECT TO AIR QUALITY MANAGEMENT AND CLIMATE CHANGE RESPONSE</b>			<b>OBJECTIVE 1: DEVELOP COMPREHENSIVE EDUCATION AND COMMUNICATION MECHANISMS, STRATEGIES AND PROGRAMMES WITH RESPECT TO AIR QUALITY MANAGEMENT AND CLIMATE CHANGE RESPONSE</b>		
<b>ACTIVITIES</b>	<b>INDICATORS</b>	<b>RESPONSIBILITY</b>	<b>FUNDING</b>	<b>TIMEFRAMES</b>	<b>COST RATING</b>
<b>TARGET: A Recognition Programme to promote air quality and climate change response, linked to awareness raising</b>					
Develop and implement a SMART-air Programme to promote air quality management.	Developed and implemented the SMART-Air: 2Precious2Pollute Recognition Programme.	DEA&DP	DEA&DP	Medium-term andContinuous	Legislative requirement
Develop a CommunicationsStrategy for the SMART-air Recognition Programme, in association with the Provincial Communications unit.	Develop a CommunicationsStrategy for the SMART-Air: 2Precious2Pollute Recognition Programme.	DEA&DP	DEA&DP	Medium-term andContinuous	R 250 000
Launch the brand "SMART-air Recognition Programme", in association with the Provincial Department's Communication unit.	Developed and launchedbrand "SMART-Air: 2Precious2Pollute".	DEA&DP	DEA&DP	Medium-term andContinuous	R 100 000
Develop and maintainan online SMART-air 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 andContinuous	Operational costs
Develop and activate a SMART-air APP for the public and authorities to raise awareness on	Developed and activated a SMART-Air: 2Precious2PolluteAPP for the public to raise airquality and	DEA&DP, DoEducation, Educational institutions, Metropolitan, District and Local	DEA&DP, DoEducation, Educational Institutions Metropolitan, District and Local	Long-term and Continuous	Less than R500 000

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air quality and climate change matters.	climate change matters.	Municipalities, Industrysector associations	Municipalities, Industrysector associations		
Produce air quality and climate change educational and awareness raising materials, as part of the SMART-air Recognition Programme.	Number of educational and awareness raising materials developed.	DEA&DP, DoEducation, Educational institutions, Metropolitan, District and Local Municipalities, Industrysector associations	DEA&DP, DoEducation, Educational Institutions Metropolitan, District and Local Municipalities, Industrysector associations	Medium-term andContinuous	Less than R100 000
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, IndustrySector associations	DEA&DP, Media, Metropolitan, District and Local Municipalities, IndustrySector associations	Medium-term andContinuous	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 andContinuous	Less than R100 000
Host an Annual SMART-air 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 andContinuous	Less than R100 000

<b>TARGET: Reporting on air quality management and climate change response in the Province</b>					
Integrate air quality and climate change response, where relevant, 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 Officers' Report.	Inputs submitted of 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	Developed the Provincial	DEA&DP, Metropolitan	DEA&DP	Short-term and Continuous	R 500 000 every 5 years

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Annual State of Air Quality Management Report.	Annual State of Air Quality Management Report.	and District Municipalities			
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<b>TARGET: Mainstream gender into air quality management awareness raising</b>					
Develop and implement projects that raise awareness on air quality management that include all gender categories.	Number of projects undertaken	DEA&DP, Metro, District Municipalities, Local Municipalities	DEA&DP	Short-term and Continuous	Operational Costs
Ensure that Air Quality Management Special Projects are gender sensitive	Number of activities undertaken.	DEA&DP, Metro, District Municipalities, Local Municipalities	DEA&DP	Short-term and Continuous	Operational Costs

<b>GOAL 3: ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY COMPLIANCE MONITORING AND ENFORCEMENT</b>			<b>OBJECTIVE 1: IMPROVE AIR QUALITY COMPLIANCE MONITORING AND ENFORCEMENT</b>		
<b>ACTIVITIES</b>	<b>INDICATORS</b>	<b>RESPONSIBILITY</b>	<b>FUNDING</b>	<b>TIMEFRAMES</b>	<b>COST RATING</b>
<b>TARGET: Air Quality Compliance and Enforcement Programme in the Western Cape</b>					
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

<b>GOAL 3: ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY COMPLIANCE MONITORING AND ENFORCEMENT</b>			<b>OBJECTIVE 2: PROMOTE CONTINUOUS IMPROVEMENT IN RESPECT OF INDUSTRY AIR QUALITY COMPLIANCE</b>		
<b>TARGET: A compliance-driven and self-regulated industry</b>					
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

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<b>GOAL 3: ENSURE EFFECTIVE AND CONSISTENT AIR QUALITY COMPLIANCE MONITORING AND ENFORCEMENT</b>			<b>OBJECTIVE 3: DEVELOP AND IMPLEMENT AIR QUALITY REGULATORY PROCESSES</b>		
<b>TARGET: Effective air quality regulatory processes</b>					
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, noise 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
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

<b>GOAL 4: SUPPORT AND IMPLEMENT AIR QUALITY AND CLIMATE CHANGE RESPONSE PROGRAMMES, INCLUDING PROMOTING AND FACILITATING THE REDUCTION OF GREENHOUSE GASES</b>			<b>OBJECTIVE 1: REDUCE GREENHOUSE GAS EMISSIONS IN LINE WITH NATIONAL AND INTERNATIONAL REQUIREMENTS</b>		
<b>ACTIVITIES</b>	<b>INDICATORS</b>	<b>RESPONSIBILITY</b>	<b>FUNDING</b>	<b>TIMEFRAMES</b>	<b>COST RATING</b>
<b>TARGET: Support of national and international protocols on the reduction of greenhouse gases</b>					
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 to other Programmes and initiatives)
Support the Provincial programme to reduce greenhouse	Supported the Provincial programme to reduce greenhouse	DEA&DP, Metropolitan, District and Local	DEA&DP, Metropolitan, District and Local	Short-term and Continuous	Operating costs (Support to other programmes and initiatives)

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gases and its associated carbon footprint.	gases and its associated carbon	Municipalities and Industry	Municipalities and Industry		
Support the awareness raising of greenhouse gas and carbon footprint reduction strategies.	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)

<b>TARGET: Reduction of emissions related to transport</b>					
Develop a methodology for vehicle emissions testing (petrol and diesel) and promote 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.)
Investigate 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
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, DFFE	DEA&DP, Metropolitan, District and Local Municipalities, Ports of Cape Town and Saldanha Bay, CTIA, Metrorail, DoTransport, DFFE	Medium-term and Continuous	No costs (Support other Programmes and initiatives)
Encourage Municipalities to procure vehicle	Number of staff trained to	DEA&DP, Metropolitan, District and	DEA&DP, Metropolitan, District and	Medium-term and Continuous	No costs (Support other

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emission testing equipment.  Explore training opportunities for officials to perform vehicle emission tests	perform vehicle emission tests.	Local Municipalities, DoTransport	Local Municipalities, DoTransport		Programmes and initiatives)
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<b>TARGET: Reduction of PM10 emissions related to residential fuel burning</b>					
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

<b>TARGET: Reduction of SO2, PM10, VOC's, NO2, greenhouse gases and odour emissions related to industrial operations</b>					
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

<b>TARGET: Reduction of PM10, and greenhouse gas and chemical emissions related to pesticides.</b>					
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	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

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(Fire protection)/ registers (chemicals) to reduce pesticide and crop spraying.					
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<b>TARGET: A collaborative effort between the Air Quality Management and Climate Change Directorates to address climate change</b>					
Jointly develop a Greenhouse Gas Monitoring and Mitigation Strategy	A completed Strategy	D: AQM, D: CC	DEA&DP	Medium-term and Continuous	No costs (Support other programmes and initiatives)
Jointly develop a strategy to monitor and mitigate short-lived climate forcings, inclusive of gases with high global warming potentials (e.g. hydrochlorofluorocarbons and hydrofluorocarbons)	A completed Strategy	D: AQM, D: CC	DEA&DP	Medium-term and Continuous	No costs (Support other programmes and initiatives)



Photography by: Zanele Jam-Jam

## 7. APPENDICES

### 7.1 APPENDIX 1

#### SOUTH AFRICAN AMBIENT AIR QUALITY STANDARDS (DEA, 2009)

SULPHUR DIOXIDE (SO <sub>2</sub> )			
Averaging period	Concentration	Frequency of Exceedence	Compliance date
10 minutes	500 µg/m <sup>3</sup> (191 ppb)	526	Immediate
1 hour	350 µg/m <sup>3</sup> (134 ppb)	88	Immediate
24 hours	125 µg/m <sup>3</sup> (48 ppb)	4	Immediate
1 year	50 µg/m <sup>3</sup> (19 ppb)	0	Immediate

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

NITROGEN DIOXIDE (NO <sub>2</sub> )			
Averaging period	Concentration	Frequency of Exceedence	Compliance date
1 hour	200 µg/m <sup>3</sup> (106 ppb)	88	Immediate
1 year	40 µg/m <sup>3</sup> (21 ppb)	0	Immediate

The reference method for the analysis of particulate matter (PM<sub>10</sub>) shall be ISO 7996

PARTICULATE MATTER (PM <sub>10</sub> )			
Averaging period	Concentration	Frequency of Exceedence	Compliance date
24 hours	120 µg/m <sup>3</sup>	4	Immediate – 31 December 2014
24 hours	75 µg/m <sup>3</sup>	4	1 January 2015
1 year	50 µg/m <sup>3</sup>	0	Immediate – 31 December 2014
1 year	40 µg/m <sup>3</sup>	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 <sub>2.5</sub> )			
Averaging period	Concentration	Frequency of Exceedence	Compliance date
24 hours	65 µg/m <sup>3</sup>	4	Immediate – 31 December 2015
24 hours	40 µg/m <sup>3</sup>	4	01 January 2016 – 31 December 2029
24 hours	25 µg/m <sup>3</sup>	4	01 January 2030
1 year	25 µg/m <sup>3</sup>	0	Immediate – 31 December 2015
1 year	20 µg/m <sup>3</sup>	0	1 January 2016 – 31 December 2029
1 year	15 µg/m <sup>3</sup>	0	1 January 2030

The reference method for the determination of PM<sub>2.5</sub> fraction of suspended particulate matter shall be EN 14907

OZONE (O <sub>3</sub> )			
Averaging period	Concentration	Frequency of Exceedence	Compliance date
8 hour (running)	120 µg/m <sup>3</sup> (61 ppb)	11	Immediate

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

BENZENE (C <sub>6</sub> H <sub>6</sub> )			
Averaging period	Concentration	Frequency of Exceedence	Compliance date
1 year	10 µg/m <sup>3</sup> (3.2 ppb)	0	Immediate – 31 December 2014
1 year	5 µg/m <sup>3</sup> (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/m <sup>3</sup>	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 <sup>3</sup> (26 ppm)	88	Immediate
8 hour (calculated on 1 hourly averages)	10 mg/m <sup>3</sup> (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 <sub>2</sub> S)	30 minutes	7 µg/m <sup>3</sup> (odour threshold)
	24 hours	150 µg/m <sup>3</sup> (health threshold)

**NATIONAL STANDARDS FOR DUST FALLOUT (DEA, 2013)**

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

## 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: PM <sub>10</sub> , PM <sub>2.5</sub>	PM <sub>10</sub> : Respirable solid or liquid particles with a diameter smaller than 10 microns PM <sub>2.5</sub> : 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	<ul style="list-style-type: none"> <li>Higher risk of cardio-respiratory mortality</li> <li>Irregular heartbeat</li> <li>Exacerbation of existing respiratory conditions</li> <li>Decreased lung function</li> <li>Higher risk of chronic respiratory disease</li> </ul>
Nitrogen Dioxide Symbol: NO <sub>2</sub>	A reddish-brown gas with a highly detectable odour, a highly corrosive and oxidising agent	<ul style="list-style-type: none"> <li>Fuel combustion in motor vehicles</li> </ul> Industrial and chemical manufacturing processes	<ul style="list-style-type: none"> <li>Increased airway resistance</li> <li>Nose, eye and throat irritation, coughing, dyspnoea, headache and nausea</li> <li>Exacerbation of existing respiratory disease, such as emphysema and bronchitis</li> <li>Exacerbation of existing heart disease</li> <li>Corrosion and stunted growth in plants</li> </ul>
Benzene: C <sub>6</sub> H <sub>6</sub>	A colourless, clear liquid readily evaporating at room temperature	<ul style="list-style-type: none"> <li>Combustion of petroleum products, service stations, and motor vehicle exhaust fumes</li> <li>Unvented wood fires</li> <li>Cigarette smoke</li> <li>Vapours from products such as</li> </ul>	Acute effects include: <ul style="list-style-type: none"> <li>Narcosis</li> <li>Headaches</li> <li>Dizziness</li> <li>Tiredness</li> <li>Confusion</li> <li>Unconsciousness</li> </ul>

POLLUTANT	DEFINITION	MAJOR SOURCES	HUMAN HEALTH AND/OR ENVIRONMENTAL IMPACTS
		glues, paints, furniture waxes and detergents	Effects following chronic exposure: <ul style="list-style-type: none"> <li>• Higher risk to carcinogenic effects</li> <li>• Aplastic anaemia</li> <li>• Loss of red and white blood cells</li> <li>• Stunted growth in plants</li> </ul>
Hydrogen Sulphide: H <sub>2</sub> S	A colourless and flammable gas with a characteristic rotten egg odour	<ul style="list-style-type: none"> <li>• Crude petroleum</li> <li>• Natural gas</li> <li>• Formed as the result of the breakdown of organic matter</li> </ul>	<ul style="list-style-type: none"> <li>• Headache</li> <li>• Skin complications</li> <li>• Respiratory and mucous membrane irritation</li> <li>• Conjunctivitis</li> <li>• Unconsciousness and/or death at high concentrations</li> </ul>



Photography by: Zanele Jam-Jam

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