



MOSSSEL BAY MUNICIPALITY

REVIEW OF THE AIR QUALITY MANAGEMENT PLAN

DRAFT REPORT

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COMPILED BY



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ABBREVIATIONS AND DEFINITIONS

AQA.....	Air Quality Act, Act 39 of 2004
AQM.....	Air Quality Monitoring
AQMP.....	Air Quality Management Plan
AQO	Air Quality Officer
DEADP	Department of Environmental Affairs and Development Planning
DEA	Department of Environmental Affairs
GRDM	Garden Route District Municipality
H ₂ S	Hydrogen Sulphide
IDP	Integrated Development Plan
NO.....	Nitrogen Monoxide
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM10	Particulate Matter with aerodynamic diameter smaller than 10 micron
SAAQIS	South African Air Quality Information System
SAWS	South African Weather Service
SO ₂	Sulphur Dioxide
THC	Total Hydrocarbon Content
tpa.....	Tons per Annum
TPM.....	Total Particulate Matter



EXECUTIVE SUMMARY

An Air Quality Management Plan (AQMP) was compiled for the Garden Route District Municipality (GRDM), formerly known as the Eden District Municipality, in 2006 as required by the National Environment Management: Air Quality Act, 2004 (NEM:AQA). As required by this Act, the AQMP must be reviewed and revised every 5 to 6 years and this was done during 2012/13. An AQMP specifically customised for the Mossel Bay Municipality was developed at the same time.

The 2012/13 version of the AQMPs version was reviewed recently and revised to suit the changing environment within the region.

In this process an in-depth background study was carried out to assess the following:

- The degree to which all municipalities complied with the 2013 version of the AQMP
- The status quo with respect to air quality management capabilities in GRDM and the seven municipalities that make up the Garden Route district
- Compilation of an extensive emissions inventory, including the emissions of greenhouse gases
- A detailed dispersion modelling study aimed at understanding the air quality within the GRDM region
- The need for additional air quality monitoring and modelling capabilities within the Garden Route region

The findings of these assessments are discussed in various progress reports which are available to the public on GRDM's website.

The vision and mission of the AQMP remains unchanged as:

VISION

TO HAVE AIR QUALITY WORTHY OF THE NAME

"THE GARDEN ROUTE"

MISSION STATEMENT

TO MINIMISE THE IMPACT OF AIR POLLUTANT EMISSIONS ON THE POPULATION

AND THE NATURAL ENVIRONMENT OF THE MOSSEL BAY MUNICIPAL DISTRICT

A key requirement in the revision process was aligning the GRDM's AQMP with the Western Cape Provincial Air Quality Management Plan (WCP AQMP). The Mossel Bay Municipality's AQMP must, in turn, align with GRDM's AQMP.





The WCP AQMP was revised in 2016 and forms the backbone of the newly revised GRDM AQMP and its goals will be used to strengthen GRDM's air quality management performance over the next five year period, and by implication that of Mossel Bay.

Within the Western Cape Provincial context, GRDM issued 21% of the total number of Atmospheric Emissions Licenses (AELs) and 18% of industry registered on National Atmospheric Emissions Inventory System (NAEIS) within the Western Cape Province, second only to the City of Cape Town (CCT). As such GRDM region is recognised as the second most industrialised area within the Western Cape Province.

Industry in Mossel Bay includes, but is not limited to:

- Agriculture
- Brick manufacturing
- Fisheries, rendering and related industry
- Forestry and related timber industry
- Petrochemical industry
- Tourism

Based on the objectives established in the 2012 AQMP, Mossel Bay's performance over the past six years is reflected in the scorecard below.

OBJECTIVE	STATUS
Objective 1: Set air quality goals	
Objective 2: Set up air quality management system	
Objective 3: Carry out risk assessments	No action was required for these objectives
Objective 4: Assess and select control measures	
Objective 5: Implement intervention and monitoring effectiveness	
Objective 6: Revise air quality goals	







OBJECTIVE	STATUS
Objective 7: Integrate the AQMP into the IDP	
Objective 8: Compliance monitoring, enforcement and control	
Objective 9: Review the AQMP	
Objective 10: Appoint an AQO	

Table 1: Compliance with 2012/13 AQMP

This second edition of Mossel Bay's AQMP provides insight into the state of air quality. The AQMP review process included a comprehensive dispersion modelling study. A potential problem area in Mossel Bay was identified in the form of high estimated nitrogen dioxide concentrations along the R102 road in Heiderand.



1 INTRODUCTION

The World Health Organisation (WHO) estimated that 9 out of every 10 people globally do not have access to clean air. Furthermore, based on 2016 data, 4.2 million deaths annually were due to poor ambient air quality, and 3.8 million due to poor indoor air quality.

To improve air quality and reduce greenhouse gas emissions, the Department of Environmental Affairs published a number of regulations (listed in Annexure 1). The National climate change response white paper (DEA, 2011), provides that South Africa will integrate climate change considerations into health sector plans to “reduce the incidence of respiratory diseases and improve air quality through reducing ambient particulate matter, ozone and sulphur dioxide concentrations by legislative and other measures to ensure full compliance with the National Ambient Air Quality Standards by 2020. In this regards, the use of legislative and other measures that also have the co-benefit of reducing greenhouse gas emissions will be prioritised”.

In accordance with regulations, Mossel Bay published the first AQMP in 2012/13. This is the 2nd edition of the AQMP and allows the Mossel Bay Municipality to:

- Compare performance to the previous and Provincial Air Quality Management Plan
- Confirm current state of air quality in the district
- Identify areas of concern
- Develop objectives to achieve over a five year period

The vision and mission of the AQMP remains unchanged as:

VISION

*TO HAVE AIR QUALITY WORTHY OF THE NAME
“THE GARDEN ROUTE”*

MISSION STATEMENT

*TO MINIMISE THE IMPACT OF AIR POLLUTANT EMISSIONS ON THE POPULATION
AND THE NATURAL ENVIRONMENT OF THE MOSSEL BAY MUNICIPAL DISTRICT*

Mossel Bay is the second most populous town in the Garden Route Municipal District and is a significant tourist attraction, both locally and internationally. Mossel Bay also plays host to the largest industries in the Garden Route District.

The GRDM is one of the most picturesque areas in the world and receives international acclaim. High tourist occupancy is experienced throughout the year. GRDM encompasses a very large area across seven municipalities and a variety of climatic conditions.



Population in the district is of low density. As at the end of 2014, GRDM accounted for 9.8% of the Western Cape Province's population, second only to the City of Cape Town, with George, Mossel Bay and Oudtshoorn comprising 66% of the total population within the area. Population growth is estimated at 3.5% per annum, but as the last census was conducted in 2011, no current information is available.

Major industries are centred within town boundaries, with the highest concentration found in George, followed by Mossel Bay and Oudtshoorn.

Primary economic activities are listed below:

- Agriculture
- Brick manufacturing
- Fisheries, rendering and related industry
- Forestry and related timber industry
- Petrochemical industry
- Tourism

The Garden Route District Municipality appointed Lethabo Air Quality Specialists (Pty) Ltd (LAQS) to review Mossel Bay Municipality's air quality management plan (AQMP) and to revise it if necessary. LAQS carried out an extensive study in the GRDM region, including Mossel Bay, to assess various aspects associated with air quality management and the findings were contained in various reports which are available on GRDM's website. Those reports, and LAQS's summarised findings, are:

Progress Report 1: Compliance with the Existing Air Quality Management Plan:

Virtually all of the goals set in the 2012/13 AQMP were met. Those not met were instances where specific actions were not yet required, e.g. health risk assessments, etc.

Progress Report 2: Status Quo Assessment and Municipal Capacity:

All municipalities within GRDM designated air quality officers (AQOs), but not all the air quality management plans defined in 2012 /13 were adopted and included in the Integrated Development Plans. AQO's spend much more time on other duties and air quality management activities receive low priority, except at District level. Limited or non-existent budgets severely hamper the efficiency of air quality management throughout the District.

Progress Report 3: Emissions Inventory:

The emissions of various pollutants that occurred within the Garden Route district during 2018 are given below. For the sake of comparison emissions from two significant wildfire incidents were also estimated.



Progress Report 4: Assessment of Air Quality in the Garden Route Region:

Comprehensive dispersion modelling was done to assess the general air quality within the region. Some potential problem areas were identified and these are discussed in detail below.

Progress Report 5: Monitoring and Modelling Requirements:

The long-term monitoring of air pollutants in general is sufficient for the region, but short-term monitoring projects in potential problem areas are highly recommended. No dispersion modelling capabilities exist and it is recommended that such a facility be established as a matter of priority to aid in air quality management in the region.

2 AIR QUALITY IN GRDM

LAQS compiled a detailed inventory of emissions that occurred during 2018 and the outcome is summarised in the table below. The following sources were assessed and included in the inventory:

- Industrial sources, including both licensed and unlicensed sources
- Residential emissions (use of fuel sources such as paraffin, coal and wood)
- Mobile emissions (vehicles, harbour and airport)
- Municipal solid waste disposal
- Municipal waste water treatment plants
- Farm animals

The impact of the 2017 Knysna and 2018 Outeniqua fires were investigated. Based on available information and making use of general international emission factors, the estimated emissions during these two incidents are summarised below for comparison against the emissions inventory.



Pollutant	GRDM Inventory	Mossel Bay Inventory	GRDM Fire incidents	
			Knysna 2017	Outeniqua 2018
Total particulate matter	1 057	326	19 889	46 968
Sulphur dioxide (SO ₂)	837	588	No reliable emission factors	
Nitrogen oxides (NO _x)	4 288	2 205	1 913	4 463
Carbon monoxide (CO)	4 784	1 080	112 659	260 552
Carbon dioxide (CO ₂)	1 589 847	347 026	No reliable emission factors	
Total hydrocarbons (THC)	3 378	1247	4 983	11 840
Methane (CH ₄)	22 219	6447	5 631	13 175
Odorous compounds	51	16	No reliable emission factors	

Table 2: Summarised Emissions Inventory and Forest Fire Emissions, tons per annum

As can be seen from the comparative figures above, the emissions from the Outeniqua fire in 2018 exceeded the total emissions from all sources included in the emissions inventory. The difference lies in the duration of emissions. The forest fire emissions occurred over a relatively short period of time, numbered in days, whereas the emissions included in the emissions inventory occurred continuously throughout the year.

Health risk is based on dosage and time of exposure, i.e. a high dosage over a short period of time is as dangerous as a low dosage over an extended period of time. Community involvement and education is, therefore, of extreme importance.

Developing strategies to avoid fires in general, and wildfires in particular, is imperative to ensure good air quality and promote health. This includes preventative fire-breaks, prohibiting the burning of garden refuse, etc., but does not negate the need for industries and consumers to curb air pollution.

3 AREAS OF CONCERN

To date GRDM reacted to complaints by the general public and thus identified areas of concern. Invariably this led to some form of air quality monitoring, typically using screening methods already in GRDM's possession.



A comprehensive dispersion modelling study was conducted after compilation of the emissions inventory. The aim of the study was determine if any others areas of concern existed outside the knowledge of both GRDM and municipal personnel. The dispersion model indicated potential problem areas in five of the seven municipalities within the GRDM region. In Mossel Bay specifically, the main concerns are the high estimated levels of nitrogen dioxide and odours.

The problem areas are shown graphically below and form the basis of LAQS's recommendations for project-based air quality monitoring actions. The pollutants involved all pose health risk problems, the exception being odours. At the estimated concentrations the odorous compounds do not pose a health risk, but are a nuisance and impacts on quality of life and tourism.

The health risks of NO₂ have been researched extensively and are summarised as follows:

Nitrogen dioxide (NO₂):

Breathing air with a high concentration of NO₂ can irritate airways in the human respiratory system. Such exposures over short periods can aggravate respiratory diseases, particularly asthma, leading to respiratory symptoms (such as coughing, wheezing or difficulty breathing), hospital admissions and visits to emergency rooms. Longer exposures to elevated concentrations of NO₂ may contribute to the development of asthma and potentially increase susceptibility to respiratory infections. People with asthma, as well as children and the elderly are generally at greater risk for the health effects of NO₂.

NO₂ along with other NO_x reacts with other chemicals in the air to form both particulate matter and ozone. Both of these are also harmful when inhaled due to effects on the respiratory system.

From the figures below it can be seen that some direct attention is required to prevent health impacts in the Mossel Bay region.

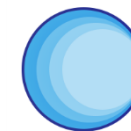


Figure 1: 99-percentile NO₂ air quality standard in danger of being breached along R102 in Heiderand
 Orange / red coloured regions show areas where the estimated concentration is approximately 80% of the air quality standard

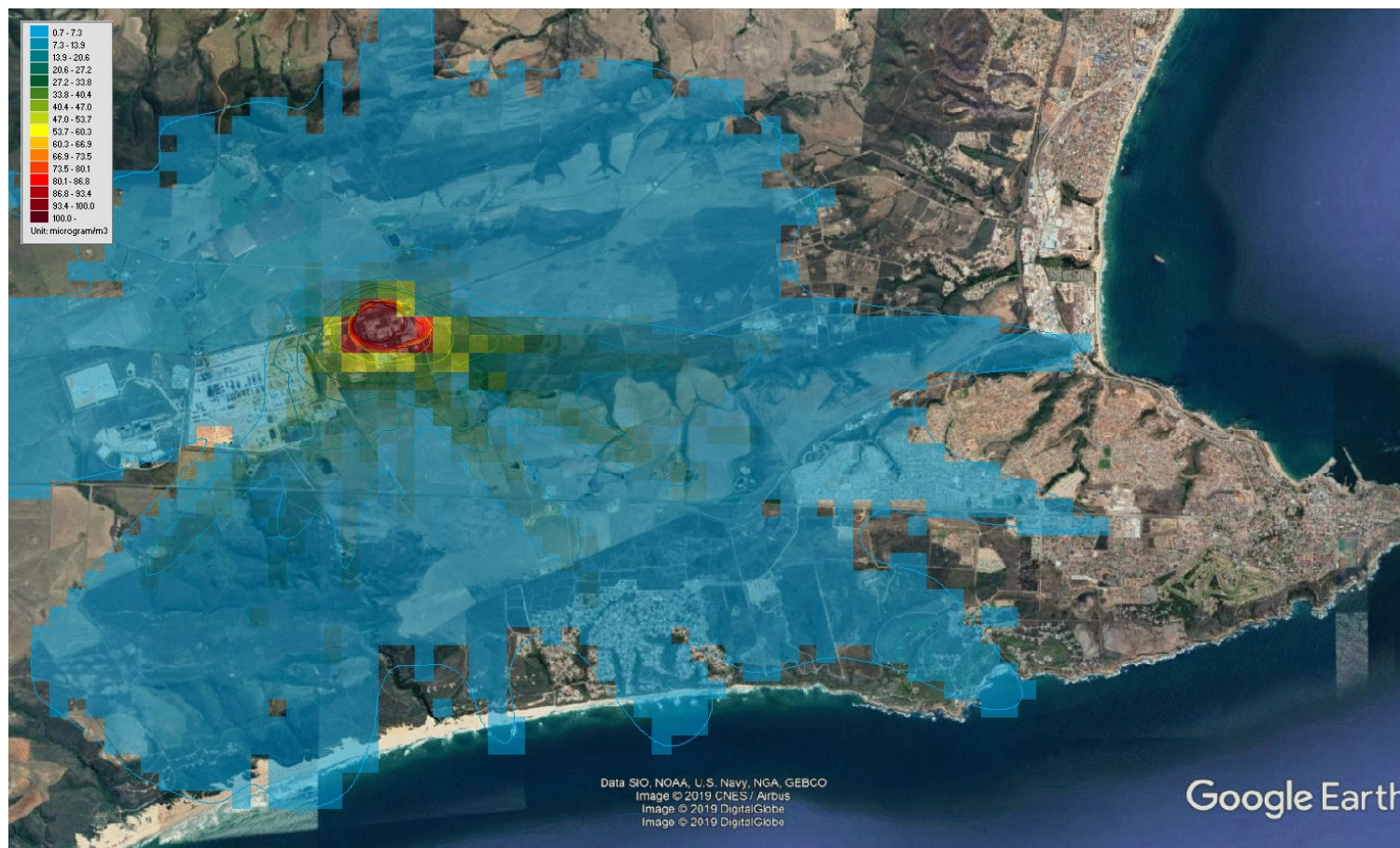
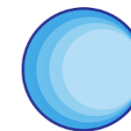
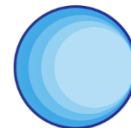


Figure 2: Areas over which odours may be detected in the Mossel Bay area for 1% of the time (88 hours per year)
 All coloured regions show the areas where the odour threshold may be exceeded



4 AQMP GOALS AND OBJECTIVES

The following goals and objectives are recommended for Mossel Bay Municipality to further improve air quality management effectiveness.

4.1 GOAL 1: Ensure Effective and Consistent Air Quality Management

Objective 1.1 Create awareness of the AQMP implications

While an AQMP was compiled for Mossel Bay 2012/13, and it was included in Mossel Bay's IDP, air quality in the Mossel Bay area only receives cursory attention. A concerted effort will be needed to create an awareness of air pollution and its risks to the population of Mossel Bay, especially those living in low income areas, to all role players within the municipal structure.

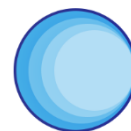
The following tasks are envisaged under this Objective:

- 1.1.1 Present the AQMP to Mossel Bay council for acceptance, approval and inclusion in the IDP.
- 1.1.2 Workshop the action plan with Mossel Bay municipal stakeholders, e.g. planning, traffic control, engineering, etc., to gain insight and buy-in so that all departments are aware of the need for proper air quality management input in all levels of development.

Objective 1.2 Promote cooperation of all spheres of municipal government

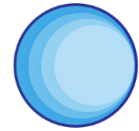
The National Framework for Air Quality Management in the Republic of South Africa (the National Framework), as published under Government Notice No. 1144 of 26 October 2018, underpins NEM:AQA by providing national norms and standards for air quality management to ensure compliance with legislation. The National Framework serves as the country's AQMP.

Paragraph 4.2 of the National Framework describes the duties and responsibilities of all levels of government involved with air quality management. Those activities that are regarded as the primary responsibilities of local municipalities are listed below.



Section No.	Title	Responsibilities
4.2.1	Information management	<ul style="list-style-type: none"> -- Monitor ambient air quality and point, non-point and mobile source emissions. -- Review emissions reports provided by industry in the NAEIS in line with AELs.
4.2.3	Strategy development	<ul style="list-style-type: none"> -- The development of air quality management plans as a component of integrated development plans as required by the Municipal Systems Act.
4.2.4	Standards setting	<ul style="list-style-type: none"> -- The setting of municipal standards for emissions from point, non-point or mobile sources in the municipality in respect of identified substances or mixtures of substances in ambient air which, through ambient concentrations, bio-accumulation, deposition or in any other way, present a threat to health, well-being or the environment in the municipality.
4.2.8	Compliance monitoring	<ul style="list-style-type: none"> -- Monitoring compliance in respect to reasonable steps to prevent the emission of any offensive odour caused by an activity, in terms of nuisance or disturbance matters. -- Monitoring compliance in respect noise caused by an activity, in terms of nuisance or disturbance matters. -- Monitoring compliance with directives to submit an atmospheric impact report. -- Monitor compliance with the requirements of the National Dust Control Regulations. -- Monitor compliance with the emission standards set out for activities declared as controlled emitters in terms of section 23 of the AQA. -- Monitor compliance with the requirements of the National Dust Control Regulations for an activity, in terms of nuisance or disturbance matters

Table 3: Primary Responsibilities of Local Municipalities



Currently GRDM fulfils 90% of air quality management duties in the Garden Route region. The current situation is not sustainable as two officials at district municipal level cannot do justice to the primary responsibilities imposed on both district and local municipalities by the National Framework. The aim of this Objective is, therefore, to develop the capacity in the Mossel Bay Municipality to comply with all of the primary responsibilities, as shown above.

In order for Mossel Bay Municipality to assume full responsibility for their obligations in terms of NEM:AQA and the National Framework, the following must be put in place:

- 1.2.1 Mossel Bay Municipality's role in effective air quality management in the Garden Route district must be clarified through discussion with GRDM officials. This is best achieved at a municipal management level so that the importance of air quality management and the costs implications are brought to the attention at the highest level of municipal management.
- 1.2.2 The municipal AQO must evaluate details contained in annual emission reports as provided by GRDM. This will assist the AQO to gain a better understanding of the air quality, make more informed recommendations on municipal council level and manage complaints more effectively.
- 1.2.3 Mossel Bay's AQO must participate in discussions and planning activities initiated by GRDM so that the AQO is involved in any air quality planning issues from the onset.
- 1.2.4 Cooperate with GRDM in all aspects relating to identification and compliance monitoring of listed activities to ensure that illegal operations are identified sooner and any concerns relating to licensed industry identified faster
- 1.2.5 The AQO must compile a detailed list of air quality monitoring equipment available in Mossel Bay Municipality, together with information on the status of the equipment, i.e. maintenance, calibration and spares. Once a comprehensive list of monitoring equipment in the Garden Route District is available it would be evident where additional resources are required. Sharing of equipment between municipalities would be a cost-effective solution to effective air quality monitoring activities.

Objective 1.3 Strengthen and build capacity in air quality management, compliance and enforcement

Mossel Bay municipality designated an air quality officer (AQO) as is required by the National Framework. The air quality function resides in the Waste Management and Pollution Control section of the Parks and Recreation Department. The team is quite large in comparison with other B-municipalities in GRDM, but has a very high workload. The majority of time is allocated to waste management. It is estimated that the AQO spends 20% of his time on air quality.



Approval was received for an amended structure which will come into effect in July 2019. Waste Management and Environmental Control will be split with a responsible person heading up each unit. Each unit will have support personnel. The AQO will fall under the Environmental Control unit.

With this planned structural change, a shift in focus and priorities for the AQO must be integrated. Air quality management must be the primary duty of an AQO. Only if there are no such issues can an AQO pay attention to other duties. However, should an air quality issue arise the AQO must be relieved from other duties to pay attention to the air quality issue at hand.

As stated before GRDM has two technical and one administrative officials dedicated to air quality management and they attend to 90% of the air quality issues in the district. As the area is vast, there are numerous industries and a variety of complaints, it is not possible for GRDM to effectively enforce air quality management actions.

This Objective promotes the scenario of a combined team effort, with Mossel Bay's AQO becoming actively involved in air quality management, thus becoming one member of a team of nine officials to manage and enforce air quality management practices. It will be a time consuming activity which requires continuous attention as it involved a multitude of activities.

The following tasks are envisaged under this Objective:

- 1.3.1 Training must be provided to the AQO on the interpretation of annual industrial emission reports if the information contained in these reports are to be of any use.
- 1.3.2 The municipal AQO must be trained in air quality management practices so that he can act as effective ad hoc compliance inspector.
- 1.3.3 The municipal AQO must be trained in the use of air quality monitoring equipment. This will enable the AQO to conduct short term air quality assessments in the Mossel Bay municipal area and report back on findings to GRDM and the Mossel Bay Council, thus forewarning both bodies on potential health risk problems.
- 1.3.4 A comprehensive dispersion modelling capability is recommended for GRDM and this system must be available to all municipalities in the district. However, the reliability of such a system is directly linked to the reliability of an emissions inventory and the AQO must maintain the Mossel Bay emissions inventory for this purpose.

Objective 1.4 Develop institutional mechanisms to improve air quality and climate change response

The largest and continuous task within air quality management is collection of data. Ensuring that the data received is accurate is an essential part of planning air quality in any region. To support this, and expand on available information, GRDM is developing the Collaborator platform to enable business and civil society's involvement in the process of gathering information.



The following tasks are envisaged under this Objective:

- 1.4.1 Mossel Bay Municipality's AQO must obtain, verify and upload relevant air quality information, such as fuel usage, emissions and related data to the Collaborator system on a regular basis.
- 1.4.2 Once activated, workshops, discussion groups and training of the target market by Mossel Bay's AQO will be essential to create buy-in from industry, especially unlisted industries, and maximise the air quality management opportunity this platform will provide.
- 1.4.3 The municipal AQO will need to encourage submissions of information from business, industry and public on the Collaborator platform.
- 1.4.4 Once the Collaborator system is populated with data, it, together with the dispersion modelling software mentioned in Objective 1.3.4, will equip Mossel Bay Municipality to manage air space more effectively and provide air quality information essential to town planning activities.
- 1.4.5 With input from GRDM, Mossel Bay's air pollution by-laws must be evaluated and revised, if necessary, to comply with Mossel Bay's unique requirements.

Objective 1.5 Develop, implement and maintain air quality management system

Managing air quality and human health is not an isolated task left to the AQOs. Knowledge gained through an air quality study is an essential tool to planning and development. This includes industrial, commercial and residential development. To ensure that a development is viable, one of the first considerations should be the quality of the existing air space and then the impact such development would have on the air space. Building a residential development close to an existing emitter will create complaints in the future and, in serious situations, lead to air pollution related illness. This AQMP promotes open communication channels between the various municipal stakeholders and industry to address existing concerns and avoid future development which would negatively impact on human health.

The following tasks are envisaged under this Objective:

- 1.5.1 Information obtained through this AQMP and GRDM's dispersion modelling process must be shared with municipal town planners. It is proposed that regular discussion between AQOs and town planners should become part of the strategy to manage the impact of air quality on Mossel Bay's residents.
- 1.5.2 Where problem areas were identified through the AQMP's dispersion model, short term air quality monitoring programs must be designed and implemented under the supervision of GRDM to verify the dispersion model estimations. The physical monitoring activities are, however, one of the primary responsibilities of municipalities according to the National Framework. Execution of such monitoring programs in the Mossel Bay area will be the responsibility of Mossel Bay's AQO.



1.5.3 Mossel Bay's AQO must subsequently report the outcome of any monitoring project to both Mossel Bay's Council and GRDM's AQO.

1.5.4 It is possible that pollution prevention plans may be required, based on the outcome of air pollution monitoring programs. The various mitigation tools and mechanisms available to both municipal and district authorities should then be evaluated by Mossel Bay's AQO, with assistance from GRDM's AQO, and ranked, depending on the requirements of each individual case. Cognisance must be taken at this stage that the eventual mitigation technique may be based on technological and/or political decisions.

Objective 1.6 Ensure adequate funding for the implementation of air quality monitoring

Although there has been a number of engagements between National, Provincial and Municipal management structures on the importance of air quality management to human health and the inclusion of air quality structures within municipal plans, very little has been done on municipal level in the Garden Route District to ensure that its mandate is met.

Although the AQMP was adopted into the Mossel Bay IDP, there is no official budget allocation for air quality management. As such, it hampers air quality management activities to the extent where any form of air quality monitoring projects is excluded. Bearing in mind that Mossel Bay is the second most populous town in the Garden Route region, and potential problem areas have already been identified, air quality monitoring activities will be required in the near future.

To assess air quality, specialised equipment is required which must be maintained and may require annual calibration. In addition, many devices require consumable items, e.g. filters, adsorbent cartridges, chemical analyses, etc., the costs of which must be budgeted for.

In consultation with GRDM, the air quality monitoring needs in Mossel Bay must be assessed so that appropriate monitoring activities can be launched.

The following tasks are envisaged under this Objective:

1.6.1 Liaise with GRDM timeously to plan an air quality budget submission to Mossel Bay Council.

1.6.2 Procure suitable air quality monitoring equipment in consultation with GRDM so that unnecessary expenditure on equipment that may be available from another municipality on a loan basis is prevented. Should such equipment be available, it is likely that Mossel Bay Municipality will need to procure consumable items, e.g. filters, adsorbent tubes, etc., and will be responsible for any chemical analyses that may be required from time-to-time.

1.6.3 Should Mossel Bay purchase air quality monitoring equipment, an annual budget for calibration, maintenance and consumables of such equipment will be required.



4.2 GOAL 2: Ensure Effective and Consistent Compliance Monitoring and Enforcement

The key word to this goal is consistency. It is important that all data is collected periodically as pre-determined and within set time limits. The data thus obtained must be used to update the emissions inventory and a comprehensive dispersion modelling facility, if available, can then reflect the air quality conditions when planning any further development. In addition, it will support the process of development of air pollution control plans.

Objective 2.1 Improve air quality compliance monitoring and enforcement

The following tasks are envisaged under this Objective:

- 2.1.1 Develop customised air pollution control plans in conjunction with GRDM as and where required.
- 2.1.2 Update and review emission inventory on the Collaborator system and highlight concerns for further investigation.

Objective 2.2 Promote continuous improvement in respect of industry air quality compliance

The following tasks are envisaged under this Objective:

- 2.2.1 Provide a reference framework to industry with approved emission survey methodology.
- 2.2.2 The AQO must undergo training to enable him to do random inspections at unlicensed industry as and when required, as well as licensed industry when requested by GRDM.

Objective 2.3 Develop and implement air quality regulatory processes

The following tasks are envisaged under this Objective:

- 2.3.1 Based on short terms air quality assessments, amendments to the emission limits may be required in Mossel Bay. Liaise with GRDM and facilitate amendments to municipal by-laws to effect revised limits.
- 2.3.2 With the assistance of GRDM, incorporate emission limits for fuel burning appliances in Mossel Bay Municipality's air pollution by-laws.
- 2.3.3 Assist GRDM with the development of a permitting system for fuel burning appliances.



2.3.4 Assist GRDM with the development of a spot fine system for vehicle emissions and implement the system on completion. If necessary, provision for such actions must be made in the air pollution bylaws.

4.3 GOAL 3: Continually engage with stakeholders to raise awareness with respect to air quality management (AQM) and climate change response (CCR)

GRDM built up a good relationship with the public and continues with its ongoing communication about air quality issues. This should serve as a model to Mossel Bay Municipality to set up its own air quality communication network which includes all shareholders, e.g. the general public, all industries, including both licensed and unlicensed industries, etc.

Objective 3.1 Develop comprehensive education and communication mechanisms, strategies and programmes with respect to AQM and CCR

The following tasks are envisaged under this Objective:

- 3.1.1 The AQO must develop a comprehensive database of interested and affected parties so that relevant information can be shared easily and widely. The electronic media is perfectly suited to such purposes.
- 3.1.2 The AQO must actively engage with all stakeholders on a regular basis, e.g. biannually, to set up a voluntary two-way communication process.
- 3.1.3 Coordinate with DEA, Forestry and Working on Fire to educate the community on the health risk associated with burning of garden and other waste as well as wildfires.

4.4 GOAL 4: Support air quality and CCR programmes, including promoting and facilitating the reduction of greenhouse gas emissions

The AQMP's emissions inventory identified the contributors to greenhouse gas emissions in the Mossel Bay municipal area, including users of fossil fuels, some of which also use cooling agents which include CFC's. This AQMP promotes direct discussion with these entities to reduce greenhouse gas emissions within the Mossel Bay area. The community itself has a large part to play in the battle against greenhouse gas emissions and must be made aware of alternative fuel and heating sources.



Objective 4.1 Reduce ozone depleting substances and greenhouse gas emissions, in line with National and International requirements

The following tasks are envisaged under this Objective:

- 4.1.1 Engage with the contributors to reduce greenhouse gas emissions through best practice framework. Assistance can be sought from GRDM.
- 4.1.2 Educate community on greenhouse gas emissions from household fuel sources and poorly maintained vehicles.
- 4.1.3 Develop a vehicle emission testing programme and a non-compliance system as service to motorists.
- 4.1.4 Partner with business and industry, especially those that make extensive use of road transport services, to roll out a voluntary vehicle emission testing programme.



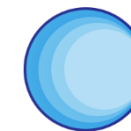
Goal	Task	Timeframe
Goal 1: Ensure effective and consistent AQM, linked to climate change		
Objective 1.1 Create awareness of AQMP implications	<ul style="list-style-type: none"> • Present the AQMP to Mossel Bay Council for acceptance, approval and inclusion in IDP • Workshop the action plan with Mossel Bay municipal stakeholders, e.g. planning, traffic control, engineering, etc., to gain insight and buy-in 	<ul style="list-style-type: none"> • 6 months • 6 months
Objective 1.2 Promote cooperation amongst all spheres of municipal government	<ul style="list-style-type: none"> • Mossel Bay Municipality's role in air quality management in GRDM must be clarified at municipal management level • Evaluate annual industry emission survey reports shared by GRDM • Participate in discussions and planning where problems exist • Cooperate with GRDM in all aspects relating to the identification and compliance monitoring of listed activities • Compile list of air quality monitoring equipment available at Mossel Bay municipality with the view of sharing equipment as and when necessary 	<ul style="list-style-type: none"> • Immediate • 6 months • 2 years • 6 months • 6 months
Objective 1.3 Strengthen and build capacity in AQM, compliance and enforcement	<ul style="list-style-type: none"> • Attend training on interpretation of air quality reports • Attend air quality management training with the view of becoming an ad hoc inspector • Attend training sessions on air quality monitoring equipment • Maintain an emissions inventory and update on regular basis 	<ul style="list-style-type: none"> • 1 year • 1 year • 1 year • Ongoing



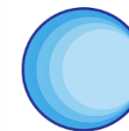
Goal	Task	Timeframe
<p>Objective 1.4</p> <p>Develop institutional mechanisms to improve air quality and climate change response</p>	<ul style="list-style-type: none"> • AQO to present and host training to Industry, business to introduce Collaborator and encourage participation by stakeholders • AQO to actively engage with stakeholders to ensure business owners and municipal stakeholders submit required information on Collaborator • Customise air quality by-laws in consultation with GRDM, e.g. including regular monitoring of small boiler emissions, etc. 	<ul style="list-style-type: none"> • 1 year • 2 years • 2 years
<p>Objective 1.5</p> <p>Develop, implement and maintain air quality management systems</p>	<ul style="list-style-type: none"> • Arrange a workshop with municipal stakeholders to discuss current poor air quality areas and develop strategies for information sharing and inclusion in development in planning • Plan and execute short-term air quality monitoring projects, in consultation with GRDM, to verify the dispersion modelling results in potential problem areas • AQO must report back on short term air quality assessments and distribute findings through appropriate channels • Participate in development of pollution prevention plans, based on outcome of dispersion modelling and air quality monitoring programs as and when necessary 	<ul style="list-style-type: none"> • 6 months • 1 year • 1 year • 1 year • 3 years



Goal	Task	Timeframe
<p>Objective 1.6</p> <p>Ensure adequate funding for the implementation of AQM by municipalities</p>	<ul style="list-style-type: none"> • AQO must plan and develop an air quality budget for submission to Mossel Bay council with the assistance of GRDM • AQO must budget for the purchase of air quality monitoring equipment which could be shared between municipalities (i.e. 4 mini-vol's in GRDM could be rotated between municipalities, the same with vehicle exhaust monitors) • Budget for calibration, maintenance and consumables of Mossel Bay-owned monitoring equipment 	<ul style="list-style-type: none"> • 1 year • 1 year • 1 year
Goal 2: Ensure effective and consistent compliance monitoring and enforcement		
<p>Objective 2.1</p> <p>Improve air quality compliance monitoring and enforcement</p>	<ul style="list-style-type: none"> • Develop customised air pollution control plans in conjunction with GRDM as and when required • Update and review emission inventory on Collaborator system and highlight concerns for further investigation 	<ul style="list-style-type: none"> • 4 years • On-going
<p>Objective 2.2</p> <p>Promote continuous improvement in respect of industry air quality compliance</p>	<ul style="list-style-type: none"> • Provide a reference framework to industry with approved emission survey methodology • AQO to undergo training to enable her to do random inspections at licensed and unlicensed industries 	<ul style="list-style-type: none"> • 3 years • 3 years

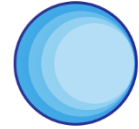


Goal	Task	Timeframe
<p>Objective 2.3</p> <p>Develop and implement air quality regulatory processes</p>	<ul style="list-style-type: none"> • Based on short terms air quality assessments, amendments to the emission limits in some municipalities may be required. Liaise and coordinate amendments to municipal by-laws to effect revised limits • With the assistance of GRDM, incorporate emission limits for fuel burning appliances in Mossel Bay Municipality's air pollution by-laws • Assist GRDM with development of permitting system for fuel burning appliances • Assist GRDM with development of spot fine system for vehicle emissions and implement system on completion 	<ul style="list-style-type: none"> • 3 years • 2 years • 2 years • 3 years
Goal 3: Continually engage with stakeholders to raise awareness with respect to AQM and climate change response		
<p>Objective 3.1</p> <p>Develop comprehensive education and communication mechanisms, strategies and programmes with respect to AQM and CCR</p>	<ul style="list-style-type: none"> • AQO must develop comprehensive database of interested and affected parties for distribution of information • AQO must actively engage with stakeholders on regular basis, e.g. biannually • Coordinate with DEA, Forestry and Working on Fire to educate the community on the health risk associated with burning of garden and other waste as well as wildfire 	<ul style="list-style-type: none"> • 6 months • 1-1½ years • 1 year



Goal	Task	Timeframe
Goal 4: Support air quality and CCR programmes, including promoting and facilitating the reduction of Greenhouse gas emissions		
<p>Objective 4.1</p> <p>Reduce ozone depleting substances and greenhouse gas emissions, in line with National and International requirements</p>	<ul style="list-style-type: none"> • Engage with largest contributors to reduce Greenhouse gas emissions through best practice framework • Educate community on greenhouse gas emissions from household fuel sources and poorly maintained vehicles • Develop a vehicle emission testing programme and a non-compliance system as service to motorists • Partner with business and industry to roll out voluntary vehicle emission testing programme 	<ul style="list-style-type: none"> • 1-1½ years • 2 years • 3 years • 5 years

Table 4: Goals, Task and Time Frames of 2019 Mossel Bay AQMP



5 SPECIFIC REQUIREMENTS APPLICABLE TO THE MOSSEL BAY MUNICIPALITY

Figures 1 and 2 of this document indicate that two potential problem areas exist within the Mossel Bay area. These are along the R102 road in Heiderand and the general spread of odours in the region.

At various points in the objectives and tasks listed above, mention is made of short-term air quality monitoring requirements due to the identification of potential air quality problems during the dispersion modelling study.

It is further defined that such short-term monitoring projects should be initiated and coordinated by GRDM, but that the actual monitoring activities are conducted by municipal AQOs as part of the legal primary air quality management responsibilities of local municipalities.

In Mossel Bay Municipality's case this implies the monitoring of the following pollutants in the areas indicated by the dispersion model:

- Nitrogen Dioxide
- Odours

At the concentrations estimated by the dispersion model, the odorous components do not pose a health risk, but is a nuisance and affects quality of life. The concentrations estimated for NO₂ are also not at a dangerous level, but is threatening the ambient air quality standard for NO₂ and a monitoring program is recommended to verify the estimation of the dispersion model.

Such monitoring activities must be conducted continuously for two months during mid-winter, i.e. June and July, and two months during mid-summer, i.e. December and January.

Two levels of monitoring equipment are available, i.e. screening and regulatory versions. Screening monitors are useful to determine if the ambient air quality standard is exceeded, but its results are not defensible. Should they indicate that a problem may exist a regulatory-level monitor must be used to verify the data and provide reliable results. Regulatory monitors, on the other hand, produce results that are above suspicion and can be used for regulatory purposes.

5.1 Gas Concentrations:

Two levels of screening and regulatory equipment is available. Two levels of screening monitors are required, i.e. passive samplers and gas analysers.

Passive samplers consist of diffusion tubes which are exposed to ambient air for a period of two weeks after which the contents of the tubes are analysed in a laboratory.



This method is cheap, but the results are of limited use as the results obtained reflect average values over the monitoring period.

Gas analysers, e.g. the Scentinel system used by GRDM, can analyse the concentrations of various gases in the atmosphere, but the analytical techniques used have not been certified as regulatory level techniques. The main advantage of such devices is that it provides a continuous output, thus indicating spikes in concentrations and allows the calculation of average values.

Regulatory-level gas analysers are automated devices and are usually installed in an environmentally controlled shelter. Such a station may also accommodate other equipment, e.g. a regulatory-level PM10 monitor. It is common that an analyser is used for each gas that must be monitored. The system operates automatically and its output is stored on a data logger for subsequent recovery and analysis. Such an installation must be visited every fortnight for maintenance purposes. It is customary to fit basic weather monitoring sensors, e.g. wind speed and direction, to such a station.

The budget costs for passive sampling devices amount to R 500.00 per device for hardware which is a once off cost and R 600.00 per device for consumables and analysis for a monitoring duration of two weeks. As monitoring over a period of two months is required, and it is customary to cover at least the four main compass directions, the costs per gas can be budgeted to amount to approximately R 12 000.00 for every two-month monitoring period.

The budget costs for a Scentinel multi-gas analyser are approximately R 500 000.

The budget costs for an automated regulatory-level air quality monitoring station, measuring SO₂ and NO₂, are approximately R 1 million.



ANNEXURE 1 | LEGISLATION

National Ambient Air Quality Standards 24 December 2009
(GN 1210 of GG No. 32816)

List of Activities which Result in Atmospheric Emissions which have or may have a Significant Detrimental Effect on the Environment, including Health, Social Conditions, Economic Conditions, Ecological Conditions or Cultural Heritage
01 April 2010
(GN 248 of GG No. 33064)

National Ambient Air Quality Standard for Particulate Matter with Aerodynamic Diameter less than 2.5 micron metres (PM2.5)
29 June 2012
(GN 486 of GG No. 35463)

National Dust Control Regulations
01 November 2013
(GN 827 of GG No. 36974)

Declaration of a small boiler as a controlled emitter and establishment of emission standards
01 November 2013
(GN 831 of GG No. 36973)

Regulations Prescribing the Format of the Atmospheric Impact Report
02 April 2015
(GN 747, as amended by GN R284)

National Atmospheric Emission Reporting Regulations
02 April 2015
(GN 283)

Amendments to the List of Activities which Result in Atmospheric Emissions which have or may have a Significant Detrimental Effect on the Environment, including Health, Social Conditions, Economic Conditions, Ecological Conditions or Cultural Heritage
12 June 2015
(GN 551 of GG No. 38863)

Declaration of Small-scale Char And Small-scale Charcoal Plants as Controlled Emitters and Establishment of Emission Standards
18 September 2015
(GN 602 of GG No. 39220)



Regulations Prescribing the Atmospheric Emission Licence Processing Fee

11 March 2016

(GN 250 of GG No. 39805)

Regulations for the Procedure and Criteria to be followed in the Determination of an Administrative Fine in terms of section 22a of the Act

18 March 2016

(GN 332 of GG No. 39833)

Air Quality Offsets Guideline

18 March 2016

(GN 333 of GG No. 39833)