Final Motivation for Postponement of the Compliance Timeframes of Regulation 11 of the Section 21 NEM:AQA Minimum Emissions Standards

Motivation Report Prepared by

September 2014

Final Motivation for Postponement of the Compliance Timeframes of Regulation 11 of the Section 21 NEM:AQA Minimum Emissions Standards

Sasol Chemical Industries (Pty) Limited operating through its Sasolburg Operations, formerly Sasol Infrachem, a division of Sasol Chemical Industries (Pty) Limited

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Executive Summary

This is an application for a postponement of the compliance timeframes of the Minimum Emissions Standards (MES) published in Notice No. 893 in Government Gazette 37054 of 22 November 2013 (GN 893), for certain special arrangements applicable to a single point source at the Sasol facility in Sasolburg.

For various reasons that are detailed in this report, this point source will not achieve compliance with all the special arrangements detailed in Part 3 of the MES within the prescribed compliance timeframes.

Accordingly, Sasol Infrachem makes an application for postponement, to allow time to investigate, design, obtain authorisations, approve, build and commission the necessary equipment to bring about compliance with special arrangements (a)(vi) of MES Category 8.1 for one incinerator at the Thermal Oxidation Plant. In essence, that special arrangement requires exit temperatures from incinerators to be maintained below 200 ºC. This application is termed within this document as the "initial postponement application".

Following conclusion of the public participation process, this application has been updated in three respects. First, based on the stakeholder comments received during the public participation process, Sasol has updated some aspects of the applications. Secondly, Sasol is in the process of restructuring its corporate structure and so the Introduction has been updated to explain those changes. Thirdly, Sasol has updated this report's Chapter 6, now entitled "Sasol's roadmap to sustainable air quality improvement". This is done to consolidate information presented throughout this application to emphasise Sasol's actions toward sustainable air quality improvement, aligned with the intent of the National Environmental Management: Air Quality Act (Act No. 39 of 2004) (NEM:AQA) and the MES, including Sasol's commitment to the ongoing investigation of and, where feasible, implementation of sustainable compliance solutions. In respect of this initial postponement, Sasol is able to achieve compliance within a 5 year period.

The application is made in terms of Regulation (11) of GN 893. Regulation (11) entitles a person to apply in writing to the National Air Quality Officer (NAQO) for a postponement from the compliance timeframes set out in Regulations (9) and (10).

Regulation (12) prescribes that an application for a postponement must include –

a) An air pollution impact assessment compiled in accordance with the Regulations prescribing the format of an Atmospheric Impact Report (as contemplated in Section 30 of the NEM:AQA) by a person registered as a professional engineer or as a professional natural scientist in the appropriate category.

b) A detailed justification and reasons for the application.

c) A concluded public participation process undertaken as specified in the National Environmental Management Act (Act No. 107 of 1998) (NEMA) Environmental Impact Assessment Regulations.

Regulation (13) limits the period for which a postponement will be granted to 5 years per postponement.

The requirements of Regulation (12) have therefore been met. An Atmospheric Impact Report has been included as well as an independent peer review report on the modelling methodology employed in the Atmospheric Impact Report. The detailed justification and reasons are included and have been supplemented by a technical appendix outlining compliance solutions with respect to the selected point sources which are the subject of this application. The public participation process was

undertaken as specified in the NEMA Environmental Impact Assessment Regulations and concluded in mid-June 2014.

Sasol respectfully requests postponement of the compliance timeframes for one incinerator at the Thermal Oxidation Plant, in respect of the aforementioned special arrangement, requiring exit gas temperatures to be maintained below 200 ºC. This postponement will enable Sasol Infrachem to complete the necessary technical investigations to identify the most appropriate solution for this requirement.

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Glossary

Definitions of terms as per GN 893 that have relevance to this application:

Existing Plant – Any plant or process that was legally authorized to operate before 1 April 2010 or any plant where an application for authorisation in terms of the National Environmental Management Act 1998 (Act No.107 of 1998), was made before 1 April 2010.

Fugitive emissions – Emissions to the air from a facility, other than those emitted from a point source.

New Plant – Any plant or process where the application for authorisation in terms of the National Environmental Management Act 1998 (Act No.107 of 1998), was made on or after 1 April 2010.

Point source – A single identifiable source and fixed location of atmospheric emission, and includes smoke stacks.

Point of compliance – Means any point within the off gas line, where a sample can be taken, from the last vessel closest to the point source of an individual listed activity to the open-end of the point source or in the case of a combination of listed activities sharing a common point source, any point from the last vessel closest to the point source up to the point within the point source prior to the combination/interference from another Listed Activity.

Definitions of terms as per the NEM:AQA that have relevance to this application:

Priority area – means an area declared as such in terms of Section 18 of NEM:AQA.

Priority area air quality management plan – means a plan referred to in Section 19 of NEM:AQA.

Additional terms provided for the purpose of clarity in this application:

Additional postponement applications – Sasol submitted draft applications for exemption in terms of Section 59 of NEM:AQA from certain Minimum Emissions Standards (MES), along with draft applications for postponement from certain MES. These exemptions were motivated on the basis that the applicable standards were infeasible based on, amongst others, technology, brownfields, environmental and economic constraints. Since the conclusion of the public commenting process, Sasol has been directed to rather seek postponement from the compliance timeframes in the MES to address its challenges. Sasol now makes application for postponement in respect of those applications which were previously submitted, advertised and made available for public comment, as exemption applications. These are referred to herein as *additional postponement applications*.

Alternative emissions limits – The standard proposed by Sasol based on what is considered reasonable and achievable as a consequence of the assessments conducted and which Sasol proposes as an alternative standard to be incorporated as a licence condition with which it must comply during the period of postponement. The alternative emissions limits are specified as *ceiling emissions limits* or *maximum emission concentrations*, as defined in this Glossary. In all instances, these alternative emission limits seek either to maintain emission levels under normal operating conditions as per current plant operations, or to reduce current emission levels, but to some limit which is not identical to the promulgated minimum emissions standards. Specifically, these alternative emissions limits do not propose an increase in current average baseline emissions.

Atmospheric Impact Report – In terms of the Minimum Emission Standards an application for postponement must be accompanied by an Atmospheric Impact Report as per Section 30 of the NEM:AQA. Regulations prescribing the format of the Atmospheric Impact Report (AIR) were published in Government Notice 747 (GN 747) of 2013.

Ambient standard – The maximum tolerable concentration of any outdoor air pollutant as set out in the National Ambient Air Quality Standards in terms of Section 9(1) of the NEM:AQA.

Ceiling emissions limit – Synonymous with "maximum emission concentrations". The administrative basis of the Minimum Emissions Standards is to require compliance with the prescribed emission limits specified for existing plant standards and new plant standards under all operational conditions, except shut down, start up and upset conditions. Whereas average emission values reflect the arithmetic mean value of emissions measurements for a given process under all operational conditions, the ceiling emission would be the 100^{th} percentile value of emissions measurements obtained. Hence, ceiling emission values would be higher than average emission values, with the extent of difference between ceiling and average values being dependent on the range of emission levels seen under different operational conditions. Since the Minimum Emissions Standards specify emissions limits as ceiling emissions limits or maximum emission concentrations, Sasol has aligned its alternative emissions limits with this format, to indicate what the 100^{th} percentile emissions measurement value would be under any operational condition (excluding shut down, start up and upset conditions). It is reiterated that Sasol does not seek to increase emission levels relative to its current emissions baseline through its postponement applications and proposed alternative emissions limits (specified as ceiling emission limits), but rather proposes these limits to conform to the administrative basis of the Minimum Emissions Standards.

Criteria pollutants – Section 9 of NEM:AQA provides a mandate for the Minister to identify a national list of pollutants in the ambient environment which present a threat to human health, well-being or the environment, which are referred to in the National Framework for Air Quality Management as "criteria pollutants". In terms of Section 9, the Minister must establish national standards for ambient air quality in respect of these criteria pollutants. Presently, eight criteria pollutants have been identified, including sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), carbon monoxide (CO), lead (Pb), particulate matter (PM_{10}), particulate matter ($PM_{2.5}$) and benzene (C_6H_6). In this document, any pollutant not specified in the National Ambient Air Quality Standards (NAAQS) is called a "non-criteria pollutant".

Existing plant standards – The emission standards which existing plants are required to meet. Emission parameters are set for various substances which may be emitted, including, for example, particulate matter, nitrogen oxides and sulfur dioxide.

Initial postponement applications – Consequent upon the first round of public participation which took place in September 2013, Sasol's draft applications for postponement in terms of Regulations (11) and (12) of GN 893 were made available for public comment in April 2014. These applications are referred to in this motivation report as *initial postponement applications*, and the final versions have been submitted to the National Air Quality Officer (NAQO). Copies of these documents are also available on SRK's website.

Listed activity – In terms of Section 21 of the NEM:AQA, the Minister of Environmental Affairs has listed activities that require an Atmospheric Emissions Licence. Listed Activities must comply with prescribed emission standards. The standards are predominantly based on 'point sources', which are single identifiable sources of emissions, with fixed location, including industrial emission stacks.

Maximum emission concentrations – Synonymous with "ceiling emissions limits". Refer to glossary definition for ceiling emissions limits.

Minimum emissions standards – Prescribed maximum emission limits and special arrangements for specified pollutants and listed activities. These standards are published in Part 3 of GN 893.

Minister – the Minister of Environmental Affairs.

New plant standards – The emission standards which existing plants are required to meet, by April 2020, and which new plants have to meet with immediate effect. Emission parameters are set for various substances which may be emitted, including, for example, particulate matter, nitrogen oxides and sulfur dioxide.

Postponement – A postponement of compliance timeframes for existing plant standards and new plant standards and their associated special arrangements, in terms of Regulations 11 and 12 of GN 893. In the context of Sasol's applications, these postponements are referred to as *initial postponements* and *additional postponements*, as defined in this Glossary.

GN 893 – Government Notice 893, 22 November 2013, published in terms of Section 21 of the National Environmental Management: Air Quality Act (Act No. 39 of 2004) and entitled '*List of Activities which Result in Atmospheric Emissions which have or may have a Significant Detrimental Effect on the Environment, Including Health and Social Conditions, Economic Conditions, Ecological Conditions or Cultural Heritage'*. GN 893 repeals the prior publication in terms of Section 21, namely Government Notice 248, 31 March 2010. GN 893 deal with aspects including: the identification of activities which result in atmospheric emissions; establishing minimum emissions standards for listed activities; prescribing compliance timeframes by which minimum emissions standards must be achieved; and detailing the requirements for applications for postponement of stipulated compliance timeframes.

Sasol Infrachem – Sasol Chemical Industries (Pty) Limited operating through its Sasolburg Operations, formerly Sasol Infrachem, a division of Sasol Chemical Industries (Pty) Limited. To avoid unnecessary confusion, the name "Sasol Infrachem" has been retained in this report.

Special arrangements – Any specific compliance requirements associated with a Listed Activity's prescribed emissions limits in Part 3 of GN 893. These include, among others, reference conditions applicable to the listed activity prescribed emission limits, abatement technology prescriptions and transitional arrangements

List of Abbreviations

AEL – Atmospheric Emissions Licence

AIR – Atmospheric Impact Report

ATR – Auto Thermal Reformer

BID – Background Information Document

CO – Carbon Monoxide

CTL – Coal-to-liquid

CRRs – Comment and Response Reports

EIA – Environmental Impact Assessment

ESP – Electrostatic Precipitator

GHG – Green House Gas

HCl – Hydrogen Chloride

HF – Hydrogen Fluoride

HSP – High Sulfur Pitch

I&APs – Interested and Affected Parties

MES – Minimum Emissions Standards

NAQO – National Air Quality Officer

NAQF – National Framework for Air Quality Management

NAAQS – National Ambient Air Quality Standards

NEMA – National Environmental Management Act

NEM:AQA – National Environmental Management: Air Quality Act

NGOs – Non-Government Organisations

NH_3 – Ammonia

NO_2 – Nitrogen Dioxide

NOx – Oxides of Nitrogen

NWMS – National Waste Management Strategy

PM – Particulate Matter

$PM_{2.5}$ – Particulate Matter with radius of less than 2.5 µm

PM_{10} – Particulate Matter with radius of less than 10 µm

SO_2 – Sulfur Dioxide

TOC – Total Organic Carbon

t/h – Tons per hour

VTAPA – Vaal Triangle Air-shed Priority Area

1 Introduction

Sasol is an international integrated energy and chemical company that employs more than 34 000 people working in 37 countries. In South Africa, Sasol owns and operates facilities at Secunda in the Mpumalanga Province, Sasolburg in the Free State Province and Ekandustria in Gauteng. The Sasolburg facility is made up of:

- Sasol Mining (Pty) Limited, which mines the utilities coal used at the Sasolburg Operations.
- Sasol Chemical Industries (Pty) Limited, operating through its Sasolburg Operations, including the entity formerly known as Sasol Infrachem ("Sasol Infrachem") which supplies utilities and reformed gas for production of chemicals.
- Sasol Chemical Industries (Pty) Limited, operating through its Sasolburg Operations, including those entities formerly known as Sasol Polymers, Sasol Solvents, Sasol Wax, Merisol and Sasol Nitro, all of which produce a range of downstream chemical products.

Sasol is currently undergoing corporate restructuring which involves consolidating the majority of its operations into a single business, namely, Sasol Chemical Industries (Pty) Limited ("SCI"). However, in order to avoid unnecessary confusion, references to these entities have been kept in this report as previously described. This postponement application relates to Sasol Chemical Industries (Pty) Limited, operating through the entity formerly known as Sasol Infrachem.

In March 2010, the Department of Environmental Affairs (DEA) published Minimum Emissions Standards (MES), in terms of the National Environmental Management: Air Quality Act (Act No. 39 of 2004) (NEM:AQA). In November 2013, the Regulation within which the MES was contained, was repealed and replaced, and this application is therefore aligned with the 2013 MES.

The MES serves to define maximum allowable emissions to atmosphere for a defined range of pollutants and specific activities that can result in such emissions. The MES also prescribe special arrangements which prescribe, amongst other things, reference conditions applicable to the listed activity prescribed emission limits, abatement technology prescriptions and transitional arrangements.

It is Sasol's intention to comply with the DEA's objective to improve air quality in South Africa. For various reasons that are detailed in this report, however, Sasol Infrachem will not be able to comply with the MES for certain emissions from their operations within the MES timeframes or for the foreseeable future. Sasol Infrachem is therefore applying for postponement of certain requirements contained in the MES ("initial postponements"). In addition Sasol Infrachem previously applied for exemption from default application of certain requirements contained in the MES for certain point sources. Since the conclusion of the public commenting process, Sasol has been directed to rather seek postponement from the compliance timeframes in the MES to address its challenges. Consequently the exemption application will be submitted as postponement applications ("additional postponements"), as explained within the separate Sasol Infrachem motivation report.

This document serves as Sasol Infrachem's motivation for the initial postponement, while a separate motivation has been prepared for Sasol Infrachem's additional postponement application.

The application for postponement of the obligation to comply with special arrangement (a)(vi) of Category 8.1 includes:

- This motivation report outlining detailed reasons and a justification for the postponement application.
- An independently compiled Atmospheric Impact Report (AIR) compiled in accordance with the Atmospheric Impact Report Regulations of October 2013.
- A Stakeholder Engagement Report outlining the public participation process that is being conducted in accordance with the National Environmental Management Act (Act No. 107 of 1998) (NEMA) Environmental Impact Assessment Regulations. This includes an overview of comments received from Interested and Affected Parties (I&APs), along with Sasol Infrachem's responses.

This motivation report is accordingly structured to present more detailed information on the activities of Sasol Infrachem. Thereafter, the MES are presented in general, together with the specific special arrangement for an incinerator at the Thermal Oxidation plant at Sasol Infrachem before the reasons compelling the postponement request are presented. In order to demonstrate the implications of the postponement requests on ambient air quality, the key findings of the AIR are presented, before presenting a summary of the public participation process that has been conducted in support of this and Sasol Infrachem's other application.

2 Sasol Infrachem

2.1 Overview

Sasol was established in 1950 and started producing synthetic fuels and chemicals in 1955, from the world's first commercial coal-to-liquids (CTL) complex in Sasolburg. The company privatised in 1979 and listed on the JSE Ltd in the same year. In the late 1970s and early 1980s, Sasol constructed two additional CTL Plants at Secunda. Sasol's activities in South Africa are both diverse and yet highly interdependent with main activities at facilities located in Secunda, Mpumalanga and Sasolburg, Free State.

Sasol is well known both locally and internationally for its core activity of converting coal to liquid fuels (known as coal-to-liquids or 'CTL'). What is perhaps less well known is the range of other activities that are built on and around that core CTL process. These various activities serve to maximise the range of products and associated value that can be derived from the basic raw materials that are used in the Sasol process, as well as the provision of so-called utilities (most notably steam) that are critical inputs to the industrial process. Sasol describes its business as one of 'integrated value chains'. By integrated value chains is meant a high degree of integration between all the process units whereby the maximum utility (and thus commercial value) can be derived from the basic material inputs of coal, natural gas, water and air.

2.2 The Sasolburg Complex

The Sasol Infrachem site (Figure 1) is located in Sasolburg in the Metsimaholo Local Municipality which is part of the Fezile Dabi District Municipality in the Free State Province. Sasol Infrachem supplies utilities and services (including infrastructure, waste management, site support and site governance) to various entities within the Sasolburg Operations (namely Sasol Polymers, Sasol Solvents, Sasol Wax, Merisol and Sasol Nitro) as well as external businesses in Sasolburg. Sasol Infrachem operates and maintains an auto thermal reformer (ATR), which reforms natural gas into synthesis gas for downstream production activities. As the custodian of the Sasolburg site's gas infrastructure, Sasol Infrachem's primary responsibility is to ensure that the reformed gas demand/supply is balanced and with assurance of supply to gas users on its site.

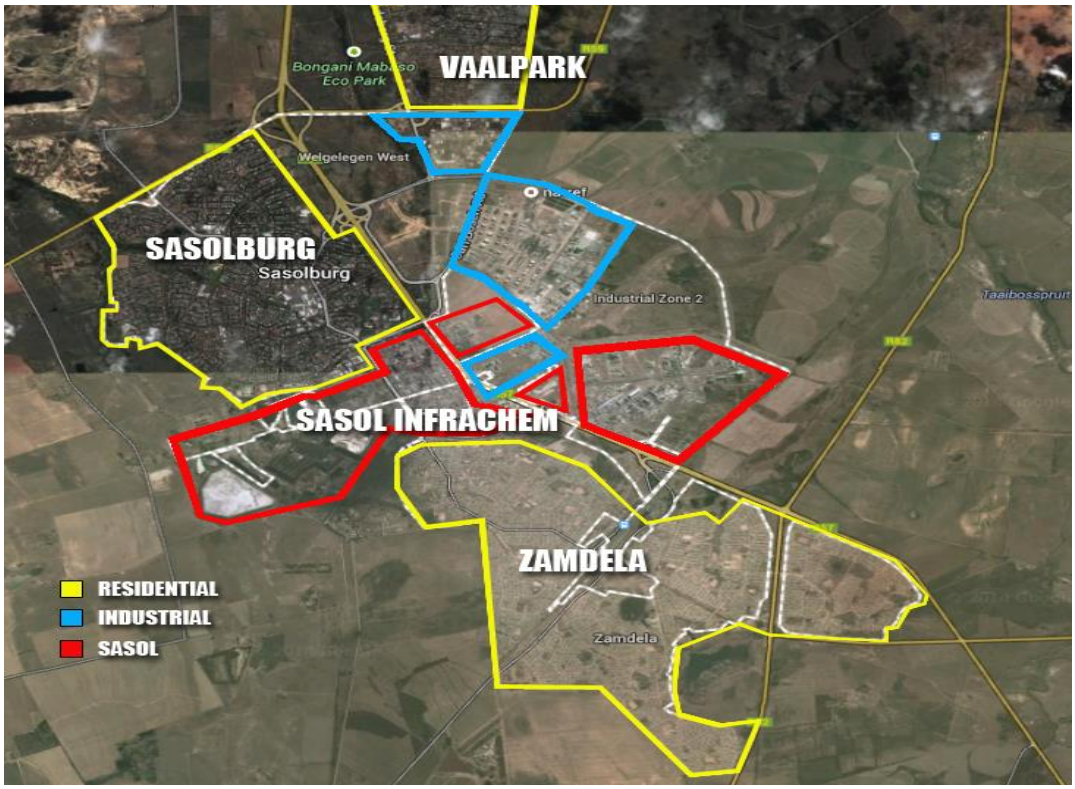

Figure 1: Map showing the position of Sasol Infrachem

2.3 Atmospheric emissions

As a result of Sasol Infrachem operations a range of atmospheric emissions are generated. The emissions are presented below as a function of the activities and facilities where they are emitted. These sources include the steam stations, incinerators and others and are illustrated in Figure 2.

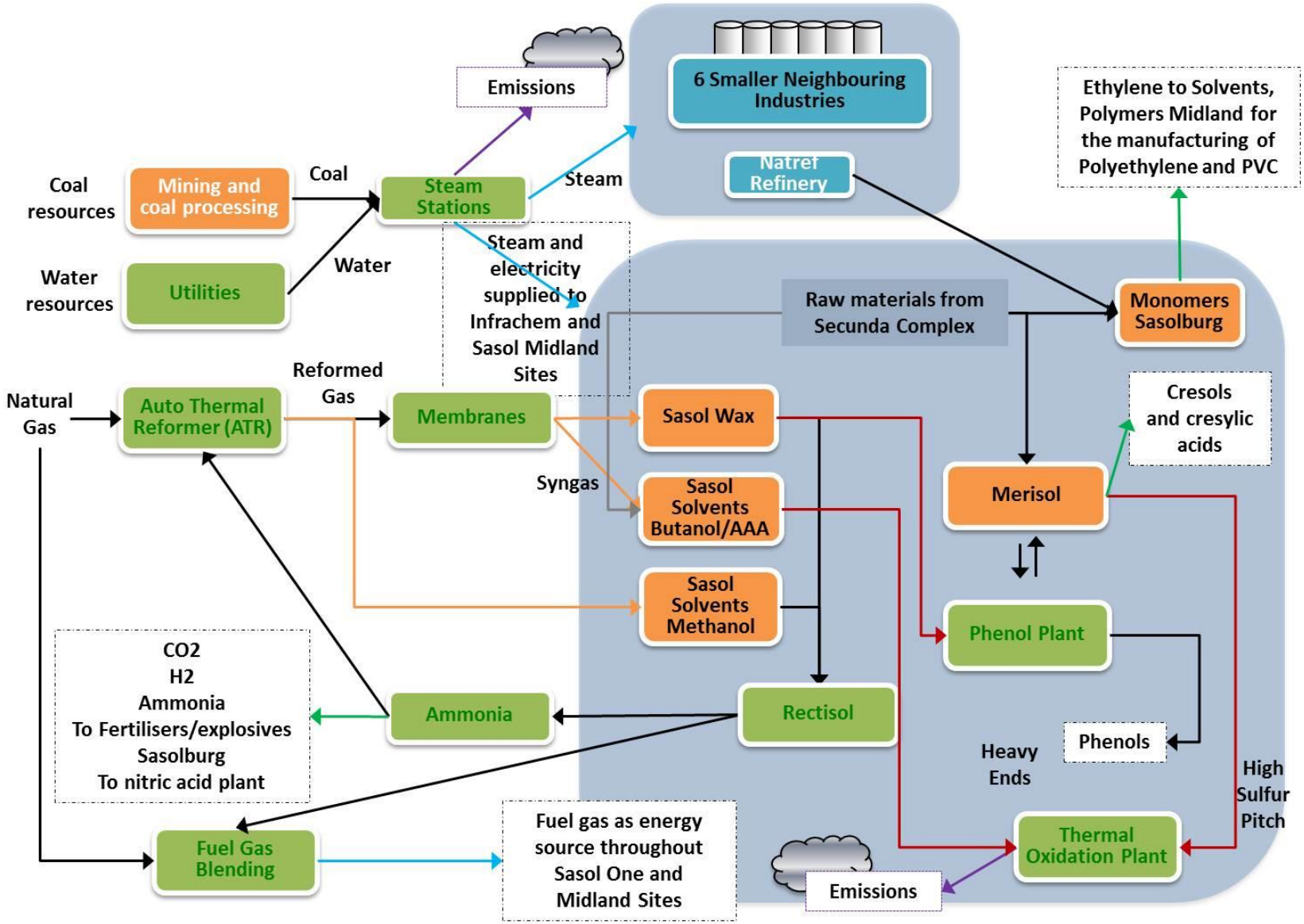

Figure 2: Schematised illustration of the industrial process at Sasolburg

The Thermal Oxidation Plant, the subject of this postponement application, is described in the next Section.

2.3.1 Thermal Oxidation Plant

At the Thermal Oxidation Plant, waste streams that are thermally treated originate from three other divisions of Sasol Chemical Industries, namely Sasol Merisol, Sasol Solvents and Sasol Monomers. These facilities can only operate if their waste streams can be addressed. The safe treatment of these waste streams and ultimate landfilling of the residues is critically dependent on the operation of the thermal oxidation facility, with the waste streams being oxidised in one of three incinerators:

- B6930 Incinerator – used to incinerate mainly High Sulfur Pitch (HSP) in a limestone fluidised bed unit. The waste stream contains HSP, organic solvents and high calorific value organic waters.
- B6990 Incinerator – used to incinerate Heavy Ends B. Waste streams containing heavy oils, off-specification waxes, Sasol spent catalyst, Funda filter cake, slop solvents and high calorific value organic waste are incinerated in this incinerator.
- B6993 Incinerator – used to incinerate spent Caustic in a down-fired incinerator.

Emissions from the incinerators could include PM, SO_2, NO_x, CO, HCl, TOCs, dioxins and furans, metals, mercury (Hg), cadmium plus thallium (Cd + Tl), hydrogen fluoride (HF) and ammonia (NH_3). While some of these pollutants are emitted at noticeable concentration, the loads (namely quantities released to the environment) are small. Exit gas temperatures of the B6990 incinerator exceed 200 °C.

The incinerators are also the subject of an additional postponement application, detailed in the separate Sasol Infrachem additional postponement motivation report.

3 The Minimum Emissions Standards

3.1 Overview

NEM:AQA is a specific environmental management act as contemplated in the NEMA, and aims to give effect to the Constitutional right to an "environment that is not harmful to health or 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". In this context, therefore, Sasol makes this application.

The Regulations identifying Listed Activities and prescribing MES for those activities were made in terms of Section 21 of the NEM:AQA, and promulgated in Government Notice 893 on 22 November 2013 (GN 893). Amongst others, Part 3 of the Regulations includes MES, which oblige existing production facilities to comply with certain emission limits and associated special arrangements by 1 April 2015 ("existing plant standards") unless otherwise specified, as well as with certain emission limits and associated special arrangements applicable to new plants by 1 April 2020 (new plant standards) unless otherwise specified. GN 893 includes, amongst others, the identification of activities which result in atmospheric emissions; establishing MES for the listed activities, including emission limits and associated special arrangements; prescribing compliance timeframes by which MES must be achieved; and detailing the requirements for applications for postponement of stipulated compliance timeframes.

The 2013 Regulations of GN 893 repealed and replaced the Regulations that had been published in March 2010 under Government Notice 248. GN 893 contains substantial amendments to the previous MES, including changes to the listed activities and their associated special arrangements, additional activities subject to regulation and changes to some of the prescribed emission limits. Notwithstanding the amendments, the compliance timeframes prescribed in the 2010 Regulations remain unchanged.

3.2 The MES applicable to Sasol Infrachem

The applicable MES are summarised in Table 1 together with an indication of whether or not Sasol Infrachem will comply with the prescribed limits and associated special arrangements. Sasol Infrachem is applying here for a postponement of the obligation to comply with special arrangement (a)(vi) of Category 8.1 and is making a parallel application for additional postponement from default application of other MES to Sasol Infrachem. Green colour coding reflects compliance with the MES for the Thermal Oxidation Plant, orange reflects the application for initial postponement as detailed in this motivation report and red reflects applications for additional postponement (detailed in a separate motivation report). Blue colour coding reflects the 2020 standards for which compliance is challenging, based on the assessment of presently available technologies.

As indicated in the table below, Sasol Infrachem is requesting a single initial postponement for the B6990 incinerator at the Thermal Oxidation Plant. The postponement which is the subject of this application is highlighted in orange in Table 1. The MES contains a special arrangement under Category 8.1 that requires flue gas temperatures of incinerators to be maintained below

200 °C. Modifications will be required to the B6990 incinerator to reduce the flue gas temperature, which will not be completed within the prescribed timeframes.

Table 1: Summary of Sasol Infrachem's compliance with the MES in respect of the Thermal Oxidation Plant (note that this is a summarised version of the MES)

MES Category	Substance(s)	Emission limits or special arrangements*		Applicable Sasol Infrachem Activities
		New plant standards	Existing plant standards	
Category 8: Sub-category 8.1	Particulate matter	10	20	B6930 (High Sulfur Pitch incinerator)
	Carbon monoxide	50	75	
	Sulfur dioxide	50	50	
	Oxides of nitrogen	200	200	
	Hydrogen chloride	10	10	
	Hydrogen fluoride	1	1	
	Sum of lead, arsenic, antimony, chromium, cobalt, copper, manganese, nickel, vanadium	0.5	0.5	
	Mercury	0.05	0.05	
	Cadmium + Thallium	0.05	0.05	
	Total Organic Compounds	10	10	
	Ammonia	10	10	
	Dioxins and furans	0.1	0.1	
	N/A	Exit gas temperatures must be maintained below 200ºC		
Category 8: Sub-category 8.1	Particulate matter	10	20	Incinerator B6990 (Heavy Ends B incinerator)
	Carbon monoxide	50	75	
	Sulfur dioxide	50	50	
	Oxides of nitrogen	200	200	
	Hydrogen chloride	10	10	
	Hydrogen fluoride	1	1	
	Sum of lead, arsenic, antimony, chromium, cobalt, copper, manganese, nickel, vanadium	0.5	0.5	
	Mercury	0.05	0.05	
	Cadmium + Thallium	0.05	0.05	
	Total Organic Compounds	10	10	
	Ammonia	10	10	
	Dioxins and furans	0.1	0.1	
	N/A	Exit gas temperatures must be maintained below 200ºC		
Category 8: Sub-category 8.1	Particulate matter	10	20	B6993 (Spent caustic incinerator)
	Carbon Monoxide	50	75	
	Sulfur dioxide	50	50	
	Oxides of nitrogen	200	200	
	Hydrogen chloride	10	10	
	Hydrogen fluoride	1	1	

MES Category	Substance(s)	Emission limits or special arrangements*		Applicable Sasol Infrachem Activities
		New plant standards	Existing plant standards	
	Sum of Lead, arsenic, antimony, chromium, cobalt, copper, manganese, nickel, vanadium	0.5	0.5	
	Mercury	0.05	0.05	
	Cadmium + Thallium	0.05	0.05	
	Total Organic Compounds	10	10	
	Ammonia	10	10	
	Dioxins and furans	0.1	0.1	
	N/A	Exit gas temperatures must be maintained below 200ºC		

**In the case of emission limits, these are specified as mg/Nm^3 under normal conditions of 273 Kelvin and 101.3 kPa, at respective O_2 reference conditions for each listed activity as specified in the MES; ng I-TEQ/Nm^3 in the case of dioxins and furans.*

Colour coding:

2020 standard for which no feasible technology is presently available to attain compliance and for which Sasol continues to seek reasonable measures for longer-term certainty

Additional postponements requested, on compliance timeframes for the prescribed emission limit or special arrangement

Initial postponement of compliance timeframes for the prescribed emission limit or special arrangement

Will comply with the prescribed emission limit or special arrangement within prescribed compliance timeframes

4 Reasons for Applying for Postponement

Sasol Infrachem operates incinerators at the Thermal Oxidation facility. This calls for responsible environmental management practices, to avoid potential risks associated with incinerator emissions, including dioxin and furan formation as described below.

Category 8.1 includes a special arrangement to restrict exit gas temperatures to below 200 ºC. One incinerator at the Thermal Oxidation facility, B6990, currently operates at elevated temperatures.

The reasons for this application for postponement are based on the time it will take Sasol Infrachem to complete technical investigations, approve and fully implement the intervention needed to reduce the exit gas temperature to below 200 ºC, to comply with the MES. Before that is elaborated on, an outline is provided on the current environmental management practices at the incinerator to mitigate environmental risks which potentially arise from the postponement of implementation of the special arrangement.

4.1 Mitigating risks of dioxin formation from higher exit gas temperatures

The requirement for incinerator flue gas exit temperatures to be lower than 200 °C reduces the risk of *de novo* dioxin and furan formation by ensuring that flue gases are below the temperature window where dioxins or furans can be formed. Incinerator B6990 was designed to operate at high temperatures above 1200 °C to ensure complete combustion of the feed material and thereby reduce emissions of other atmospheric pollutants such as carbon monoxide (CO) and Total Organic Compounds (TOC), which are also regulated with prescribed emission limits under Category 8.1 of the MES.

For the risk of dioxin and furan formation to materialise, two necessary preconditions are required: in addition to the optimal temperature window, the precursor chemical components for their formation – chlorinated compounds – must also be present in the flue gas. Without chlorinated compounds present, it would not be chemically possible for dioxins and furans to form, regardless of the temperature conditions within the stack. No feed streams containing chlorinated compounds are fed to the B6990 incinerator. Unlike general waste with numerous and varying feed sources that may contain chlorinated compounds, a finite set of feed streams to incinerator B6990 originate from within the factory, and are more homogenous with regards to feed composition. It is therefore unlikely that dioxins and furans could be formed.

4.2 Technology options and development schedule for compliance with special arrangement for Incinerator B6990

The exit gas temperature for incinerator B6990 exceeds 200 ºC. Reducing the exit gas temperature to comply with the special arrangement would require the installation of appropriate technology, for example waste heat recovery or the addition of a quench. Sasol Infrachem is exploring solutions for compliance with this special arrangement, and hence will continue with a formal project for this purpose.

In the current plant configuration there are significant space constraints around the Thermal Oxidation Plant, which may materially impact on Sasol Infrachem's ability to retrofit incinerator B6990 with either waste heat recovery or quench. This would potentially influence the technologies that may be considered, and may place constraints on practicable implementation of any technologies for this purpose. This is one reason why retrofits to an existing brownfields operation are considerably more challenging than building a new greenfields plant.

The above concerns notwithstanding, at present, insufficient technical work has been conducted to conclude definitively whether or not compliance can be achieved. There is no immediately obvious and easily installable technology that can be installed and this therefore requires further investigation. Accordingly, further investigation into compliance solutions is warranted, in line with Sasol's rigorous project due diligence procedures.

4.3 Postponement request

Sasol Infrachem applies for postponement of the obligation to comply with special arrangement (a)(vi) under Category 8.1 for incinerator B6990, pertaining to exit gas temperatures.

A five-year postponement is requested to allow for detailed investigations into the compliance implications, following the regulatory certainty obtained in November 2013. The postponement is

requested to fully investigate solutions, and if determined reasonable and appropriate, to approve, design, construct, commission and optimise the selected solution.

It is important to note that a subsequent application may be required depending on the outcome of the investigations. This notwithstanding Sasol Infrachem will make every reasonable effort to achieve compliance within the postponement period.

In the interim, Sasol Infrachem commits that, as per current practice, no feed streams containing chlorinated compounds will be fed into the B6990 incinerator, to circumvent the possibility of *de novo* dioxin and furan formation.

5 The Atmospheric Impact Report

5.1 Overview

The AIR is a regulatory requirement and has to be compiled and submitted as part of an application for postponements. The purpose of the AIR is to provide an assessment of the implications for ambient air quality and associated potential impacts, of the emissions that will occur if the postponement is granted and proposed alternative emissions controls were accepted. The AIR was completed by independent consultants and not Sasol Infrachem itself. Airshed Planning Professionals (Airshed) was appointed to this end. The full AIR is included in Annexure A, with key elements of the report and the findings being summarised in this Section of the report.

It should be noted that the postponement in question, being the reduction in exit gas temperatures for incinerator B6990 of the Sasol Infrachem Thermal Oxidation Plant, will not result in a reduction in emissions, but it will in all likelihood reduce the dispersion potential of the plume. Although this was not assessed, it is expected that the impact on the ambient air quality will be minimal, since it will bring the plume closer to the source, hence resulting in a minimal increased impact on the already small impact from the incinerators on ambient air quality. Regarding the potential curbing of the *de novo* formation of dioxins, it is expected that the change in temperature will not have any effect, since the precursors for dioxin formation are not present within the flue gas.

Notwithstanding the above, the results of dispersion modelling for cumulative emissions from the B6990, B6993 and B6930 incinerators at the Thermal Oxidation Plant are presented below. These show the ambient concentrations of incinerator emissions in the model domain as a function of the concentration of emissions from the incinerators under emission limit scenarios including compliance with existing plant standards and new plant standards.

5.2 Study approach and method

5.2.1 Dispersion modelling

Dispersion modelling is a key tool in assessing the ambient air quality implications of atmospheric emissions. A dispersion model serves to simulate the way in which emissions will be transported, diffused and dispersed by the atmosphere and ultimately how they will manifest as ‘ground-level’ or ‘ambient’ concentrations. For the purposes of this assessment, the “Regulations Regarding Air Dispersion Modelling” (Government Gazette 533, published 11 July 2014) were used to guide dispersion model selection. The CALPUFF model was selected mainly because it can simulate

pollution dispersion in low wind (still) conditions. In addition CALPUFF can be used to model chemical transformations in the atmosphere, specifically in relation to the conversion of NO to NO_2 and the secondary formation of particulates.

5.2.2 Peer review of dispersion modelling methodology

The dispersion modelling methodology was reviewed by E^{x}ponent Inc., which was identified as the appropriate peer reviewer in light of its extensive international experience in the design, development, and application of research and regulatory air quality models. One of E^{x}ponent's directors played a significant role in the development of the CALPUFF modelling system. The peer reviewer was provided with a plan of study and the draft AIR, which was prepared by Airshed in accordance with the Dispersion Modelling Regulations, as referenced by the AIR Regulations of October 2013.

The peer reviewer's findings were assessed in terms of their potential impact on air quality. For cases where the peer review findings were identified as having a potentially significant impact on ambient air quality, the dispersion model inputs or settings were revised and the model was re-run taking into account the recommendations. Conversely where the findings were expected to have very marginal effects on the results, the findings were noted. Airshed's plan of study, the peer reviewer's report and Airshed's comments on each of the findings are included as Annexure B.

Two key comments were considered material for the purposes of the study, and actions were taken to address the findings.

The first relates to the use of the Probability Density Function (PDF) for dispersion from tall stacks under convective conditions, typical of the Highveld. This is of significance for tall stacks in convective conditions since it better considers short-term elevated concentrations that typically occur during down draught conditions. This finding was not deemed to be significant for the Sasolburg simulation, since convective conditions are less likely than in the Highveld and good model correlation with measured values was already achieved.

The second relates to the peer reviewer's aim of replicating Airshed's results independently. Errors in the initial input files sent to the peer reviewer meant that Airshed's updated modelled results could not be replicated. Since it was important for the peer reviewer's assessment to independently model and obtain similar results to Airshed, updated input files were sent to E^{x}ponent for a re-run until the results were satisfactory.

The remainder of findings and comments on these are detailed in Annexure B. They relate to, among others, land use category data, wet and dry deposition of emissions and chemical transformation of NO_x.

5.2.3 Ambient air quality monitoring stations

As opposed to predicted ambient concentrations using a dispersion model, ambient air quality monitoring serves to provide direct physical measurements of selected key pollutants. Sasol operates three ambient air quality monitoring stations in and around Sasolburg, namely at AJ Jacobs, Leitrim and Ecopark. Data for 2010, 2011 and 2012 from AJ Jacobs and Leitrim were included in the AIR investigation, since operation of the Ecopark station only commenced in 2012. NO_2, NO and NO_x observations made at Ecopark monitoring station for 2012 were, however,

included in the analysis of NO_2/NO_x ratios. The monitoring stations are accredited (ISO/IEC17025) to ensure data quality and availability, with 90% data availability for the three years.

5.2.4 Emissions scenarios

In order to assess the impact of each of the additional postponements for which Sasol has applied, four emissions scenarios were modelled, with the results throughout the AIR presented as illustration in Figure 3.

1. **Current baseline emissions**, reflective of the impacts of present operations, which are modelled as *averages* of measurements taken from continuous emission monitoring (where available) or periodic emission monitoring. This scenario is the represented by the first column in the presentation of all AIR graphs (shown in blue in Figure 3). Baseline emissions were derived from accredited (ISO/IEC17025) third parties and laboratories. Emissions measurements follow the requirements prescribed in Schedule A of GN 893. The reason baseline emissions were modelled as averages of measured point source emissions was to obtain a picture of long-term average impacts of Sasol Infrachem's emissions on ambient air concentrations, which could be reasonably compared with monitored ambient concentrations, as a means of assessing the representativeness of the dispersion model's predictions. Modelling baseline emissions at a ceiling level, which is seldom reflective of actual emissions, would over-predict ambient impacts and therefore not allow for reasonable assessment of the model's representativeness.

The following three scenarios are modelled to reflect the administrative basis of the MES, being ceiling emission levels. These scenarios are therefore theoretical cases where the point source is constantly emitting at the highest expected emission level possible under normal operating conditions, for the given scenario (i.e. the maximum emission concentration).

2. **Compliance with the 2015 existing plant standards.** This is modelled as a ceiling emissions limit (i.e. maximum emission concentration) aligned with the prescribed standard, and reflects a scenario where abatement equipment is introduced to theoretically reduce emissions to conform to the standards. This scenario is the represented by the second column in the presentation of all AIR graphs (shown in red in Figure 3);
3. **Compliance with the 2020 new plant standards.** This is modelled as a ceiling emissions limit (i.e. maximum emission concentration) aligned with the prescribed standard, and reflects a scenario where abatement equipment is introduced to theoretically reduce emissions to conform to the standards. This scenario is the represented by the third column in the presentation of all AIR graphs (shown in green in Figure 3); and
4. **A worst-case scenario of operating constantly at the requested alternative emissions limits**, which have been specified as ceiling emissions limits (i.e. maximum emission concentrations). This scenario is the represented by the fourth column in the presentation of all AIR graphs (shown in purple in Figure 3). It is re-emphasised that Sasol Infrachem will not physically increase its current baseline emissions (expressed as an average). In some instances the scenario appears higher than the baseline, only because it portrays the worst case outcome where the maximum emission concentration occurs under the 99^{th} percentile worst meteorological conditions – and this is modelled assuming these conditions prevail for the entire duration of the modelling period. Sasol seeks alternative emissions limits which are aligned with the manner in which the MES are stated and which accommodate the

natural variability inherent in emissions under different operating conditions, and hence must request a ceiling emissions limit rather than an average emissions limit. Hence the alternative emission limit is simply a different way of expressing current baseline emissions (in cases where further abatement is not possible), or may even reflect a reduction in average baseline emissions (in cases where further abatement is possible, but not to a level which achieves compliance with the MES ceiling emissions limits).

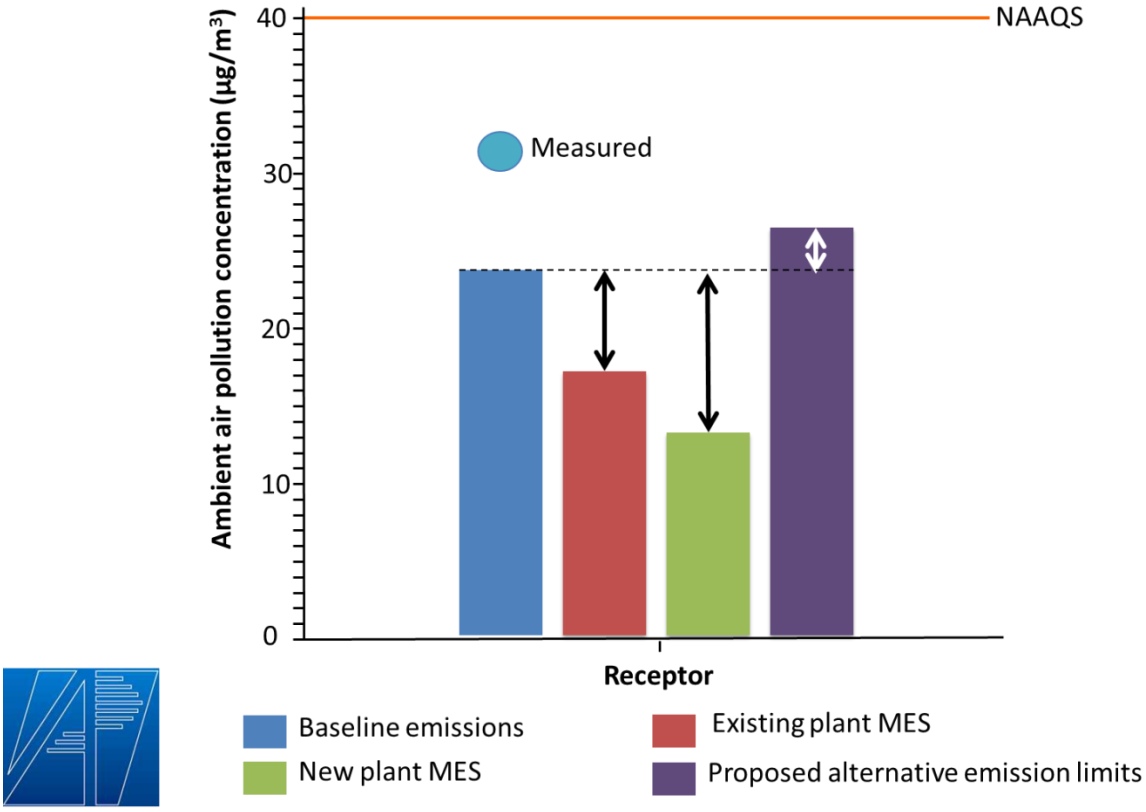

Figure 3: Schematic displaying how the dispersion modelling scenarios are presented in the AIR, for each receptor point in the modelling domain

In Figure 3, the black arrows above the red and green bars reflect the predicted delta (i.e. change) in ambient impacts of Sasol's baseline emissions versus the given compliance scenario. At a practical level, the white arrow on the purple bar represents the theoretical delta increase in short-term ambient impacts, where maximum emission concentrations occur, compared with the predicted impact of average current baseline emissions.

The blue dot in Figure 3 represents physically measured ambient air quality, reflective of the total impact of all sources in the vicinity, as the 99th percentile recorded value over the total modelling period. On a given day, there is a 99% chance that the actual measured ambient air quality would be lower than this value, but this value is reflected for the purpose of aligning with modelling requirements.

The orange line represents the applicable National Ambient Air Quality Standard (NAAQS) or, where not available, relevant international benchmark, used for interpretation of the dispersion modelling results, as described in Section 5.2.5.

5.2.5 National Ambient Air Quality Standards

Once ambient concentrations have been predicted using the dispersion model, or direct physical measurements sourced, the predicted or measured concentrations are typically compared to defined standards or other thresholds to assess the health and/or environmental risk implications of the predicted or measured air quality. In South Africa, NAAQS have been set for criteria pollutants at limits deemed to uphold a permissible level of health risk and the assessment has accordingly been based on a comparison between the predicted concentrations and the NAAQS. The measured concentrations have been used to ascertain the representativeness of the modelling and to assess compliance with the NAAQS as a function of all sources of emissions.

For non-criteria pollutants where NAAQS have not been set, health-effect screening levels that could be used for assessing the non-criteria pollutants emitted by the incinerators have been identified from literature reviews and internationally recognised databases. These non-criteria pollutants for which screening levels were identified, include various emissions from incinerators, namely lead, arsenic, antimony, chromium, cobalt, copper, manganese, nickel and vanadium. The benchmarks used are listed in Table 2.

Table 2: Most stringent health-effect screening level identified as health effect screening level for non-criteria pollutants assessed.

Compound	Acute exposure[(a)] [units: µg/m^3]	Chronic exposure[(b)] [units: µg/m^3]
Lead (Pb)	(c)	(d)
Arsenic (As)	0.2 (g)	0.015 (g)
Antimony (Sb)	(c)	(d)
Chromium (Cr)	(c)	0.1 (e)
Cobalt (Co)	(c)	0.1 (f)
Copper (Cu)	100 (g)	(d)
Manganese (Mn)	(c)	0.05 (e)
Nickel (Ni)	0.2 (g)	0.014 (g)
Vanadium (V)	0.8 (f)	0.1 (f)
Ammonia (NH_3)	1184(f)	(d)
HCl	2100(g)	(d)
HF	240(g)	(d)

(a) Hourly concentrations compared with short-term / acute exposure health effect screening level
(b) Annual concentrations compared with long-term / chronic exposure health effect screening level
(c) No hourly health screening level
(d) No annual health screening level
(e) US-EPA IRIS Inhalation Reference Concentrations (µg/m³) – chronic
(f) US ATSDR Maximum Risk Levels (MRLs) (µg/m³) - acute
(g) Californian OEHHA (µg/m³) – acute
(h) No annual health screening level

5.2.6 Sensitive receptors

Twelve sensitive receptors were defined in and around the Sasolburg complex and at various distances from the sources within the 50 km-by-50 km modelling domain. The twelve receptors include residential areas, ambient air quality monitoring stations and points of maximum predicted pollutant concentrations, and are illustrated in Figure 4 and tabulated in Table 3. The predicted ambient concentrations for each of the four emissions scenarios have been presented as bar charts relative to the NAAQS (where these exist) and to measured ambient concentrations (also where these exist) for each sensitive receptor. The sensitive receptors are listed in Table 3.

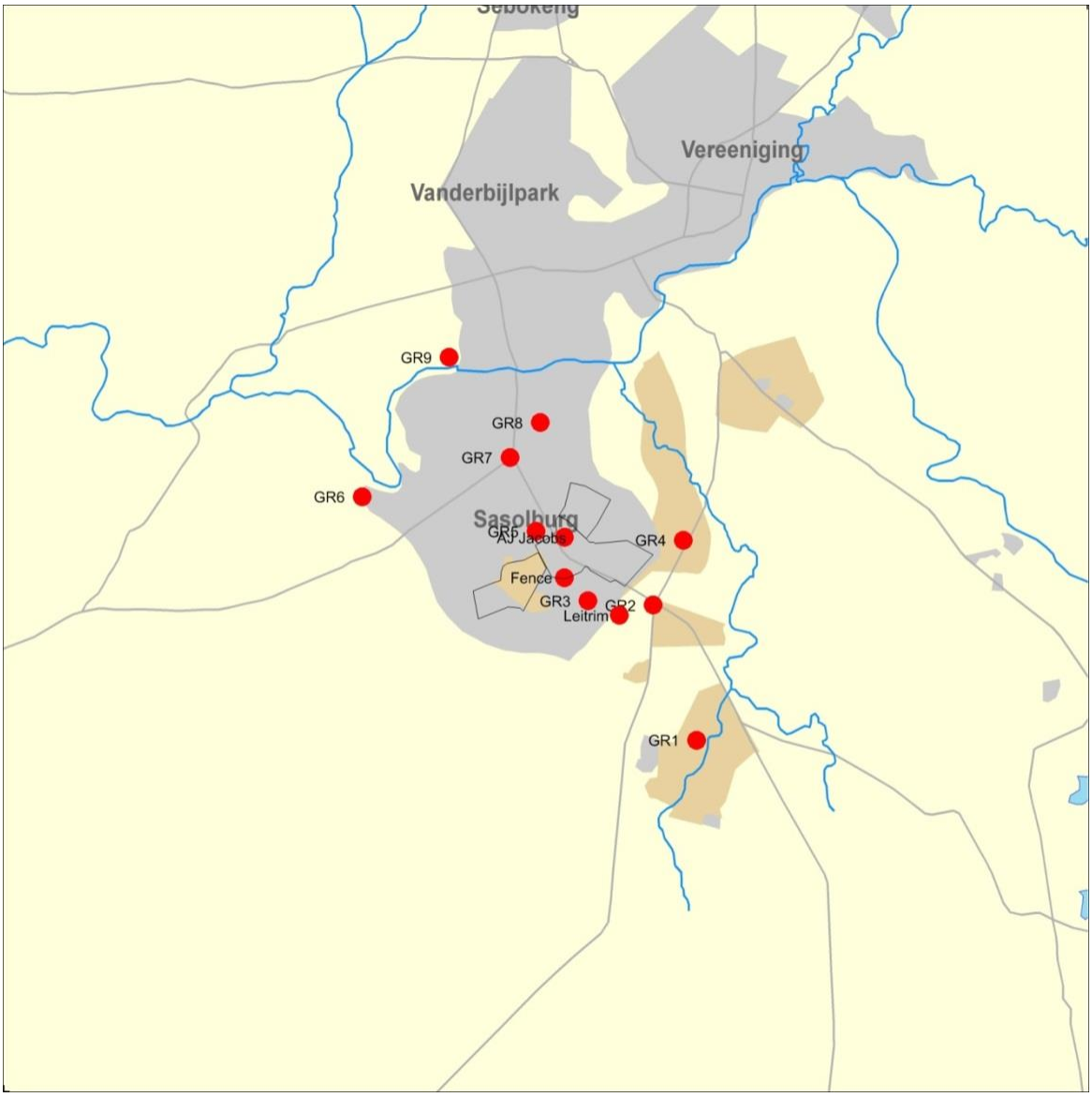

Figure 4: Map showing the positions of the twelve sensitive receptors identified for presenting the predicted ambient air quality for the different pollutants referenced in this application and for each emissions scenario

Table 3: Summary listing of the sensitive receptors illustrated in Figure 4

Receptor code name [(a)]	Receptor details	Distance from source (metres) [(b)]
GR5	Sasolburg - point of maximum	1 176
AJ Jacobs	SASOL AJ Jacobs monitoring station	1 391
Fenceline	SASOL Fence-line monitoring station	1 410
GR3	Zamdela - point of maximum	2 858
Leitrim	SASOL Leitrim monitoring station	4 268
GR7	SASOL Eco-Park monitoring station	4 668
GR2	Zamdela (boundary)	5 224
GR8	Vaalpark	5 817
GR4	Edge of industrial zone (East of plant)	5 930
GR6	Marlbank river estate AH	9 195
GR9	Vanwaarshof AH	10 044
GR1	Edge of impact plume (South East of plant)	10 968

5.2.7 Model performance

Although atmospheric models are indispensable in air quality assessment studies, their limitations should always be taken into account. As detailed in the AIR, dispersion modelling has inherent uncertainty. The accuracy of the model predicted ambient concentrations are vulnerable to three main sources of errors resulting from: incorrect input emissions data; inaccurate meteorological data and inadequate scientific formulation of the model.

The emphasis in this assessment has been on the ‘delta’, being the difference in predicted ambient concentrations under the four emissions scenarios modelled. The model uncertainty is therefore a constant factor among the scenarios, and the delta can be considered, with a reasonable degree of confidence, as representative of the differences in ambient concentrations that would materialise under different emissions scenarios. The intention behind the atmospheric impact modelling for this motivation has therefore been to show the contribution of each source applying for postponement to ground level concentrations of applicable criteria pollutants in the vicinity of the Sasol Infrachem facility. The delta approach is strongly consistent the risk based approach that underpins Sasol Infrachem’s environmental management philosophy. The modelled contribution of the baseline scenario is compared with the modelled contributions of the scenarios depicting compliance with existing and new plant standards, to determine the difference that compliance with the MES will make to ambient concentrations of these pollutants in relation to the NAAQS. Since the aim of the dispersion modelling was to illustrate the change in ground level concentrations from the current levels (the baseline emission scenario) to those levels resulting from compliance with the prescribed emission limits (the existing and new plant standards), the intention was not comprehensively to include all air emissions from Sasol Infrachem or those associated with activities other than Sasol Infrachem. Unaccounted emissions include those from unintended emissions within the plant (fugitive emissions) and small vents, as well as air emissions from other industries, emissions from activities occurring within the communities and domestic fuel burning (especially during the winter season), as well as long-range transport of pollutants into the local air shed.

Since model inputs are only estimates, even the most sophisticated models will have inherent uncertainties and will have the potential to underestimate or overestimate actual concentrations. Model performance was assessed by using the fractional bias method, as recommended by the US Environmental Protection Agency, which concluded that model predictions lay well within a factor of two when compared with the measured data, and hence was considered reasonably representative. Further detail on this analysis is included in the AIR.

5.2.8 Compliance with AIR Regulations

Due to the nature of this specific application, the procedure prescribed by the AIR Regulations was adapted to reflect the purpose of the assessment, as described below. It therefore, represents a "fit for purpose" assessment. This notwithstanding, as also explained in the preface to the AIR, further detail on our point sources which do not form part of the postponements have been incorporated into the AIR in light of stakeholder comments received. This information does not alter the conclusions arising from the initial air quality assessment.

A. Baseline Modelling

The dispersion modelling was conducted using baseline emissions representative of normal operating conditions. The MES regulates normal operating conditions; therefore only normal operating conditions were included in the assessment. Maximum emissions and emissions during start-up, shut-down, maintenance or upset conditions are in many cases not available as measurements are not conducted during these upset conditions. Due to safety concerns and practical considerations, emissions are measured during operations representative of normal operating conditions during planned, scheduled measurement campaigns.

B. Fugitive Emissions

Sasol manages fugitive emissions from its facilities, which includes fallout dust in the case of Sasolburg Operations. The dust fallout management approach is described further in the AIR.

C. Modelling of the B6990 Incinerator emissions

Due to operating conditions on furnace B6990, the flue gas temperature exceeds viable temperatures for PM, metals, and dioxin/furans sampling (US EPA method 29). As no reliable data for these emissions is available, the PM, metals and dioxins/furans emissions from the B6990 incinerator have not been included in the dispersion model. Measurements are however available (and included in the model) for CO, SO_2, NO_x, HCl, HF, TOC and NH_3.

Since the materials fed into the incinerator originate from within the factory, and are homogenous with regards to their composition, Sasol Infrachem believes the impact of PM, metals and dioxins/furans is no greater than for B6993 and B6930, which have been modelled. Work is ongoing to improve measurement of emissions within such a high stack temperature domain and will form part of the technical evaluation going forward.

5.3 Key findings

In presenting these findings it is necessary to briefly describe the use of the 99th percentile to show predicted and measured ambient air pollution concentrations. As a simulation (and simplification) of reality, dispersion models will always contain some degree of error. Model validation studies elsewhere have indicated that typically the highest predicted concentrations are

overestimated as a result of the way that meteorological processes are parameterised in the model.

At the same time the NAAQS include both a limit value and the requirement that the limit value be met for at least 99% of the time. For hourly average values (such as the ambient SO_2 and NO_2 standards), that implies that the limit value can be exceeded for up to 88 hourly average values (or 1% of the time). Equivalently for daily averages (such as the ambient PM_{10} standard) up to 4 daily average values can be exceeded. For annual averages the limit value is the standard with no exceedances being allowed. All the predicted and measured values shown in this report are based accordingly on the 99th percentile values except for annual averages.

5.4 Summary of AIR results

5.4.1 Particulate Matter

As described in further detail in Section 5.1.4.4 of the AIR, the CALPUFF modelling suite enabled inclusion of the impact of the chemical conversion of sulfur dioxide and nitrogen oxides to secondary particulates within the dispersion model results. Thus, the predicted PM_{10} concentrations reflected in the AIR dispersion modelling results include direct emissions of PM_{10} plus secondary particulates formed from Sasol's emissions.

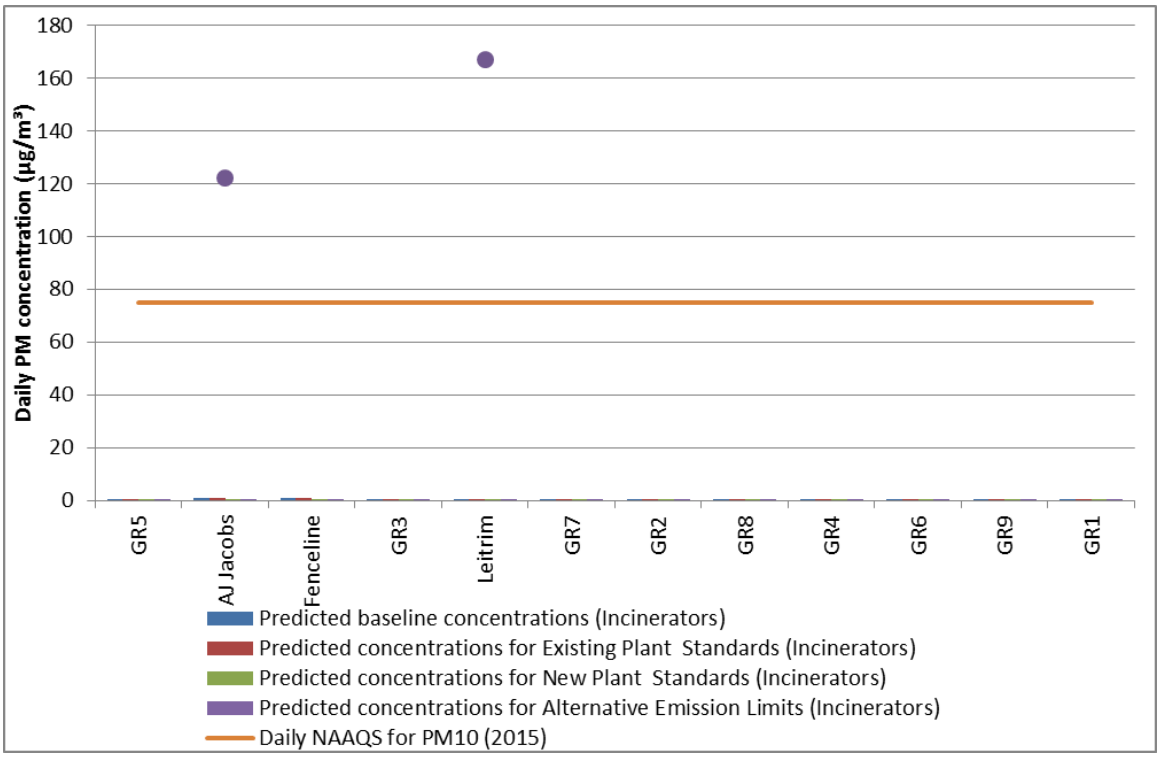

Figure 5: Measured and predicted 99th percentile hourly PM concentration at identified receptors for Thermal Oxidation plant (excluding incinerator B6990)

Figure 5 demonstrates elevated ambient PM_{10} concentrations measured at two receptors, significantly in excess of the national ambient air quality standards (NAAQS). PM emissions from incinerator B6990 are not included in this model, as explained above. The ambient PM impact is, however, expected to be similar to the other two incinerators, based on flow parameters and

visibility of the plume. The AIR indicates that PM emissions from the other two incinerators at the Thermal Oxidation Plant contribute negligibly to the ambient PM concentrations.

5.4.2 Sulfur dioxide

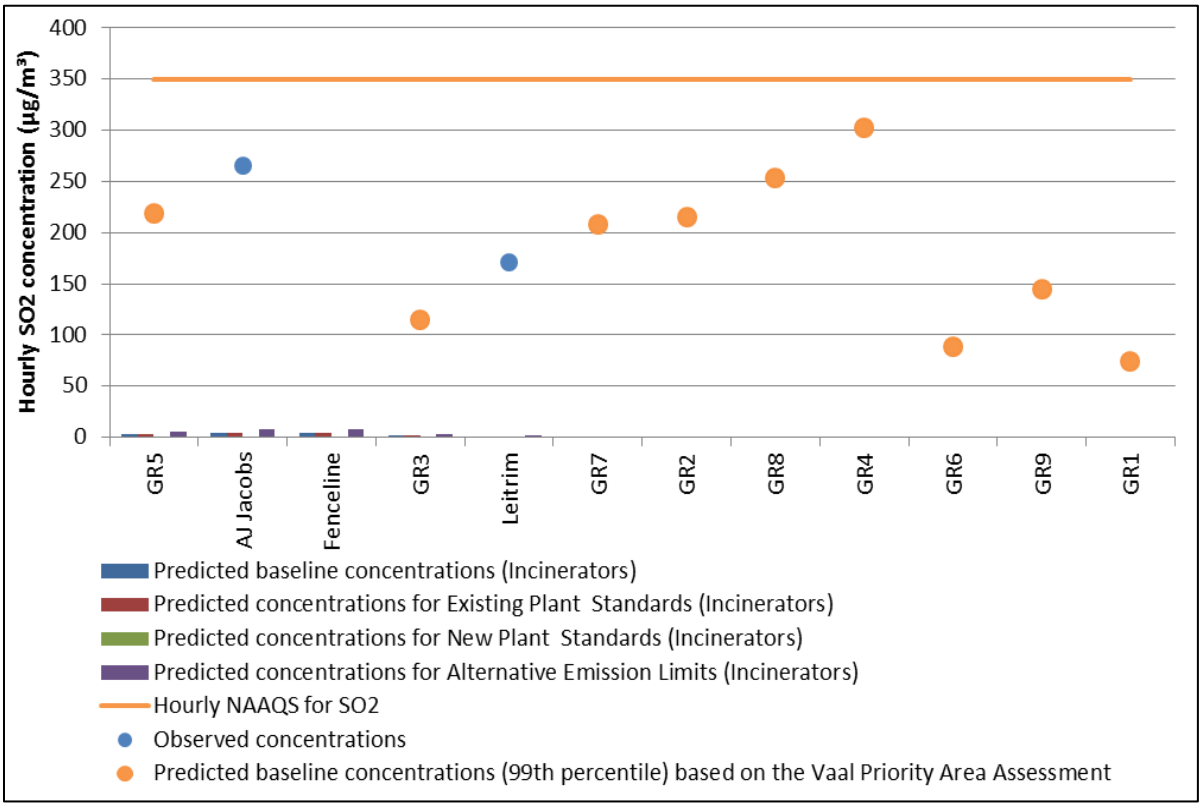

Figure 6: Measured and predicted 99th percentile hourly SO_2 concentration at identified receptors for Infrachem Incinerators

The ambient hourly SO_2 concentrations in the area around the plant are within the 350 ug/m^3 limit value specified by the NAAQS, as shown in Figure 6. 26 hourly exceedances of the NAAQS are experienced, compared with the 88 per year allowed by the NAAQS. The overwhelming majority of values are much lower – for Leitrim, for example, 90% of the average concentration of SO_2 over the 3 year monitoring period is 51,7 ug/m^3 or less and for AJ Jacobs is 86,4 ug/m^3 or less, compared with the NAAQS of 350 ug/m^3.

The dispersion model results indicate that the incinerators have a very limited impact on ambient SO_2 concentrations.

5.4.3 Oxides of Nitrogen

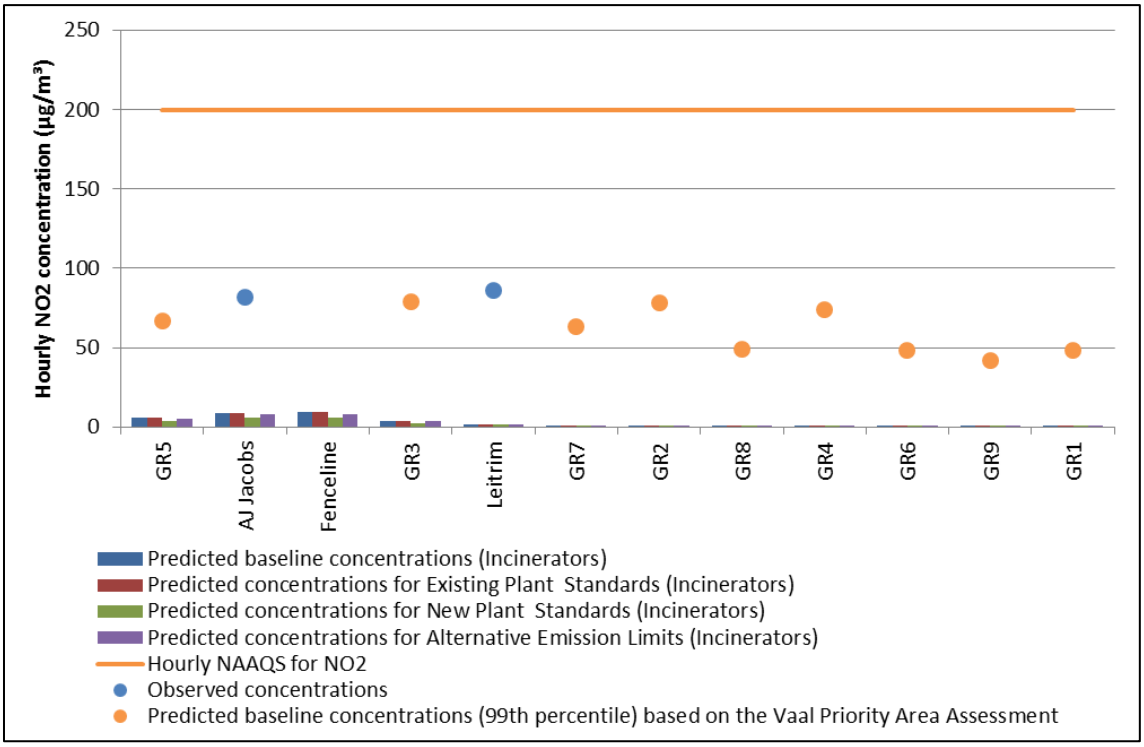

Figure 7: Measured and predicted 99th percentile hourly NO_2 concentration at identified receptors for Infrachem Incinerators

Figure 7 demonstrates that the ambient hourly NO_2 concentrations in the area around the plant are well within the 200 ug/m^3 limit value specified by the NAAQS, with the 99th percentile value at the AJ Jacobs and Leitrim monitoring stations being 74.6 ug/m^3 and 82.9 ug/m^3 respectively, and only 3 exceedances recorded over the 3 year monitoring period (compared with the 88 per year allowed by the NAAQS).

The dispersion model results indicate that the incinerators have a very limited impact on ambient NO_x concentrations.

5.4.4 Non-criteria pollutants

A screening exercise of non-criteria pollutants emitted from the incinerators at Thermal Oxidation was conducted, since no NAAQS exist against which to compare modelled impacts. The purpose of the assessment was to compare the modelled ambient concentrations of these pollutants to the strictest health effect screening levels derived from the following sources: World Health Organisation (WHO); US-EPA IRIS inhalation reference concentrations; Californian OEHHA; and US ATSDR Maximum Risk Levels. The strictest health effect screening level used is illustrated in Table 4.

Table 4: Strictest health effect screening level for non-criteria pollutants assessed

Compound	Acute exposure[(a)] [units: µg/m^3]	Chronic exposure[(b)] [units: µg/m^3]
Lead (Pb)	(c)	(d)
Arsenic (As)	0.2 (g)	0.015 (g)
Antimony (Sb)	(c)	(d)
Chromium (Cr)	(c)	0.1 (e)
Cobalt (Co)	(c)	0.1 (f)
Copper (Cu)	100 (g)	(d)
Manganese (Mn)	(c)	0.05 (e)
Nickel (Ni)	0.2 (g)	0.014 (g)
Vanadium (V)	0.8 (f)	0.1 (f)
Ammonia (NH_3)	1184(f)	(d)
HCl	2100(g)	(d)
HF	240(g)	(d)

(a) Hourly concentrations compared with short-term / acute exposure health effect screening level
(b) Annual concentrations compared with long-term / chronic exposure health effect screening level
(c) No hourly health screening level
(d) No annual health screening level
(e) US-EPA IRIS Inhalation Reference Concentrations (µg/m³) – chronic
(f) US ATSDR Maximum Risk Levels (MRLs) (µg/m³) – acute
(g) Californian OEHHA (µg/m³) – acute
(h) No annual health screening level

Table 5 shows a summary of the screening exercise for the non-criteria pollutants that would possibly exceed the screening level concentrations, namely manganese (Mn), ammonia (NH_3), benzene (as an indicator of total organic compounds, or TOCs), hydrogen chloride (HCl) and hydrogen fluoride (HF). This exercise demonstrates that for non-criteria pollutants, both the strictest acute (hourly) and chronic (average annual) limits are not exceeded. While metal emissions from the B6990 incinerator are not included in this model, the ambient impact is expected to be similar to the other two incinerators. The full results of the non-criteria pollutant screening exercise are reflected in the AIR.

Table 5: Summary listing of the maximum predicted concentrations of selected non-criteria pollutants compared to the strictest health effect screening levels (see Table 4). The predicted concentrations derive from combined emissions from incinerators B6990, B6993 and B6930

Compound	Maximum concentration[(a)]	Screening level
Baseline operations		
Mn*	0.0005	0.05 [(b)]
NH_3	0.550	1184 [(c)]
HCl	0.174	2100 [(c)]
HF	0.050	240 [(c)]
Benzene	0.079	5 [(d)]
Existing and New Plant Standards		
Mn*	0.0001	0.05 [(b)]
NH_3	0.480	1184 [(c)]
HCl	0.147	2100 [(c)]
HF	0.050	240 [(c)]
Benzene	0.039	5 [(d)]
Alternative emissions limit scenario		
Mn*	0.0016	0.05 [(b)]
NH_3	0.542	1184 [(c)]
HCl	0.105	2100 [(c)]
HF	0.050	240 [(c)]
Benzene	0.03	5 [(d)]

(a) Maximum predicted concentration across the 12 receptors
(b) Chronic exposure level, µg/m^3
(c) Acute exposure level, µg/m^3
(d) South African NAAAQS

* Includes Mn emissions from B6930 and B6993, not B6990

5.5 Overall findings of the AIR

5.5.1 Compliance with the NAAQS

The purpose of the MES is to achieve the intent of the NEM:AQA which means ensuring that ambient air quality is achieved that does not threaten the health or well-being of people and the environment. To all intents and purposes that means ambient air quality that complies with the NAAQS. Thus in assessing the request for postponement from compliance timeframes of Sasol Infrachem's listed activities, the effect of granting such a request has to be assessed in terms of the implication for ambient air quality.

Prevailing air quality is best reflected in directly measured concentrations of the pollutants in question and in the case of Sasol Infrachem, measured ambient air quality from three monitoring stations complies with the NAAQS for SO_2 and NO_x but not PM_{10}. The compliance in respect of the NAAQS suggests that current emissions from both Sasol Infrachem and other emitters in the

airshed are broadly acceptable in regulatory terms. In respect of PM_{10} it is known that there are multiple sources contributing to ambient PM_{10} load in the Vaal Triangle Area Priority Air-shed, including other industries and ground level sources such as domestic fuel use. Despite the fact that there is non-compliance with the PM_{10} NAAQS, the predicted contribution of Sasol Infrachem's Thermal Oxidation plant to PM_{10} concentrations is seen to be less than 6% of the NAAQS limit value, and an even lower fraction of the measured concentrations.

Dispersion modelling further indicates that Sasol Infrachem is not the dominant contributor to ambient NO_x concentrations at any of the receptors modelled, nor is it the dominant contributor to ambient SO_2 concentrations other than for receptors closest to the source. In respect of the other criteria pollutants most notably SO_2 and NO_2, predicted ambient concentrations are all seen to comply with the NAAQS. Thus at the level of principle, reducing emissions of these pollutants will serve to further reduce ambient concentrations that already comply with the NAAQS.

The predicted concentrations arising from the Thermal Oxidation Plant's incinerators for non-criteria pollutants lie well within the strictest health effect screening levels for acute and chronic exposure.

5.5.2 The effect of the alternative emissions limits

The alternative emissions limits proposed by Sasol Infrachem for the three incinerators in question are discussed further in Sasol Infrachem's motivation report for its additional postponement application.

As discussed above, the postponement application that is the subject of this motivation report, regarding the special arrangement pertaining to incinerator exit gas temperatures, will have a negligible (and most likely, marginally negative) impact on ambient air quality.

5.5.3 Health effects

The AIR Regulations prescribe an assessment of the health effects of the emissions for which relief is sought from the MES based on the degree to which there is compliance with the NAAQS. It cannot be argued that compliance with the NAAQS means no health risk. Indeed the World Health Organisation indicates that there is no safe limit in respect of exposure to PM. The NAAQS prescribe, however, a permissible or tolerable level of health risk. The overall findings of the AIR are that the alternative emissions limits requested by Sasol Infrachem will result in permissible health risks.

5.5.4 Ecological effects

An assessment of air pollution impacts on soil, water and receptors other than human was not formally included in the AIR. Nonetheless, the AIR includes a brief literature review of available studies on deposition of atmospheric sulfur and nitrogen on South African ecosystems.

Sasol has furthermore conducted its own literature study of the ecological impacts of atmospheric emissions in the Mpumalanga Highveld airshed, which is hereunder summarised.

Anthropogenic emissions of sulfur and nitrogen is a relatively new phenomenon in South Africa which became prominent once large scale coal fired power plants were introduced during the 1960s. Sasol estimates that it contributes about 15% of the total sulfur and nitrogen emissions into the Mpumalanga Highveld air shed. It is, however, currently not considered possible to isolate any single point source contribution from the deposition impacts from the other sources,

either anthropogenic or natural. Due to this contribution to the total sulfur (S) and nitrogen (N) emission load in the Mpumalanga Highveld, Sasol has for many years actively supported research efforts to quantify the ecological impact of these atmospheric pollutants in South Africa where there are large differences between the European situation where most of this type of research has taken place.

The research work to date has focused on: (1) better understanding the transport and fate of atmospheric pollutants in order to determine the spatial deposition rates; and (2) measuring directly deposition impacts to water, soil and ecosystems. The critical load mapping approach developed for the European situation has been extensively used as a proxy for assessing risk. Recent critical load mapping has identified some areas in the inland region of South Africa where critical threshold limits have been exceeded although for the majority of the sites pollutant concentrations have been found to be well below the critical thresholds considered necessary for environmental damage to occur.

While sulfur emissions are the dominant acidification inputs, nitrogen emissions are responsible for the formation of low level ozone through the reaction between oxides of nitrogen (NO_x) and volatile organic compounds (VOC) - both from human and natural sources – in the presence of sunlight. Ozone is known to cause damage to vegetation and be harmful to materials. Despite the ozone concentrations in South Africa being above the European critical levels for crop damages, no vegetation damages have to date been reported. Reasons suggested for this are varied including the view that impacts have either not been identified due to a lack of local research attention on this topic; or vegetation, as in some known species to have adapted to the high ozone levels.

The observed evidence to date is that there have been no widespread ecological impacts which can directly be attributed to atmospheric deposition. The majority of soils in the inland region of South Africa have a sufficiently large capacity to buffer the additional acidifying inputs but less so the additional sulphate making salt build and flux a more important criterion. The salt loads need to be assessed against the other water quality drivers of the catchment. According to the work reviewed there have at most been some limited changes to soil and water quality which can be linked to atmospheric deposition of sulphate and nitrate species.

While the evidence tends to suggest that the South African situation is not at a tipping point the understanding of the linkage between atmospheric emission concentrations and ecological impacts remains an important area of research. Sasol continues to actively support joint research on this issue. In addition to continued assessments of atmospheric dry and wet deposition of sulfur and nitrogen species, further studies on the effects of ozone, a secondary pollutant, on local forests and agriculture in South Africa are thought to be necessary to better quantify ozone impacts on ecosystems. The current knowledge base needs to be expanded to permit reliable quantification of air pollution impacts on people, crops and natural systems and to enable accurate assessment of industrial activity impacts in order for a rational basis for cost effective strategies on reducing air pollutants to be implemented.

5.5.5 Assessment of costs and benefits

In concluding the findings of the AIR assessment, it is reiterated that Sasol Infrachem's application for a postponement on special arrangement (a)(vi) to reduce exit gas temperatures to 200 ºC has a negligible impact on improving ambient air quality. Nevertheless, Sasol Infrachem

continues with investigations to assess the costs associated with complying with this special arrangement for incinerator B6990.

6 Sasol's roadmap to sustainable air quality improvement

Sasol follows a Group-wide risk-based approach to identifying and managing its priority environmental risks. Sasol's environmental policies, targets, standards and guidelines are all then driven as a function of the identified risks in a systematic focus on continuous environmental improvement.

This Chapter outlines the holistic approach to sustainable air quality improvement, while the specifics of interventions implemented and planned per point source, are summarised in Figure 8.

6.1 Commitment to continued implementation of Sasol's risk-based approach

Sasol prioritises emission reductions as a function of addressing risk and identifies emissions abatement opportunities which will realise the greatest improvements in onsite or ambient air quality. Often these interventions are win-win outcomes, with other benefits such as improving production efficiencies, reducing waste and demand for raw materials and generating new products from streams that would otherwise have been wastes.

Over the past decade, Sasol has spent in excess of R20 billion, or R2 billion per year, on various environmental improvements. This expenditure excludes very significant investments in the Department of Energy's Clean Fuels 1 programme (and imminent Clean Fuels 2 programme), which has resulted in, and will further result in reduced motor vehicle emissions. The natural gas conversion in Sasolburg in 2004 delivered material improvements in the Sasolburg air emission footprint, and was driven by Sasol's business objectives of delivering sustainable returns to shareholders in a socially and environmentally responsible manner.

6.2 Upholding Vaal Triangle Air-shed Priority Area Plan commitments

Sasol Infrachem is committed to honouring its VTAPA commitments. Sasol Infrachem is required to reduce its ambient impact on NO_x, SO_2 and Particulates by 18%, 7% and 1% respectively and has committed to these reductions. Sasol Infrachem is currently reviewing different technology options to achieve the emissions reduction commitment, and will submit a plan to the VTAPA Multi Stakeholder Implementation Group during November 2014, as prescribed in the Vaal Triangle Air-shed Priority Area Air Quality Management Plan.

6.3 Commitment to compliance with reasonable and achievable standards which achieve sustainable ambient air quality improvements

Sasol prioritises compliance with all applicable environmental laws, including air quality laws such as the MES.

Sasol's roadmap for compliance with air quality law involves a multi-faceted approach, aligned with a risk-based philosophy:

6.3.1 Compliance with point source standards along achievable timelines

For some point sources, through Sasol's proactive environmental improvement approach, Sasol will comply with the point source standards within the prescribed timeframes for existing plant standards and new plant standards.

For one incinerator, as detailed in this motivation report, compliance with prescribed flue gas exit temperatures is achievable within the short to medium term, but the implementation of compliance solutions has a schedule that extends beyond the compliance timeframes. In this case, Sasol has applied for a postponement. Sasol commits to fully investigate solutions, and if determined reasonable and appropriate, to approve, design, construct, commission and optimise the selected solution to ensure that this source's exit gas temperature complies with the applicable special arrangement for Sub-category 8.1.

6.3.2 Approach to compliance in respect of additional postponement applications

Sasol Infrachem had previously applied for exemption from default application of the MES in cases where compliance cannot feasibly be achieved with presently available technologies, and will not materially improve ambient air quality. However, Sasol has been directed to make an application for additional postponements, as described in a separate report. While Sasol's concerns with the MES remain, Sasol proposes three commitments to assure its stakeholders that sustainable environmental improvements will continue to be implemented and that, where reasonably feasible and achievable in the longer term, it will comply.

A. Commitment to compliance with alternative emissions limits

Sasol does not propose that for the duration of its additional postponement period its atmospheric emissions licences contain no emissions limits. Instead, for this period Sasol seeks alignment of the NEM:AQA's future emission limits prescribed in its atmospheric emission licences with alternative emissions limits (specified as maximum emission concentrations) that have been informed by integrated environmental management principles. Sasol Infrachem asserts that the alternative emissions limits requested in this additional postponement application are the best that can feasibly be achieved on its facility, with presently available technology. Sasol furthermore intends that all the legal obligations associated with licence conditions, be attached to these alternative emissions limits, if incorporated in its licences. As described in the AIR, these alternative emissions limits will not cause exceedances of the NAAQS.

B. Commitment to periodic technology scans for sustainable compliance solutions

Despite not being able to comply using currently available technologies in the short to medium term, Sasol commits that, throughout the postponement period, it will conduct continued technology scans to investigate any future solutions that emerge which may enable it to comply over the longer term. Where promising new technologies are identified, Sasol commits to embarking on more detailed technical investigations, in accordance with Sasol's project governance framework. In this manner, it may be possible that in future, feasible solutions are identified, and that compliance is eventually achieved with the standards, albeit in the longer

term. In order to ensure that the National Air Quality Officer (NAQO) is kept abreast of developments, Sasol proposes providing annual feedback to the NAQO as well as a comprehensive status report on its investigations and conclusions at the end of the postponement period.

C. Commitment to engage with the DEA to advance the regulatory implementation of alternative compliance mechanisms

Sasol is supportive of appropriate alternative compliance mechanisms to achieve the objectives of the Constitution, the NAQF and the NEM:AQA. Evident from the AIR prepared for this application, as well as other air quality assessments, is the significant air quality challenge in the Vaal Triangle arising from ground-level emissions of PM from domestic fuel use and the exposure of communities to the same.

Sasol believes that air quality offsets could provide significant air quality improvements with associated community health and socio-economic benefits, particularly in priority areas. Sasol will conclude a detailed assessment of the potential ambient air quality improvements that can be attained through a pilot offset study by the end of 2014. It is hoped that the pilot may demonstrate more holistically sustainable improvements in ambient air quality, particularly toward PM_{10} challenges in the VTAPA where Sasol's Infrachem facility is located and in which respect there are exceedances of the NAAQS which are not, on the basis of the AIR, attributable to Sasol's activities. Sasol will grow its knowledge of how off-site projects might work from this pilot investigation. Offsets, if clearly defined in scope and properly supported by regulations providing appropriate incentives for investment, may provide a significant lever to improve ambient air quality. To this end, Sasol commits to engage with the Department to advance the regulatory implementation of offsets as an alternative compliance mechanism.

D. Summary of roadmap to sustainable air quality improvement

In summarising this chapter, Sasol follows a Group-wide risk-based approach to identifying and managing its priority environmental risks. Sasol's environmental policies, targets, standards and guidelines are all then driven as a function of the identified risks with a systematic focus on continuous environmental improvement.

Figure 8 presents a summary of the information contained within the Sasolburg Operations motivation reports and associated technical appendices, demonstrating the roadmap to air quality improvement, described by emission source.

A short description is provided for the seven types of air quality improvement actions depicted in Figure 8, which Sasol has adopted in past years, and which Sasol will continue to act on. The labelling below corresponds to the labels included in Figure 8's legend. These actions include:

a) Proactive investments informed by a risk-based approach and aligned with voluntary internal targets. For example:

   - Investments on upgrading of ESP systems to reduce PM emissions to levels significantly lower that initial design.

b) The implementation of commitments to the Vaal Triangle Airshed Priority Area air quality management plan. Technical investigations have been undertaken to inform Sasol's plan to reach the VTAPA commitments. These will be presented in November 2014.

c) Implementation of solutions to reach compliance with existing or new plant standards, where feasible solutions for compliance have been identified. For example:

- Renewal of steam plant electrostatic precipitators to reach existing plant PM standards under all normal operating conditions.

d) Implementation of solutions to reach compliance with existing or new plant standards, where feasible solutions for compliance have been identified, and where the initial postponement applications were made, to allow for the successful implementation of projects. For example:

- Renewal of steam plant electrostatic precipitators to reach existing plant PM standards under all normal operating conditions.

e) Implementation of solutions driven by MES compliance, which are aligned with NEMA sustainable development principles and which result in point source emission improvements, but which are unlikely to reach the prescribed emission limits set by the MES. For example:

- Solutions informed by the waste hierarchy either to avoid waste incineration or divert portions of waste streams from incinerators for beneficiation.

f) Technical investigations driven by MES compliance. For example:

- Investigations initiated recently due to November 2013 amendments to the MES, for reduction in flue gas temperature of the B6990 incinerator.

g) Studies implemented to investigate the feasibility and potential for air quality offsets to deliver sustainable ambient air quality improvements. For example:

- Sasol's current air quality offset pilot study, investigating the feasibility of RDP house insulation to reduce winter domestic coal burning.

Through these actions, Sasol will in most cases comply with the MES, as identified technical solutions are implemented. For 3 incinerators and the steam plants, while sustainable emission reduction interventions have and will continue to be implemented along the lines summarised above and illustrated in Figure 8, feasible compliance with the new plant standards is not foreseen with presently available technologies. For these limited cases, Sasol's approach will be to responsibly manage its emissions while striving towards the desired environmental outcome of ambient air quality improvement, by upholding its commitments outlined in Section 6.3.2 (a) - (c).

Air quality improvement actions	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30	Pollutant of focus (ambient)
Converting the site from coal to gas (Eliminating Category 3.6)																												
Conversion from coal gasification to gas reforming																												PM, SO2, NOx, H2S, VOCs (including additional benefit of greenhouse gases)
Nitric acid plant																												
Installation of selective catalytic reduction to reduce emissions of N2O																												N2O (a greenhouse gas)
Steam stations 1 and 2 - MES sub-category 1.1																												
Ammonia dosing implemented to improve PM10 collection efficiency																												PM10
Implementation of high frequency inverters (Steam Station 2 pilot)																												PM10
Replacement of ESP internals Steam Station 1 (pre-2004, therefore not shown on timeline)																												PM10
Replacement of ESP internals Steam Station 2																												PM10
Grow power generation on natural gas, to back out of coal-based electricity imports																												PM10, SO2, NOx (including additional benefit of greenhouse gases)
Heat integration to increase power generation from waste heat																												PM10, SO2, NOx (including additional benefit of greenhouse gases)
Vaal Triangle Priority Area Commitment approval and implementation																												PM10, SO2, NOx
Incinerator B6930 (high sulphur pitch) - MES sub-category 8.1																												
Conclude trial run on HSP as an alternative fuel to cement industry																												All regulated incinerator emissions
Subject to successful pilot, scale up on alternative fuels solution to reduce waste incinerated																												All regulated incinerator emissions
Incinerator B6990 (Heavy Ends B) - MES sub-category 8.1																												
Consequent upon a sucecsful trial on HSP as an alternative fuel, conclude trial run on heavy ends A and B as an alternative fuel to cement industry																												All regulated incinerator emissions
Subject to successful pilot, scale up on alternative fuels solution to reduce waste incinerated																												All regulated incinerator emissions
Incinerator B6990 - MES sub-category 8.1																												
Investigate and implement, if feasible, flue gas outlet temperature reduction technology																												Outlet temperature reduction (not emission related)
Off-site solutions for ambient air quality improvement																												
Ad hoc Sponsorship of Basa Magogo intervention in Zamdela																												Ambient and indoor PM10, SO2, carbon monoxide, greenhouse gases
Trial implementation of household insulation on 12 homes in Zamdela																												Ambient and indoor PM10, SO2, carbon monoxide, greenhouse gases
Triple bottom line economic modelling of potential offset opportunities																												Ambient and indoor PM10, SO2, carbon monoxide, greenhouse gases
Possible implementation of offsets, subject to approval of regulations for offsets as an alternative compliance mechanism																												Ambient and indoor PM10, SO2, carbon monoxide, greenhouse gases

Action linked to voluntary initiative or internal target (described under (a) of Section 7)

Action linked to Vaal Triangle Airshed Priority Area air quality management plan commitment (described under (b) of Section 7)

Action linked to MES compliance project, where existing and/or new plant standard will be achieved (described under (c) of Section 7)

Action linked to MES air quality footprint improvement, but unlikely to reach limits specified by MES (described under (d) of Section 7)

Technical investigation to explore environmental improvement options linked to MES point sources (described under (e) of Section 7)

Investigations to off-site investments as means to contribute to NEM:AQA ambient air quality improvement objectives (described under (f) of Section 7)

Figure 8: Roadmap to sustainable air quality improvement for Sasol Infrachem

7 Stakeholder Engagement

Sasol has structured its public participation process in support of postponement applications along the Environmental Impact Assessment (EIA) regulations published under the National Environmental Management Act (Act 107 of 1998) (NEMA), as specified in the November 2013 Minimum Emissions Standards (MES) regulations.

The stakeholder engagement process is an important component of the application process and is closely linked to the technical steps and activities required in the preparation of Motivation Reports (Figure 9).

The initial stakeholder engagement process comprised two rounds of engagement; public meetings that took place during the announcement phase and a second round of public meetings and focus group meetings that took place when the Draft Motivation Reports in support of postponement applications were made available for public comment.

Since the conclusion of the initial stakeholder engagement process in June 2014, the Minister of Environmental Affairs has formally notified Sasol that she will not consider its exemption applications, and has advised that postponement applications should be made instead. Sasol will therefore submit its previous exemption applications as additional postponement applications. While the additional applications contain materially the same content as the original exemption applications, a further opportunity will be provided to stakeholders to comment on these as additional postponement applications.

The final postponement applications that have not been affected by the Minister's notification were submitted to the National Air Quality Officer (NAQO) for decision-making in September 2014. Stakeholders were notified that their comments on final postponement applications could be submitted directly to the NAQO.

A copy of the Stakeholder Engagement Report is attached in Annexure C.

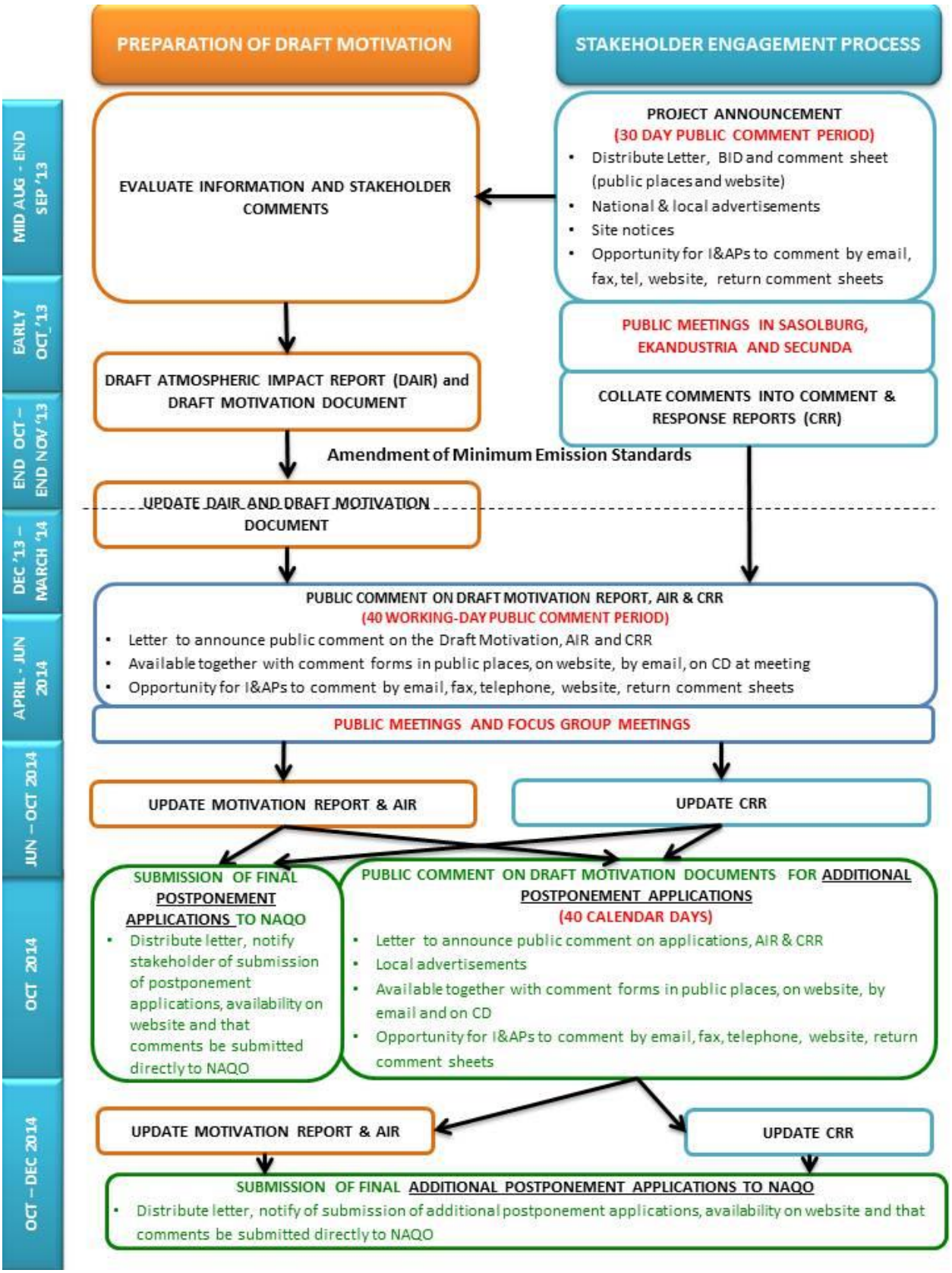

Figure 9: Technical and Stakeholder Engagement Process

7.1 Project announcement

Sasol's application process was announced between **15 September 2014 and 15 October 2014.** Stakeholders were invited to separate public meetings which were held from 7 – 10 October 2013 for the different Sasol operations. The public meeting for the Sasolburg operation took place on Monday, 7 October 2013, between 13:00 and 15:00, at the Boiketlong Community Hall in Sasolburg. Stakeholders received notification of public meetings and was invited to participate in the process as follows:

- A letter of invitation was sent to stakeholders to invite them to the public meetings and register as stakeholder.
- The invitation letter was accompanied by a Background Information Document (BID), providing more information on Sasol's operations and a comment form for stakeholders to submit their comments.
- Advertisements were placed in national and local newspapers to announce Sasol's application process.
- The BID, invitation letter and comment forms were made available in public places and on the SRK website www.srk.co.za,
- Telephonic and sms notification were made to stakeholders to inform and remind them of public meetings and opportunities to comment.

Key issues and comments raised by stakeholders

The key comments, concerns and suggestions raised by stakeholders for the Sasolburg operation are summarised below. For a comprehensive record of stakeholder comments, please refer to Annexure D.

- **Comments relating to Sasol's application process** – Stakeholders' comments focused on Sasol's reasons for applying for postponement, legal requirements, timeframe for compliance, and requests for details regarding which plants and processes require postponement.
- **Stakeholder engagement** - It was noted that the BID did not provide sufficient information for meaningful stakeholder comment. Stakeholders commented on the poor attendance at the public meeting and made suggestions for more convenient venues and meeting times. Some stakeholders requested an extended public comment period.

  The Sasol Community Working Group thanked Sasol for its efforts and demonstrating care for the surrounding communities.
- **Environmental concerns** - Stakeholders expressed concern regarding Sasol's air emissions and actual contribution to air pollution in the area. Other environmental concerns regarding the impact of Sasol's emissions on water quality, health and socio-economic aspects, such as Sasol's obligation to re-invest in communities in their area of operation, and to empower communities to care for the environment, were also raised.

7.2 Public comment on the Draft Motivation Report

Due to the fact that the public meetings held during the first round of stakeholder engagement was poorly attended, despite reasonable efforts, it was proposed to hold focus group meetings with key stakeholders, in addition to public meetings during the second round of engagement to encourage greater stakeholder participation in Sasol's application process.

The public meeting for the Sasolburg operation took place on Monday, 19 May 2014, between 13:00 and 15:00, at the Ingwe Conference Centre in Van der Bijl Park. Stakeholders received notification of public meetings and was invited to comment on the Draft Motivation Report during the comment period from **15 April 2014 to 13 June 2014**, as follows:

- Distribution by email and mail, of an invitation letter to attend public meetings, accompanied by a Comment Form in English. These documents were available in, Afrikaans and Sotho upon request.
- Posting the letter, Comment Form and Draft Motivation Reports on the SRK website (www.srk.co.za).
- Placing the letter, Comment Form and the Draft Motivation Reports in publicly accessible venues close to the Infrachem operation, as during the announcement phase.
- Advertisements in two national newspapers to announce the availability of the Draft Motivation Report for public comment:
  - Sunday Times (English), Sunday 30 March 2014; and
  - Beeld (Afrikaans), Tuesday 1 April 2014.
- Advertisements in local newspapers:
  - Sasolburg Ster (English), Wednesday 2 April 2014;
  - Puisano (Sesotho), Friday 11 April 2014; and
  - Vaal Weekblad (Afrikaans, Wednesday 2 April 2014).
- Telephonic and SMS notifications were sent to stakeholders to notify them of opportunities to comment.

Focus group meeting with key stakeholders

A focus group meeting was held with key stakeholders such as NGOs, environmental and conservation groups and organised sectors of society (business and labour, organised civil society groups and community based organisations) on 23 May 2014, at the Hacklebrooke Conference Centre in Johannesburg. All comments made at this meeting have been included in the CRRs of all Sasol operations.

Key issues and comments raised by stakeholders

The key issues, comments and concerns raised by stakeholders during the comment period on the draft Motivation Reports are summarised below. For a comprehensive record of stakeholder comments, please refer to Annexure D.

- **Application process** - Stakeholders were of the opinion that Sasol was in direct violation of the Bill of Rights, which stipulates that every citizen is entitled to an environment that is not harmful to their health and questioned why Sasol was delaying compliance as it had since

2010 to comply with the MES. In addition, that Sasol had no right to apply for postponement when the area in which they operate was not in compliance with national ambient air quality standards.

- **Environmental concerns** – Questions relating to the amount of money that Sasol has spent to reduce PM_{10} emissions in Zamdela and questions regarding Sasol's contribution to emission of greenhouse gases and climate change. Concerns were expressed that Sasol's emissions causes serious respiratory problems, headaches and asthma. Stakeholders wanted to know what Sasol's impact was on health of residents and how this impact was going to be addressed.
- Some stakeholders felt that Sasol was shifting the blame for non-compliance with ambient air quality standards to communities. In addition, that Sasol has been afforded sufficient opportunity to comply with the MES.
- Some stakeholders were of the opinion that postponements from the MES should not be granted for Sasol operations as there was no legal basis for their application and that Sasol has not addressed the adverse health impacts of their operations, or cumulative impacts. Applications have not been submitted within the appropriate time of compliance date postponement should not be allowed for hazardous air pollutants, such as PM and other hazardous emissions.
- **Stakeholder engagement** – Questions were asked regarding the methods used to involve stakeholders in Sasol's application process and the success of public meetings to engage stakeholders. It was noted that the information presented at public meetings were too technical and that capacity building initiatives should have been engaged to assist stakeholders to contribute more meaningfully to this process. In addition, that the 40 day comment period was not sufficient to comment on reports and consult with specialists.
- It was noted that advertisements were not the most effective way of advertising public meetings and suggestions were made for more effective ways of notifying communities of public meetings in future. Questions were raised as to how stakeholders were to provide comment on reports when it is stated in the draft motivation reports that it was a criminal offence to publish any part of the document without written consent of the author.

7.3 Way forward on application process

Stakeholders were informed in writing (email, fax, post) that the Minister of Environmental Affairs formally notified Sasol that she would not consider its exemption applications, and advised that postponement applications should be made instead. In line with the Minister's notification, Sasol will submit the following to the NAQA for decision-making:

- final postponement applications that have not been affected by the Ministers' notification; and
- previous exemption applications as additional postponement applications.

7.4 Notification of submission of final postponement applications

Stakeholders were advised in writing (mail, email and fax) that final postponement applications were submitted to the NAQO for decision-making and that comments on the reports can be submitted directly to the NAQO within 21 days. Final Motivation Reports were available

electronically for stakeholder's information, on the SRK website (www.srk.co.za), or on request from the stakeholder engagement office.

7.5 Comment and Response Report

All comments, concerns, questions and suggestions raised for the Sasolburg operation during the stakeholder engagement process, including comments during public meetings and written comments received from stakeholders have been recorded in the Comment and Response Report (CRR). The CRR provides a consolidated record of stakeholder comments, as well as responses from the SRK, Airshed and the Sasol project team members. The CRR is attached as Annexure D.

8 Conclusions

It is Sasol's intention to comply with the DEA's objective to improve air quality in South Africa. As detailed in this report, Sasol Infrachem makes an application for postponement of the obligation to comply with special arrangement (a)(vi) for Category 8.1 regarding the exit gas temperature for incinerator B6990 at its Thermal Oxidation plant. A five-year postponement is requested to allow for detailed investigations into the compliance implications. The postponement is requested to fully investigate solutions, and if determined reasonable and appropriate, to approve, design, construct, commission and optimise the selected solution. It is important to note that a subsequent application may be required depending on the modification required for compliance.

Sasol has assessed the ambient air quality impact of the combined emissions from the Thermal Oxidation plant, through an AIR conducted by an independent third party. The AIR found that the Thermal Oxidation plant's contribution to ambient air quality was negligible in comparison to presently measured ambient air quality and in comparison to health guidelines against which predicted concentrations of non-criteria pollutants were assessed.

Annexures

Annexure A: Atmospheric Impact Report

Annexure B: Peer Review Report on the approach to the Atmospheric Impact Report

Annexure C: Volume 1 - Stakeholder Engagement Report

Annexure D: Volume 2 – Comments and Response Report