Fezile Dabi
District Municipality

Fezile Dabi District Municipality
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Aiming above the horizon

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Atmospheric Emissions Licence Holder: SASOL South Africa Ltd., through its Sasolburg Operations' Gas Loop, Utilities and Chemicals

Atmospheric Emissions licence Reference Number: FDDM-MET-2013-23-P2

ATMOSPHERIC EMISSIONS LICENCE ISSUED IN TERMS OF SECTION 13 OF REGULATION No.893 of 22 NOVEMBER 2013 READ WITH s43 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY AMENDMENT ACT, 2004, (ACT NO. 20 OF 2014)

This Atmospheric Emissions Licence issued to **SASOL South Africa Limited., through its Sasolburg Operations' Gas Loop, Utilities and Chemicals**, in terms of section 13 of the National Environmental Management: Air Quality Amendment Act, 2014 (Act No. 20 of 2014) : Listed of Activities which result in atmospheric emissions which have or may have as significant detrimental effects on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage: Part 2 General, Postponement of compliance time frames in respect of listed activities' numbers 1.1; 1.5; 2.1; 6.1; 7.1; 7.2; 7.3 and 8.1.

The Atmospheric Emissions Licence has been issued on the basis of information provided in the company's application submitted in May 2017 and information that became available during processing of the application including the National Air Quality Officer's decision on Sasolburg Operations' application for postponement submitted on 31 March 2017.

The Atmospheric Emissions Licence is valid until 31 March 2019.

The Atmospheric Emissions Licence is issued on the basis of information provided in Sasolburg Operations' application for postponement to meet certain minimum emissions in terms of Section 11 of National Air Quality Act: Listed Activities and Minimum Emissions Standards, submitted to the National Air Quality Officer and information that became available during processing of the application.

The reason for issuance of the current licence is reviewing and varying of the Atmospheric Emission Licence: FDDM-MET-2013-23-P1 to Atmospheric Emission Licence: FDDM-MET-2013-23-P2.
The Atmospheric Emissions Licence is issued subject to the conditions and requirements set out below which form part of the Atmospheric Emissions Licence and which are binding on the holder of the Atmospheric Emissions Licence, hereinafter referred to as the ("the licence holder").

1. ATMOSPHERIC EMISSIONS LICENCE ADMINISTRATION

Name of the Licensing Authority	Fezile Dabi District Municipality
Atmospheric Emissions Licence Number	FDDM-MET-2013-23-P2
Atmospheric Emissions Licence Issue Date	Date of Signature by Air Quality Officer
Atmospheric Emissions Licence Type	Final
Review Date, not later than	31 March 2019

2. ATMOSPHERIC EMISSIONS LICENCE HOLDER DETAILS

Enterprise Name	Sasol South Africa Limited through its Sasolburg Gas Loop, Utilities and Chemicals plant
Trading as	N/A
Enterprise Registration Number (Registration Numbers if Joint Venture)	1968/013914/07
Registered Address	50 Katherine Street Sandton
Postal Address	PO Box 1 Sasolburg 1947
Telephone Number (General)	016 960 1111
Industry Sector	Petrochemical Industry
Name of Responsible Officer	Louis Fourie
Name of Emission Control Officer	Ristoff van Zyl
Telephone Number	016 920 4913
Cell Phone Number	083 632 5975
Fax Number	011 219 2438
Email Address	ristoff.vanzyl@sasol.com
After Hours Contact Details	083 632 5975
Land Use Zoning as per Town Planning Scheme	Industrial

3. SITUATION AND EXTENT OF PLANT

3.1 LOCATION AND EXTENT OF PLANT

Physical Address of the Premises	Sasol One Site Klasie Havenga Street Sasolburg 1947
Description of Site (Erf)	Subdivision 6 of 2 of Driefontein No- 2 and certain subdivisions of the farm Saltberry Plain, Roseberry Plain Fierewarde and Antrim and subdivision 5 of 4 of Montrose, District of Sasolburg, Free State.
Coordinates of Approximate Centre of Operations	Sasol 1 Latitude: S 26.82678 Longitude: E 27.84206
Extent	15.51 km²
Elevation Above Mean Sea Level (m)	1 498 m
Province	Free State
District Municipality	Fezile Dabi
Local Municipality	Metsimaholo
Designated Priority Area	Vaal Triangle Priority Area

3.2 Description of Surrounding Land Use within 5 km radius

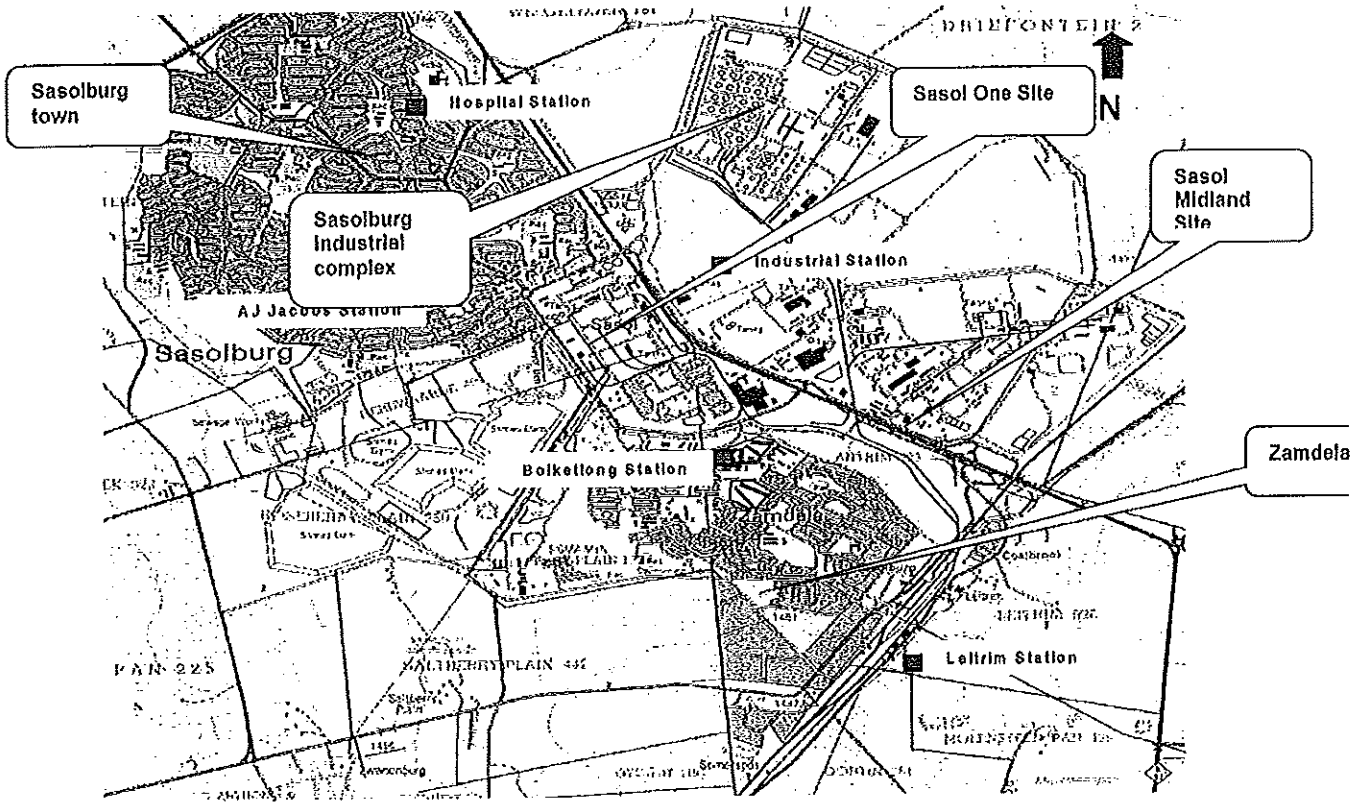


Figure 1: Sasolburg Area layout

Within a 5 km radius from the Sasol One facility is the town of Sasolburg, a residential area as well as a township called Zamdela. Other land use includes heavy as well as light industries. Sasol's water treatment facility and waste areas also falls within this 5 km radius.

4. GENERAL CONDITIONS

4.1. Process and ownership changes

The holder of the atmospheric emissions licence must ensure that all unit processes and apparatus used for the purpose of undertaking the listed activity in question, and all appliances and mitigation measures for preventing or reducing atmospheric emissions, are at all times properly maintained and operated.

Building, plant or site works related to the listed activity or activities used by the licence holder shall be extended, altered or added subject to the applicable requirements for an environmental authorisation from the competent authority as per the provisions of the National Environmental Management Act 1998 (Act No. 107 of 1998) (NEMA), as amended read with the Environmental Impact Assessment Regulations thereunder. The investigation, assessment and communication of potential impact of such an activity must follow the required assessment procedure as prescribed in the Environmental Impact Assessment Regulations published in terms of section 24(5) of the National Environmental Management Act.

Any changes in processes or production increases which may have an impact on atmospheric emissions, by the licence holder, will require prior approval by the licensing authority.

Any changes to the type and quantities of input materials and products, or to production equipment and treatment facilities which may have an impact on atmospheric emissions will require prior written approval by the licensing authority.

The licence holder must, in writing, inform the licensing authority of any change of ownership of the enterprise. The licensing authority must be informed within 30 (thirty) days after the change of ownership.

The licence holder must immediately on cessation or decommissioning of the listed activity, in writing, inform the licensing authority.

4.2. General duty of care

The holder of the license must, when undertaking the listed activity, adhere to the duty of care obligations as set out in section 28 of the NEMA.

The license holder must undertake the necessary measures to minimize or contain the atmospheric emissions. The measures are set out in section 28(3) of the NEMA.

Failure to comply with the above condition is a breach of the duty of care, and the licence holder will be subject to the sanctions set out in section 28 of the NEMA.

4.3. Sampling and/or analysis requirements

Measurement, calculation and/or sampling and analysis shall be carried out in accordance with any nationally or internationally acceptable standard. A different method may be acceptable to the licensing

authority as long as it has been consulted and agreed to the satisfactory documentation necessary in confirming the equivalent test reliability, quality and equivalence of analyses.

The licence holder is responsible for quality assurance of methods and performance. Where the holder of the licence uses external laboratories for sampling or analysis, accredited laboratories shall be used.

4.4. General requirements for licence holder

The licence holder is responsible for ensuring compliance with the conditions of this licence by any person acting on his, her or its behalf, including but not limited to, an employee, agent, sub-contractor or person rendering a service to the holder of the licence.

The licence does not relieve the licence holder to comply with any other statutory requirements that may be applicable to the carrying on of the listed activity.

A copy of the licence must be kept at the premises where the listed activity is undertaken. The licence must be made available to the environmental management inspector representing the licensing authority who requests to see it.

The licence holder must inform, in writing, the licensing authority of any change to its details including the name of the emissions control officer, postal address and/or telephonic details.

A definite offset implementation plan to reduce PM and SO_2 pollution in the ambient / receiving environment is to be presented to the NAQO and licensing authority by 30 June 2015, followed by an appropriate public participation process. The conditions around this will be included as an annexure to this AEL.

4.5. Statutory obligations

The licence holder must comply with the obligations as set out in Chapter 5 of the Act.

4.6. Annual payment of atmospheric emissions licence processing fee

The licence holder must, for the period of validity of the licence, pay the processing fee annually to the licensing authority. Alternatively the licence holder can pay the emissions licence processing fee once off.

4.7 Variation of Atmospheric Emissions Licence

The Air Quality Officer reserves the right to by notice, in writing, set and adjust the emissions limit value or standards after consultation with the holder.

4.8 Non- Compliance with Conditions

If the holder fails to comply with the conditions or requirements of this Atmospheric Emissions Licence, the Air Quality Officer may by notice in writing call upon such a holder to comply with such conditions or requirement within a reasonable period specified in the notice, and in the event of failure on the part of such holder to comply with the said conditions or requirement within the period so specified, the Air Quality Officer may cancel the Atmospheric Emissions License or suspend the operation thereof for such period as he or she may deem fit.

5. NATURE OF PROCESS

5.1. PROCESS DESCRIPTION

Gas Loop, Utilities and Chemicals: Steam Stations (1 & 2)

Sasolburg Operations operates two steam/power stations in Sasolburg. Pulverised coal is fired in boilers which are used for steam and power generation. Both the steam and power generated at these stations are used for Sasol's purposes, although Sasol can export electricity to the National Grid to assist with national electricity supply. Emissions include combustion gasses (SO_2, NO, NO_2, Particulates, CO_2 and CO).

Gas Loop, Utilities and Chemicals: Auto Thermal Reformers and Rectisol

Sasol Sasolburg Operations operates two Auto Thermal Reformers (ATRs) on the Sasol One facility. Natural gas is reformed in the ATRs to form the building blocks of the Fischer Tropsch process. The heat required in the ATRs is obtained from the Fired Heaters which is fired with process tail gas, except during start-up when they are fired with natural gas. Emissions from the two Fired Heaters are combustion gas products, such as NO, NO_2, CO and CO_2. Little to no sulphur compounds are present.

Sasol Sasolburg Operations also operates the Rectisol plant on the Sasol One Site. The purpose of the Rectisol plant is "dew point correction" and "CO_2" removal. Due to the high concentration of methane and other hydrocarbons, the gas from the first two stages are sent to the flare and those from the last three stages are sent to atmosphere through the Steam Station 1 Stacks. Emissions include hydrocarbons specifically benzene with high concentrations of CO_2 emitted from the Steam Station 1 stacks.

Gas Loop, Utilities and Chemicals: Thermal Oxidation

Sasol Sasolburg Operations operates a thermal oxidation unit where waste streams from various production units are thermally oxidised. As part of the oxidation process, heat is recovered by means of steam generation in the B6930 incinerator, which supplements the steam supply to the plants from the Steam Stations. Three incinerators, B6990 (chemical incinerator), B6930 (high sulphur pitch incinerator) and B6993 (spent caustic incinerator) are operated on a continuous basis. The B6930 high sulphur pitch incinerator has a bag house for particulate emission control, whilst the caustic incinerator has a wet scrubber to have both SO_2 and particulate matter emission control.

Gas Loop, Utilities and Chemicals: Ammonia

Sasol Sasolburg Operations operates an Ammonia plant on the Sasol One Site. The Benfield unit is part of the Ammonia plant and consists of a CO_2 absorber column were CO_2 is removed from the process gas stream using the Benfield solution. The Benfield solution is regenerated in the desorber column were the CO_2 is desorbed to the atmosphere and also partially worked up to high grade CO_2 for the food industry.

Gas Loop, Utilities and Chemicals: Nitric acid plant (NAP)

A nitric acid plant is operational at the Sasol Bunsen Street site. Ammonia is piped from the cold storage area to the nitric acid plant where it is reacted with oxygen to produce NOx, as an intermediate product, which is fed to a catalyst to selectively convert NO to NO_2. The NO_2 is fed to a series of absorption columns where nitric acid is formed. The exhaust vent from the second tower, which contains NO_2, and N_2O is sent to the de-NOx reactor, where the gas is reduced over a catalyst to nitrogen and oxygen, which is released to atmosphere.

Gas Loop, Utilities and Chemicals: Ammonium Nitrate

Sasol Sasolburg Operations operates the ammonium nitrate solution plant. This plant is integrated into the NAP plant. The nitric acid from the NAP plant is reacted with ammonia in a reactor to form the ammonium nitrate solution.

Gas Loop, Utilities and Chemicals: Prillan

Sasol Sasolburg Operations operates a Prillan unit on the Sasol One Site. Aqueous ammonium nitrate is concentrated by means of parallel evaporators. The concentrated liquor is then fed to the top of the prill tower where after it is sprayed using nozzles to obtain a desired diameter. The spheres fall through counter current air flow which cools the droplet and forms the prill. The upward air flow is passed through three scrubbers at the top of the Prillan plant before it is vented to atmosphere. The prills are fed to drying, cooling and screening units where off specification prills are recycled to the dissolving tank whilst the on specification prills are packaged as final product. The air used for drying is passed through a scrubber before being vented to atmosphere. Emissions are particulates coming from the scrubbers on top of the Prill tower as well as from the drying scrubbers.

Sasol Cobalt Manufacturing Plant

Sasol Sasolburg Operations operates a Fischer-Tropsch Co-catalyst manufacturing plant on the Sasol One site. The plant consists of the steps described below:

Support Modification

During this process volatile organic compounds (VOC) (mainly ethanol) are removed from the reactor under vacuum through a cooling water condenser. After passing through a gas liquid separator and a knock out vessel, vapours are incinerated in the VOC incinerator while all liquid residues are collected in the spent ethanol tank.

1st Calcination

The powder is fed to a calciner, which is heated by a gas burner. Ethanol groups are removed under air at elevated temperatures. At the calciner exit the product (roasted modified support powder) passes through a water cooler. Vapours from the hoppers and the calciner are fed to the VOC incinerator.

Impregnation

The calcined modified support powder is treated with impregnation liquid. The impregnation reactor is heated by a hot oil jacket and has a screw agitator. Aqueous vapours are removed from the reactor under vacuum through a cooling water condenser. The condensate is routed to the chemical sewer while clean vapours are released to atmosphere.

2nd Calcination

During this step the nitrate salts in the powder are converted into oxides under release of NOx. Preheated air acts as the fluidising medium which carries the nitrous vapours to the De-NOx unit. This unit is also fed with an anhydrous ammonia solution and is equipped with a gas burner. It facilitates a two-step catalytic reduction of NOx with NH_3 to nitrogen and water.

Reduction

The oxygen free powder enters a fluidised bed reduction reactor where hydrogen is used as a reduction medium and nitrogen is used for purging. After passing through the fluidised bed the gas stream is cooled in two steps. The coolers utilise water and a water/glycol mixture respectively. After removal of water and ammonia in an adsorption dryer, the regenerated reduction gas is fed into the compressor suction and recirculated. A regenerated gas bleed-off is located between the water cooler and water glycol chiller. Water and ammonia removed from the gas is routed to the chemical sewer.

Coating

The active catalyst requires coating to prevent auto-ignition. This is done by feeding the catalyst into the coating tank where it is suspended in molten wax (synthetic paraffins). Wax volatiles from the wax melt tank and coating tank are routed to a separate dedicated wax scrubber where they are stripped with water. Stripper water from the wax melt tank scrubber is routed to the storm water drain, while stripper water from the coating tank scrubber is routed to the chemical sewer as it may contain metals. Clean gas from both scrubbers is released to atmosphere. Both tanks and transfer lines have jackets with hot oil for heating.

Packaging

Finished product (active catalyst suspended in wax) runs through to the drum filling station using a nitrogen purge, to package the product for distribution and use.

Gas Loop, Utilities and Chemicals: Phenolics (N-Base, Cresol, ATAR, TNPE and Phenosolvan) and Paraffins

The phenolics value chain is comprised of a few plants which extract and purify a range of phenolic products from tar acid containing feed streams sourced from Secunda Synfuels Operations. Various process chemicals are used to extract the tar acids and to remove impurities where-after phenol, cresols and xylenols are recovered via distillation. Solid waste generated by the process is incinerated while liquid effluent is first cleaned to recover phenolic component before the water is treated at the Sasol Bio-works. All relieve valves and vents are connected to the plant's flare system and normal combustion products are emitted (CO2, CO, NO, NO2 and H2O). The fuel gas furnace emits combustion gas products and SO2 and SO3 are emitted from the SOx scrubber.

The Paraffin plant takes feed from the Wax plants and distills a range of paraffin products. A number of fuel gas fired furnaces are operational on the plant providing sufficient heat for the purification steps. These emit combustions products.

Gas Loop, Utilities and Chemicals: SGEPP (Sasol Gas Engine Power Plant)

The combined cycle Power Plant consisting of several Gas Engines utilizes approximately 290 000 000 kilograms (approximately 12 Petajoules) per annum of natural gas to generate approximately 180 MWh of electricity per hour as well as medium pressure steam.

Gas Loop, Utilities and Chemicals: Monomers

Sasol, Sasolburg Chemical Operations operates a Monomer production and separation unit where ethylene is produced to be used within the polyethylene and polyvinylchloride manufacturing plants. A Mixture of ethane and ethylene is piped to Sasolburg from Secunda where it enters the Ethylene Purification Unit (S4500) where the ethylene is separated from the ethane by means of distillation. The ethylene is then routed to the customers.

The ethane product from the S4500 is then routed to the Cracking Unit (S4600) where it is cracked to ethylene. Once cracked, the ethylene/ethane gas mixture goes through a quenching, scrubbing and drying phase where after the gas is selectively hydrogenated to and heavy components as well as unreacted ethane are removed. The ethylene is then stored in the ethylene tank to be distributed to the polythene and vinyl chloride monomer plants. Hydrocarbon off-gasses are sent to the plant's main flare where it is converted to CO_2, CO and H_2O. The cracking unit emits traces of H_2S from the caustic scrubber.convert acetylene to ethylene. After this the C_2 mixture is purified by means of distillation processes where light .

5.2. LISTED ACTIVITIES

Listed Activities, as published in terms of Section 21 of the AQA, authorised to be conducted at the premises by the licence holder:

Listed Activity Number	Category of Listed Activity	Sub-category of the Listed Activity	Listed Activity Name	Description of the Listed Activity
Steam/Power Generation (Steam Stations 1, 2)				
1	1	1.1	Solid Fuel Combustion installations	Solid fuels (excluding biomass) combustion installations used primarily for steam raising or electricity generation

Listed Activity Number	Category of Listed Activity	Sub-category of the Listed Activity	Listed Activity Name	Description of the Listed Activity
SGEPP				
2	1	1.5	Reciprocating engines	Liquid and gas fuel stationary engines used for electricity generation
Auto Thermal Reformers (ATR) and Rectisol				
3	2	2.1	Petroleum Industry	Petroleum industry, the production of gaseous and liquid fuels as well as petrochemicals from crude oil, coal, gas or biomass
Cobalt Catalyst Manufacturing Plant				
4	7	7.4	Production use in Manufacturing or recovery of antimony, beryllium, cadmium, chromium, cobalt, lead, mercury, selenium, by the application of heat	Manufacturing activity involving the production, use or recovery of antimony, beryllium, cadmium, chromium, cobalt, lead, mercury, selenium, thallium and their salts
N-Base, Cresol, Paraffins, ATAR, TNPE and Phenosolvan				
5	6	6.1	Organic chemical industry	The manufacturing or use in manufacture of hydrocarbons not specified elsewhere. Storage tanks and product transfer facilities with a cumulative tankage capacity more than 500 m^3.
Thermal Oxidation				
6	8	8.1	Thermal treatment of hazardous and general waste	Facilities where general and hazardous waste are treated by the application of heat (Applicable : Capacity of Incinerator > 10kg/hour)
Nitric acid plant				
7	7	7.1	Inorganic Chemical Industry	The use of ammonia in the manufacturing of ammonia
8	7	7.2	Inorganic Chemical Industry	The primary production of nitric acid in concentrations exceeding 10%
Ammonia, Ammonium nitrate and Prillan				
9	7	7.1	Inorganic Chemical Industry	The use of ammonia in the manufacturing of ammonia
10	7	7.3	Inorganic Chemical Industry	The manufacturing of ammonium nitrate and its processing into fertilisers
Monomers				

Listed Activity Number	Category of Listed Activity	Sub-category of the Listed Activity	Listed Activity Name	Description of the Listed Activity
11	2	2.1	Petroleum Industry	Petroleum industry, the production of gaseous and liquid fuels as well as petrochemicals from crude oil, coal, gas or biomass

5.3. UNIT PROCESS OR PROCESSES

List of all unit processes associated with the listed activities to be undertaken at the site of work.

Unit Process	Function of Unit Process	Batch or Continuous Process
ATR		
Auto Thermal reformers	Convert natural gas to reform gas	Continuous
Membrane separators	Purification of reformed gas	Continuous
Flares	Destruction of gas	Batch
Rectisol		
Rectisol	CO_2 removal and dew point correction	Continuous
Thermal Oxidation		
B6993 Spent Caustic Incinerator	The incineration of spent caustic solution and off specification solvent products including MIBK by-products in a down fired incinerator.	Continuous
Spent Caustic Storage F6903	Intermediate storage	
Hydrocarbon Solvents F6963 A/B F6927 B	Intermediate storage	
Sodium Carbonate F6954	Intermediate storage	
Caustic F6959 / F6975	Intermediate storage	
B6930 High Sulphur Pitch Incinerator	The incineration of High Sulphur Pitch, Organic solvents and High Organic waters in a limestone fluidized bed unit.	Continuous
HSP Storage tanks F6926 / F6990	Intermediate storage	
HOW tank F6938	Intermediate storage	
BFW tank F6939	Intermediate storage	

B6990 Chemical Incinerator	The incineration of heavy oils, off-specification waxes, Sasol spent catalyst, funda filter cake, slop solvents and high organic waste.	Continuous
Product tank	Intermediate storage	
SS1 and SSII		
Fuel oil tanks	Holding fuel	Continuous
Coal bunkers/silos	Holding coal	Continuous
Boiler	Steam production	Continuous
Feed water tanks	Holding water	Continuous
Resins (HCL, caustic)	Holding chemicals	Continuous
NH3 tank	Holding ammonia	Continuous
Blow down tank		Continuous
NITRIC ACID PLANT		
NO reactor	Reaction of NH_3 and air to form NO & NO_2 (NOx)	Continuous
Absorber columns	Absorption of NOx to HNO_3	Continuous
De-NOx reactor	Reduction of NOx to O_2 and N_2	Continuous
AMMONIUM NITRATE		
AN reactor	Reaction to form ammonium nitrate	Continuous
Neutralizer	pH correction	Continuous
AN solution tank	Storage of AN solution	Continuous
PRILLAN		
Wet section	Concentration of ammonium nitrate solution	Continuous
Dry section	Drying of prilled ammonium nitrate	Continuous
Storage	Storage of prilled ammonium nitrate	Continuous
AMMONIA		
CO_2 capture	**Remove moisture from the CO_2 stream**	**Continuous**
CO-shift	**Reacts CO + steam to form H_2**	**Continuous**
Benfilled	**Removal of CO_2 from the process stream**	**Continuous**
PSA	**Production of LPH_2**	**Continuous**
Deoxo	**N_2 purification**	**Continuous**
Ammonia synthesis	**Production of NH_3**	**Continuous**
BFW	**Demineralized water**	**Continuous**
COBALT CATALYST MANUFACTURING		
Storage tanks/bags	Containing raw materials for the support modification step	Continuous
Reactor	Allow for chemical reactions	Batch

VOC destruction unit	Destroying VOC vapours	Continuous
Hoppers	Temporary storage of the support powder	Continuous
Water cooler	Cooling the roasted support powder for storage	Continuous
Mixing tank	Mixing cobalt nitrate, water and metal promoter	Batch
Heated reactor	Impregnating support powder with the metals and subsequent partial drying	Batch
DeNOx unit	Catalytic destruction of NOx fumes	Continuous
Sieve	Sizing of the particles	Continuous
Reverse pulse jet cartridge filters	Removing of dust particulates	Continuous
Purge hopper	Remove oxygen	Continuous
Reduction reactor	Activation step on the catalyst	Continuous
Coolers	Cooling of the activated catalyst	Continuous
Wax CoatingTank	Wax coating of the activated catalyst	Continuous
Packaging unit	Package of the activated catalyst for distribution	Continuous
Vent System	Removing of dust particles from step 1,4,6 and 7 hoppers off gas.	Continuous
N-Base, Cresol, ATAR, TNPE and Phenosolvan		
Phenol producing column	Process NBF DTA material for phenol production	Continuous
Feedstock storage	Hold feed material	Batch
Rundown tanks	Hold product phenol	Batch
Final product tanks	Hold final product phenol	Batch
Product Stabiliser tanks	Hold chemicals	Batch
Tempered water system	Hold and provide condensate to phenol unit	Continuous
Relief system	Relief system in high pressure cases	Batch
HP steam	Provide heat to phenol unit reboilers/heater	Continuous
HOW Storage tanks	Holding high organic effluent materials	Batch
Sand Filtration	Filter solids from HOW water	Continuous
Extraction	Extract phenolics from the high organic wastewater	Continuous
C stream distillation	Recover butyl acetate (solvent)	Continuous
Stripping section	Strip out butyl acetate from final effluent	Continuous
Crude tar acids storage	Hold tar acids extracted from high organic effluent	Batch
Separators	Remove tar and oil from high organic stream	Continuous
Storage tanks	Holding raw materials – Formalin, Caustic Soda, O-cresol, Water	Batch

Feed storage tanks	Holding raw materials as buffer between Secunda and Sasolburg	Batch
Drying and N-base removal	Removing excess water from the feed followed by a process step to remove unwanted nitrogen base compounds from the feed	Continuous
Phenol production	Phenol produced from cleaned-up cresol feed	Continuous
Phenol removal	Remaining phenol in bottom product from above unit has to be removed	Continuous
Product Splitter	Separates cresol products from feed based on boiling points differences	Continuous
Intermediate feed product storage	Between units products are temporarily stored to minimize the whole production train to be affected if one unit experiences problems	Batch / Continuous
Final product tanks	Bulk storage before shipment to customer	Batch / Continuous
Loading facility	Road tanker loading of intermediate or final products	Batch
Loading facility	Road tanker loading of pitch type material for transport to incineration plant	Batch
Paraffins plant		
Reactors	Production of hydrocarbons	Continuous
Distillation column	Separation of hydrocarbons	Continuous
Furnaces	Provide heat to the distillation columns	Continuous
Flare system	Flaring of excess hydrocarbons as well as over-pressure protection	Continuous
SGEPP		
Gas Engines	Utilisation of Natural gas to generate electricity	Continuous
Monomers		
Ethylene unit S4600	Cracking of ethane and propane Separation of ethylene & ethane from C2 rich gas	Continuous
Ethylene storage tank	Storage of final product	Continuous
Ethane storage sphere	Storage of furnace feed material	Continuous
Propylene storage sphere and bullets	Storage of refrigerant product	Continuous
Cracker system	Cracking of ethane or propane to ethylene (This unit operation include boiler feed water, dilution steam, crack gas quench, MEA, Caustic and fuelgas)	Continuous
Cooling water system	Used as cooling medium	Continuous
Loading bay facility	Loading of ethylene road tanker	Batch
Feed gas preparation	Ethane saturator	Continuous

Compression	Crack gas compression as well as ethylene and propylene compression	Continuous
Flare system	Flaring of off-spec product during upset conditions as well as over-pressure protection	Continuous
Cold separation	This unit operation include de-ethaniser, C3-recovery, secondary feed gas drying, cold separation, de-methaniser, ethylene cycle, C2-splitter and ethane system	Continuous
Liquefaction	This unit operation include propylene refrigeration, ethylene distribution and storage	Batch
Pre-cooling and drying	Propylene system, pre-cooling, acetylene removal, primary feed gas drying	Continuous
Utilities	Plant air, instrument air, LP nitrogen, de-oxo nitrogen, fire steam, 38bar HP steam, 4.5bar MP steam & 1.5bar LP steam, drinking water, condensate & fire water system	Continuous / Batch

5.4. HOURS OF OPERATIONS

Unit Process / Plant	Operating Hours (e.g. 07h00 – 17h00)	No. Days Operation per Year
ATR		
Reformers	24 hours	365
Membrane separators	24 hours	365
Flares	Ad hoc	When required
THERMAL OXIDATION		
B6993 Spent Caustic Incinerator	24 Hours	365
B6930 High Sulphur Pitch Incinerator	24 Hours	365
B6990 Chemical Incinerator	24 Hours	365
STEAM STATIONS 1 AND 2		
Fuel oil tanks	24 hours	365
Coal bunkers/silos	24 hours	365
15 Boilers	24 hours	365
Feed water tanks	24 hours	365
Resins (HCL, caustic)	24 hours	365
Coarse ash	24 hours	365
Ash water	24 hours	365
NH_3 tank	24 hours	365
Blowdowns tank	24 hours	365
NITRIC ACID PLANT		

Unit Process / Plant	Operating Hours (e.g. 07h00 – 17h00)	No. Days Operation per Year
NO reactor	24 hours	365
Absober columns	24 hours	365
De-NOx reactor	24 hours	365
AMMONIUM NITRATE		
AN reactor	24 hours	365
Neutralizer	24 hours	365
AN solution tank	24 hours	365
PRILLAN		
Wet section	24 hours	365
Dry section	24 hours	365
Storage	24 hours	365
AMMONIA		
CO_2 capture	24 hours	365
CO-shift	24 hours	365
Benfield	24 hours	365
PSA	24 hours	365
Ammonia synthesis	24 hours	365
BFW	24 hours	365
De-Oxo	24 hours	365
COBALT CATALYST MANUFACTURING		
Storage tanks/Bags	24 hours	365 days
Reactor	24 hours	365 days
VOC destruction unit	24 hours	365 days
Hoppers	24 hours	365 days
Calciner	24 hours	365 days
Water cooler	24 hours	365 days
Mixing tank	24 hours	365 days
Heated reactor	24 hours	365 days
Fluidised bed calciner	24 hours	365 days
DeNOx unit	24 hours	365 days
Sieve	24 hours	365 days
Reverse pulse jet cartridge filters	24 hors	365 days
Mixing tank	24 hours	365 days
Heated reactor	24 hours	365 days

Unit Process / Plant	Operating Hours (e.g. 07h00 – 17h00)	No. Days Operation per Year
Fluidised bed calciner	24 hours	365 days
DeNOx unit	24 hours	365 days
Sieve	24 hours	365 days
Reverse pulse jet cartridge filters	24 hours	365 days
Purge Hopper	24 hours	365 days
Reduction Reactor	24 hours	365 days
Coolers	24 hours	365 days
Tank	24 hours	365 days
Scrubber	24 hours	365 days
Packaging unit	24 hours	365 days
N-BASE, CRESOL, PARAFFIN, ATAR, TNPE and PHENOSOLVAN		
Flares	Ad hoc	When required
Phenol producing column	24 hours	350
Feedstock storage	24 hours	365
Rundown tanks	24 hours	350
Final product tanks	24 hours	365
Stabiliser tanks	24 hours	350
Condensate system	24 hours	350
Relief system	24 hours	350
HP steam	24 hours	350
HOW Storage tanks	24 hours	350
Sand Filtration	24 hours	350
Extraction	24 hours	350
C stream distillation	24 hours	350
Stripping section	24 hours	350
Crude tar acids storage	24 hours	350
Separators	24 hours	350
Storage Tanks	24 hours	365 (except for statutory inspection)
Intermediate / Product Tanks		365 days/year (except for statutory inspections
SGEPP		
Sasol Gas Engine Power Plant	24 hours	365
MONOMERS		
Ethylene unit 4600	24 hours	365

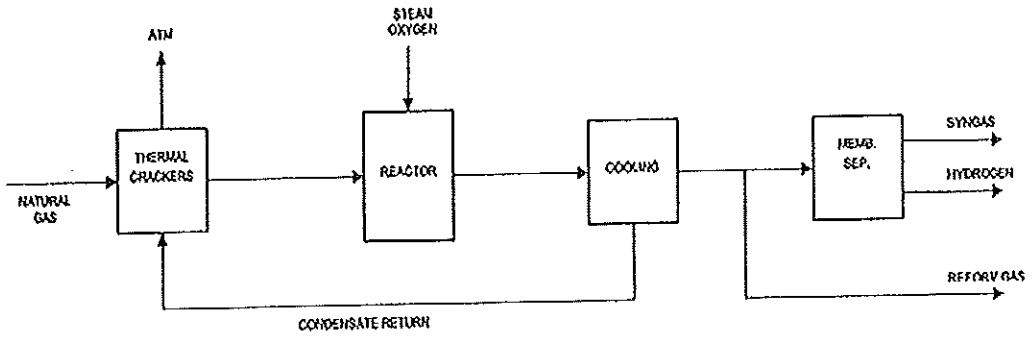
Unit Process / Plant	Operating Hours (e.g. 07h00 – 17h00)	No. Days Operation per Year
Ethylene storage tank	24 hours	365
Ethane storage sphere	24 hours	365
Propylene storage sphere and bullets	24 hours	365
Cracker system	24 hours per day (there are 3 furnaces, 2 should always be online while the 3rd one is on decoking)	365
Cooling water system	24 hours	365
Loading bay facility	24 hours	365
Feed gas preparation	24 hours	365
Compression	24 hours	365
Flare system	24 hours	365
Cold separation	24 hours	365
Liquefaction	24 hours	365
Pre-cooling and drying	24 hours	365
Utilities	24 hours	365

5.5 GRAPHICAL PROCESS INFORMATION

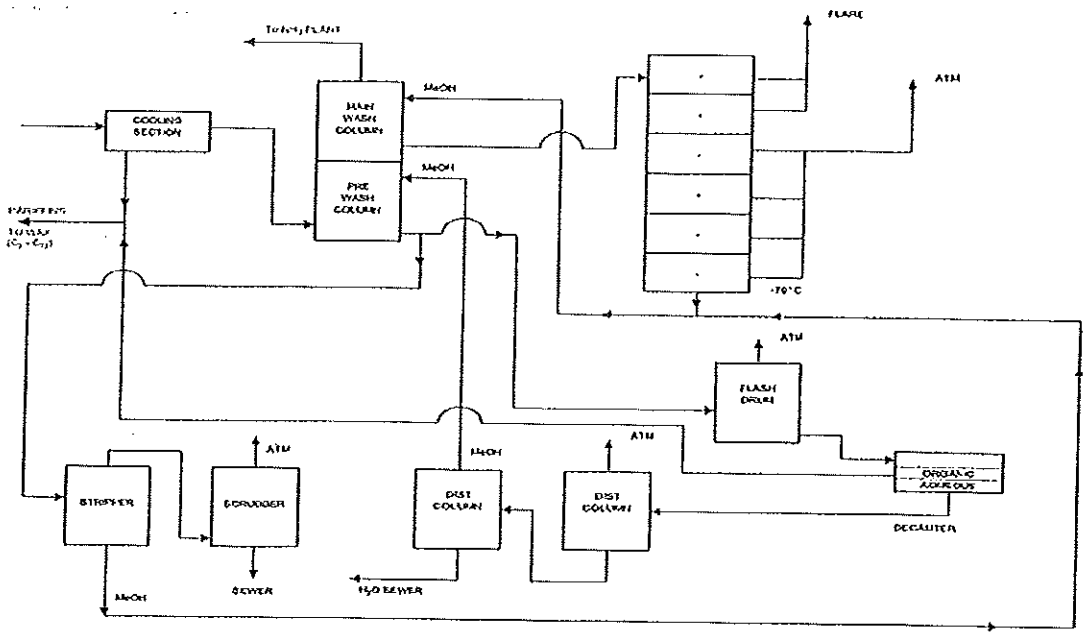
Simplified block diagram with the name of each unit process in a block; showing links between all unit processes or blocks.

Process flow chart(s) clearly indicating inputs, outputs and emissions at the site of works, including points of potential fugitive emissions and emergency releases.

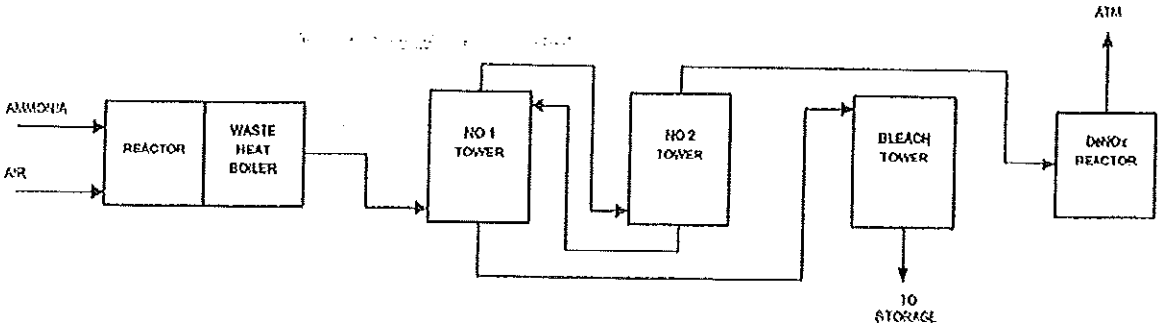
Auto Thermal Reformers (ATR)



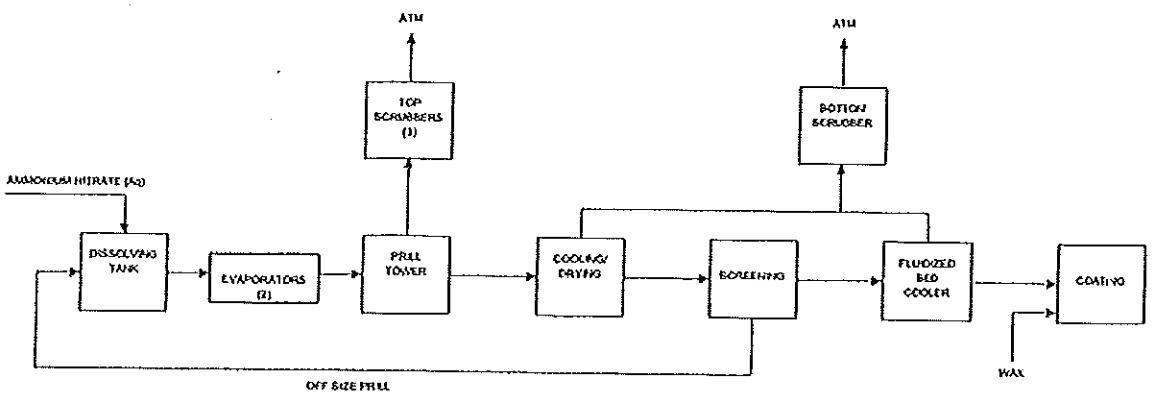
Rectisol



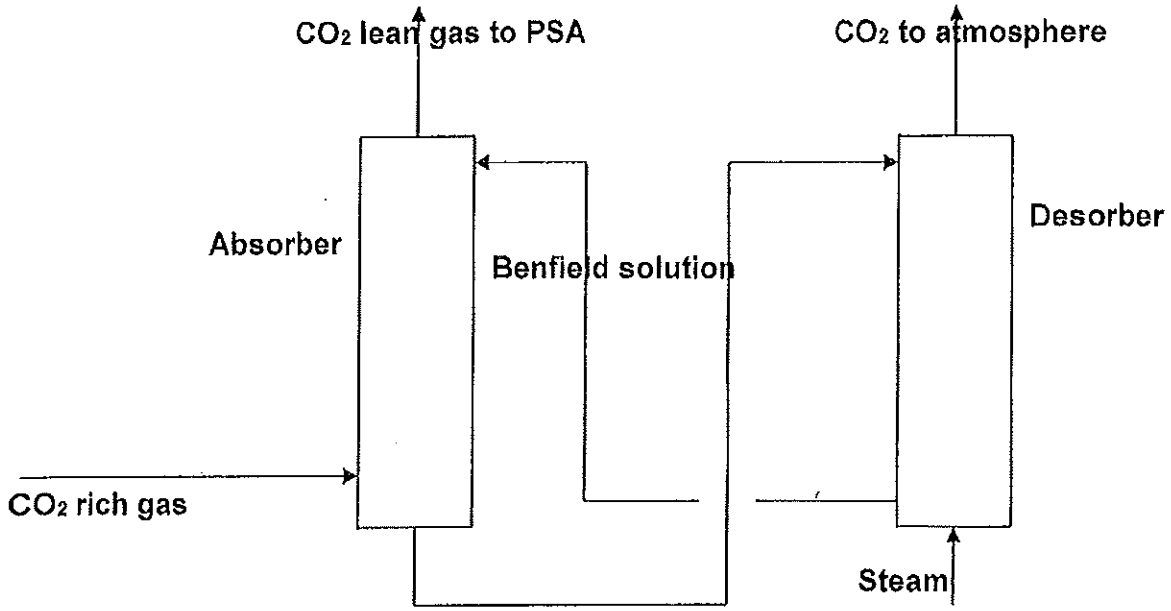
Sasol Nitro – Nitric Acid Plant



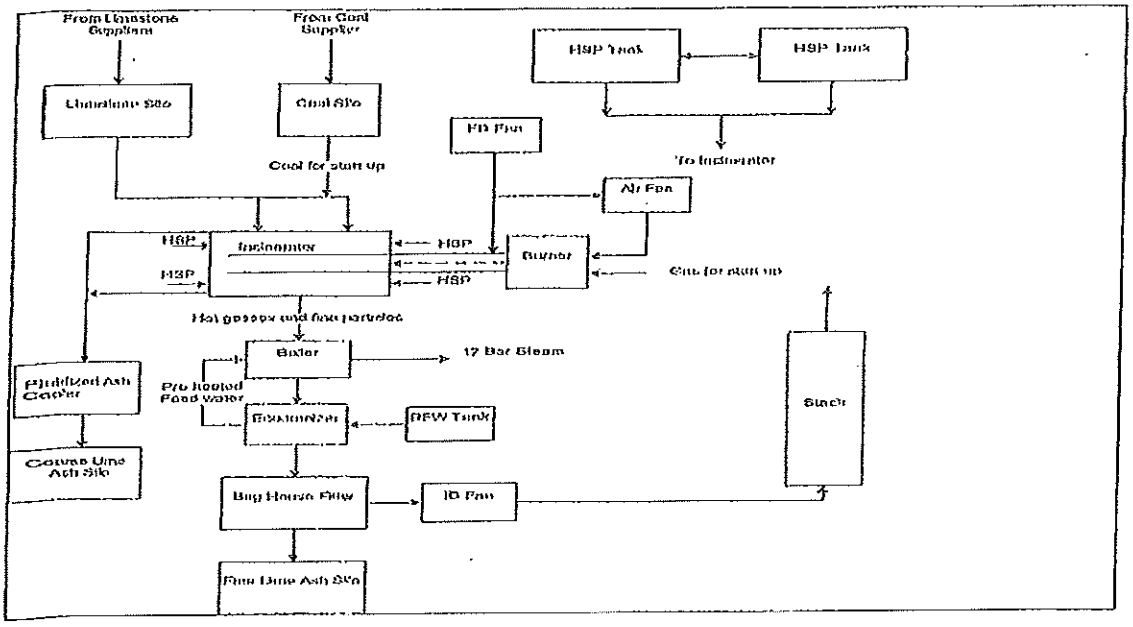
Ammonium Nitrate Prillan Plant



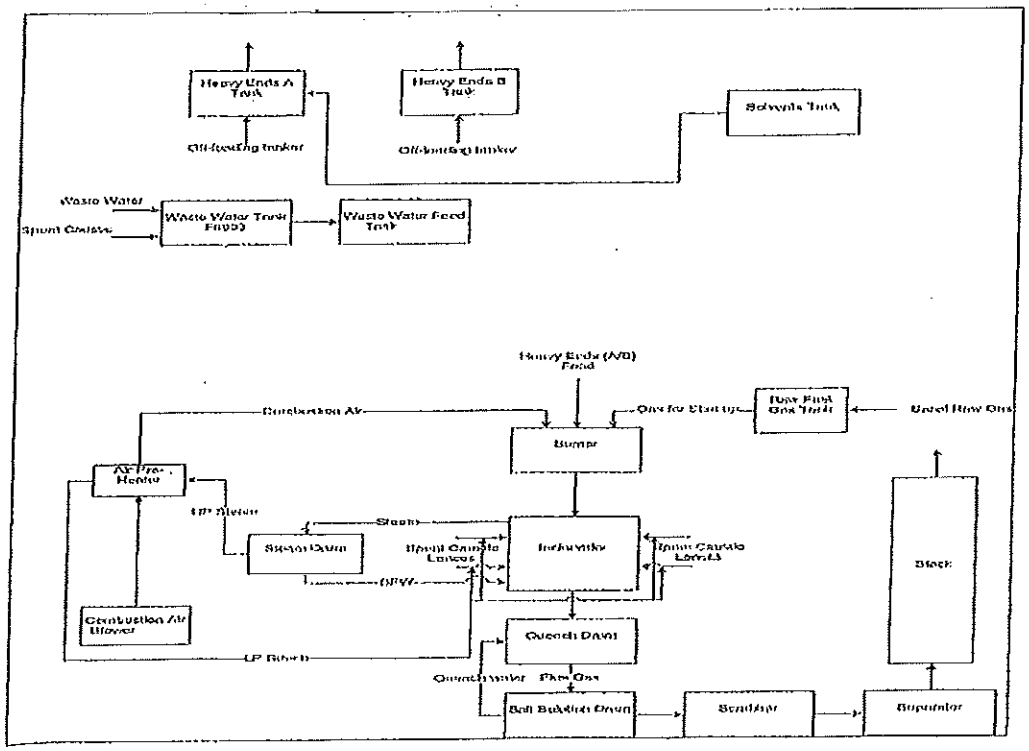
Benfield Plant:



Thermal Oxidation

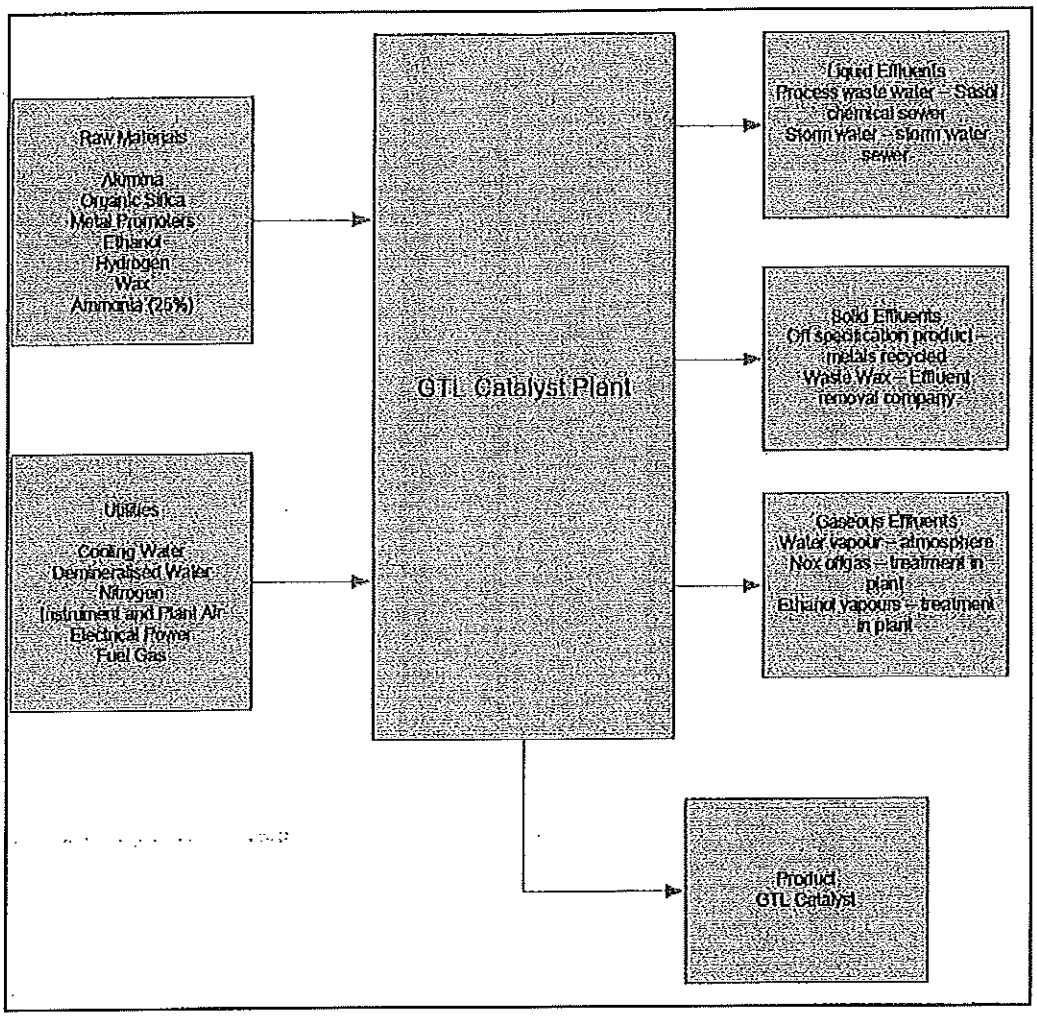


Block Flow Diagram of HSP Incinerator

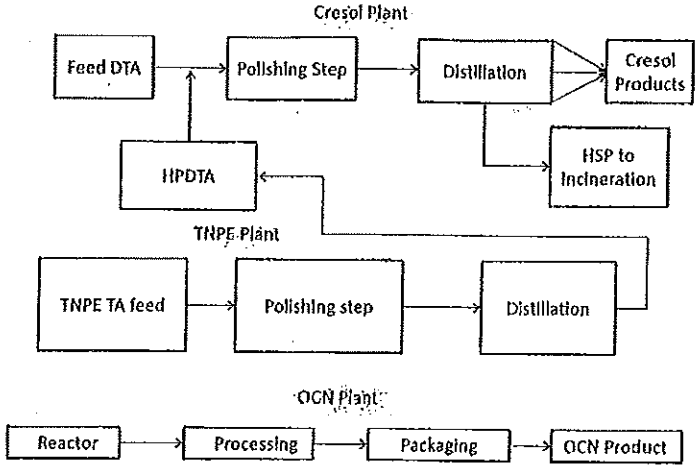


Block Flow Diagram of Spent Caustic Incinerator

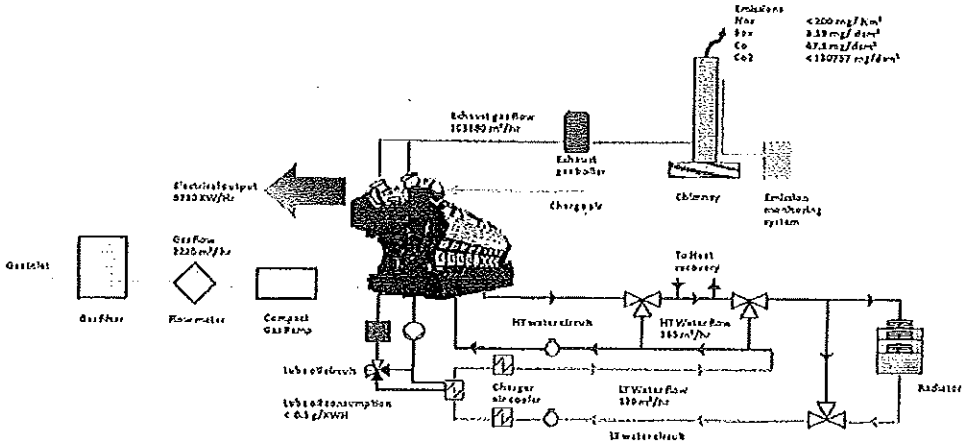
Cobalt Catalyst

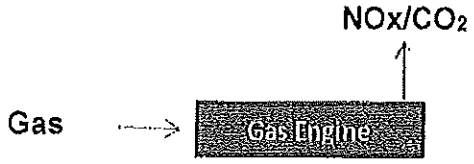


Cresol and TNPE

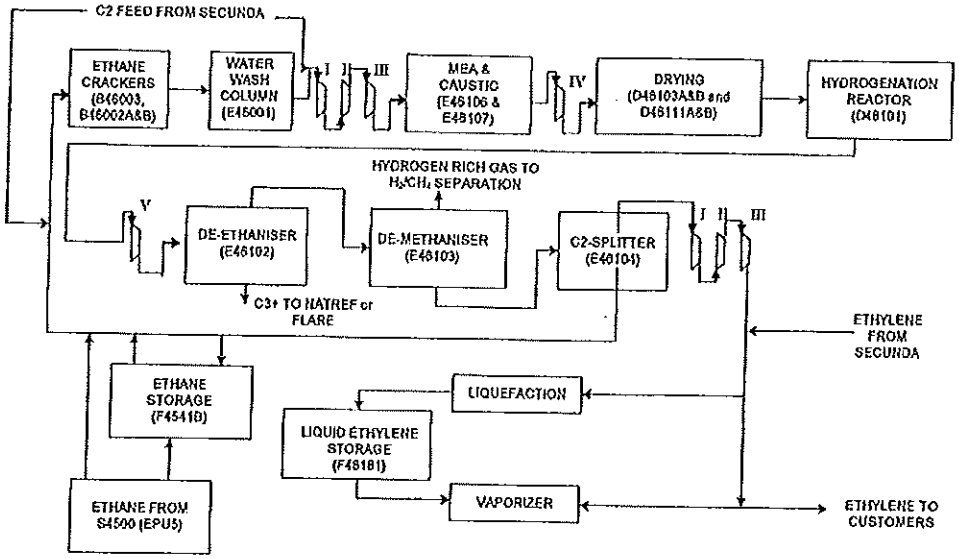


Sasol Gas Engine Power Plant

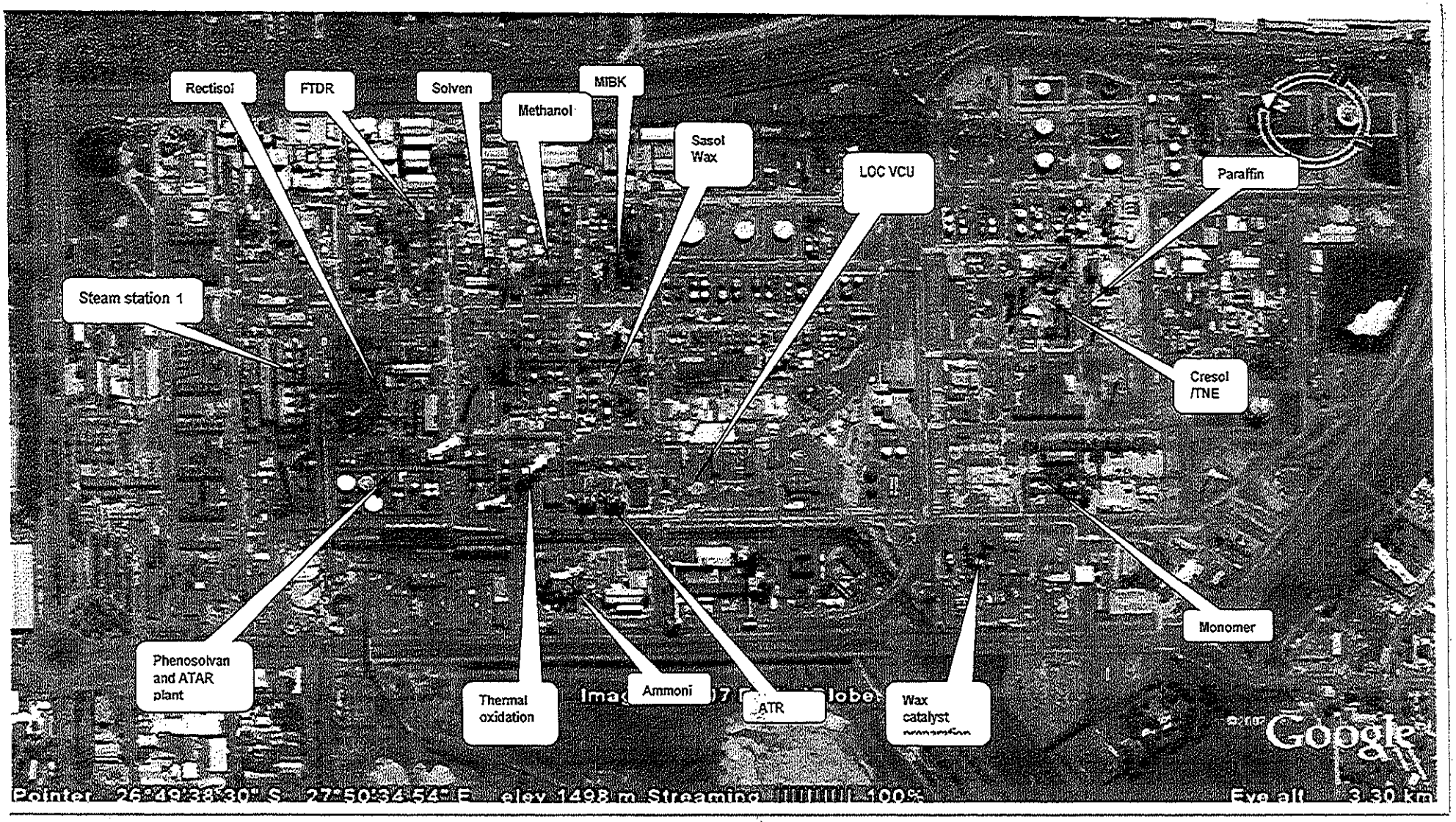




Simple block diagram of Sasol Gas Engine Power Generation Plant layout
Monomers plant



Site layout diagram (plan view and to scale) indicating location of unit processes, plants, buildings, stacks, stockpiles and roads (include true north arrow and scale).


Rectisol
FTDR
Solven
Methanol
MIBK
Sasol Wax
LOC VCU
Paraffin
Steam station 1
Cresol /TNE
Phenosolvan and ATAR plant
Thermal oxidation
Ammoni
ATR
Wax catalyst
Monomer
Google

6. RAW MATERIALS AND PRODUCTS

6.1. Raw materials used

Raw material name	Maximum Permitted Consumption Capacity (Quantity)	Units (quantity/period)
ATR		
Natural gas	[redacted]	kNm³/a
Rectisol		
Gas mixture (CO, H_2, CO_2, CH_4)	1 576 800	kNm³/a
Thermal Oxidation		
Spent Caustic	30 660	t/a
Organic Solvents	13 140	t/a
High Sulphur Pitch	21 900	t/a
Organic Solvents	17 520	t/a
Limestone	26 280	t/a
Organic waste water	17 520	t/a
Off- specification waxes	720	t/a
Sasol spent catalyst	2 448	t/a
Funda filter cake	2 640	t/a
Polyethylene wax	960	t/a
Other solid waste	1 800	t/a
High organic waste	4 800	t/a
Pitch/ tar waste Slop oils	1 800	t/a
Fuel Gas	8 760	kNm³/a
Coal	n/a	m³/a
Steam station 1 and Steam station 2		
Water (Steam station 1)	6 132	kt/a
Water (Steam station 2)	9 070	kt/a
Coal (Steam station 1)	2 148	kt/a
Coal (Steam station 2)	2 000	kt/a
Catalyst		t/a

Ammonia		
Gas mixture (CO, H_2, CO_2, CH_4)	[redacted]	kNm³/a
Nitrogen	[redacted]	t/a
Steam	[redacted]	t/a
Prillian		
Ammonia nitrate solution (88%)	[redacted]	t/a
Nitric Acid/Ammonium Nitrate		
Ammonia	[redacted]	t/a
Air	613 200	t/a
Cobalt Catalyst Manufacturing		
Alumina	*	*
Tetra Ethyl Ortho Silicate	*	*
Wax	*	*
Hydrogen	*	*
Ethanol	*	*
Ammonia	*	*
Nitrogen	*	*
N-Base, Cresol, Paraffin, ATAR, TNPE and Phenosolvan		
*	*	*
SGEPP		
Natural Gas	[redacted]	kg/a
Monomers		
C2-feed from Secunda	Information protected due to License agreements– Licensing Authority can view information on site	
Depropaniser off gas from Natref (propane + ethane)		
PPU4 bottoms from Natref (mainly propane)		

6.2. PRODUCTION RATES

Product Name	Maximum Production Capacity (Volume)	Units (quantity/period)
ATR		
Reformed gas (CO and H_2)	[redacted]	kNm³/a

Rectisol		
Gas mixture (CO, H_2, CO_2, CH_4)	1 226 400	kNm³/a
Thermal Oxidation		
Sodium Carbonate	286.2 m³ per 24h day	
Steam	1 000 000	t/a
Gypsum (Oxylime)	26 280	t/a
Catalyst	Depending on raw material feed (195 t/m)	
Steam station 1 and Steam station 2		
Steam production Steam 1	1 226 400	Ton/a per boiler
Steam 2 – boilers 9 to 13	1 270 200	Ton/a per boiler
Steam 2 – boilers 14 & 15	1 357 800	Ton/a per boiler
Ammonia		
Liquid ammonia	[redacted]	t/a
H_2	[redacted]	kNm³/a
Process tail gas	[redacted]	kNm³/a
Nitrogen	[redacted]	kNm³/a
CO_2	[redacted]	t/a
Ammonia hydroxide	[redacted]	t/a
Low pressure steam	[redacted]	t/a
Prillan		
Prilled ammonium nitrate	[redacted]	t/a
Nitric Acid/Ammonium Nitrate		
Nitric acid	[redacted]	t/a
Ammonium nitrate	[redacted]	t/a
Cobalt Catalyst Manufacturing		
Active Catalyst	680	t/a
N-Base, Cresol, Paraffins, ATAR, TNPE and Phenosolvan		
IP – available at Plant	IP – available at Plant	IP – available at Plant
SGEPP		
Power Generation	175.14	MWh/h
Monomers		
Ethylene	[redacted]	ton/a

By-Product Name	Maximum Permitted Production Capacity (Quantity)	Units (quantity/period)
N-Base, Cresol, Paraffins, ATAR, TNPE and Phenosolvan		
IP – available at Plant	IP – available at Plant	IP – available at Plant

* I.P. – available at Plant

6.3. MATERIALS USED IN ENERGY SOURCES

Materials for Energy Source	Actual Consumption Rate (Quantity)	Units (quantity/period)	Materials Characteristics
Coal (Thermal Oxidation)	Approx 50 ton per annum for start up of incinerator B6930	t/a	Sulphur content: ±0.5% Ash Content: ±30%
Start up Oil for boilers	11 639 313	Litres/a	Ash: 0 Sulphur content: ±1.0%
SO Electricity	537	MW	n/a
Fuel gas	40 000	Nm^3/h	n/a
SGEPP Natural Gas	276 000 000	kg/a	n/a

6.4. SOURCES OF ATMOSPHERIC EMISSIONS

6.4.1. Point source parameters

Point Source code	Source name	Latitude (decimal degrees)	Longitude (decimal degrees)	Height of Release Above Ground (m)	Height Above Nearby Building (m)	Diameter at Stack Tip / Vent Exit (m)	Actual Gas Exit Temperature (°C)	Actual Gas Volumetric Flow (m^3/hr)	Actual Gas Exit Velocity (m/s)
ATR and Rectisol (ATR sources)									
1	Fired Heaters ATR A	26.82653	27.84331	65	-	3.32	190	794710	25.5
2	Fired Heaters ATR B	26.82689	27.84069	65	-	3.32	190	769778	24.7
STEAM STATIONS									
3	SS1 Boiler 4	26.82272	27.84006	75	N/a	2.5	160	260 000	14.7
4	SS1 Boiler 5&6	26.82272	27.84007	75	N/a	2.5	160	505969	28.6
5	SS1 Boiler 7&8	26.82272	27.84008	75	N/a	2.5	160	505969	28.6
6	SS2 Boiler 1 to 7	26.82247	27.84853	145	N/a	7.8	160	1737413	10.1
Thermal Oxidation									
7	B6990	26.82556	27.84044	40		1.5	570	24811	3.9
8	B6930	26.82544	27.84022	40		1.53	171	173411	26.2
9	B6993	26.82544	27.84086	40		1.2	83	52522	12.9
ATR and Rectisol (Rectisol sources)									
10	Rectisol E stream off gas	26.82272	27.84006	75		5	Combined with Steam Station 1		
Ammonia and Prillan plant (NAP Plant)									
11	NAP stack	26.82542	27.86047	76	-	1.42	235	90000	22.3

Point Source code	Source name	Latitude (decimal degrees)	Longitude (decimal degrees)	Height of Release Above Ground (m)	Height Above Nearby Building (m)	Diameter at Stack Tip / Vent Exit (m)	Actual Gas Exit Temperature (°C)	Actual Gas Volumetric Flow (m^3/hr)	Actual Gas Exit Velocity (m/s)
Ammonia and Prillian plant (Prillan sources)									
12	Prill Tower	26.82881	27.84078	85	N/a	1.5	23.9	185 000	28.3
12a	Scrubber Stack 1	26.82881	27.84078	22	N/a	1.0	32	80 000	28
12b	Scrubber Stack 2	26.82881	27.84078	22	N/a	1.0	32	80 000	28
Ammonia plant and Prillan (Ammonia sources)									
13	Benfield tower	26.82644	27.83922	55		1.5	85	10179	1.6
Flares (2 x Factory main flare, 1 x ammonia flare, 1 x ammonia storage flare, 1 x N-Base, Cresol, Paraffins, ATAR, TNPE and Phenosolvan flare)									
FMF 1	Factory Main flare 1*	26.82469	27.84078	75		3			
FMF 2	Factory Main flare 2*	26.82497	27.83981	75		3			
AF 1	Ammonia flare*	26.82639	27.83856						
ASF 1	Ammonia storage flare*	26.4938	27.5126						
CF	N-Base, Cresol, Paraffins and TNPE	26.831706	27.845865	67	None in vicinity	1.2			
MF	Elevated Flare (B101)	26.83351	27.84492	65	None in the vicinity	0.914			
MTF	Tank Flare (B180)	26.83408	27.84626	30	None in the vicinity				
MGF	Ground Flare (B009)	26.83342	27.84558	24.39					
Cobalt Catalyst Manufacturing Plant									
14	DeNOx unit	26.8255	27.8387	29.5	21.5	0.6	450	12 000	12

Point Source code	Source name	Latitude (decimal degrees)	Longitude (decimal degrees)	Height of Release Above Ground (m)	Height Above Nearby Building (m)	Diameter at Stack Tip / Vent Exit (m)	Actual Gas Exit Temperature (°C)	Actual Gas Volumetric Flow (m³/hr)	Actual Gas Exit Velocity (m/s)
15	DeNOx unit	26.8255	27.8387	29.5	21.5	0.6	450	12 000	12
16	Wax Scrubber 1	26.82585	27.83854	21	13	0.08	130	13.2	1
17	Wax Scrubber 2	26.82585	27.83854	3.5	4.5	0.08	130	13.2	1
18	Step 4 burner flue gas	26.82581	27.83848	27	19	0.15	330	550	10
19	Step 6 burner flue gas	26.82585	27.83854	27	19	0.15	330	600	10
20	Hot oil system fuel gas burner	26.82566	27.83852	27	19	0.3	330	1120	1.1
21	Step 7 burner flue gas	26.82585	27.83854	27	19	0.3	550	600	10
				N-Base, Cresol, Phenosolvan and TNPE					
22	Fuel gas furnace	26.83031	27.84717	40	None in vicinity	0.11	98.5	164	4.8
23	SOx scrubber on N-base units	26.83017	27.84686	12	None in vicinity	0.11	124	1998	58.4
24	Phenosolvan	26.823927	27.839275	30	None in vicinity	0.2	21	1.1	0.60
				SGEPP					
25	Exhaust stack	26o49.179'	27o50.863'	27	13	OD = 1,375 and ID = 1,224	369	230000	55
26	Exhaust stack	26o49.179'	27o50.863'	27	13	OD = 1,375 and ID = 1,224	369	230000	55
27	Exhaust stack	26o49.179'	27o50.863'	27	13	OD = 1,375 and ID = 1,224	369	230000	55
28	Exhaust stack	26o49.179'	27o50.863'	27	13	OD = 1,375 and ID = 1,224	369	230000	55
29	Exhaust stack	26o49.179'	27o50.863'	27	13	OD = 1,375 and ID = 1,224	369	230000	55

Point Source code	Source name	Latitude (decimal degrees)	Longitude (decimal degrees)	Height of Release Above Ground (m)	Height Above Nearby Building (m)	Diameter at Stack Tip / Vent Exit (m)	Actual Gas Exit Temperature (°C)	Actual Gas Volumetric Flow (m³/hr)	Actual Gas Exit Velocity (m/s)
30	Exhaust stack	26o49.179'	27o50.863'	27	13	OD = 1,375 and ID = 1,224	369	230000	55
31	Exhaust stack	26o49.164'	27o50.890'	27	13	OD = 1,375 and ID = 1,224	369	230000	55
32	Exhaust stack	26o49.164'	27o50.890'	27	13	OD = 1,375 and ID = 1,224	369	230000	55
33	Exhaust stack	26o49.164'	27o50.890'	27	13	OD = 1,375 and ID = 1,224	369	230000	55
34	Exhaust stack	26o49.164'	27o50.890'	27	13	OD = 1,375 and ID = 1,224	369	230000	55
35	Exhaust stack	26o49.164'	27o50.890'	27	13	OD = 1,375 and ID = 1,224	369	230000	55
36	Exhaust stack	26o49.164'	27o50.890'	27	13	OD = 1,375 and ID = 1,224	369	230000	55
37	Exhaust stack	26o49.151'	27o50.916'	27	13	OD = 1,375 and ID = 1,224	369	230000	55
38	Exhaust stack	26o49.151'	27o50.916'	27	13	OD = 1,375 and ID = 1,224	369	230000	55
39	Exhaust stack	26o49.151'	27o50.916'	27	13	OD = 1,375 and ID = 1,224	369	230000	55
40	Exhaust stack	26o49.151'	27o50.916'	27	13	OD = 1,375 and ID = 1,224	369	230000	55
41	Exhaust stack	26o49.151'	27o50.916'	27	13	OD = 1,375 and ID = 1,224	369	230000	55
42	Exhaust stack	26o49.151'	27o50.916'	27	13	OD = 1,375 and ID = 1,224	369	230000	55
Paraffin									
43	Oven B 4701	26.83.058	27.84.625	26	None in the vicinity	1	409	18378	6.5

Point Source code	Source name	Latitude (decimal degrees)	Longitude (decimal degrees)	Height of Release Above Ground (m)	Height Above Nearby Building (m)	Diameter at Stack Tip / Vent Exit (m)	Actual Gas Exit Temperature (°C)	Actual Gas Volumetric Flow (m^3/hr)	Actual Gas Exit Velocity (m/s)
44	Oven B 4702	26.83.058	27.84.625	26	None in the vicinity	1	320	18661	6.6
45	Oven B 4801	26.83.069	27.84.644	26	None in the vicinity	1.25	165	23856	5.4
46	Oven B 4802	26.83.069	27.84.644	26	None in the vicinity	1.25	285	30925	7
Monomers									
47	Steam cracker furnaces, B002A/B	26.832	27.84386	20	None in the vicinity	1.8	417	26 978 x 2	5.9
48	Steam cracker furnaces, B003	26.832	27.84386	26.275	None in the vicinity	1.2 x 2	200	69 183 (both stacks)	8.5
49	Mea Regen Off Gas	26.832	27.84386	35	None in the vicinity	0.1016	40	0.098	0.003

6.4.2. Area and/or line source parameters

Area Source Code	Source Name	Source Description	Latitude (decimal degrees) of SW corner	Longitude (decimal degrees) of SW corner	Height of Release Above Ground (m)	Length of Area (m)	Width of Area (m)	Emissions Hours	Type of Emissions
1	Old OSBs	Water separation basin	26.82731	27.84106	0	20	15	24 hours	Continuous
2	APIs	Water separation basin	26.83453	27.84419	0	60	50	24 hours	Continuous
3	New OSBs	Water separation basin	26.83283	27.97206	0	100	20	24 hours	Continuous
4	Fine ash dam 5	Solids dams containing fine ash	26.844076	27.816837	40m	880	810	24 hours	Continuous
5	Fine ash dam 4	Solids dams containing fine ash	26.838832	27.82662	50m	709	696	24 hours	Continuous
6	Fine ash dam 3	Solids dams containing fine ash	26.834657	27.833084	40m	780	595	24 hours	Continuous

7. APPLIANCES AND MEASURES TO PREVENT AIR POLLUTION

7.1. Appliances and control measures

Associated Source Code	Appliances			Abatement Equipment Control Technology							
	Appliance / Process Equipment Number	Appliance Serial Number	Appliance Type / Description	Abatement Equipment Technology Name and Model	Abatement Equipment Technology Manufacture Date	Commission Date	Date of Significant Modification / Upgrade	Technology Type	Design Capacity	Minimum Control Efficiency (%)	Minimum Utilisation (%)
3	SS1 Boiler 4	Not available	Boiler4	Walter/ Lurgis	Not available	Not available	Not available	Electrostatic precipitators	Not available	Not available	96%
4	SS1 Boiler 5	Not available	Boiler5	Walter/ Lurgis	Not available	Not available	Not available	Electrostatic precipitators	Not available	Not available	96%
	SS1 Boiler 6	Not available	Boiler6	Walter/ Lurgis	Not available	Not available	Not available	Electrostatic precipitators	Not available	Not available	96%
5	SS1 Boiler 7	Not available	Boiler7	Walter/Lurgis	Not available	Not available	Not available	Electrostatic precipitators	Not available	Not available	96%
	SS1 Boiler 8	Not available	Boiler8	Walter/Lurgis	Not available	Not available	Not available	Electrostatic precipitators	Not available	Not available	96%
6 1 stack 7 boilers	SS2 Boiler 9	Not available	Boiler 9	Walter/Lurgis	Not available	Not available	Not available	Electrostatic precipitators	Not available	Not available	96%
	SS2 Boiler 10	Not available	Boiler 10	Walter/Lurgis	Not available	Not available	Not available	Electrostatic precipitators	Not available	Not available	96%
	SS2 Boiler 11	Not available	Boiler 11	Walter/Lurgis	Not available	Not available	Not available	Electrostatic precipitators	Not available	Not available	96%

Associated Source Code	Appliances			Abatement Equipment Control Technology							
	Appliance / Process Equipment Number	Appliance Serial Number	Appliance Type / Description	Abatement Equipment Technology Name and Model	Abatement Equipment Technology Manufacture Date	Commission Date	Date of Significant Modification / Upgrade	Technology Type	Design Capacity	Minimum Control Efficiency (%)	Minimum Utilisation (%)
	SS2 Boiler 12	Not available	Boiler 12	Walter/Lurgis	Not available	Not available	Not available	Electrostatic precipitators	Not available	Not available	96%
	SS2 Boiler 13	Not available	Boiler 13	Walter/Lurgis	Not available	Not available	Not available	Electrostatic precipitators	Not available	Not available	96%
	SS2 Boiler 14	Not available	Boiler 14	Walter/Lurgis	Not available	Not available	Not available	Electrostatic precipitators	Not available	Not available	96%
	SS2 Boiler 15	Not available	Boiler 15	Walter/Lurgis	Not available	Not available	Not available	Electrostatic precipitators	Not available	Not available	96%
8	Thermal Oxidation	Not available	B6930	Not available	Not available	Not available	Not available	Baghouse	Not available	Not available	96%
9	Thermal Oxidation	Not available	B6993	Not available	Not available	Not available	Not available	Venturi Scrubber	Not available	Not available	96%
10	Prillan Plant	Not available	Prill Tower	Not available	Not available	Not available	Not available	Scrubber	Not available	Not available	96%
11	Prillan Scrubber 1	Not available	Prill Tower	Not available	Not available	Not available	Not available	Scrubber	Not available	99.5	96%
12	Prillan Scrubber 2	Not available	Prill Tower	Not available	Not available	Not available	Not available	Scrubber	Not available	Not available	96%
13	NAP Plant	Not available	Effluent stack	DeNOx reactor	Not available	Not available	Not available	Selective catalytic reduction	Not available	Not available	96%

Associated Source Code	Appliances			Abatement Equipment Control Technology							
	Appliance / Process Equipment Number	Appliance Serial Number	Appliance Type / Description	Abatement Equipment Technology Name and Model	Abatement Equipment Technology Manufacture Date	Commission Date	Date of Significant Modification / Upgrade	Technology Type	Design Capacity	Minimum Control Efficiency (%)	Minimum Utilisation (%)
16	Not available	Not available	Not available	Not available	Not available	Wet scrubbing	Sept 2010	N/a	N/a	Not applicable	96%
17	Not available	Not available	Not available	Not available	Not available	Wet scrubbing	Sept 2010	N/a	N/a	Not applicable	96%
23	E4331/01	H2O/Phenol/ Sox Scrubber	Not available	Not available	Not available	Scrubber	2003	N/a	1984kg/h gas	Not applicable	96%
25	YBA 011	Integrated Oxidation Catalyst	DBAC203277	12/09/2011	Wärtsilä Finland OY	DN 500 – DN2000	14/12/2012	N/A		Not applicable	96%
26	YBA 011	Integrated Oxidation Catalyst	DBAC203277	12/09/2011	Wärtsilä Finland OY	DN 500 – DN2000	14/12/2012	N/A		Not applicable	96%
27	YBA 011	Integrated Oxidation Catalyst	DBAC203277	12/09/2011	Wärtsilä Finland OY	DN 500 – DN2000	14/12/2012	N/A		Not applicable	96%
28	YBA 011	Integrated Oxidation Catalyst	DBAC203277	12/09/2011	Wärtsilä Finland OY	DN 500 – DN2000	14/12/2012	N/A		Not applicable	96%
29	YBA 011	Integrated Oxidation Catalyst	DBAC203277	12/09/2011	Wärtsilä Finland OY	DN 500 – DN2000	14/12/2012	N/A		Not applicable	96%

Associated Source Code	Appliances			Abatement Equipment Control Technology							
	Appliance / Process Equipment Number	Appliance Serial Number	Appliance Type / Description	Abatement Equipment Technology Name and Model	Abatement Equipment Technology Manufacture Date	Commission Date	Date of Significant Modification / Upgrade	Technology Type	Design Capacity	Minimum Control Efficiency (%)	Minimum Utilisation (%)
30	YBA 011	Integrated Oxidation Catalyst	DBAC203277	12/09/2011	Wärtsilä Finland OY	DN 500 – DN2000	14/12/2012	N/A		Not applicable	96%
31	YBA 011	Integrated Oxidation Catalyst	DBAC203277	12/09/2011	Wärtsilä Finland OY	DN 500 – DN2000	14/12/2012	N/A		Not applicable	96%
32	YBA 011	Integrated Oxidation Catalyst	DBAC203277	12/09/2011	Wärtsilä Finland OY	DN 500 – DN2000	14/12/2012	N/A		Not applicable	96%
33	YBA 011	Integrated Oxidation Catalyst	DBAC203277	12/09/2011	Wärtsilä Finland OY	DN 500 – DN2000	14/12/2012	N/A		Not applicable	96%
34	YBA 011	Integrated Oxidation Catalyst	DBAC203277	12/09/2011	Wärtsilä Finland OY	DN 500 – DN2000	14/12/2012	N/A		Not applicable	96%
35	YBA 011	Integrated Oxidation Catalyst	DBAC203277	12/09/2011	Wärtsilä Finland OY	DN 500 – DN2000	14/12/2012	N/A		Not applicable	96%
36	YBA 011	Integrated Oxidation Catalyst	DBAC203277	12/09/2011	Wärtsilä Finland OY	DN 500 – DN2000	14/12/2012	N/A		Not applicable	96%
37	YBA 011	Integrated Oxidation Catalyst	DBAC203277	12/09/2011	Wärtsilä Finland OY	DN 500 – DN2000	14/12/2012	N/A		Not applicable	96%

Associated Source Code	Appliances			Abatement Equipment Control Technology							
	Appliance / Process Equipment Number	Appliance Serial Number	Appliance Type / Description	Abatement Equipment Technology Name and Model	Abatement Equipment Technology Manufacture Date	Commission Date	Date of Significant Modification / Upgrade	Technology Type	Design Capacity	Minimum Control Efficiency (%)	Minimum Utilisation (%)
38	YBA 011	Integrated Oxidation Catalyst	DBAC203277	12/09/2011	Wärtsilä Finland OY	DN 500 – DN2000	14/12/2012	N/A		Not applicable	96%
39	YBA 011	Integrated Oxidation Catalyst	DBAC203277	12/09/2011	Wärtsilä Finland OY	DN 500 – DN2000	14/12/2012	N/A		Not applicable	96%
40	YBA 011	Integrated Oxidation Catalyst	DBAC203277	12/09/2011	Wärtsilä Finland OY	DN 500 – DN2000	14/12/2012	N/A		Not applicable	96%
41	YBA 011	Integrated Oxidation Catalyst	DBAC203277	12/09/2011	Wärtsilä Finland OY	DN 500 – DN2000	14/12/2012	N/A		Not applicable	96%
42	YBA 011	Integrated Oxidation Catalyst	DBAC203277	12/09/2011	Wärtsilä Finland OY	DN 500 – DN2000	14/12/2012	N/A		Not applicable	96%
FMF 1	Factory Main flare 1*	Not available	Factory Main flare 1*	Flare	Not available	Not available	Not available	Flare	Not available	Not available	96%
FMF 2	Factory Main flare 2*	Not available	Factory Main flare 2*	Flare	Not available	Not available	Not available	Flare	Not available	Not available	
AF 1	Ammonia flare*	Not available	Ammonia flare*	Flare	Not available	Not available	Not available	Flare	Not available	Not available	96%

Associated Source Code	Appliances			Abatement Equipment Control Technology							
	Appliance / Process Equipment Number	Appliance Serial Number	Appliance Type / Description	Abatement Equipment Technology Name and Model	Abatement Equipment Technology Manufacture Date	Commission Date	Date of Significant Modification / Upgrade	Technology Type	Design Capacity	Minimum Control Efficiency (%)	Minimum Utilisation (%)
ASF 1	Ammonia storage flare*	Not available	Ammonia storage flare*	Flare	Not available	Not available	Not available	Flare	Not available	Not available	96%

7.2. POINT SOURCE – MINIMUM EMISSIONS STANDARDSAXIMUM EMISSIONS RATES (UNDER NORMAL WORKING CONDITIONS)

Point Source Code	Category	Appliance	Pollutant Name	Maximum Release Rate			Duration of Emissions
				(mg/Nm³)*	Compliance Time Frame	Average Period	
1	Subcategory 2.1: Combustion Installations	ATR A	PM	120	01 April 2015 - 31 March 2020	Hourly	Continuous
				70	01 April 2020 - 31 March 2025		
			SO_2	1 700	01 April 2015 - 31 March 2020		
				1 000	01 April 2020 - 31 March 2025		
			NO_X	1 700	01 April 2015 - 31 March 2020		
				400	01 April 2020 - 31 March 2025		
2	Subcategory 2.1: Combustion Installations	ATR B	PM	120	01 April 2015 - 31 March 2020	Hourly	Continuous
				70	01 April 2020 - 31 March 2025		
			SO_2	1 700	01 April 2015 - 31 March 2020		
				1 000	01 April 2020 - 31 March 2025		
			NO_X	1 700	01 April 2015 - 31 March 2020		
				1 000	01 April 2020 - 31 March 2025		
3	Subcategory 1.1: Solid Fuel Combustion Installations	Steam Station 1: Boiler 4	PM	165	01 April 2015 - 31 March 2020	Daily	Continuous
				50	01 April 2020 - 31 March 2025		
			SO_2	3500	01 April 2015 - 31 March 2020		
				2000	01 April 2020 - 31 March 2025		
			NO_X	1450	01 April 2015 - 31 March 2020		
				750	01 April 2020 - 31 March 2025		
4	Subcategory 1.1: Solid Fuel Combustion Installations	Steam Station 1: Boilers 5 & 6	PM	165	01 April 2015 - 31 March 2020	Daily	Continuous
				50	01 April 2020 - 31 March 2025		
			SO_2	3500	01 April 2015 - 31 March 2020		

				2000	01 April 2020 - 31 March 2025		
			NO_X	1450	01 April 2015 - 31 March 2020		
				750	01 April 2020 - 31 March 2025		
5	Subcategory 1.1: Solid Fuel Combustion Installations	Steam Station 1: Boilers 7 & 8	PM	165	01 April 2015 - 31 March 2020	Daily	Continuous
				50	01 April 2020 - 31 March 2025		
			SO_2	3500	01 April 2015 - 31 March 2020		
				2000	01 April 2020 - 31 March 2025		
			NO_X	1450	01 April 2015 - 31 March 2020		
				750	01 April 2020 - 31 March 2025		
6	Subcategory 1.1: Solid Fuel Combustion Installations	Steam Station 2: Boiler 9 – 15	PM	100	01 April 2015 - 31 March 2020	Daily	Continuous
				50	01 April 2020 - 31 March 2025		
			SO_2	3500	01 April 2015 - 31 March 2020		
				2000	01 April 2020 - 31 March 2025		
			NO_X	1250	01 April 2015 - 31 March 2020		
				750	01 April 2020 - 31 March 2025		
7	Sub-category 8.1: Thermal Treatment of Hazardous & General Waste	B6930 (High Sulphur Pitch Incinerator)	PM	100	01 April 2018 - 31 March 2020	Daily	Continuous
				10	01 April 2020 - 31 March 2025		
			CO	75	01 April 2015 - 31 March 2020		
				50	01 April 2020 - 31 March 2025		
			SO_2	3 600	01 April 2018 - 31 March 2020		
				50	01 April 2020 - 31 March 2025		
			NOx (expressed as NO2)	800	01 April 2018 - 31 March 2020		
				200	01 April 2020 - 31 March 2025		
			HCl	10	01 April 2015 - 31 March 2025		

			HF	1	01 April 2015 - 31 March 2025		
			Sum of Pb, As, Sb, Cr, Co, Cu, Mn, Ni and V.	6	01 April 2018 - 31 March 2020		
				0.5	01 April 2020 - 31 March 2025		
			Hg	0.05	01 April 2015 - 31 March 2025		
			Cd & Tl	0.05	01 April 2015 - 31 March 2025		
			TOC	15	01 April 2018 - 31 March 2020		
				10	01 April 2020 - 31 March 2025		
			NH_3	10	01 April 2015 - 31 March 2025		
			ng I-TEQ /Nm3 under normal conditions of 273 K, 101.3 KPa, 10% oxygen, dry gas and on a daily average basis				
			PCDD/PCDF	0.1	01 April 2015 - 31 March 2025		
8	Sub-category 8.1: Thermal Treatment of Hazardous & General Waste	B6993 (Spent Caustic Incinerator)	PM	300	01 April 2015 - 31 March 2018	Daily	Continuous
				10	01 April 2020 - 31 March 2025		
			CO	1 110	01 April 2018 - 31 March 2020		
				50	01 April 2020 - 31 March 2025		
			SO_2	260	01 April 2018 - 31 March 2020		
				50	01 April 2020 - 31 March 2025		
			NOx (expressed as NO_2)	420	01 April 2018 - 31 March 2020		
				200	01 April 2020 - 31 March 2025		
			HCl	10	01 April 2015 - 31 March 2025		
			HF	1	01 April 2015 - 31 March 2025		
			Sum of Pb, As, Sb, Cr, Co, Cu, Mn, Ni and V.	20	01 April 2018 - 31 March 2020		
				0.5	01 April 2020 - 31 March 2025		
			Hg	0.05	01 April 2015 - 31 March 2025		
			Cd & Tl	0.05	01 April 2015 - 31 March 2025		

			TOC	20	01 April 2015 - 31 March 2020		
				10	01 April 2020 - 31 March 2025		
			NH_3	10	01 April 2015 - 31 March 2025		
			ng I-TEQ /Nm3 under normal conditions of 273 K, 101.3 KPa, 10% oxygen, dry gas and on a daily average basis				
			PCDD/PCDF	0.1	01 April 2015 - 31 March 2025		
9	Sub-category 8.1: Thermal Treatment of Hazardous & General Waste	B6990 (Heavy End B Incinerator)	PM	600	01 April 2018 - 31 March 2020	Daily	Continuous
				10	01 April 2020 - 31 March 2025		
			CO	75	01 April 2015 - 31 March 2020		
				50	01 April 2020 - 31 March 2025		
			SO_2	1 050	01 April 2018 - 31 March 2020		
				50	01 April 2020 - 31 March 2025		
			NOx (expressed as NO_2)	570	01 April 2018 - 31 March 2020		
				200	01 April 2020 - 31 March 2025		
			HCl	10	01 April 2015 - 31 March 2025		
			HF	3.3	01 April 2018 - 31 March 2020		
				1	01 April 2020 - 31 March 2025		
			Sum of Pb, As, Sb, Cr, Co, Cu, Mn, Ni and V.	60	01 April 2018 - 31 March 2020		
				0.5	01 April 2020 - 31 March 2025		
			Hg	0.05	01 April 2018 - 31 March 2025		
			Cd & Tl	0.05	01 April 2018 - 31 March 2025		
			TOC	15	01 April 2018 - 31 March 2020		
				10	01 April 2020 - 31 March 2025		
			NH_3	10	01 April 2015 - 31 March 2025		
			ng I-TEQ /Nm3 under normal conditions of 273 K, 101.3 KPa, 10%				

			oxygen, dry gas and on a daily average basis				
			PCDD/PCDF	0.1	01 April 2018 - 31 March 2025		
			Exit gas temperatures must be maintained below 1000°C		01 April 2018 - 31 March 2020		
10	Sub-category 6: Organics Chemical Industry	Rectisol E stream off gas	VOCs	40 000	01 April 2015 - 31 March 2025	Hourly	Continuous
11	Sub-Category 7.2 Production of acids	NAP stack	NOx	500	01 April 2015 - 31 March 2020	Daily	Continuous
				350	1 April 2020 – 31 March 2025		
12	Sub-Category 7.3 Production of Chemical Fertilisers	Prill Tower	Particulates	50	01 April 2015 - 31 March 2025	Hourly	Batch
			NH_3	100	01 April 2015 - 31 March 2020	Hourly	Batch
				50	1 April 2020 – 31 March 2025		
12a		Scrubber Stack 1	Particulates	50	01 April 2015 - 31 March 2025	Hourly	Batch
			NH_3	100	01 April 2015 - 31 March 2020	Hourly	Batch
				50	1 April 2020 – 31 March 2025		
12b		Scrubber Stack 2	Particulates	50	01 April 2015 - 31 March 2020	Hourly	Batch
			NH_3	100	01 April 2015 - 31 March 2025	Hourly	Batch
				50	1 April 2020 – 31 March 2025		
14	Sub-Category 4.1: Drying and Calcining	DeNOx unit	NOx	700	01 April 2015 - 31 March 2020	Hourly	Continues
				700	1 April 2020 – 31 March 2025		
15	Sub-Category 4.1: Drying and Calcining	DeNOx unit	NOx	700	01 April 2015 - 31 March 2020	Hourly	Continues
				700	1 April 2020 – 31 March 2025		
16	Sub-category 6: Organics	Wax Scrubber 1	VOC's	40 000	01 April 2015 - 31 March 2025	Hourly	Continues

17	Chemical Industry	Wax Scrubber 2	VOC's	40 000	01 April 2015 - 31 March 2025	Hourly	Continues
18	Sub-Category 4.1: Drying and Calcining	Step 4 burner flue gas	NOx	700	01 April 2015 - 31 March 2020	Hourly	Continues
			VOCs	40	01 April 2015 - 31 March 2020	Hourly	Continues
19	Sub-Category 4.1: Drying and Calcining	Step 6 burner flue gas	NOx	700	01 April 2015 - 31 March 2020	Hourly	Continues
			VOCs	40			
20	Sub-Category 4.1: Drying and Calcining	Hot oil system fuel gas burner	NOx	700	01 April 2015 - 31 March 2020	Hourly	Continues
			VOCs	40			
21	Sub-Category 4.1: Drying and Calcining	Step 7 burner flue gas	NOx	700	01 April 2015 - 31 March 2020	Hourly	Continues
			VOC's	40			
22	Subcategory 2.1: Combustion installations	Fuel gas furnace	PM	120	01 April 2015 - 31 March 2020	Hourly	Continues
				70	01 April 2015 - 31 March 2025		
			SO_2	1 700	01 April 2015 - 31 March 2020		
				1 000	01 April 2015 - 31 March 2025		
			NOx	1 700	01 April 2015 - 31 March 2020		
				400	01 April 2015 - 31 March 2025		
23	Subcategory 6: Organic Chemical Industry	SOx scrubber on N-base units	SO_3	100	01 April 2015 - 31 March 2020	Hourly	Continues
				30	01 April 2015 - 31 March 2025		
			VOCs	40 000	01 April 2015 - 31 March 2025		
24	Subcategory 6: Organic Chemical Industry	Phenosolvan	VOCs	40 000	01 April 2015 - 31 March 2025	Hourly	
25	Subcategory 1.5: Reciprocating Engines	Exhaust stack 1	NOx	400	01 April 2015 - 31 March 2025	Hourly	Continues
			PM	50	01 April 2015 - 31 March 2025		

			SO2	1170	01 April 2015 - 31 March 2025		
26		Exhaust stack 2	NOx	400	01 April 2015 - 31 March 2025	Hourly	Continues
			PM	50	01 April 2015 - 31 March 2025		
			SO2	1170	01 April 2015 - 31 March 2025		
27		Exhaust stack 3	NOx	400	01 April 2015 - 31 March 2025	Hourly	Continues
			PM	50	01 April 2015 - 31 March 2025		
			SO2	1170	01 April 2015 - 31 March 2025		
28		Exhaust stack 4	NOx	400	01 April 2015 - 31 March 2025	Hourly	Continues
			PM	50	01 April 2015 - 31 March 2025		
			SO2	1170	01 April 2015 - 31 March 2025		
29		Exhaust stack 5	NOx	400	01 April 2015 - 31 March 2025	Hourly	Continues
			PM	50	01 April 2015 - 31 March 2025		
			SO2	1170	01 April 2015 - 31 March 2025		
30		Exhaust stack 6	NOx	400	01 April 2015 - 31 March 2025	Hourly	Continues
			PM	50	01 April 2015 - 31 March 2025		
			SO2	1170	01 April 2015 - 31 March 2025		
31		Exhaust stack 7	NOx	400	01 April 2015 - 31 March 2025	Hourly	Continues
			PM	50	01 April 2015 - 31 March 2025		
			SO2	1170	01 April 2015 - 31 March 2025		
32		Exhaust stack 8	NOx	400	01 April 2015 - 31 March 2025	Hourly	Continues

			PM	50	01 April 2015 - 31 March 2025		
			SO2	1170	01 April 2015 - 31 March 2025		
33		Exhaust stack 9	NOx	400	01 April 2015 - 31 March 2025	Hourly	Continues
			PM	50	01 April 2015 - 31 March 2025		
			SO2	1170	01 April 2015 - 31 March 2025		
34		Exhaust stack 10	NOx	400	01 April 2015 - 31 March 2025	Hourly	Continues
			PM	50	01 April 2015 - 31 March 2025		
			SO2	1170	01 April 2015 - 31 March 2025		
35		Exhaust stack 11	NOx	400	01 April 2015 - 31 March 2025	Hourly	Continues
			PM	50	01 April 2015 - 31 March 2025		
			SO2	1170	01 April 2015 - 31 March 2025		
36		Exhaust stack 12	NOx	400	01 April 2015 - 31 March 2025	Hourly	Continues
			PM	50	01 April 2015 - 31 March 2025		
			SO2	1170	01 April 2015 - 31 March 2025		
37		Exhaust stack 13	NOx	400	01 April 2015 - 31 March 2025	Hourly	Continues
			PM	50	01 April 2015 - 31 March 2025		
			SO2	1170	01 April 2015 - 31 March 2025		
38		Exhaust stack 14	NOx	400	01 April 2015 - 31 March 2025	Hourly	Continues
			PM	50	01 April 2015 - 31 March 2025		
			SO2	1170	01 April 2015 - 31 March 2025		

39		Exhaust stack 15	NOx	400	01 April 2015 - 31 March 2025	Hourly	Continues
			PM	50	01 April 2015 - 31 March 2025		
			SO2	1170	01 April 2015 - 31 March 2025		
40		Exhaust stack 16	NOx	400	01 April 2015 - 31 March 2025	Hourly	Continues
			PM	50	01 April 2015 - 31 March 2025		
			SO2	1170	01 April 2015 - 31 March 2025		
41		Exhaust stack 17	NOx	400	01 April 2015 - 31 March 2025	Hourly	Continues
			PM	50	01 April 2015 - 31 March 2025		
			SO2	1170	01 April 2015 - 31 March 2025		
42		Exhaust stack 18	NOx	400	01 April 2015 - 31 March 2025	Hourly	Continues
			PM	50	01 April 2015 - 31 March 2025		
			SO2	1170	01 April 2015 - 31 March 2025		
43	Subcategory 2.1: Combustion installations	Oven B 4701	PM	120	01 April 2015 - 31 March 2020	Hourly	Continues
				70	01 April 2015 - 31 March 2025		
			SO_2	1 700	01 April 2015 - 31 March 2020		
				1 000	01 April 2015 - 31 March 2025		
			NOx	1 700	01 April 2015 - 31 March 2020		
				400	01 April 2015 - 31 March 2025		
44	Subcategory 2.1: Combustion installations	Oven B 4702	PM	120	01 April 2015 - 31 March 2020	Hourly	Continues
				70	01 April 2015 - 31 March 2025		

			SO_2	1 700	01 April 2015 - 31 March 2020		
				1 000	01 April 2015 - 31 March 2025		
			NOx	1 700	01 April 2015 - 31 March 2020		
				400	01 April 2015 - 31 March 2025		
45	Subcategory 2.1: Combustion installations	Oven B 4801	PM	120	01 April 2015 - 31 March 2020	Hourly	Continues
				70	01 April 2015 - 31 March 2025		
			SO_2	1 700	01 April 2015 - 31 March 2020		
				1 000	01 April 2015 - 31 March 2025		
			NOx	1 700	01 April 2015 - 31 March 2020		
				400	01 April 2015 - 31 March 2025		
46	Subcategory 2.1: Combustion installations	Oven B 4802	PM	120	01 April 2015 - 31 March 2020	Hourly	Continues
				70	01 April 2015 - 31 March 2025		
			SO_2	1 700	01 April 2015 - 31 March 2020		
				1 000	01 April 2015 - 31 March 2025		
			NOx	1 700	01 April 2015 - 31 March 2020		
				400	01 April 2015 - 31 March 2025		
47	Subcategory 2.1: Combustion installations	Steam cracker furnaces, B002A/B	PM	120	01 April 2015 - 31 March 2020	Hourly	Continues
				70	01 April 2015 - 31 March 2025		
			SO_2	1 700	01 April 2015 - 31 March 2020		
				1 000	01 April 2015 - 31 March 2025		

			NOx	1 700	01 April 2015 - 31 March 2020		
				400	01 April 2015 - 31 March 2025		
48	Subcategory 2.1: Combustion installations	Steam cracker furnaces, B003	PM	120	01 April 2015 - 31 March 2020	Hourly	Continues
				70	01 April 2015 - 31 March 2025		
			SO_2	1 700	01 April 2015 - 31 March 2020		
				1 000	01 April 2015 - 31 March 2025		
			NOx	1 700	01 April 2015 - 31 March 2020		
				400	01 April 2015 - 31 March 2025		
49	Subcategory 6: Organic Chemical Industry	MEA Regen Off Gas	Methyl Amine	10	01 April 2015 - 31 March 2020	Hourly	Continues

*: No halogenated components may be combusted in any of the incinerators

Point sources 1 – 9, 22, 43, 44, 45, 46, 47, 48 expressed at 10% O_2, dry gas

Point source 25 – 42 expressed at 15% O_2, dry gas.

Point sources 10 – 12, 23, 24 and 49 expressed under prevailing oxygen conditions, dry gas

Point source – operating requirements

7.2.1 The licence holder must report any non-compliance with the condition stipulated in the license

7.2. 2 Since the licence holder's activities are carried out in a national air pollution priority area (Vaal Triangle Air shed Priority Area), further stricter condition may be introduced should it be found prudent to do so

7.2.3 The licence holder is responsible for ensuring compliance with conditions stipulated in this licence.

7.2.4 All records of compliance and noncompliance must be maintained and be kept for at least five (5) years.

7.2. Any abnormalities experienced shall form part of the normal part of the monthly reporting and be forwarded to the licensing authority.

7.2.6 The licence holder must comply with air emissions reporting requirements as stipulated in the listed activities and associated minimum emissions standards in terms of the National Environmental Management: Air Quality Act (39 of 2004) (Government Notice No. 248, Gazette No. 33064 dated 30 March 2010 as amended in Government Notice No.893, Gazette No.37054 dated 22 November 2013)

7.2.7 The licence holder must comply with air emissions monitoring or sampling requirements as stipulated in the listed activities and associated minimum emissions standards in terms of the National Environmental Management: Air Quality Act (39 of 2004) (Government Notice No. 248, Gazette No. 33064 dated 30 March 2010 as amended in Government Notice No.893, Gazette No.37054 dated 22 November 2013). Section 4.3 of the licence should be taken into account should the facility wish to use another sampling method

7.2.8 Due to the extended shut down of the B6990, B6993 and B6930 units, a once off extended start-up of 6 months will be allowed per incinerator to allow for calibrations of all online monitoring equipment and stabilisation of the units, after which the conditions as per the above table will apply. The start-up date must be communicated to the Licensing Officer to determine the start of the 6 month period.

7.2.9 In the case of a limit value exceedance of a parameter not monitored through online monitoring but via a third party, the following shall apply:

- The air quality officer shall be notified within 24-hours from the time that Sasol becomes aware of the exceedance
- Within 14 days after the notification of the air quality officer, a plan on how the facility will manage the upset condition and the plant be brought back into compliance, must be presented to the air quality officer together with a dispersion model for approval.
- On acceptance of the plan with its associated impact, the Air Quality officer will issue a written approval for the implementation of the plan and the necessary reporting and tracking to bring the plant back into compliance
- Failing to adhere to the above mentioned under 7.2.9 or the plan will constitute non-compliance

7.3. POINT SOURCE OPERATING CONDITIONS (UNDER START-UP, MAINTENANCE AND SHUT-DOWN CONDITIONS)

The following conditions must be adhered to as a minimum during start up, maintenance/upset and shut down conditions:

Should normal start up, maintenance/upset and shutdown conditions exceed a period of 48 hours, Section 30 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), shall apply.

Should normal start up, maintenance/upset and shut down conditions exceed a period of 96 hours for the B6930, B6990 and B6993 point sources, Section 30 of the National Environmental Management Act, 1998 (Act No 107 of 1998), shall apply.

Technical and Engineering testing work will be considered extraordinary maintenance to which conditions in Section 7.2 and normal start-up, shut down and maintenance/upset conditions do not apply. Prior notification must be given to the Air Quality Officer to confirm the start and end date of this testing work.

7.4. POINT SOURCE – EMISSIONS MONITORING AND REPORTING REQUIREMENTS

Point Source Code	Emissions Sampling / Monitoring Method	Sampling Frequency	Sampling Duration	Parameters to be measured	Parameters to be reported	Conditions under which monitoring should be stopped	Reporting Frequency
1	Periodic emission monitoring As indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	At least Annually v/s Biannually	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Particulate matter, SO_2 and NOx	Particulate matter, SO_2 and NOx	Upon written approval by the Air Quality Officer	Annually v/s Biannully
2	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	At least Annually	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Particulates, SO_2 and NOx	Particulates, SO_2 and NOx	Upon written approval by the Air Quality Officer	Annually
3	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Continuous emission monitoring for particulates, SO_2 and NOx	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Particulates, SO_2 and NOx	Particulates, SO_2 and NOx	Upon written approval by the Air Quality Officer	Annually
4	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Continuous emission monitoring for particulates, SO_2 and NOx	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Particulates, SO_2 and NOx	Particulates, SO_2 and NOx	Upon written approval by the Air Quality Officer	Annually

5	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Continuous emission monitoring for particulates, SO_2 and NOx	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Particulates, SO_2 and NOx	Particulates, SO_2 and NOx	Upon written approval by the Air Quality Officer	Annually
6	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Continuous emission monitoring for particulates, SO_2 and NOx	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Particulates, SO_2 and NOx	Particulates, SO_2 and NOx	Upon written approval by the Air Quality Officer	Annually
7	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Continuous emission monitoring as per Minimum Emission Standards All other parameters, at least annually	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations. (Refer to Schedule A)	Particulates, SO_2, NOx, CO, HCl, HF, NH_3, Pb, As, Sb, Cr, Co, Cu, Mn, Ni, V, Hg, Cd, Tl, TOC, dioxins&furans	Particulates, SO_2, NOx, CO, HCl, HF, NH_3, Pb, As, Sb, Cr, Co, Cu, Mn, Ni, V, Hg, Cd, Tl, TOC, dioxins&furans	Upon written approval by the Air Quality Officer	Annually Particulates, metals and PCDD/PCDF reports on a quarterly basis until 1 April 2018
8	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Continuous emission monitoring as per Minimum Emission Standards All other parameters, at least annually	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Particulates, SO_2, NOx, CO, HCl, HF, NH_3, Pb, As, Sb, Cr, Co, Cu, Mn, Ni, V, Hg, Cd, Tl, TOC, dioxins&furans	Particulates, SO_2, NOx, CO, HCl, HF, NH_3, Pb, As, Sb, Cr, Co, Cu, Mn, Ni, V, Hg, Cd, Tl, TOC, dioxins&furans	Upon written approval by the Air Quality Officer	Annually

9	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Continuous emission monitoring as per Minimum Emission Standards, excluding particulates and flow due to the high tempraturs All other parameters, including particulates and flow at least annually	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Particulates, SO_2, NOx, CO, HCl, HF, NH_3, Pb, As, Sb, Cr, Co, Cu, Mn, Ni, V, Hg, Cd, Tl, TOC, dioxins&furans	Particulates, SO_2, NOx, CO, HCl, HF, NH_3, Pb, As, Sb, Cr, Co, Cu, Mn, Ni, V, Hg, Cd, Tl, TOC, dioxins&furans	Upon written approval by the Air Quality Officer	Annually
10	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	At least Annualy	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	VOCs	VOCs	Upon written approval by the Air Quality Officer	Annually
11	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	At least Annualy	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Particulates and NH_3	Particulates and NH_3	Upon written approval by the Air Quality Officer	Annually

12	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	At least Annualy	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Particulates and NH_3	Particulates and NH_3	Upon written approval by the Air Quality Officer	Annually
12a	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	At least Annualy	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Particulates and NH_3	Particulates and NH_3	Upon written approval by the Air Quality Officer	Annually
12b	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	At least Annualy	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Particulates and NH_3	Particulates and NH_3	Upon written approval by the Air Quality Officer	Annually
13	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	At least Annualy	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	NOx	NOx	Upon written approval by the Air Quality Officer	Annually
14 & 15	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	At least Annualy	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	NOx	NOx	Upon written approval by the Air Quality Officer	Annually
16 & 17	As Indicated in the National Environmental Management: Air	At least Annualy	As Indicated in the National Environmental	VOCs	VOCs	Upon written approval by the	Annually

	Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)		Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)			Air Quality Officer	
18 – 21	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	At least Annualy	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	NOx VOCs	NOx VOCs	Upon written approval by the Air Quality Officer	Annually
22	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	At least Annualy	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Particulates, SO_2 and NOx	Particulates, SO_2 and NOx	Upon written approval by the Air Quality Officer	Annually
23	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	At least Annualy	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	SO_3 and VOCs	SO_3 and VOCs	Upon written approval by the Air Quality Officer	Annually
24-42	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	At least Annualy	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Particulates, SO_2 and NOx	Particulates, SO_2 and NOx	Upon written approval by the Air Quality Officer	Annually

43-48	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	At least Annualy	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Particulates, SO_2 and NOx	Particulates, SO_2 and NOx	Upon written approval by the Air Quality Officer	Annually
49	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	At least Annualy	As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A)	Methyl amine	Methyl amine	Upon written approval by the Air Quality Officer	Annually

7.5. AREA AND/OR LINE SOURCE – MANAGEMENT AND MITIGATION MEASURES

Area and/or Line Source Code	Area and/or Line Source Description	Description of Specific Measures	Timeframe for Achieving Required Control Efficiency	Method of Monitoring Measures Effectiveness	Contingency Measures
None					

7.6. ROUTINE REPORTING AND RECORD-KEEPING

Complaints register

The licence holder must maintain a complaints register at its premises, and such register must be made available for inspections. The complaints register must include the following information on the complainant, namely, the name, physical address, telephone number, date and the time when the complaint was registered. The register should also provide space for noise, dust and offensive odours complaints.

Furthermore, the licence holder is to investigate and, monthly, report to the licencing authority in a summarised format on the total number of complaints logged. The complaints must be reported in the following format with each component indicated as may be necessary:

(a) Source code / name;
(b) Root cause analysis;

(c) Calculation of impacts / emissions associated with incidents and dispersion modelling of pollutants, where applicable;
(d) Measures implemented or to be implemented to prevent recurrence; and
(e) Date by which measure will be implemented.

The licensing authority must also be provided with a copy of the complaints register. The record of a complaint must be kept for at least 5 (five) years after the complaint was made.

7. REPORTING

7.1 Annual reporting

The licence holder must complete and submit to the licensing authority an annual report. The report must include information for the year under review (i.e. annual year end of the company). The report must be submitted to the licensing authority not later than 60 (sixty) days after the end of each reporting period. The annual report must include, amongst others, the following items:

(a) Pollutant emissions trend;

(b) Compliance audit report(s);

(c) Major upgrades projects (i.e. abatement equipment or process equipment); and

(d) Greenhouse gas emissions.

The holder of the licence must keep a copy of the annual report for a period of at least 5 (five) years.

7.2 Reporting of abnormal releases and emergency responses

The holder must prevent deviations from normal operating conditions that would result in pollution exceeding specified limit values. If any conditions exist that will result in excessive emissions or nuisance must be immediately reported to the Air Quality Officer. Section 30 NEMA incidence must also be reported to the Air Quality Officer within 24 hours. Where excessive emissions occur, which could cause adverse health and environmental impacts or nuisance, urgent corrective measures must be taken by the holder to contain or minimise the emissions through operational interventions. Remediation, if required shall be carried out to the satisfaction of the licensing authority and/or any other government agencies.

8. DISPOSAL OF WASTE AND EFFLUENT ARISING FROM ABATEMENT EQUIPMENT CONTROL TECHNOLOGY

The disposal of any waste and effluent arising from the abatement equipment control technology must comply with the relevant legislation and requirements of the relevant authorities.

Unique Stack or Area ID (As per 5.4.1 or 5.4.5 above)	Waste / Effluent Type	Hazardous Components Present	Method of Disposal	Registration / Permit / License Status
4,	*Ash*	*None*	*Land filling*	*n/a*
7,	*Gypsum*	*None*	*Land filling*	*n/a*
All scrubber liquor and water effluent are treated at the Sasol bio- and water works facility				

9. PENALTIES FOR NON-COMPLIANCE WITH LICENCE AND STATUTORY CONDITIONS OR REQUIREMENTS

Failure to comply with any of the licence and relevant statutory conditions and/or requirements is an offence, and licence holder, if convicted, will be subjected to those penalties as set out in section 52 of the AQA.

10. REPORTING OF ABNORMAL RELEASES AND EMERGENCY RESPONSES

The holder must prevent deviations from normal operating conditions that would result in pollution exceeding specified limit values. If any conditions exist that will result in excessive emissions or nuisance must be immediately reported to the Air Quality Officer. Section 30 NEMA incidence must also be reported to the Air Quality Officer within 24 hours. Where excessive emissions occur, which could cause adverse health and environmental impacts or nuisance, urgent corrective measures must be taken by the holder to contain or minimise the emissions through operational interventions. Remediation, if required shall be carried out to the satisfaction of the licensing authority and/or any other government agencies.

11. APPEAL OF ATMOSPHERIC EMISSIONS LICENCE

11.1 The holder of the authorization must notify every registered interested and affected party, in writing and within five (5) working days of the date of issue, of the holder's receipt of this atmospheric emissions licence.

11.2 The written notification referred to in Condition 11.1 above must –
- 10.2.1 Specify the date on which the atmospheric emissions licence was issued;
- 11.2.2 Inform interested and affected parties of the appeal procedure provided for in Chapter 7 the GN No R543 of 18 June 2010; and
- 11.2.3 Advise interested and affected parties that a copy of the atmospheric emissions licence and reasons for the decision will be furnished on request

11.3 An appeal against the decisions contained in this atmospheric emissions licence must be lodged and addressed to: Municipal Manager, Fezile Dabi District Municipality, P.O. Box 10, Sasolburg, 1949, Tel No:016 970 8600, Fax No: 016 973 1582

12. REVIEW

12.1 The authority shall have the right to review the licence continuously within the period as stipulated in clause 1 above or as and when such review is deemed necessary by the Air Quality Officer;

12.2 Such review shall be done as a result of amendments in legislation or by virtue of findings from regular inspections done by the Air Quality Officer;

12.3 The authority shall serve the license holder with a 30(thirty) day notice when such a necessity arises;

12.4 The authority shall under no circumstances be barred by license holder from reviewing the license upon receiving notice of review.