Gert Sibande District Municipality

Please address all correspondence to:

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OFFICE OF THE MUNICIPAL MANAGER

Enquiries: Ms. MLT Mogakabe (017 801 7000)
Our Ref: 13/19/1/Govan Mbeki/Sasol South Africa Limited- Secunda Operations Solvents/0017/2025/F04
Date: 25 February 2025

Sasol South Africa Limited- Secunda Operations Solvents
PDP Kruger
Secunda
2302

Attention: Mr. Hannes Buys

Dear Sir

ATMOSPHERIC EMISSION LICENCE IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT, 2004 (ACT NO. 39 OF 2004) AS AMENDED.

With reference to your application dated **16 February 2024**, enclosed, herewith, the Atmospheric Emission Licence No **Govan Mbeki/Sasol South Africa Limited- Secunda Operations Solvents/0017/2025/F04** dated **25 February 2025** in respect of the **Sasol South Africa Limited- Secunda Operations Solvents.**

Your attention is drawn to the following conditions for licence issue –

a. Chapter 5, Section 42 of the Act, Issuing of Atmospheric Emission Licence
And
b. Chapter 5, Section 43 of the Act, Content of Provisional Atmospheric Emission Licence, and Atmospheric Emission Licence.

1. SITUATION AND EXTENT OF PLANT

Situation
PDP Kruger, Secunda, Govan Mbeki Local Municipality, Gert Sibande District, Mpumalanga.

Extent
24.05km^2

2. NATURE OF PROCESS AND LISTED ACTIVITIES

Section 21

Listed Activity Number	Category of Listed Activity	Sub-category of the listed activity	Description of the Listed Activity	Application
2.1	Petroleum Industry	Combustion Installations	Combustion installations not used primarily for steam raising or electricity generation (furnaces and heaters). The production or use in production of organic chemicals not specified elsewhere including acetylene, acetic, maleic or phthalic anhydride or their acids, carbon disulphide, pyridine, formaldehyde, acetaldehyde, acrolein and its derivatives, acrylonitrile, amines and synthetic rubber. The production of organometallic compounds, organic dyes and pigments, surface active agents. The polymerisation or co-polymerisation of any unsaturated hydrocarbons substituted hydrocarbons (including vinyl chloride). The manufacture, recovery or purification of acrylic acid or any ester of acrylic acid. The use of toluene di-isocyanate or other di-isocyanate or comparable volatility or recovery of pyridine.	All refinery furnaces and heaters. All installations producing and/or using more than 100 tons per annum of any of the listed compounds.
6	Organic Chemicals Industry	N/A		

Yours in good governance,

MR. CA HABILE
MUNICIPAL MANAGER

GERT SIBANDE DISTRICT MUNICIPALITY

NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT, 2004 (ACT NO. 39 OF 2004) AS AMENDED

Atmospheric Emission License

Sasol South Africa Limited- Secunda Operations Solvents

Is authorized to continue the processes listed below, with equipment and plant as detailed in the licence conditions of licence no. **Govan Mbeki/Sasol South Africa Limited- Secunda Operations Solvents/0017/2025/F04** on the premise known as **PDP Kruger Site, Secunda, Govan Mbeki Local Municipality, Gert Sibande District Municipality, Mpumalanga.**

Category 2 Sub-category 2.1: Combustion Installations; Sub-category 6: Organic Chemical Industry.

.

LICENSING AUTHORITY

Govan Mbeki/Sasol South Africa Limited- Secunda Operations Solvents/0017/2025/F04

Date: 25 February 2025

Gert Sibande District Municipality

Office hours:
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ATMOSPHERIC EMISSION LICENCE AS CONTEMPLATED IN SECTION 43 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT, 2004, (ACT NO. 39 OF 2004) (NEMAQA) AS AMENDED

I, **Mary Lorette Tebogo Mogakabe**, in my capacity as **License Officer** (hereinafter referred to as "the Licensing Authority"), in terms of section 36(1) of the National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004, hereinafter referred to as the "Act"), and as provided for in section 40(1)(a) of the Act, hereby grant an Atmospheric Emission Licence to **Sasol South Africa Limited- Secunda Operations Solvents** ("the Applicant)."

The Atmospheric Emission Licence is issued to **Sasol South Africa Limited- Secunda Operations Solvents** in terms of section 42 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), in respect of Listed Activity **Category 2 Sub-category 2.1: Combustion Installations; Sub-category 6: Organic Chemical Industry.**

The Atmospheric Emission Licence has been issued based on information provided in the company's application dated **16 February 2024** and information that became available during processing of the application.

The Atmospheric Emission Licence is valid upon signature for a period not exceeding five (05) years from the date of issue of this licence. The reason for issuing the licence is renewal. The Atmospheric Emission Licence is issued subject to the conditions and requirements set out below which form part of The Atmospheric Emission Licence, and which are binding on the holder of the Atmospheric Emission Licence ("the holder").

1 ATMOSPHERIC EMISSION LICENCE ADMINISTRATION

Name of the Licensing Authority	Gert Sibande District Municipality
Atmospheric Emission Licence Number	Govan Mbeki/Sasol South Africa Limited- Secunda Operations Solvents/0017/2025/F04
Atmospheric Emission Licence Issue Date	25 February 2025
Atmospheric Emission Licence Type	Renewal
Renewal Date	30 November 2029
Expiry date	25 February 2030

2 ATMOSPHERIC EMISSION LICENCE HOLDER DETAILS

Enterprise Name	Sasol South Africa Ltd
Trading as	Secunda Operations Solvents
Enterprise Registration Number (Registration Numbers if Joint Venture)	1968/013914/06
Registered Address	Sasol Place 50 Katherine Street Sandton Gauteng

Postal Address	Private Bag 1013 Secunda 2302
Telephone Number (General)	017 610 5105
Industry Sector	Organic Composites Solvents Manufacturing
Name of Responsible Person or Emission Control Officer	Mr. Hannes Buys
Telephone Number	017 619 3515
Cell Phone Number	082 339 3906
Email Address	Hannes.buys@sasol.com
After Hours Contact Details	082 902 1989
Land Use Zoning as per Town Planning Scheme	Industrial Special

3. LOCATION AND EXTENT OF PLANT

3.1. Facility Address

Physical Address of the Premises	PDP Kruger Secunda 2302
Description of Site (Erf)	Highveld Ridge, Mpumalanga
Coordinates of Approximate Centre of Operations	[redacted]
Extent (km²)	24.05
Elevation Above Mean Sea Level (m)	1 597
Province	Mpumalanga
Metropolitan/District Municipality	Gert Sibande District Municipality
Local Municipality	Govan Mbeki Local Municipality
Designated Priority Area	Highveld Priority Area

3.2. Description of surrounding land use (within 5 km radius)

- Secunda – residential and commercial
- Embalenhle – residential and commercial
- Mining activities
- Farming activities

Figure 1: Secunda Operations satellite image

4. GENERAL CONDITIONS

4.1. Process and ownership changes

(a) The holder of the Atmospheric Emission 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 always properly maintained, and operated.

(b) No building, plant or site of works related to the listed activity or activities used by the licence holder shall be extended, altered, or added to the listed activity without an environmental authorisation from the competent authority. The investigation, assessment, and communication of potential impact of such an activity must follow the assessment procedure as prescribed in the Environmental Impact Assessment Regulations published in terms of Section 24(5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended.

(c) Any changes in processes or production increases, by the licence holder, will require prior written approval from the licensing authority.

(d) Any changes or increase to the type and quantities of input materials and products, or to production equipment and treatment facilities will require prior written approval from the licensing authority.

(e) 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 thirty (30) working days after the change of ownership.

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

(g) The licence holder must notify the Licensing Authority in writing and submit the closure and rehabilitation plan three (3) months prior to the decommissioning of the facility.

4.2. General duty of care

(a) The holder of the Licence must, when undertaking the listed activity, adhere to the duty of care obligations as set out in section 28 of the NEMA as amended including Part II Section 3 of Gert Sibande District Municipal Air Quality by-laws.

(b) The Licence 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 as amended.

(c) 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 as amended including Part III Section 3 of Gert Sibande District Municipal Air Quality by-laws.

4.3. Sampling and/or analysis requirements

(a) Measurement, calculation and /or sampling and analysis shall be carried out in accordance with any nationally or internationally acceptable standard in line with Annexure A of NEMAQA as amended.

(b) Methods other than those contained in Annexure A of NEMAQA as amended may be used with the written consent of the National Air Quality Officer.

(c) In seeking the written consent referred to in paragraph (b), an applicant must provide the National Air Quality Officer with any information that supports the equivalence of the method other than those listed in Annexure A of NEMAQA as amended.

(d) The licence holder is responsible for quality assurance of methods and performance. Where the holder of the licence uses internal or external laboratories for sampling or analysis, only accredited laboratories by the national accreditation body shall be used. The certified copy of accreditation of the internal or external laboratory must be submitted to the Licensing Authority on annual basis.

(e) The licence holder must provide the Licensing Authority on request with raw data obtained during sampling and or analysis including proof of agreed methodology used to reach the results submitted for compliance.

4.4. General requirements for licence holder

(a) The licence holder must conduct an induction on air quality management issues including compliance with the conditions of this licence to 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.

(b) 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.

(c) A valid licence must be kept at the premises where the listed activity is undertaken. The licence must be made available to the Environmental Management Inspector / Air Quality Officer or an authorised officer representing the licensing authority who requests to see it.

(d) The Atmospheric Emission Licence Certificate must be displayed at the premises where the listed activity is undertaken.

(e) The licence holder must inform, in writing, the licensing authority of any change to its details but not limited to the name of the Emission Control Officer, postal address and/or telephonic details within five (05) working days after such change has been effected.

(f) The Emission Control Officer or facility representative must attend the Highveld Priority Area Implementation Task Team or Air Quality Stakeholder Forum Meetings bi-annually.

(g) The licence holder must report and submit annual emission report for the preceding year in terms of GNR 283 in Government Gazette 38633 of 02 April 2015 and GNR 4493 in Government Gazette 50284 of 08 March 2024 (National Atmospheric Emission Inventory System Reporting Regulations).

(h) The licence holder must hold an environmental/air quality consultation meeting with interested and affected parties as well the community surrounding Sasol Secunda bi-annually to give feedback on the processes, projects conducted by

the facility as well as compliance status in relation to air quality management. The licence holder must submit written proof of such consultation to the licensing authority bi-annually.

4.5. Statutory obligations

The licence holder must comply with the obligations as set out in Chapter 5 of NEMAQA (Act No. 39 of 2004) as amended, National Environmental Management Act, 1998 (Act No. 108 of 1998) as amended, including Gert Sibande District Municipal Air Quality Management by-laws.

5 NATURE OF PROCESS

5.1. Process Description

5.1.1. Chemical Work Up (CWU)

5.1.1.1. Primary Separation (East and West) (U2/36)

The purpose of the primary separation unit (Unit 2/36) is to recover the carbonyls and alcohol (NACs), from the Secunda Synfuels Operations (SSO) Synthol plant feed. This is done through a set of distillation columns. The NACs are further separated into streams of carbonyls and alcohols via distillation columns. The carbonyls are fed to the carbonyl recovery units, whilst the alcohols are fed to the alcohol recovery units. Reaction water from the SSO Synthol plants enters 2/36TK- 101 where oil is decanted into 2/36DM-104 and subsequently pumped back to SSO Synthol. To remove oil from the primary distillation columns, side streams from these columns are cooled and then collected in 2/36DM-109. The content of 2/36DM-109 is returned to SSO Synthol via 2/36DM-04. Both these drums are controlled at atmospheric pressure via a vent and continuous nitrogen blanket. The pressure of the primary distillation columns is controlled by nitrogen injection and venting to atmosphere. Before being released into the atmosphere, the vent gas is first condensed and sent to knock-out drums 2/36DM-108. The vapours from 2/36DM-108 are then first sent to the vent gas scrubber (2/36VL-108) before finally being released to the atmosphere.

5.1.1.2. Carbonyl Production (East and West) (U2/37)

The production of the individual carbonyl products takes place at the carbonyl recovery units (Unit 2/37). The carbonyl stream from the primary separation units (Unit 2/36) is fed to the carbonyl recovery units (Unit 2/37). The objective of these units is to separate the raw carbonyl streams into mixed aldehydes, methanol, methyl-ethyl-ketone and acetone via distillation columns.

5.1.1.3. Alcohol Production (East and West) (U2/38; U38N; U73; Unit 237N)

The production of the individual alcohol products is done as detailed below:

- **Alcohol Recovery Plants (Unit 2/38)**

The alcohol stream from the primary separation units (Unit 2/36) is fed to the alcohol recovery unit (Unit 2/38). The objective of this unit is to:

i. Remove water from the alcohol stream (alcohol dehydration sections), then
ii. Remove traces of carbonyls (hydrogenation section), and then finally
iii. Separate the dry alcohol mixtures into various alcohols (alcohol recovery section).

In the alcohol dehydration section, a carrier liquid is added to remove the water from the main alcohol feed stream from Unit 2/36, via an azeotropic distillation process. The carrier liquid is then recovered and recycled. The dry alcohol stream is then fed to the hydrogenation reactor where the unwanted carbonyls in the stream are converted to corresponding alcohols. This dry (water free) and carbonyl free mixed alcohol stream, is fed to the alcohol recovery section, where various alcohols present within the dry alcohol stream are stripped and removed through a series of distillation columns.

- **Normal Propanol Plant: Chemicals Work-Up West (Unit 38N)**

In the n-propanol plant, the Propylol product from the alcohol recovery units (Unit 2/38), is upgraded to 99.90 % n-propanol in an extractive distillation process.

- **High Purity Ethanol (HPE) Plant: Chemical work-up West (Unit 73)**

At the High Purity Ethanol plant, 99.99% Ethanol (high purity ethanol, HPE) is produced using a mixture of Ethylol 95 (95% Ethanol) from the alcohol recovery units (Unit 2/38), Ethylol 93 from the Ethyl Acetate unit and intermittent feedstock from the U37 hydrogenation reactor, by means of a combination of distillation and extractive distillation units.

- **Ethylol 99 / IPA Plant: Chemical work-up East (Unit 237N)**

At Unit 237N, acetaldehyde is separated from the mixed aldehyde feed stream from Unit 2/37 via a distillation process. The acetaldehyde is then further hydrogenated at the U37 reactor to form an ethanol rich stream which is utilized as a feedstock for the HPE unit or recycled to 36TK-101. The hydrogenation reactor at U237N is utilized to convert acetone into iso-propanol which is further purified via distillation to 99.8% purity.

5.1.1.4. Ethyl Acetate (Unit 590)

At Unit 590, ethyl acetate is produced from Ethylol 95 received from Unit 2/38. Lights components, mainly ethers present in the feed are removed by distillation prior to converting ethanol to ethyl acetate. The ethanol is converted to ethyl acetate in a vapour phase dehydrogenation reactor. The crude product from the first reactor is hydrogenated in a polishing reactor to remove some impurities. The hydrogen is separated from the crude reactor product, compressed and exported back to SSO. The crude product from the reactor system is further separated into ethyl acetate and 93% ethanol (Ethylol 93) via distillation columns. Ethyl Acetate is the final product, and Ethylol 93 is used at U73 to produce HPE. The vents from the pressure control system on process equipment, as well as heavies from final ethyl acetate distillation column are sent to Unit 590 process flare.

5.1.2. Co-monomers

5.1.2.1. Hexene (Unit 300)

The Hexene plant processes two types of Secunda Synfuels Operations Refinery feed streams (stabilized light oil and condensate stream) to produce 1-Hexene and 1-Pentene (Train 2). The plant consists of the following sections:

- SLO feed preparation
- Unit 1100 feed preparation
- Train 1
- Train 2
- Train 3

5.1.2.1.1. SLO Feed preparation (Unit 3100)

This section receives feed from the Sasol Synfuels refinery and processes it in an extractive distillation process. A Solvent is used to extract impurities from the feed stream to enable the product to be used further upstream.

5.1.2.1.2. Feed preparation (Unit 1100)

This section receives two feed streams from the Sasol Synfuels refinery and processes these in a distillation process.

5.1.2.1.3. Hexene Trains 1, 2 and 3 (Unit 300)

This section receives feed streams from the Hexene feed preparation units and produces 1-Hexene. Off gases are sent to Hexene flare for destruction. Train 2 is also able to produce 1-Pentene as and when required by the market.

5.1.2.2 Octene (Unit 301, 302 and 304)

The Octene plants process several feed streams to produce 1-Octene. The plants consist of the following sections:

5.1.2.2.1. Octene Train 1 (Unit 301)

This section receives feed from the Sasol Synfuels refinery and processes it in a distillation process to produce 1-Octene. This plant includes a regenerator and scrubber system for recovery of Potassium Carbonate.

5.1.2.2.2. Octene Train 2 (Unit 302)

This section receives two feed streams from the Sasol Synfuels refinery and processes these in a distillation process to produce 1-Octene. Acids in this plant are removed through solvent extraction.

5.1.2.2.3. Octene train 3 (Unit 304)

The 1-Heptene feed stream from Octene Train 2 is routed to the plant where it is processed to remove acids. This stream is subsequently combined with acid free streams from Octene Train 1 and Hexene units to go through a series of reaction, distillation, adsorption units to produce Octanol and 1-Octene products. The unreacted and by- products are returned to the SO Refinery for further processing.

The Octene 3 plant hydroformulates1-Heptene in the presence of syngas and catalysts to produce linear and branched C8 aldehydes. These aldehydes are hydrogenated with hydrogen to form Octanol and branched C8 alcohols (iso-Octanol). Some of the purified Octanol is sold as product but most of it is used as intermediate product which is dehydrated to produce 1-Octene product. The iso-Octanol is returned to SSO Refinery for further processing.

The plant utilizes Dowtherm hot oil as one of the heating mediums to achieve desired reaction temperatures. A hot oil heater (304HT-1901) burns fuel gas from the complex and flash gas from the front-end section of the plant to generate heat required to maintain the temperature of the circulating hot oil supply. The off gases from the heater are released into the atmosphere. The plant is also equipped with a thermal oxidizer (304HT-1902) located adjacent to the hot oil heater. The oxidizer burns vacuum off-gases from the various sections of the plant. The thermal oxidizer and the hot oil heater share the same stack. The gas relief devices in the different sections of the plant are connected to the Octene Train 3 flare system. The plant has a dedicated tank farm with tanks that are equipped with a nitrogen pressure control system that periodically vents to the atmosphere to maintain tanks operating pressures.

5.1.2.3 Safol (Unit 303)

The Safol plant extracts olefins from the feed received from SO. The olefin in the feed is concentrated in a distillation process. The product from the upstream section is treated using a solvent extraction process step to remove acids and oxygenates. The acid free olefins are reacted with pure gas from SO to produce an intermediate aldehyde product. The aldehyde product is then hydrogenated into a Safol™ product, which is further purified to meet desired product specifications. The unreacted pure gas from the hydroformylation is returned to the SO fuel gas header system and purge gases from the hydrogenation section are routed into flare system for destruction. The gas relief devices in the different sections of the plant are connected to the flare system. The plant has a dedicated tank farm with tanks that are equipped with a nitrogen pressure control system that periodically vents to the atmosphere to maintain tanks operating pressures.

5.2. Listed Activities

Listed Activity Number	Category of Listed Activity	Sub-category of the listed activity	Description of the Listed Activity	Application	Secunda Solvents Processes
2.1	Petroleum Industry	Combustion Installations	Combustion installations not used primarily for steam raising or electricity generation (furnaces and heaters).	All refinery furnaces and heaters.	Octene 1 Octene 3
6	Organic Chemicals Industry	N/A	The production or use in production of organic chemicals not specified elsewhere including acetylene, acetic, maleic or phthalic anhydride or their acids, carbon disulphide, pyridine, formaldehyde, acetaldehyde, acrolein and its derivatives, acrylonitrile, amines and synthetic rubber. The production of organometallic compounds, organic dyes and pigments, surface active agents. The polymerisation or co-polymerisation of any unsaturated hydrocarbons substituted hydrocarbons (including vinyl chloride). The manufacture, recovery or purification of acrylic acid or any ester of acrylic acid. The use of toluene di-isocyanate or other di-isocyanate or comparable volatility or recovery of pyridine.	All installations producing and/or using more than 100 tons per annum of any of the listed compounds.	Chemical Work-up East and West Co-monomers

5.3. Unit process or processes

Unit process	Function of unit process	Batch or continuous process	Operating hours per day	Operating days per year
Chemical Work-Up (CWU)				
Primary Separation Unit 2/36	Separation of Non-Acid chemicals from extraction water received from Synthol (U2/20) and subsequent separation of the NACs into Alcohols and Carbonyls.	Continuous	24	365
Carbonyl Recovery Unit 2/37	Separation of Raw Carbonyls into Acetone, Methyl-ethyl-ketone, Aldehydes and Methanol.	Continuous	24	365
Alcohol recovery Unit 2/38	Separation of Raw Alcohols into Ethylol 95, iso-propylol, Propylol, iso-butylol, Sabutol and Sabutol bottoms.	Continuous	24	365
n-Propanol Unit 38N	Purification of Propylol to pure Propanol and producing Propanol B as a by-product.	Continuous	24	365
High purity Ethanol Unit 73	Purification of Ethylol 95, Ethylol 93 and hydrogenated acetaldehyde to pure Ethanol and producing Ethanol lights as a by-product.	Continuous	24	365

Ethanol (99) / IPA Unit 237N	The manufacture of Ethanol from Acetaldehyde and conversion of acetone to Iso – propanol (IPA). Purification of ethanol and acetone through distillation respectively.	Continuous	24	365
Ethyl Acetate Unit 590	The production of Ethyl acetate and subsequent purification through distillation. Producing Ethanol lights as a by- product.	Intermittent	24	365
Hexene				
Hexene Train 1, 2 & 3 U300	Production of 1-Hexene and 1-Pentene (Hexene Train 2).	Continuous	24	365
Hexene flare Unit 300, U 301, Unit 302, Unit 303, U304	Destruction of organic gases during emergency, start-up, shut down and upset conditions.	Continuous	24	365
Octene				
Octene Train 1 Unit 301	Production of 1-Octene	Continuous	24	365
Octene Train 1 Thermal Regenerator Unit 302	Recovery of Potassium Carbonate	Continuous	24	365
Octene Train 2 Unit 301	Production of 1-Octene	Continuous	24	365
Octene Train 3 Unit 304	Production of 1-Octene, n-Octanol from 1-Heptene via reaction and distillation steps.	Continuous	24	365
Octene Train 3 flare Unit 300, Unit 301, Unit 302, Unit 303, Unit 304.	Destruction of organic gases during emergency, start-up, shutdown and upset conditions.	Batch	24	365
Safol				
Safol Unit 303	Production of detergent alcohol Safol™	Continuous	24	365
Solvents Loading				
Chemical work-up (CWU) East loading facilities	CWU East operates facilities for the loading of road tankers with various chemical products produced by CWU East.	Continuous	24	365
Chemical work-up (CWU) West loading facilities	CWU West operates facilities for the loading of road tankers with various chemical products produced by CWU West.	Continuous	24	365
Solvents road and rail loading	Solvents operates facilities for the loading of road and rail tankers with various chemical products produced by the Solvents business units.	Continuous	24	365
Alcohol fuel loading facilities at Safol	Safol operates facilities for the loading of road tankers with alcohol fuel produced at Safol.	Batch	24	365
n-Octanol loading facilities at Octene 3	Octene 3 operates facilities for the loading of road tankers with n-Octanol produced at Octene 3.	Batch	24	365

5.4. Graphical Process Information

Figure 2: Primary separation Unit 36

Figure 3: Primary separation Unit 236

Figure 4: Carbonyl Recovery Unit 37

Figure 5: Carbonyl Recovery Unit 237

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Figure 6: Acetone Hydrogenation Unit 237N

Figure 7: Alcohol Recovery Unit 38

Figure 8: Alcohol Recovery Unit 238

Figure 9: NPA Unit 38N

Figure 10: HPE Unit 7

Figure 11: Ethyl Acetate Unit 590

5.4.2. Co-Monomers

Figure 12: Hexene Train 1, 2 and 3

Figure 13: Octene Train Unit 1 and 2; Unit 301 and Unit 302

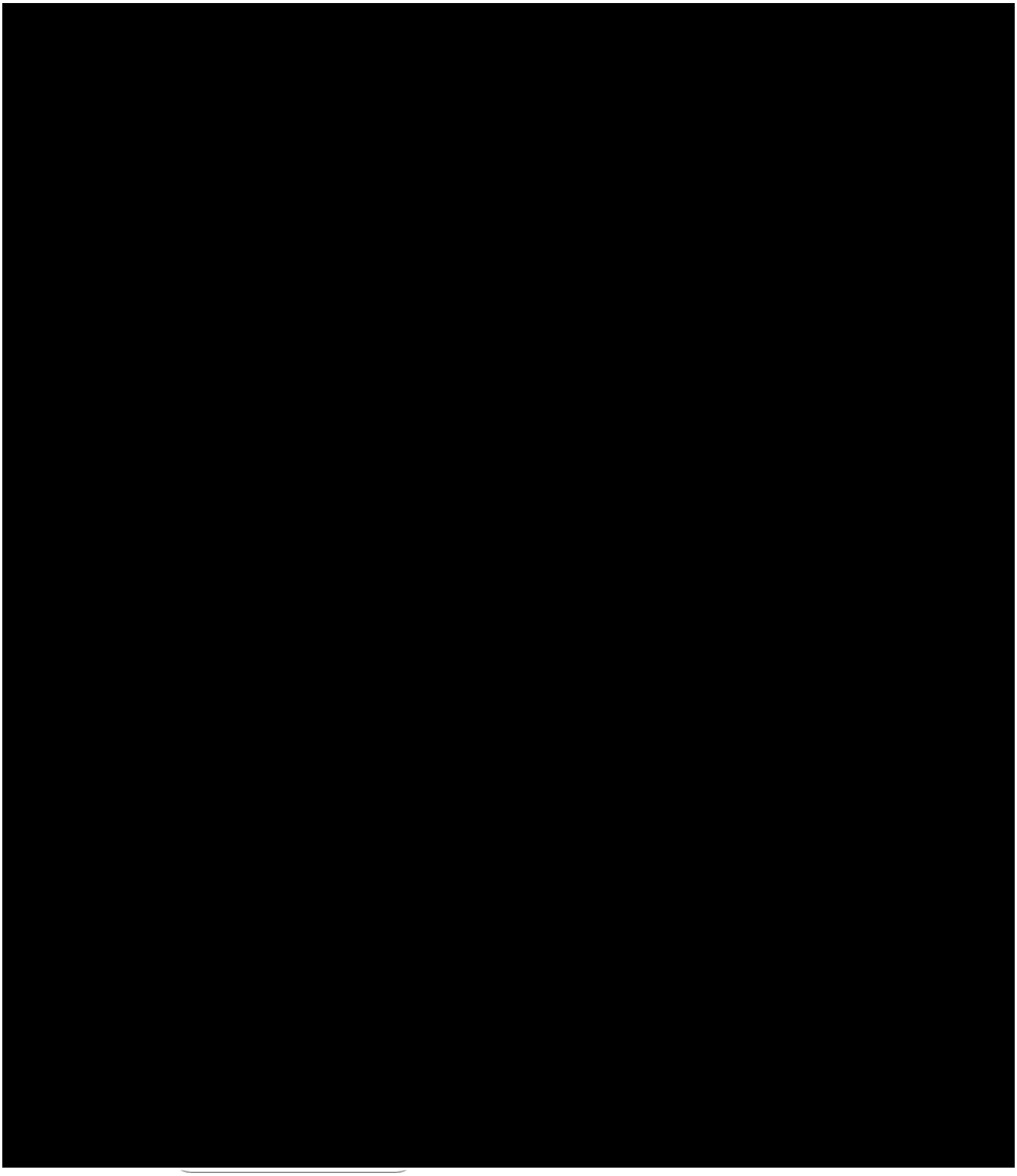

Figure 14: Octene 3 Unit 304

Figure 15: Safol Unit 303

5.4.3. Solvents Rail and Road Loading

5.4.3.1. Chemical work-up (CWU) and Ethyl Acetate (EA)

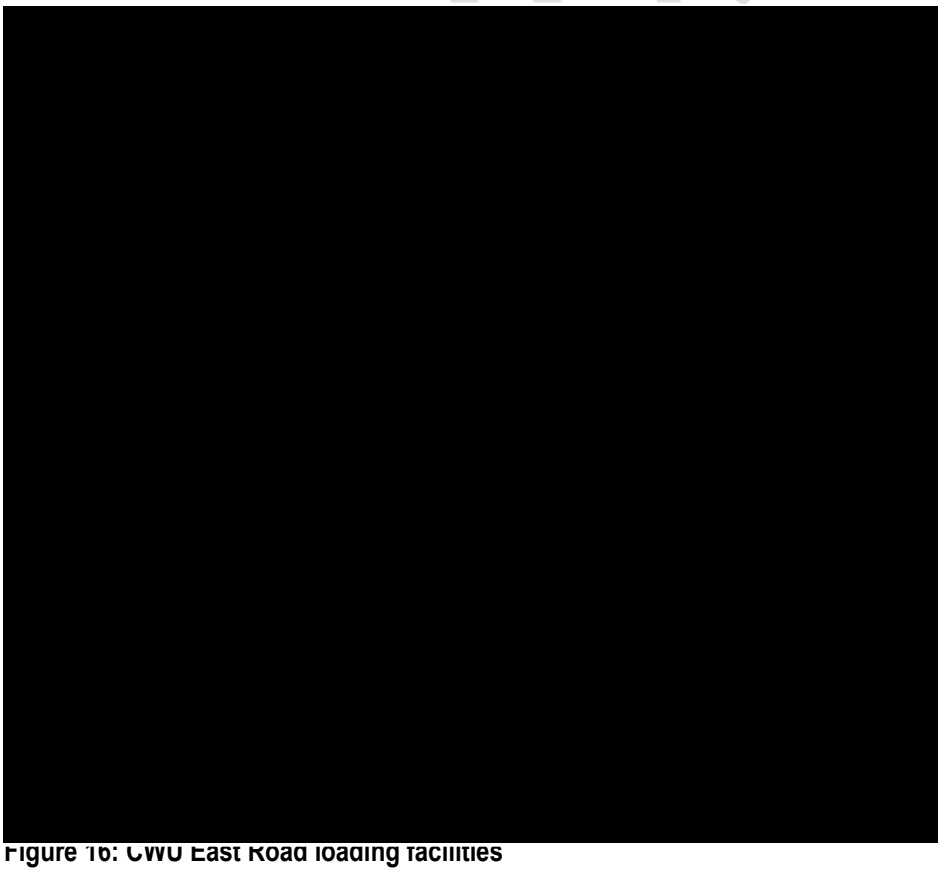

Figure 16: CWU East Road loading facilities

Figure 17: CWU West Road loading facilities

Figure 18: Solvents road and rail loading

Figure 19:

6. RAW MATERIAL AND PRODUCTS

6.1. Raw material

Material type	Maximum Operational Consumption Rate	Units (quantity/period)
Chemical Work Up West		
Reaction West		Kilotons per annum
Chemical Work Up East		
Reaction West		Kilotons per annum
Ethyl Acetate Unit 590		
Ethanol 95		Kilotons per annum
Hexene Unit 300		
Feed (C5-C7)		Tons per annum
NMP		Tons per annum
Methanol		Tons per annum
Octene Train 1 and 2; Unit 301 and 302		
Feed		Tons per annum
Ethanol circulation		Tons per annum
NMP circulation		Tons per annum
Potassium Carbonate		Tons per annum
Potassium Hydroxide (KOH)		Tons per annum
Thermal Regenerator Unit 302		
Potassium salt		Tons per annum
Stripper off gases		Tons per annum
Atomising steam		Tons per annum
Octene 3 Unit 304		

Octene III Feed	[redacted]		Tons per annum
Syngas			Kilo cubic meters (normal) per annum
Hydrogen			Kilo cubic meters (normal) per annum
Safol Unit 303			
Safol Feed			Tons per annum
Acetonitrite top-up			Tons per annum
HP Hydrogen			Tons per annum
Pure Gas			Tons per annum

6.2 Production rates

Production name	Maximum Production Rate	Units (quantity/period)
Chemical Work Up West		
Propanol bottoms	[redacted]	Tons per annum
n-Propanol		Tons per annum
Acetone		Tons per annum
High Purity Ethanol		Tons per annum
Ethylol 95		Tons per annum
Iso-propylol		Tons per annum
Methyl Ethyl Ketone (MEK)		Tons per annum
Methanol		Tons per annum
Sabutol		Tons per annum
Iso-butylol		Tons per annum
Sabutol bottoms		Tons per annum
Ethanol Light (pre-cut)		Tons per annum
Chemical West Up East		
Acetone		Tons per annum
Methyl Ethyl Ketone (MEK)		Tons per annum
Methanol		Tons per annum
Ethylol 95		Tons per annum
Ethylol 99		Tons per annum
IPA		Tons per annum
Ethyl Acetate Unit 590		
Ethyl Acetate		Tons per annum
Ethanol Lights (pre-cut)		Tons per annum
Hexene Train 1,2 and 3-Unit 300		
1-Hexene		Tons per annum
1-Pentene		Tona per annum
Octene Train 1 Unit 301 and Octene Train 2 Unit 302		
1-Octene	[redacted]	Tons per annum
Octene Train 3 Unit 304		
1-Octene		Tons per annum
n-Octanol		Tons per annum
Safol Unit 303		Tons per annum

6.3. By-products

Production name	Maximum Production Rate	Units (quantity/period)
Hexene Unit 300		
Gum Oil	[redacted]	Tons per annum
Safol Unit 303		
Alcohol fuel		Tons per annum

6.4. Material used in energy sources

Energy Source	Maximum Consumption Rate	Units (quantity/period)
Chemical Work Up West		
LP Steam	[redacted]	Kilotons per annum
MP Steam		Kilotons per annum
HP Steam		Kilotons per annum
Electricity		Megawatt hour per annum
Chemical West Up East		
LP (4B) Steam		Kilotons per annum
MP (8B) Steam		Kilotons per annum
HP (43B) Steam		Kilotons per annum
Electricity		Megawatt hour per annum
Ethyl Acetate Unit 590		
HP Steam		Kilotons per annum
Electricity		Megawatt hour per annum
Fuel gas		Kilo cubic meters (normal) per annum
Hexene Train 1,2 and 3-Unit 300		
Steam		Kilotons per annum
Fuel gas		Kilo cubic meters (normal) per annum
Electricity		Megawatt hour per annum
Octene Train 1 Unit 301 and Octene Train 2 Unit 302		
Steam	[redacted]	Kilotons per annum
Fuel gas		Kilo cubic meters(normal) per annum
Electricity		Megawatt hour per annum
Safol Unit 303		
Steam		Tons per annum
Electricity		Megawatt hour per annum
Octene Train 3 Unit 304		
HP Steam		Tons per annum
Instrument Air		Tons per annum
Fuel gas		Tons per annum
Electricity		Megawatt hour per annum

6.5. Sources of atmospheric emission

6.5.1. 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)	Gas exit temperature (°C)	Gas volumetric flow (m^3/h)	Gas exit velocity (m/s)	Emission hours	Type of emission
SV01	Octene 1 Thermal Regeneration	[redacted]		66	63	1.3	88	66.654	17	24	Continuous
SV02	Octene 304HT-1901 (Heat Oil Heater)			58	52	2.1	516	322 053	25	24	Continuous

6.5.2. Area Source Parameters

Unique ID	Source name	Latitude (decimal degrees)	Longitude (decimal degrees)	Height of release above ground (m)	Length of Area (m)	Width of Area (m)
3	304TK-6001: Octene product	[redacted]		N/A	N/A	N/A
4	304TK-6501A: Octene rundown			N/A	N/A	N/A
5	304TK-6501B: Octene rundown			N/A	N/A	N/A
6	304TK-6204: Octanol tank			N/A	N/A	N/A
7	304TK-6201: Octene Feed			N/A	N/A	N/A
8	304TK-6203: Aldehyde tank			N/A	N/A	N/A
9	304TK-1201: Catalyst inventory tank			N/A	N/A	N/A
10	303TK-1201: Catalyst charging tank			N/A	N/A	N/A
11	303TK-1202: Catalyst concentrate tank			N/A	N/A	N/A
12	303TK-6203: AR Feed/ Rework Tank			N/A	N/A	N/A
13	303TK-6401: Acid Removal Solvent			N/A	N/A	N/A
14	303TK-6206: Hydrocarbon slop			N/A	N/A	N/A

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15	303TK-6207: Water slop	[redacted]	N/A	N/A	N/A
16	303TK-6302: Waste liquid fuel tank (C13 + alcohols + wax esters)		N/A	N/A	N/A
17	303TK-6301: C12-C13 alcohols (slops tank)		N/A	N/A	N/A
18	303TK-6201: Base Feed tank		N/A	N/A	N/A
19	303TK-6202: Blending Feed tank		N/A	N/A	N/A
20	303TK-6204: OXO Feed tank		N/A	N/A	N/A
21	303TK-6303: Transition Cut		N/A	N/A	N/A
22	303TK-6501A: Alcohol day tank		N/A	N/A	N/A
23	303TK-6501B: Alcohol day tank		N/A	N/A	N/A
24	303TK-6205: Aldehyde tank		N/A	N/A	N/A
25	303TK-6001: C12-C13 final alcohols product		N/A	N/A	N/A
26	303TK-6002: C14-C15 final alcohols product		N/A	N/A	N/A
27	301TK-6005: Octene product		N/A	N/A	N/A
28	301TK-6205: Octene feed (SLO Naptha)		N/A	N/A	N/A
29	301TK-6505A: Octene rundown		N/A	N/A	N/A
30	301TK-6505B: Octene rundown		N/A	N/A	N/A
31	301TK-6006: Octene product		N/A	N/A	N/A
32	301TK-6206: Octene feed (SLO Naptha)		N/A	N/A	N/A
33	301TK-6403: Fresh Etahnol		N/A	N/A	N/A
34	301TK-6506A: Octene rundown		N/A	N/A	N/A

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35	301TK-6506B: Octene rundown	[redacted]		N/A	N/A	N/A
36	302TK-1002: Fresh pot carb tank			N/A	N/A	N/A
37	302TK-1003: Spent pot carb tank			N/A	N/A	N/A
38	300TK-6401: Fresh NMP			N/A	N/A	N/A
39	300TK-6402: NMP inventory			N/A	N/A	N/A
40	300TK-6601: Methanol (fresh)			N/A	N/A	N/A
41	300TK-6602: Methanol/Water			N/A	N/A	N/A
42	300TK-6501A: Hexene rundown			N/A	N/A	N/A
43	300TK-6501B: Hexene rundown			N/A	N/A	N/A
44	300TK-6502A: Hexene rundow (Pentene ad hoc)			N/A	N/A	N/A
45	300TK-6502B: Hexene rundow (Pentene ad hoc)			N/A	N/A	N/A
46	300TK-6503A: Hexene rundown			N/A	N/A	N/A
47	300TK-6503B: Hexene rundown			N/A	N/A	N/A
48	300TK-6001: Hexene product			N/A	N/A	N/A
49	300TK-6002: Hexene product			N/A	N/A	N/A
50	300TK-6004: Hexene product			N/A	N/A	N/A
51	300TK-6201: Reactor product (C hydrocarbons)			N/A	N/A	N/A
52	300TK-6202: Reactor product (C hydrocarbons)			N/A	N/A	N/A
53	300TK-6203: Reactor product (C hydrocarbons)			N/A	N/A	N/A

54	036TK-0101: CWU Feed	[redacted]	20.87	N/A	N/A
55	036TK-0103A: Synthol wash water return		20.87	N/A	N/A
56	036TK-0103B: Synthol wash water return		11.02	N/A	N/A
57	038TK-0201: Make-up paraffins		11.02	N/A	N/A
58	038TK-0202: Paraffin slop		5.97	N/A	N/A
59	071TK-0301A: Acetic Acid Rundown		5.97	N/A	N/A
60	071TK-0301B: Acetic Acid Rundown		8.23	N/A	N/A
61	071TK-0302: Acetic Acid		8.23	N/A	N/A
62	071TK-0303A: Propionic Acid		16.31	N/A	N/A
63	071TK-0303B: Propionic Acid		5.13	N/A	N/A
64	071TK-0304: Propionic Acid		5.13	N/A	N/A
65	071TK-0305: Acid Slop		9.46	N/A	N/A
67	071TK-0306: MTBE storage		9.68	N/A	N/A
68	073TK-0101: Paraffin storage		8.33	N/A	N/A
69	236TK-0101: CWU feed		7.75	N/A	N/A
70	236TK-0103A: Synthol wash water return		11.02	N/A	N/A
71	236TK-0103B: Synthol wash water return		11.02	N/A	N/A
72	237TK-0201: Caustic Tank		3.42	N/A	N/A

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73	237TK-0202: Acetic Acid Tank		3.35	N/A	N/A	
74	237TK-0203: Slop tank E99		8.54	N/A	N/A	
75	237TK-0204: Off Spec Ethylol - Ethylo 99		4.8	N/A	N/A	
76	237TK-0205A: Crotonaldehyde Storage Tank		5.41	N/A	N/A	
77	237TK-0205B: Crotonaldehyde Storage Tank		5.40	N/A	N/A	
78	237TK-0207: Crotonaldehyde Storage Tank		9.59	N/A	N/A	
79	556TK-9001: Ethyl Acetate Rundown		12.0	N/A	N/A	
80	556TK-9002: Ethyl Acetate Rundown		12.0	N/A	N/A	
81	556TK-9003: Ethyl Acetate Storage		15.0	N/A	N/A	
82	556TK-9004: Ethyl Acetate Slop		12.0	N/A	N/A	
83	556TK-9005: Ethanol 93%		15.0	N/A	N/A	

7. APPLIANCES AND MEASURES TO PREVENT AIR POLLUTION

7.1. Appliances and control measures

Point Source or unit associated with equipment	Equipment Type	Equipment Serial Number	Equipment Manufacture Date	Commission Date	Date of Modification /Upgrade	Design Capacity	Minimum Control Efficiency (%)	Minimum Utilisation (%)	Type of pollutant to abate
Octene 1 (Thermal Regenerator)	Scrubber Wet	302-VL-1065	1998	2000	N/A	N/A	99.99%	90%	Particulate Matter

7.2. Point Source – maximum emission rates (under normal working conditions)

7.2.1. Octene 1; Octene 3 (Sub-category 2.1)

Point Source Name/Code	Listed Activity	Pollutant Name	Maximum Release Ratee		Average Period	Duration of Emissions
			(mg/Nm³) under normal conditions of 10% O_2, 273 Kelvin and 101.3kPa	Compliance Timeframe		
Octene 1 (Thermal Regenerator)	Sub-category 2.1	Particulate matter (PM)	70	Immediately	Daily	Continuous
		SO_2	1000	Immediately	Daily	Continuous
		NOx (as NO_2)	400	Immediately	Daily	Continuous
Octene 304HT-1901 (Heat Oil Heater)	Sub-category 2.1	Particulate matter (PM)	70	Immediately	Daily	Continuous
		SO_2	1000	Immediately	Daily	Continuous
		NOx (as NO_2)	400	Immediately	Daily	Continuous

The following special arrangements shall apply:

i. No continuous flaring of hydrogen sulphide-rich gases shall be allowed.

ii. A bubble cap of combustion installations and catalytic cracking units shall be at 1.2 kg SO_2/ton.

7.2.2. Chemical Work-up East and West, Co-monomers (Category 6)

The following special arrangements shall apply:

(a) The following special arrangement shall apply for the storage and handling of raw materials, intermediate and final products with a vapour pressure greater than 14kPa at operating temperature: - Leak detection and repair (LDAR) program must be reviewed, updated, and submitted to the Licensing Authority for approval three (03) months after the licence is issued.

(b) The following special and special arrangements shall apply for control of TVOC's from storage of raw materials, intermediate and final products with a vapour pressure of up to 14kPa at operating temperature, except during loading and offloading. (Alternative control measures that can achieve the same or better results may be used)-

(i) Storage vessels for liquids shall be of the following type:

Application	All permanent immobile liquid storage facilities at a single site with a combined storage capacity of greater than 1000 cubic meters
True vapour of contents at product storage temperature	Type of tank or vessel
Type 1: Up to 14 kPa	Fixed roof tank vented to atmosphere, or as per Type 2 and 3

Type 2: Above 14kPa and up to 91 kPa with a throughput of less than 50 000 m^3 per annum	Fixed roof tank with pressure vacuum vents fitted as a minimum to prevent 'breathing' losses or as per Type 3
Type 3: Above 14 kPa up to 91 kPa with a throughput of greater than 50 000 m^3 per annum	(a) External floating roof tank with primary rim seal and secondary rim seal for tank with diameter greater than 20m, or fixed roof tank with internal floating deck / roof fitted with primary seal, or fixed roof tank with vapour recovery system. (b) Fixed-roof tank with internal floating deck/roof fitted with primary seal or (c) Fixed-roof tank with vapour recovery system.
Type 4: Above 91 kPa	Pressure vessel.

(ii) The roof legs, slotted pipes and/or dipping well on floating roof tanks (except for domed floating roof tanks or internal floating roof tanks) shall have sleeves fitted to minimize emissions.

(iii) Relief valves on pressurized storage should undergo periodic checks for internal leaks. This can be carried out using portable acoustic monitors or if venting to atmosphere with an accessible open end tested with a hydrocarbon analyser as part of the LDAR programme.

(c). The following special arrangements shall apply for control of TVOCs from the loading and unloading (excluding ships) of raw materials, intermediate and final products with a vapour pressure of greater than 14kPa at handling temperature. Alternative control measures that can achieve the same or better results may be used:

(i) All installations with a throughput of greater than 50'000 m^3 per annum of products with a vapour pressure greater than 14 kPa, must be fitted with vapour recovery / destruction units. Emission limits are set out in the table below –

Description	Vapour Recovery Unit				
Application	All loading /offloading facilities with a throughput greater than 50 000m^3 per annum				
Substance or mixture of substances		**Compliance Timeframe**	**mg/Nm^3 under normal conditions of 273 Kelvin and 101.3kPa**	**Average Period**	**Duration of Emissions**
Common name	**Chemical symbol**				
Total volatile organic compounds from vapour recovery/destruction units using non thermal treatment	N/A	From 1 April 2025	40 000	Daily	Continuous

(ii) For road tanker and rail car loading/offloading facilities where the throughput is less than 50 000 m^3 per annum, and where ambient air quality is, or likely to be impacted, all liquid products shall be loaded using bottom loading, or equivalent, with the venting pipe connected to a vapour balancing system. Where vapour balancing and or bottom loading is not possible, a recovery system utilizing adsorption, absorption, condensation or incineration of the remaining VOCs with a collection efficiency of at least 95% shall be fitted.

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7.3. Point source – maximum emission rates (under start-up, maintenance, and shut-down conditions)

Point Source Code	Pollutant Name	Maximum Release Rate		Averaging Period	Maximum Gas Volumetric Flow (m^3/hr)	Maximum Gas Exit Velocity (m/s)	Emission Hours	Maximum Permitted Duration of Emissions
		(mg/Nm^3)	Date to be Achieved By					
All point sources	All point source pollutant	N/A	N/A	N/A	N/A	N/A	N/A	Within 48 hours after commissioning of plant or equipment

Should normal start-up, maintenance, upset and shut-down conditions exceed a period of 48 hours, Section 30 of the National Environmental Management, 1998 (Act No. 107 of 1998), shall apply unless otherwise specified by the Licensing Authority.

7.4. Point source – emission monitoring and reporting requirements

Point Source code	Emission Sampling Method	Sampling Frequency	Sampling Duration	Parameters to be Measured	Parameters to be Reported	Reporting Frequency	Conditions under which Monitoring could be Stopped
Octene 1 (Thermal Regenerator)	In line with GNR 893 in Government Gazette 37054 of 22 November 2013	In line with GNR 893 in Government Gazette 37054 of 22 November 2013	In line with GNR 893 in Government Gazette 37054 of 22 November 2013	In line with GNR 893 in Government Gazette 37054 of 22 November 2013	In line with GNR 893 in Government Gazette 37054 of 22 November 2013	In line with GNR 893 in Government Gazette 37054 of 22 November 2013	Only on written authorisation by the Licensing Authority
Octene 304HT-1901 (Heat Oil Heater)	In line with GNR 893 in Government Gazette 37054 of 22 November 2013	In line with GNR 893 in Government Gazette 37054 of 22 November 2013	In line with GNR 893 in Government Gazette 37054 of 22 November 2013	In line with GNR 893 in Government Gazette 37054 of 22 November 2013	In line with GNR 893 in Government Gazette 37054 of 22 November 2013	In line with GNR 893 in Government Gazette 37054 of 22 November 2013	Only on written authorisation by the Licensing Authority

7.5. Area 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
All area sources	All area sources	Implementation of fugitive management plan.	Immediately	Submit annual reports to Licensing Authority on the implementation of the Fugitive Management Plan.	In line with Sasol Solvents approved site fugitive management plan.

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7.6. Routine reporting and record-keeping

7.6.1. Complaints register

The licence holder must maintain complaints register at its premises, and such register must be made available for inspections. The complaints register must include the following information: the name of the complainant, 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 licensing authority in a summarised format on the total number of complaints logged. The complaints must be reported in the following format:

a) Root cause analysis.
b) Calculation of impacts / emissions associated with incidents and dispersion modelling of pollutants, where applicable.
c) Measures implemented or to be implemented to prevent recurrence; and
d) 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.

7.6.2. Annual reporting

The licence holder must complete and submit to the licensing authority an annual report after the facility annual financial year, 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 sixty (60) days after the end of each reporting period. The annual report must include, amongst others the following:

a) The name, description, and licence reference number of the plant as reflected in the Atmospheric Emission Licence.
b) The name and address of the accredited measurement service provider that carried out or verified the emission test, including the test report produced by the accredited measurement.
c) The date and time on which emission test was carried out.
d) A declaration by the licence holder to the effect that normal operating conditions were maintained during the emission tests.
e) Pollutant emissions trend for listed activity.
f) External Atmospheric Emission Licence compliance audit report.
g) Major upgrades projects (i.e. abatement equipment or process equipment).
h) Complaints received and action taken to address complains received.
i) Proof of annual reporting of greenhouse gas emissions to the National Department in accordance with the National Greenhouse Gas Emission Reporting Regulations Government Gazette No. 40762 of 03 April 2017.
j) Compliance status to statutory obligation (4.5) including any other issued authorisations.

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

7.7. Investigation

Investigation	Purpose	Completion Date
Additional/new point source- Octene Train 3(304)	To investigate the feasibility of installing sampling ports and do baseline emission monitoring if sampling ports can be installed. If not, investigate suitable emission estimation method to finalise emissions and reporting requirements. Report findings to the licensing authority.	Eighteen (18) months after date of issue of this licence.
Non-functioning of the 304HT-1902 (Thermal Oxidiser)	To determine the cause of the oxidiser's non-functioning and outline future plans for the oxidiser.	Eighteen (18) months after date of issue of this licence.

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

Source Code / Name	Waste / Effluent Type	Hazardous Components Present	Method of Disposal
Octene 1 Thermal Regenerator	Effluent from venturi scrubber	None	In line with NEMA and SEMA's

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

Failure to comply with the 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 Chapter 7 Section 52 of NEMAQA (Act No. 39 of 2004), including any penalties contained in the Gert Sibande District Municipality By-laws.

10. APPEAL OF LICENCE

10.1 The Licence Holder must notify every registered interested and affected party, in writing and within ten (10) working days of receiving the District's decision.

10.2 The notification referred to in 10.1. must –

10.2.1 Inform the registered interested and affected parties of the appeal procedure provided for in Chapter 7 Part 3 Section 62 of Municipal Systems Act, 2000 (Act 32 of 2000), as amended.

10.2.2 Advise the interested and affected parties that a copy of the Atmospheric Emission Licence and reasons for the decision will be furnished on request.

10.2.3 An appeal against the decision must be lodged in terms of Chapter 7 Part 3 Section 62 of Municipal Systems Act, 2000 (Act 32 of 2000), from the date of issue of this Atmospheric Emission Licence, with:

Municipal Manager,
PO Box 1748,
Ermelo
2350
Fax No. 017-811 1207.

And

10.3. Specify the date on which the Atmospheric Emission Licence was issued.

11. REVIEW OF ATMOSPHERIC EMISSION LICENCE

In terms of NEMAQA (Act No. 39 of 2004) as amended, this Atmospheric Emission Licence is valid for five (05) years from date of issue of the licence.