

LEGAL NOTICE NO.34

**E ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT
(NO 8 OF 1999)**

**THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION
(AIR QUALITY) REGULATIONS, 2014**

ARRANGEMENT OF REGULATIONS

REGULATIONS

PART 1: PRELIMINARY PROVISIONS

- 1 - Citation
- 2 - Interpretation
- 3 - Objectives
- 4 – Application, exemptions and provisional emission standards

PART II: GENERAL PROHIBITIONS

- 5 - Air pollution
- 6 - Priority air pollutants
- 7 - Ambient air quality limits
- 8 - Suspended Particulate matter
- 9 – Odour guideline

PART III: PERMISSIBLE LEVELS

- 10 - Review of priority pollutants

PART IV: CONTROLLED AREAS

- 11 - Air quality limits in controlled areas
- 12 - Declaration of controlled areas
- 13 - Air quality management plan

PART V: STATIONARY SOURCES

- 14 - Emission from controlled facilities
- 15 - Emission standards
- 16- Air pollution control systems
- 17- Exposure report format
- 18 - Excessive Emissions
- 19 - Emission report
- 20 - Air quality limits at property boundary
- 21 - Control order
- 22 - Fugitive emission control plan
- 23 - Fugitive emission reduction measures

PART VI: MOBILE SOURCES

- 24 - Internal combustion engines
- 25 - Vehicular emission sources
- 26 - Inspection of motor vehicles
- 27 - Vehicular emission reduction measures
- 28 - Dispersion of Particulate matter

PART VII: OCCUPATIONAL AIR QUALITY LIMITS

- 29 - Occupational exposure of air pollutants
- 30 - Variation of exposure limits
- 31 - Exposure to hazardous substances

PART VIII: OTHER SOURCES

- 32 - Particulate emission from material handling
- 33 - Particulate emission from demolitions
- 34- Effects of stockpiling of material
- 35 - Emissions from waste incinerators
- 36 - Nitrogen Oxides emissions
- 37 - Open burning
- 38 - Cross-border air pollution

PART IX: LICENCES

- 39 - Application for an emission licence

- 40 - Application procedure
- 41 - Emission licence
- 42 - Requirements for application of emission licence
- 43 - Licence processing period
- 44 - Renewal of emission licence.
- 45 -Transfer of emission licence
- 46 - Liability of Transferee
- 47 - Variation of emission licence by Authority
- 48 - Compliance plan
- 49 - Suspension, revocation or cancellation of emission licence
- 50 - Register of emission licences
- 51 - Appeal provision

PART X: METHODS OF MEASUREMENT, ANALYSIS AND LABORATORIES

- 52 - Measurement of Air pollutants
- 53 - Measurement of ambient air quality
- 54 - Visible air pollutants
- 55 - Measurement of vehicular emissions
- 56 - Period for Storing records
- 57 – Obnoxious smells

PART XI: INSPECTION & MONITORING

- 58 - Monitoring ambient air quality
- 59 - Assessment of ambient air quality
- 60 - Preliminary assessment of stationary sources
- 61 - Provision of Portholes in Stacks
- 62 - Provision of service for stack sampling
- 63 - Stack emission recording and reporting requirements
- 64 - Continuous Monitoring System requirements
- 65 - Air quality monitoring records

PART XII: REPORTING

- 66 – Initial emission assessment report

- 67 - Atmospheric impact report
- 68 - Monitoring records
- 69 - Notification of excessive emissions

PART XIII: MISCELLANEOUS

- 70 - Guideline for monitoring air pollutants
- 71 - Greenhouse gases
- 72 - Dioxins and furans
- 73 - Emission rate for oxides of nitrogen
- 74 - Notification of permissible levels
- 75 - Baseline levels of priority air pollutant
- 76 - Offences & Penalties
- 77 - Pollution Charges
- 78 -Revocation of LN. 131/2006
- 79 - Transitional Provision

SCHEDULES

First Schedule - Ambient Air Quality Tolerance Limits

Second Schedule - Priority Air Pollutants

Third Schedule- Emission Limits for Controlled and Non-Controlled Amenities

Fourth Schedule - Guideline on Air Pollution Monitoring Parameters from Stationary Sources

Fifth Schedule - General Guidelines

Sixth Schedule - List of Controlled Areas

Seventh Schedule.- Acceptable Emission Control Systems

Eighth Schedule- Emission Monitoring Report Form

Ninth Schedule – Emission Licence Forms

Tenth Schedule - Record of Pollution Exposure Results.

Eleventh Schedule - Methods of Test and Measurement of Air Pollutants

Twelfth Schedule –Acceptable Mobile Emission Control Technologies.

Thirteenth Schedule - Fees

Fourteenth Schedule: List of Controlled Facilities

**THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION
ACT.
(No. 8 of 1999)**

IN EXERCISE of the powers conferred by sections 147 of the Environmental Management and Co-ordination Act, the Cabinet Secretary for Environment ,Water and Natural Resources makes the following Regulations-

**THE ENVIRONMENTAL MANAGEMENT AND
CO-ORDINATION
(AIR QUALITY) REGULATIONS, 2013**

PART 1-PRELIMINARY

Citation.

1. These Regulations may be cited as the Environmental Management and Co-ordination (Air Quality) Regulations, 2013, and shall come into operation on such date as the Cabinet Secretary may, by notice in the Gazette, appoint.

Interpretation.

2. In these Regulations unless the context otherwise requires:

“ambient air quality standards” means those ambient air quality standards specified under these Regulations which, in the judgment of the Authority, are requisite to protect human health and allow an adequate margin of safety;

“Bureau” means the Kenya Bureau of Standards established under the Standards Act;

“controlled areas” means any area designated as such by the Cabinet Secretary under regulation 11;

“control Order” means the instructions to a proponent issued in writing in order to comply with the specific legal requirements;

“emission limits” means the permissible levels of emission of pollutants set out in the Third Schedule;

“equipment shut-down” means the process of taking a unit of equipment off-line from an operative condition such that normal production rates are not being achieved;

“equipment start-up” means the process of bringing a unit of equipment on-line from an inoperative condition such that normal production rates are being achieved;

“exposure limit” means the standards of exposure or discharge or emissions established under the Act or under these Regulations;

"excessive emission" means emission of an air pollutant in excess of an emission standard or emission target;

"existing facility" means any facility having an air pollutant source that is constructed, or in operation, installed or used in Kenya on or before the commencement of these Regulations;

"incinerator" means any equipment, device or contrivance used for the destruction, by burning, of solids, liquids or gaseous wastes, other than any equipment, device or contrivance used exclusively to burn wood wastes;

“Kenya Standard” means a standard developed or adopted by the Kenya Bureau of Standards;

"malfunction" means any sudden, infrequent and not reasonably preventable failure of air pollution control equipment, process or process equipment, to operate in a normal manner, but does not include any failure that is primarily caused by poor maintenance or negligent operation;

“monitoring” means any periodic or continuous surveillance or testing to determine the level of compliance with statutory requirements or pollutant levels in various media or in humans, animals, and other living things.

Cap 496

“PM_{2.5}” means Particulate matter with an aerodynamic diameter of less than or equal to a nominal 2.5 micrometers, as determined by the appropriate reference methods listed under the Eleventh Schedule ;

"PM₁₀" means finely divided solid or liquid material, with an aerodynamic diameter less than or equal to ten micrometers emitted to the ambient air as measured by applicable reference methods listed under the Eleventh Schedule, or an equivalent or alternate method approved by the Authority;

“Ringlemann number” means value representing the darkness of a plume of smoke assessed by visual comparison with a set of grids numbered from 0(white) to 5 (black) (Ringlemann Chart);

“Ringlemann Smoke Chart” means the chart published and described in the Relevant Kenya Standard, or any chart, recorder, indicator, or device for the measurement of smoke density which is approved by the Authority as the equivalent of the said Ringlemann Scale;

“stack” means a flue, chimney, conduit or other device constructed for the purpose of discharging air contaminants into the atmosphere;

“stack height” means the vertical distance measured in metres between the points of discharge from a stack into the atmosphere and the land thereunder;

“stationary source” means any fixed building, structure, facility, installation, equipment or any motor vehicle, waterborne craft, aircraft or diesel locomotive deposited, parked, moored, or otherwise remaining temporarily in place, which emits or may emit any air pollutant;

"Standard conditions" means a temperature of 293° K (20°C) and a pressure of 101.3 kilopascals (29.92 in Hg);

Objective.

3. The objective of these Regulations is to provide for the prevention, control and abatement of air pollution to ensure clean and healthy ambient air.

Application.

4. (1) These Regulations shall apply to:-

- (a) all internal combustion engines;
- (b) all premises, places, processes, operations, or works to which the provisions of the Act and Regulations made thereunder apply; and
- (c) any other appliance or activity that the Cabinet Secretary may by order in the Gazette, specify.

(2) The provisions of these Regulations shall be in addition to other requirements imposed by or under the Act or any other written law.

Exemptions .

(3) Notwithstanding paragraph (1), the following operations shall be permissible under these Regulations provided that they are not used for the disposal of refuse-

- (a) back-burning to control or suppress wildfires;
- (b) fire fighting rehearsals or drills conducted by fire service agencies;
- (c) traditional and cultural burning of savanna grasslands;
- (d) burning for purposes of public health protection; and
- (e) emissions of air pollutants from all stationary and mobile sources as set out under Part I of the Fifth Schedule.

(4) Where, in relation to a Particular air pollutant or air pollutant source, there are no emission standards, targets or guidelines set out in these Regulations, the Authority may apply, subject to such modifications, if any, as the Authority may consider necessary, any internationally recognized emission standards, targets or guidelines in relation to the air pollutant or air pollutant source.

(5) For the purposes of paragraph (4) the Authority in consultation with relevant lead agencies shall within six months of the coming into operation of these Regulations, formulate the National Emission Standards for air pollutants such as those stipulated under the Third Schedule.

PART II - GENERAL PROHIBITIONS

Air pollution.

5. (1) No person shall-

(a) act in a way that directly or indirectly causes, or is likely to cause immediate or subsequent air pollution; or

(b) emit any liquid, solid or gaseous substance or deposit any such substance in levels exceeding those set out in the First Schedule.

Priority air pollutants.

6. No person shall cause or allow emission of the priority air pollutants prescribed in the Second Schedule to cause the ambient air quality limits prescribed in the First Schedule to be exceeded.

Ambient air quality.

7. No person shall cause the ambient air quality levels specified in the First Schedule of these Regulations to be exceeded.

Suspended particulate matter.

8. (1) No person shall cause or allow particulate emissions into the atmosphere from any facility listed under the Fourth Schedule in excess of those limits stipulated under the Third Schedule.

Where “suspended Particulate matter” means all Particulate material which persists in the atmosphere or in flue gas stream for lengthy

periods because the Particles are too small in size to have appreciable falling velocity;

Odour guidelines.

9. A person, being an owner of premises, who causes or allows the generation, from any source, of any odour which unreasonably interferes, or is likely to unreasonably interfere, with any other person's lawful use or enjoyment of his property shall ensure that the odour emission limits comply with the ambient quality limits set out under the First Schedule of these regulations.

PART III - PERMISSIBLE LEVELS

Review of priority pollutants.

10. (1) The Authority shall in consultation with relevant lead agencies, from time to time review the list of priority pollutants set out under the Second Schedule and the ambient air quality levels provided for in the First Schedule and prescribe the permissible levels thereof.

Setting ambient air quality limits.

(2) The Authority shall in setting limits for ambient air quality levels as stipulated in the First Schedule take into account the limit-determining factors set out under Part III of the Fifth Schedule;

PART IV - CONTROLLED AREAS

Air quality controlled areas.

11. No person shall cause pollution in a controlled area listed under the Sixth Schedule so as to exceed the limits stipulated under the First Schedule.

Declaration of a controlled area.

12. (1) The Cabinet Secretary may in consultation with the Authority declare an area as a controlled area where-

- (a) ambient air quality standards are being or are likely to be exceeded in the area, or any other situation exists which is causing, or is likely to cause, a significant negative impact on human health, environment and national heritage; or
- (b) the area requires a specific air quality management action plan to rectify the situation.

(2) The declaration of a controlled area under paragraph (1)

may be withdrawn by the Cabinet Secretary after consultation with the Authority if the area is in compliance with ambient air quality standards for a period of at least three months or as may be deemed fit by the Authority.

Air Quality
Management Plan.

13. (1) The Authority shall, within three months after the declaration of a controlled area under Regulation 12, in consultation with the relevant lead agencies prepare an area air quality management plan for the area and submit the same to the Cabinet Secretary who shall publish the same in the Gazette.

(2) A controlled area air quality management plan -

- (a) shall be aimed at coordinating air quality management in the area;
- (b) shall address issues related to air quality in the area; and
- (c) may, for the purposes of implementation, provide for the establishment of a committee representing relevant stakeholders.

(3) A controlled area management plan shall lapse upon the withdrawal of the declaration of the controlled area under paragraph 2..

PART V - STATIONERY SOURCES

Emission control
from listed
facilities.

14.(1) No person, operating a controlled facility specified in the Fourteenth Schedule shall-

- (a) cause emission of any pollutant listed under the Second Schedule from any point sources without a valid emission licence issued in accordance with the provisions of the Act; or
- (b) cause emission of any air pollutant listed under the

Second Schedule from any point sources in levels exceeding the limits set out under the Third Schedule.

Where “point source” means a single identifiable source and fixed location of atmospheric emission, and includes smoke stacks and residential chimneys;

(2) A facility not listed under the Fourteenth Schedule which is found to be in contravention of this regulation more than three times within a period of six months shall be required to apply for an emission licence under regulation 39.

(3) No person shall cause or allow the emission of visible air pollutants from a stationery source in excess of the limits set out in the Third Schedule.

(4) The provisions of paragraph (1) (b) shall not apply to the start-up and shut-down of equipment in respect of which an emission licence has been issued under these Regulations.

Where:-

"start up" means the setting into operation of a facility, or sources in a facility, for any purpose;

"shut down" means the cessation of operation of a facility or source, as the case may be, for any purpose;

Emission standards.

15. No person, owner or operator of a facility shall cause or allow the emission of air pollutants in excess of the limits stipulated under the Third Schedule.

Air pollution control systems.

16.(1) The control systems set out in the Seventh Schedule shall be used by all persons whose operations cause or are likely to cause the emission of pollutants in excess of the limits set out in the Third Schedule.

(2) Any waste or other by-product of a system referred to in paragraph (1) shall be disposed of or treated in accordance with regulations made in that respect under this Act.

(3) The emission reduction measures set out under Part IV of the Fifth schedule shall be applied in the operation of burners.

Exposure report format.

17. The owner or operator of a controlled facility shall ensure that exposure of workers to occupational air pollutants is monitored and recorded in accordance with the Tenth Schedule.

Excessive emissions.

18. A licensee shall report to the Authority any event resulting in an excess emission-

(a) by giving a notice of such event, in Form II set out in the Ninth Schedule, within twenty-four hours after the occurrence of the event; and

(b) by delivering a written report to the Authority within fourteen days after the occurrence of the event, describing the circumstances surrounding the event and the corrective measures taken or planned to be taken to prevent future occurrence of the same.

Emission report.

19. (1) A licensee shall submit an emissions report in respect of each calendar year to the Authority within six months after the end of that calendar year, unless otherwise directed by the Authority.

(2) An emissions report shall contain information on the matters set out in Part V of the Fifth Schedule.

Air quality at property boundary.

20. (1) No person, operator or owner of any facility shall cause or allow fugitive emissions to cause the ambient air quality at its property boundary to exceed the limits prescribed under the First Schedule.

(2) The owner or operator of a facility from which the fugitive emissions cause ambient air quality limits specified under the First

Schedule to be exceeded shall institute remedial measures recommended under Part VI of the Fifth Schedule.

Control order.

21.(1) A control Order may be issued in anticipation of a breach of any provision of these Regulations or of any term or condition of a licence, or in response to such breach.

(2) A control order shall-

- (a) specify the breach in respect of which it is issued;
- (b) specify the steps to be taken to ameliorate the effects of the breach;
- (c) specify the time within which the steps shall be taken; and
- (d) may, where appropriate, require the immediate cessation of the breach;

(3) Any person who fails to comply with the provisions of a control order issued under this regulation commits an offence and shall be liable on conviction to a fine not exceeding one hundred thousand or imprisonment for a term not exceeding three years;

Fugitive emission control plan.

22.(1) The Authority may, as part of the requirements of an application for emission licence for a controlled facility with a fugitive emission air pollutant source, or as part of a requirement of a control Order under regulation 21, require the applicant to submit a written fugitive emission control plan for the control of fugitive particulate emissions, if –

- (a) the facility has a fugitive emissions source operating with emissions in excess of twenty percent opacity

as determined by methods prescribed under Part VII of the Fifth schedule of these Regulations;

- (b) the facility has a fugitive emissions source operating with visible emissions that are being transported off the boundary of the property on which the source is located; or
- (c) in relation to the facility, the ambient air quality standard for total suspended particulates or for PM₁₀ specified in these Regulations is being exceeded at a location off the boundary of the property on which the source is located.

Where "opacity" means the degree to which emissions reduce the transmission of light and obscure the view of an object in the background;

(2) The Authority shall review a fugitive emission control plan within forty-five days of the receipt thereof, and shall, before the end of that period, notify the applicant as to whether the plan is approved, disapproved, or if further information is required.

(3) Where a fugitive emissions control plan is submitted as part of the requirements of a licence application, such plan shall be reviewed along with all other aspects of the application and all provisions relating to the time period for review of licence applications shall apply to the review of such plan.

(4) Where a fugitive emission control plan is disapproved, the notification of the disapproval of the plan shall –

- (a) be given to the licensee within twenty-one days, setting out the reasons thereof; and
- (b) inform the licensee that he is entitled to revise and resubmit the plan within thirty days of the date of delivery of such notification.

(5) If after the review of a resubmitted fugitive emission control plan there remain aspects of the plan that are unsatisfactory to the Authority, the Authority may approve the plan subject to such terms, conditions or modifications as it thinks necessary in order to eliminate or mitigate the unsatisfactory aspects of the plan.

(6) Where a plan is made subject to any term, condition or modification under paragraph (5), the notification of the approval of the plan shall contain a written statement of the reasons for the term, condition or modification, as the case may be.

(7) The Authority may periodically review any fugitive emission control plan approved by it and if the Authority determines that the objectives of the plan are not being met, it shall require submission of a revised plan within sixty days after such request.

(8) For the purposes of this regulation, fugitive emission air pollutant sources shall include those indicated in Part VIII of the Fifth Schedule.

Fugitive emission reduction measures.

23. A fugitive emission control plan may require the employment of measures or operating procedures indicated in Part VI of the Fifth Schedule.

PART VI - MOBILE SOURCES

Internal combustion engines General.

24. The Authority shall ensure that emissions from all internal combustion engines are monitored in accordance with the methods set out under the Eleventh Schedule.

Vehicular emission sources.

25. (1) No person shall cause or allow the emission of visible air pollutants from a stationary or mobile vehicle in excess of the limits set out under the prescribed Standard.

Control of vehicular emissions .

(2) Every operator or owner of a mobile emission source including road, rail, air, marine and inland water transport and conveyance equipment, shall control the emission of priority air pollutants set out in the Second Schedule.

Vehicular
emission limits.

(3) The emissions from an internal combustion engine shall not exceed the limits prescribed under the prescribed Standard.

Methods of test.

(4) The vehicular emissions shall be tested in accordance with the prescribed standard or any other method approved by the Authority in consultation with the Bureau.

(5) Any person who causes emissions from a mobile source in excess of the prescribed standards commits an offence.

Where “mobile source” means a moving producer of air pollutant, mainly forms of transport including motorcycles, cars, trucks, trains, ships and aircrafts;

(6) In this regulation “prescribed standard” means the Standard prescribing codes of practice for the inspection of motor vehicles.

Inspection of
motor vehicles.

26. (1) The Authority in consultation with the agency responsible for motor vehicle inspection may at any time order the inspection of a vehicle releasing visible exhaust emissions.

27. (2) The Authority in consultation with the agency responsible for motor vehicle inspection shall ensure that-

(a) all commercial and public service vehicles undergo emission tests annually; and

(b) all private vehicles over five years old undergo emission tests once in every two years;

(3) The emission tests referred to in paragraph(2) shall be carried out by the relevant agency responsible for the motor vehicle inspection or accredited emission vehicle testing centers.

Emission reduction
measures.

28. In order to meet the emission standards stipulated by the

Bureau, the owner or operator of a mobile emission source may use any of the emission reduction measures specified under the Twelfth Schedule or any other technology acceptable to the Authority.

Dispersion of particulate matter.

29. No person shall cause or allow the dispersion of visible particulate matter from any material being transported by motor vehicle or by other mode of transportation.

PART VII - OCCUPATIONAL AIR QUALITY LIMITS

Occupational exposure of air pollutants.

LN. 60 /2007

30. (1) The occupier or operator of premises shall ensure that exposure of indoor air pollutants does not exceed the exposure limits stipulated under the Factories and Other Places of Work (Hazardous Substances) Rules or under any other relevant law.

(2) Where the hazardous substances referred to in paragraph (1) are not covered under the legislation referred to therein, the occupier or operator shall apply the guidelines provided by the manufacturer or supplier of the substances.

Variation of exposure levels.

31. The Authority, in consultation with the relevant lead agencies may-

- (a) prescribe exposure limits of air pollutants and emission levels of hazardous substances;
- (b) prohibit the use of substances which pollute the working environment; or
- (c) specify particular measures of prevention of pollution or protection of workers.

Exposure to hazardous substances.

32. An owner or occupier of a controlled facility shall-

- (a) inform the workers of the hazards in specific work environments;

- (b) train the workers on the potential hazards of any hazardous substance to which they are exposed and the safety precautions to be taken to prevent any harm to their health;
- (c) ensure that measurements of pollutants are carried out by a laboratory designated by the Authority in order to determine compliance with the prevailing allowed levels of exposure;
- (d) ensure that record of measurements carried out under paragraph (c) are reported to the Authority on a quarterly basis; and
- (e) take exposure reduction measures recommended under Part IX of the Fifth Schedule.

PART VIII - OTHER SOURCES

Particulates from material handling.

33. No person operating construction equipment or handling construction material shall allow emission of particulate matter so as to adversely affect the limits set out in the First schedule.

Particulates from demolitions.

34. No person shall cause or allow emission of particulate matter during the demolition of structures, buildings, or parts of buildings in such a manner as to adversely affect the limits set out in the First Schedule.

Effect of stockpiling material.

35. No person shall cause or allow stockpiling or other storage of material in a manner likely to cause ambient air quality levels set out under the First Schedule to be exceeded.

Emissions from waste incinerators.

36. No person, operator or owner of any waste incinerator shall allow or cause emission of air pollutants set out under the Second Schedule in excess of the appropriate mass emission rates indicated in the Third Schedule.

Nox emissions.

37. (1) No owner or operator of fuel burning equipment shall cause

or allow emissions of oxides of nitrogen in excess of those stipulated in the Third Schedule.

(2) The owner or operator of a facility whose fuel burning equipment causes emission of nitrogen oxides in excess of the limits specified under the Third Schedule shall institute remedial measures recommended under the Part X of the Fifth Schedule.

Where "nitrogen oxides" means the sum of nitric oxide (NO) and nitrogen dioxide (NO₂) expressed collectively as a nitrogen dioxide equivalent;

Open burning.

38. No person shall cause or allow emissions of priority air pollutants set out under the Second Schedule from disposal of medical waste, domestic waste, plastics, tyres, industrial waste or other waste by open burning.

Cross-Border air pollution.

39.(1) Every owner or operator of a controlled facility shall ensure that emissions from his facility does not cause air pollution in any territory outside the jurisdiction of Kenya in excess of the relevant ambient air quality levels prescribed both in Kenya and in the territory outside the jurisdiction of Kenya.

(2) No person shall cause the quality of the ambient air in controlled areas to exceed the limits stipulated in the First Schedule.

PART IX - LICENCES

Application for an emission licence.

40. The owner or operator of any controlled facility shall apply to the Authority for an emission licence within twelve months from the date these Regulations come into force.

Application procedure for provisional emission licence

41. (1) An owner or operator of a controlled facility shall apply for a provisional emission licence by submitting to the Authority, an application as set out in Form I, of the Ninth Schedule.

(2) An application shall be considered complete when the

following requirements are satisfied-

- (a) the application form is complete in respect of all the information required of the applicant, including any necessary supporting data and calculations;
- (b) the licence application is accompanied by a compliance plan that indicates the proposed activities and the schedule for bringing the facility into compliance where –
 - (i) the expected emissions from any source or activity in the application are likely to exceed any applicable emission standard or target;
 - (ii) any expected emissions from the facility are based on dispersion modeling, are found to be likely to exceed any ambient air quality standard; or
 - (iii) any expected ambient air quality measurements at required monitoring locations exceeds a prescribed air quality standard;
- (c) an authorized official of the applicant certifies the truth, accuracy, and completeness of the application, as provided in the application form; and
- (d) the application form is accompanied by proof of payment of the prescribed licence application fee and prescribed emission licence fee.

(3) Where the Authority considers and is satisfied that the application is complete, it shall issue the applicant with a provisional licence in Form III set out in the Ninth Schedule within a period of ninety days from the date of receipt of the application.

(4) Where the Authority considers and it is satisfied that an application under this regulation is incomplete, it shall notify the applicant accordingly within a period of sixty days of the receipt of the application.

(5) A notification under paragraph 4 shall be in writing and shall specify the information needed to make the application complete and prescribe a reasonable time frame for response from the applicant.

(6) Where, while processing an application that is found to be complete, the Authority determines that additional information is necessary to evaluate or take final action on that application, the Authority may in writing request for such information and set a reasonable deadline for response.

(7) Once the Authority determines that an application is complete, the Authority shall notify the applicant accordingly and such notification shall constitute a provisional emission licence, which shall remain in effect until the Authority notifies the applicant in writing the approval or refusal of the application ..

Application for
initial
mission licence.

41.(1) A provisional licensee shall ensure that the facility undergoes monitoring by the Authority at agreed intervals, and may, with the approval of the Authority, apply for an emission licence in Form IV set out in the Ninth Schedule.

(2) An emission licence, shall be in Form V set out in the Ninth Schedule, and shall be valid for a period of one year ,beginning on the date of the approval of the application for the licence, and may be renewed, on application for a successive period of one year.

(3) An emission licence shall be subject to such terms and conditions as the Authority may deem necessary.

Requirements for
applications.

42. An application for an emission licence shall be accompanied by-

(a) the prescribed fee as set out in the Thirteenth

Schedule; and

(b) such other information as the Authority may from time to time specify.

Licence processing period.

43. (1) The Authority shall make a decision in respect of a licence application within ninety days after receipt and shall-

(a) notify the applicant of the decision, and give written reasons if the application was unsuccessful;

(b) notify any person who may have complained of the proposed activity; and

(c) at the request of any person contemplated in paragraph (b), give written reasons for its decision or make public its reasons.

(2) Where an application has been rejected under paragraph (1) the applicant shall reapply in a similar manner to the initial application.

Renewal of emission licence.

44.

(1) An application for the renewal of a licence shall be accompanied by-

(a) the prescribed application fee stipulated under the Thirteenth Schedule; and

(b) such other information as may be required by the Authority.

(2) The Authority shall, at the time of considering an application for renewal, decide on the continuation or otherwise of-

(a) ambient air monitoring;

- (b) meteorological monitoring ;
- (c) source testing;or
- (d) any other condition specified in the licence.

(3) The applicants shall, for the purposes of paragraph (3) demonstrate-

- (a) the adequacy of existing data;
- (b) its relationship to past, present and future facility operating conditions; and
- (c) the adequacy of other means to document continuing compliance.

Transfer of
Emission Licence.

45. (1) Where a licensee wishes to transfer the license to another person ,the transferee and transferor shall jointly apply to the Director- General for approval of the transfer in Form VII set out under the Ninth Schedule at least ninety days prior to any such change.

(2) The Director-General shall consider an application under paragraph (1) and may grant the approval or decline with reasons in writing and forward to the applicant.

(3) Where the Director-General grants his approval, the transfer shall be effective upon payment of a transfer fee prescribed under the Thirteenth Schedule.

(4) A licence transferred under paragraph (3) shall be only in respect of the facility for which the licence was issued.

(5) A person to whom a licence is transferred to shall be issued with a Certificate of Transfer in Form VIII set out in the Ninth Schedule.

(6) The transferor of a licence under these Regulations shall be liable for all liabilities prior to the date of transfer.

Liability of transferee

46. (1) The transferee shall be responsible for any future liabilities or any obligations imposed with regard to the licence from the date the transfer become effective.

(2) Notwithstanding paragraph (1) the holder of an emission licence may apply to the Authority for the variation of the licence.

(3) An application under paragraph (2) shall be in Form IX set out in the Ninth Schedule and shall be accompanied by the prescribed fee.

(4) Upon receipt of an application for variation of an emission licence the Authority in consultation with the relevant lead agencies shall consider the application within forty-five days, and where the application is approved, shall issue a certificate of variation in Form X set out in the Ninth Schedule.

Variation of emission licence by Authority.

47. The Authority may, in consultation with the relevant lead agencies vary an emission licence where it deems it necessary and inform the holder accordingly in writing, giving reasons for the necessary variation.

Compliance Plan.

48. (1) As part of the requirements of a control Order or of an application for the grant or renewal of a licence, the Authority may require the completion of a compliance plan.

(2) A compliance plan shall include the elements stipulated in Part XI of the Fifth Schedule

Suspension, Revocation or Cancellation of Emission Licence.

49. (1) The Authority may at any time, after issuing an emission licence under these Regulations, suspend, revoke or cancel the licence on such terms and conditions as it may deem fit.

(2) A licence shall be suspended, revoked or canceled under

paragraph (1) where-

- (a) the licensee contravenes the conditions set out in the licence;
- (b) there is substantial change or modification in the activities in respect of which it was issued;
- (c) the emission poses a health or environmental threat which could not be reasonably foreseen before the licence was issued;
- (d) it is established that the information or data given by the licensee in support of the application for an emission licence was false, incorrect or intended to mislead;
- (e) the licensee fails to obey a control order issued under these Regulations; or
- (f) the licensee fails to submit and comply with a fugitive particulate emissions control plan or a compliance plan as required under these Regulations.

Register of
Emission Licences.

50. (1) The Authority shall maintain:-

- (a) a register of emission licences as set out in Form XI under the Ninth Schedule, and
- (b) monitoring reports which shall be public documents maintained at the offices of the Authority for inspection by any person on payment of the fees specified under the Thirteenth Schedule.

Appeal.

51. A person aggrieved by the decision of the Authority pursuant to the exercise of its powers under this part may appeal in the manner provided in the Act.

PART X - METHODS OF MEASUREMENT AND ANALYSIS

Measurement of air pollutants.

52.(1) A person, owner or operator of a facility listed under the Fourth Schedule shall ensure that measurement of emissions and occupational exposure levels are carried out in accordance with the methods of test set out in the Eleventh Schedule.

(2) The analysis of all measurements in paragraph (1) above shall be carried out by laboratories designated by the Authority.

Measurement of Ambient Air Quality.

53. The Authority in consultation with the relevant lead agencies may carry out all measurements of ambient air quality levels in accordance with the methods of test set out in the Eleventh Schedule.

Visible air pollutants.

54. Measurements of visible air pollutants shall be in accordance with the relevant method of measurement set out under the Eleventh Schedule or in accordance with any method approved by the Authority.

Measuring vehicular emissions.

55.(1) The procedure for measuring vehicular exhaust emissions shall be in accordance with the relevant methods of test and analysis stipulated under the Eleventh Schedule or any other method approved by the Authority.

Period for storing records.

56.(1) The record of the measurements carried out as required under regulation 52 shall be kept by the owner, occupier, or operator of the facility for a period of at least two years or such other period as may be prescribed by the Authority.

(2) All emission test reports shall be delivered to the Authority within ninety days from the date of completion of testing.

(3) The Authority may, grant an extension of the period specified in paragraph (2) upon the submission to the Authority, not less than five days before the expiration of such period, of a written explanation for the requested extension.

(4) The records of these measurements shall be submitted to the Authority within thirty days after analysis.

Obnoxious smells.

57.(1) An owner or operator of a controlled facility shall measure the level of obnoxious smells by use of analytical and measurement methods stipulated under the Eleventh Schedule, or alternatively may cause such levels to be assessed by a laboratory designated by the Authority.

Where “odour” means property of substance that stimulates characteristic smell;

PART XI - INSPECTION AND MONITORING

Monitoring of ambient air quality .

58. The Authority may carry out monitoring of ambient air quality or request a relevant lead agency to do so on its behalf.

Assessment of Air Quality .

59. The Authority may in consultation with the relevant lead agencies assess the air quality in accordance with the guidelines set out in Part XII of the Fifth Schedule.

Preliminary assessment of stationary sources.

60.(1) Pursuant to these Regulations, preliminary assessment of stationary sources of air pollutants shall be carried out by the Authority in consultation with lead agencies within controlled areas following the relevant guidelines.

(2) For each controlled facility, the assessment for air pollutants shall include, as a minimum, the parameters indicated under the Fourth Schedule or any other parameter determined by the Authority.

Stack height.

61.(1) An owner or operator of a controlled facility while installing a stack shall ensure that it complies with the requirements stipulated under Part XIV of the Fifth Schedule

Provision of portholes in stacks.

(2) An owner or operator of a controlled facility shall provide portholes, and platforms which shall be conveniently located for easy access and all other facilities required for taking samples of air or emission from any chimney, flue or duct, plant or vessel or any other

outlets.

Provision of service for stack sampling.

62. Where the Authority requires stack emission tests to be performed under these Regulations, an owner of a facility shall provide the following-

- (a) sampling ports which are adequate for the test methods applicable to the facility;
- (b) safe sampling platforms or other suitable and safe permanent or temporary structures or equipment; and
- (c) safe access to sampling platforms.

Stack emission recording and reporting requirements.

63. (1) Results of emissions sampling and analysis shall be prescribed in the format set out in Part XIII of the Fifth Schedule and expressed in metric units consistent with the emission standards or targets set out in these Regulations and in the conditions, if any, imposed in the relevant licence.

Continuous monitoring system requirements.

64. (1) A licensee who has any of the sources of emission set out in the Third Schedule shall install, calibrate, maintain and operate equipment for continuously monitoring and recording emission levels in accordance with these Regulations, or equivalent emission measuring systems as may be approved by the Authority.

(2) An owner or operator of a facility existing before the coming into force of these Regulations shall install equipment as required under paragraph (1) within a period of twenty-four months after the coming into force thereof.

Air quality monitoring records.

65. (1) An owner or operator of a controlled facility shall maintain air quality monitoring records for sources of air pollution in the manner prescribed by the Authority.

(2) The monitoring records shall be in the prescribed form as set out in the Eighth Schedule.

(3) The records referred to in paragraph (1) shall be preserved

by the licensee for a period of two years or such longer period as may be prescribed by the Authority.

PART XII - REPORTING

Initial emission
assessment report.

66. An owner and operator of any stationary source which is subject to regulation 14(1), shall, not later than one year from the date of these Regulations come into operation-

- (a) submit an initial emission assessment report in accordance with the guidelines set out in Part XII of the Fifth Schedule;
- (b) notify the Authority of their applicability status;
- (c) submit an emission assessment report as to what constitutes best available technology for the source, including technical and economic support documentation; and
- (d) provide a detailed schedule, acceptable to the Authority, for implementing the best available technology program.

Atmospheric
impact report.

67. (1) The Authority may require an operator, owner or occupier to submit an atmospheric impact report in accordance with the guidelines set out in Part XII of the Fifth Schedule.

(2) All emission test reports shall be delivered to the Authority within ninety days from the date of completion of testing.

Monitoring
records.

68. (1) An owner or operator of any facility listed in the Fourteenth Schedule shall submit the monitoring records to the Authority on a quarterly basis.

(2) The Authority shall convey its written comments on the records to the applicant within thirty days of the receipt thereof.

(3) An owner or operator of a controlled facility, equipment, or air pollution control device which emits or causes to be emitted any air pollutant shall submit to the Authority any relevant information that the Authority may request in writing within sixty calendar days or any other period determined by the Authority.

(4) An owner or operator of a controlled facility shall complete the installation and performance tests of the above equipment and begin monitoring and recording before issuance of an emission license.

Notification of excessive emissions.

69. (1) An owner or operator of any facility where the air pollution control system breaks down or malfunctions, and is likely to cause excessive emissions leading to imminent danger, shall notify the Authority within a period of twenty-four hours from the time of the occurrence.

(2) An owner or operator of any controlled facility to which paragraph (1) applies shall submit to the Authority a report on emission limit exceedence in the Form II set out in the Ninth Schedule .

PART XIII- MISCELLANEOUS

Guideline for monitoring air pollutants.

70. The Authority in consultation with the relevant lead agencies may issue guidelines, including guidelines listed under Part XIII of the Fifth Schedule to these Regulations, on the monitoring of air pollutants.

Greenhouse gases.

71. An owner or operator may adapt or install air pollution control technologies for mitigation of green house gases in accordance with the guidelines set out in Part X of the Fifth Schedule.

Dioxins and furans.

72. An owner or operator may retrofit his production processes with air pollution control technologies specified under the Seventh Schedule in order to reduce emission of dioxins and furans to limits

specified under the Third Schedule.

Emission rate for oxides of nitrogen.

73. The maximum emission rate for oxides of nitrogen from stationary internal combustion engines shall not exceed those achieved using best available technology specified under the Part X the Fifth Schedule, or any other technology approved by the Authority.

Notification of permissible levels.

74. (1) The Cabinet Secretary shall upon the coming into operation of these Regulations, issue a notice in respect of facilities listed in the Fourteenth Schedule to-

(a) prescribe maximum emission standards in respect of a substance or mixture of substances resulting from a listed activity and identified in the notice including-

(i) the permissible amount or concentration of that substance or mixture or,

(ii) the manner in which the measurement of such emissions shall be carried out; and

(b) prescribe transitional and other special arrangements in respect of existing activities.

Baseline Levels of Priority Air Pollutant.

75. The Authority may in consultation with the relevant lead agencies establish baseline levels of priority air pollutants set out in the Second Schedule.

Offences & Penalties.

76. A person who contravenes the provisions of these Regulations, commits an offence and is liable on conviction to a fine of Five Hundred Thousand Shillings or imprisonment for a term not exceeding six months

Charges for pollution.

77. Where the Authority demonstrates that a person is not complying with any of the standards set out in these Regulations, the Authority may charge such person a penalty of ten thousand Kenya

shillings for every parameter not being complied with, per day, until such person demonstrates full compliance with the relevant standard related to such parameter.

Revocation of LN
131/2006

78. The Environmental Management and Co-ordination (Fossil Fuels) Regulations, 2006, are revoked.

Transitional
Provision.

79. Notwithstanding Regulation 78 any person carrying out any activities prescribed in these Regulations immediately before the coming into operation of these Regulations shall, subject to regulation 64(2), within twelve months from the coming into force thereof, take all necessary measures to ensure full compliance with these Regulations.

FIRST SCHEDULE
AMBIENT AIR QUALITY TOLERANCE LIMITS

Table 1: Ambient Air Quality Tolerance Limits

	Pollutant	Time weighted Average			
			Industrial area	Residential, Rural & Other area	Controlled areas***
1.	Sulphur oxides (SO _x);	Annual Average*	80 µg/m ³	60 µg/m ³	15 µg/m ³
		24 hours**	125 µg/m ³	80 µg/m ³	30 µg/m ³
		Annual Average		0.019 ppm/50µg/m ³	
		Month Average			
		24 Hours		0.048ppm /125µg/m ³	
		One Hour			
		Instant Peak		500 µg/m ³	
		Instant Peak (10 min)		0.191 ppm	
2.	Oxides of Nitrogen (NO _x);	Annual Average*	80 µg/m ³	60 µg/m ³	15 µg/m ³
		24 hours**	150 µg/m ³	80 µg/m ³	30 µg/m ³
		8 hours			
		Annual Average		0.2 ppm	
		Month Average		0.3 ppm	
		24 Hours		0.4 ppm	
		One Hour		0.8 ppm	
		Instant Peak		1.4 ppm	
3.	Nitrogen Dioxide	Annual Average	150 µg/m ³	0.05 ppm	
		Month Average		0.08 ppm	
		24 Hours	100 µg/m ³	0.1 ppm	
		One Hour		0.2 ppm	
		Instant Peak		0.5 ppm	
4.	Suspended Particulate	Annual Average*	360 µg/m ³	140 µg/m ³	70 µg/m ³

	Pollutant	Time weighted Average			
	matter (SPM)				
		24 hours**	500 µg/m ³	200 µg/m ³	100 µg/m ³
			Industrial area	Residential, Rural & Other area	Controlled areas***
		mg/Kg			
		Annual Average*****		100 µg/m ³	
		24 hours***		180 µg/m ³	
5.	Respirable Particulate Matter (<10µm) (RPM)	Annual Average*	70 µg/m ³	50 µg/m ³	50 µg/m ³
		24 hours**	150 µg/Nm ³	100 µg/Nm ³	75 µg/Nm ³
6.	PM _{2.5}	Annual Average	35 µg/m ³		
		24 hours	75 µg/m ³		
7.	Lead (Pb)	Annual Average*	1.0 µg/Nm ³	0.75 µg/Nm ³	0.50 µg/m ³
		24 hours**	1.5 µg/m ³	1.00 µg/m ³	0.75 µg/m ³
		Month Average		2.5	
8.	Carbon monoxide (CO)/ carbon dioxide (CO ₂)	8 hours**	5.0 mg/m ³	2.0 mg/m ³	1.0 mg/m ³
		1 hour	10.0 mg/m ³	4.0 mg/m ³	2.0 mg/m ³
		mg/Kg			
		24 hours**			
9.	Hydrogen Sulphide	24 hours**	150µg/m ³		
10.	Non-methane hydrocarbons				
		instant Peak	700ppb		
11.	Total VOC	24 hours**	600 µg/m ³		
12.	Ozone	1-Hour	200 µg/m ³	0.12 ppm	
		8 hour (instant Peak)	120 µg/m ³	1.25 ppm	

And any other parameter as may be prescribed by the Authority from time to time

Legend

a) μg - *microgram*

b) m^3 – *cubic metre*

c) *ppm* – *Parts per million*

d) *ppb* – *Parts per billion*

e) Values at Standard Temperature and Pressure (STP)

f) Conversion factors from ppm to mg/m^3 and mg/m^3 to ppm are stipulated under the Eleventh Schedule

g) * [Annual Arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval.]

h) [** 24 hourly/8 hourly values should be met 98% of the time in a year. However, 2% of the time, it may exceed but not on two consecutive days.]

i) Whenever and wherever two consecutive values exceeds the limit specified above for the respective category, it would be considered adequate reason to institute regular/continuous monitoring and further investigations.

j) * the 24-hour limit may not be exceeded more than three times in one year;

k) ** 24-hour limit may not be exceeded more than three times in one year micrograms/ m^3

l) *** Not to be exceeded more than once per year average concentration

m)***In conversion of units from ppm to mg/m^3 and vice versa shall use guidelines set out under Part II of the Fifth Schedule.

b) Table 2: Ambient Air Quality at Property Boundary for General Pollutants

	Pollutant	Time weighted Average	Property Boundary
1	Particulate matter (PM)	Annual Average*	50 $\mu\text{g}/\text{m}^3$
		24 hours**	70 $\mu\text{g}/\text{m}^3$
2.	Oxides of Nitrogen (NO_x);	Annual Average*	80 $\mu\text{g}/\text{m}^3$
		24 hours**	150 $\mu\text{g}/\text{m}^3$
3.	Sulphur oxides (SO_x);	Annual Average*	50 $\mu\text{g}/\text{m}^3$
		24 hours**	125 $\mu\text{g}/\text{m}^3$
4.	Hydrogen Sulphide	24 hours**	50 $\mu\text{g}/\text{m}^3$
5.	Lead(Pb)	Annual/24 hours	0.5-2.0 $\mu\text{g}/\text{m}^3$
6.	Ammonia	24 hours**	100 $\mu\text{g}/\text{m}^3$

Note.

- a) For residential premises in designated industrial areas, the above standards do not apply.
- b) For industries in designated residential areas, standards for residential areas shall apply.

SECOND SCHEDULE

PRIORITY AIR POLLUTANTS

Part I: General Source Pollutants

- a) Particulate matter (Dust, black smoke, smog, aerosols);
- b) Sulphur oxides (SO_x);
- c) Nitrogen oxides (NO_x);
- d) Carbon monoxide (CO)
- e) Carbon dioxide (CO₂);
- f) Hydrocarbons (HC);
- g) Volatile organic Compounds(VOC);
- h) Hydrogen Sulphide (H₂S);
- i) Hydrogen Chloride (HCl);
- j) Lead and its compounds;
- k) Mercury vapour (Hg)
- l) Ozone (O₃);
- m) Dioxins and furans (PCDD and PCDF).

Part II: Mobile Source Pollutants

- a) Hydrocarbons (HCs)
- b) Volatile organic Compounds(VOC);
- c) Sulphur dioxide (SO_x)
- d) Nitrogen oxides (NO_x)
- e) Particulates (PM)
- f) Carbon Monoxide (CO)

Part III: Greenhouse gases(GHG)

- a) Carbon dioxide (CO₂);
- b) Methane (CH₄);
- c) Nitrous oxides (N₂O);
- d) Hydrofluorocarbons (HCFCs);
- e) Perfluorocarbons (PFCs); and
- f) Sulphur hexafluoride (SF₆);

THIRD SCHEDULE

EMISSION LIMITS FOR CONTROLLED AND NON-CONTROLLED FACILITIES

Industry	Air Pollutant	Opacity	Particulate (Dust) PM ₁₀ (mg/Nm ³)		Sulphur oxide (SO _x) (mg/Nm ³)		Nitrogen oxides (NO _x) (mg/Nm ³)		O ₂ %	Carbon monoxide (mg/Nm ³)	Carbon dioxide (mg/Nm ³)	Hydrocarbons (mg/Nm ³)	Hydrogen Sulphide (mg/Nm ³)	Hydrogen Chloride (mg/Nm ³)	Hydrogen Fluoride (mg/Nm ³)	Lead (mg/Nm ³)	Dioxins/Furans
			NDA	DA	NDA	DA	NDA	DA									
Aluminium recycling plants			10 – 30									20		*			*
Asphalt mixing batch plants			< 100 t: g/kg		2000		460			*	*	20					
			100 to 300 t: 22g/kg														

Industry	Air Pollutant	Opacity	Particulate (Dust) PM ₁₀ (mg/Nm ³)		Sulphur oxide (SO _x) (mg/Nm ³)		Nitrogen oxides (NO _x) (mg/Nm ³)		O ₂ %	Carbon monoxide (mg/Nm ³)	Carbon dioxide (mg/Nm ³)	Hydrocarbons (mg/Nm ³)	Hydrogen Sulphide (mg/Nm ³)	Hydrogen Chloride (mg/Nm ³)	Hydrogen Fluoride (mg/Nm ³)	Lead (mg/Nm ³)	Dioxins/Furans
			NDA	DA	NDA	DA	NDA	DA									
			300 to 500 t: 31g/kg														
			> 500 t: 33 g/kg														
Boilers		*	50		*		*			*	*	*	*				*
Cement plants			50		400		1500			*	500	300					0.5 Nm
Ceramics manufacture			400				180-250 ppm										
Coke & coal plants			*		*		*			*	*	*	*	*			
Dairy			50														
Fertilizer plant			50		*		500					20	30		50		
Iron Foundry			50		560					*	*				5		

Industry	Air Pollutant		Opacity	Particulate (Dust) PM ₁₀ (mg/Nm ³)		Sulphur oxide (SO _x) (mg/Nm ³)		Nitrogen oxides (NO _x) (mg/Nm ³)		O ₂ %	Carbon monoxide (mg/Nm ³)	Carbon dioxide (mg/Nm ³)	Hydrocarbons (mg/Nm ³)	Hydrogen Sulphide (mg/Nm ³)	Hydrogen Chloride (mg/Nm ³)	Hydrogen Fluoride (mg/Nm ³)	Lead (mg/Nm ³)	Dioxins/Furans	
				NDA	DA	NDA	DA	NDA	DA										
Brass bronze Foundry			50		20 - 50														
Glass Manufacture			20 - 50		Oil fired: 1,800			1000 - 2000							50	5			
					Gas fired: 700														
Galvanizing operations		*	50																
Incinerators		*	< 10 t: 4g/kg 10 to 30 t: 10g/kg 30 to 50 t: 10g/kg > 50 t:		500			Existing :130-600 ppm			*		*						2.080 TE m ³

Industry	Air Pollutant		Opacity	Particulate (Dust) PM ₁₀ (mg/Nm ³)	Sulphur oxide (SO _x) (mg/Nm ³)	Nitrogen oxides (NO _x) (mg/Nm ³)	O ₂ %	Carbon monoxide (mg/Nm ³)	Carbon dioxide (mg/Nm ³)	Hydrocarbons (mg/Nm ³)	Hydrogen Sulphide (mg/Nm ³)	Hydrogen Chloride (mg/Nm ³)	Hydrogen Fluoride (mg/Nm ³)	Lead (mg/Nm ³)	Dioxins/Furans
			NDA	DA	NDA	DA	NDA	DA							
		17.5 g/kg					New: 60-400 ppm								0.1 ng TE m ³
	Municipal waste		100				300	*	*						
	Medical waste		20 (PM _{2.5})		500		300	*	*	*		*			*
	Industrial waste	*	50		150		460	*	*	*	*	*			*
	Kraft pulp mills		100-150		500		600	*	*	20	15	*	*		*
	Lead Recycling plants		20 (PM _{2.5})		400									50(B&R)	*

Industry	Air Pollutant		Particulate (Dust) PM ₁₀ (mg/Nm ³)	Sulphur oxide (SO _x) (mg/Nm ³)	Nitrogen oxides (NO _x) (mg/Nm ³)	O ₂ %	Carbon monoxide (mg/Nm ³)	Carbon dioxide (mg/Nm ³)	Hydrocarbons (mg/Nm ³)	Hydrogen Sulphide (mg/Nm ³)	Hydrogen Chloride (mg/Nm ³)	Hydrogen Fluoride (mg/Nm ³)	Lead (mg/Nm ³)	Dioxins/Furans
	Opacity													
			NDA	DA	NDA	DA								
													Furnace)	
													10 Pot Furnace)	
Mineral Processing		50												
Mining & Quarry	20%	400												
Non-ferrous secondary smelters		50		20	*		*	*	*	*				
Non-ferrous secondary smelters	*	< 10 t: 7.5 g/kg (PM _{2.5})		800	*		*	*	20	15				*

Industry	Air Pollutant		Opacity	Particulate (Dust) PM ₁₀ (mg/Nm ³)		Sulphur oxide (SO _x) (mg/Nm ³)		Nitrogen oxides (NO _x) (mg/Nm ³)		O ₂ %	Carbon monoxide (mg/Nm ³)	Carbon dioxide (mg/Nm ³)	Hydrocarbons (mg/Nm ³)	Hydrogen Sulphide (mg/Nm ³)	Hydrogen Chloride (mg/Nm ³)	Hydrogen Fluoride (mg/Nm ³)	Lead (mg/Nm ³)	Dioxins/Furans
	NDA	DA		NDA	DA	NDA	DA											
	10 to 30 t: 22.5 g/kg (PM _{2.5})																	
	30 to 50 t: 37.5g/kg (PM _{2.5})																	
	> 50 t: 52.5 g/kg (PM _{2.5})																	
Paint and varnish manufacturing	50 (PM _{2.5})												20	15	10			
Pesticides formulation	20												20		5			

Industry	Air Pollutant		Particulate (Dust) PM ₁₀ (mg/Nm ³)	Sulphur oxide (SO _x) (mg/Nm ³)		Nitrogen oxides (NO _x) (mg/Nm ³)		O ₂ %	Carbon monoxide (mg/Nm ³)	Carbon dioxide (mg/Nm ³)	Hydrocarbons (mg/Nm ³)	Hydrogen Sulphide (mg/Nm ³)	Hydrogen Chloride (mg/Nm ³)	Hydrogen Fluoride (mg/Nm ³)	Lead (mg/Nm ³)	Dioxins/Furans
	Opacity															
			NDA	DA	NDA	DA	NDA	DA								
		(PM _{2.5})														
Pesticide manufacturing		20									20					
Petroleum Refineries		50		Sulphur recovery: 150		460		*		20	152					*
				Combustion units:500												
Pharmaceuticals manufacturing plants		20								80		10				
Printing industry										20		10				

Industry	Air Pollutant	Opacity	Particulate (Dust) PM ₁₀ (mg/Nm ³)		Sulphur oxide (SO _x) (mg/Nm ³)		Nitrogen oxides (NO _x) (mg/Nm ³)		O ₂ %	Carbon monoxide (mg/Nm ³)	Carbon dioxide (mg/Nm ³)	Hydrocarbons (mg/Nm ³)	Hydrogen Sulphide (mg/Nm ³)	Hydrogen Chloride (mg/Nm ³)	Hydrogen Fluoride (mg/Nm ³)	Lead (mg/Nm ³)	Dioxins/Furans
			NDA	DA	NDA	DA	NDA	DA									
Steel mills		*	Existing -240 (PM _{2.5})		500		200			*							
			New-120 (PM _{2.5})				180										
Sulphuric acid Plants			50		SO ₂ : 2 kg/t acid												
					SO ₃ : 0.15 kg/t acid												

Industry	Air Pollutant		Opacity	Particulate (Dust) PM ₁₀ (mg/Nm ³)		Sulphur oxide (SO _x) (mg/Nm ³)		Nitrogen oxides (NO _x) (mg/Nm ³)		O ₂ %	Carbon monoxide (mg/Nm ³)	Carbon dioxide (mg/Nm ³)	Hydrocarbons (mg/Nm ³)	Hydrogen Sulphide (mg/Nm ³)	Hydrogen Chloride (mg/Nm ³)	Hydrogen Fluoride (mg/Nm ³)	Lead (mg/Nm ³)	Dioxins/Furans
	NDA	DA		NDA	DA	NDA	DA											
					< 100 t: 3.75 g/kg													
					100 to 300 t: 10.5 g/kg													
					300 to 500 t: 34.5g/kg													
					> 500 t: 48 g/kg													

Industry	Air Pollutant	Opacity	Particulate (Dust) PM ₁₀ (mg/Nm ³)		Sulphur oxide (SO _x) (mg/Nm ³)		Nitrogen oxides (NO _x) (mg/Nm ³)		O ₂ %	Carbon monoxide (mg/Nm ³)	Carbon dioxide (mg/Nm ³)	Hydrocarbons (mg/Nm ³)	Hydrogen Sulphide (mg/Nm ³)	Hydrogen Chloride (mg/Nm ³)	Hydrogen Fluoride (mg/Nm ³)	Lead (mg/Nm ³)	Dioxins/Furans	
			NDA	DA	NDA	DA	NDA	DA										
Sugar Manufacture			(< 8.7 mw input boiler):		2000		Liquid fuels:											
			(>8.7 mw input boiler):				460 ppm											
Soda ash Manufacture			50															
Tanneries			50		1000		1500					20	15	*				*
Textiles			50									20						
Geothermal Power plants					*		*						*					
Thermal Power Plants																		

Industry	Air Pollutant		Particulate (Dust) PM ₁₀ (mg/Nm ³)	Sulphur oxide (SO _x) (mg/Nm ³)	Nitrogen oxides (NO _x) (mg/Nm ³)	O ₂ %	Carbon monoxide (mg/Nm ³)	Carbon dioxide (mg/Nm ³)	Hydrocarbons (mg/Nm ³)	Hydrogen Sulphide (mg/Nm ³)	Hydrogen Chloride (mg/Nm ³)	Hydrogen Fluoride (mg/Nm ³)	Lead (mg/Nm ³)	Dioxins/Furans
	Opacity													
			NDA	DA	NDA	DA								
Small combustion facilities(3MWth – 50NMWth)Reciprocating internal Combustion Engine (RICE)														
Engine (Gas)		N/A		N/A		200(SI) 1,600(CI)								
Liquid	K S 1 5 1 5	50		Use 1.5% sulphur fuel(SF)*		Boreø<40 0mm: 1460 Boreø≥40 0mm: 1,850								
Turbine														

Industry	Air Pollutant		Opacity	Particulate (Dust) PM ₁₀ (mg/Nm ³)	Sulphur oxide (SO _x) (mg/Nm ³)	Nitrogen oxides (NO _x) (mg/Nm ³)	O ₂ %	Carbon monoxide (mg/Nm ³)	Carbon dioxide (mg/Nm ³)	Hydrocarbons (mg/Nm ³)	Hydrogen Sulphide (mg/Nm ³)	Hydrogen Chloride (mg/Nm ³)	Hydrogen Fluoride (mg/Nm ³)	Lead (mg/Nm ³)	Dioxins/Furans
			NDA	DA	NDA	DA									
Natural Gas															
3MWth to < 15MWth			N/A		N/A										
15MWth to < 50MWth			N/A		N/A										
Other fuels															
3MWth to < 15MWth			N/A		0.5%SF										

Industry	Air Pollutant		Particulate (Dust) PM ₁₀ (mg/Nm ³)	Sulphur oxide (SO _x) (mg/Nm ³)	Nitrogen oxides (NO _x) (mg/Nm ³)	O ₂ %	Carbon monoxide (mg/Nm ³)	Carbon dioxide (mg/Nm ³)	Hydrocarbons (mg/Nm ³)	Hydrogen Sulphide (mg/Nm ³)	Hydrogen Chloride (mg/Nm ³)	Hydrogen Fluoride (mg/Nm ³)	Lead (mg/Nm ³)	Dioxins/Furans
	Opacity													
			NDA	DA	NDA	DA								
15MWth to < 50MWth			N/A		0.5% SF or lower		74ppm							
Boiler														
Gas			N/A		N/A		320							
Liquid			50 or 150 *		2000		460							
Solid			50 or 150 *		2000		650							
Combustion Technology/Fuel														
RICE														

Industry	Air Pollutant		Particulate (Dust) PM ₁₀ (mg/Nm ³)	Sulphur oxide (SO _x) (mg/Nm ³)		Nitrogen oxides (NO _x) (mg/Nm ³)		O ₂ %	Carbon monoxide (mg/Nm ³)	Carbon dioxide (mg/Nm ³)	Hydrocarbons (mg/Nm ³)	Hydrogen Sulphide (mg/Nm ³)	Hydrogen Chloride (mg/Nm ³)	Hydrogen Fluoride (mg/Nm ³)	Lead (mg/Nm ³)	Dioxins/Furans
	Opacity			NDA	DA	NDA	DA									
Natural Gas		N/A	N/A	N/A	N/A	200(SI) 400(DF)	200(SI) 400(DF/CI)	15%								
Liquid fuels(>=50MWth to < 300MWth)		50	30	1,170 or ≤2%SF	0.5% SF	1,460(CI, Bore ø<400mm) 1,850(CI, Bore ø≥400mm) 2,000(DF)		15%								
Liquid fuels(plant≥300MWth)		50	30	585 or ≤1%SF	0.2% SF	740**	400	15%								

Industry	Air Pollutant	Opacity	Particulate (Dust) PM ₁₀ (mg/Nm ³)		Sulphur oxide (SO _x) (mg/Nm ³)		Nitrogen oxides (NO _x) (mg/Nm ³)		O ₂ %	Carbon monoxide (mg/Nm ³)	Carbon dioxide (mg/Nm ³)	Hydrocarbons (mg/Nm ³)	Hydrogen Sulphide (mg/Nm ³)	Hydrogen Chloride (mg/Nm ³)	Hydrogen Fluoride (mg/Nm ³)	Lead (mg/Nm ³)	Dioxins/Furans
			NDA	DA	NDA	DA	NDA	DA									
			NDA	DA	NDA	DA	NDA	DA									
	Biofuels/Gaseous fuels other than Natural Gas		50	30	N/A	N/A	30% Natural Gas & Liquid Fuels	>									
	Combustion Turbine																
	Natural Gas (All turbine types of unit> 50MWth)		N/A	N/A	N/A	N/A	51	25									
	Fuels other than Natural Gas(unit> 50MWth)		50	30	Use 1%SF	Use 0.5% SF											
	Boiler																
	Natural Gas		N/A	N/A	N/A	N/A	240	240	3%								

Industry	Air Pollutant		Particulate (Dust) PM ₁₀ (mg/Nm ³)	Sulphur oxide (SO _x) (mg/Nm ³)		Nitrogen oxides (NO _x) (mg/Nm ³)		O ₂ %	Carbon monoxide (mg/Nm ³)	Carbon dioxide (mg/Nm ³)	Hydrocarbons (mg/Nm ³)	Hydrogen Sulphide (mg/Nm ³)	Hydrogen Chloride (mg/Nm ³)	Hydrogen Fluoride (mg/Nm ³)	Lead (mg/Nm ³)	Dioxins/Furans
	Opacity			NDA	DA	NDA	DA									
Other Gaseous fuels			50	30	400	400	240	240	3%							
Liquid Fuels(Plant >=50MWth to < 600MWth)			50	30	900-1500	400	400	200	3%							
Liquid Fuels(>=600MWth)			50	30	200-850	200	400	200	3%							
Solid Fuels>=50MWth to < 600MWth)			50	30	900-1500	400	510	200	6%							
Solid Fuels(>=600MWth)			50	30	200-850	200	1,100 upto volatile matter of fuel < 10%	200	6%							

Industry	Air Pollutant		Particulate (Dust) PM ₁₀ (mg/Nm ³)	Sulphur oxide (SO _x) (mg/Nm ³)		Nitrogen oxides (NO _x) (mg/Nm ³)		O ₂ %	Carbon monoxide (mg/Nm ³)	Carbon dioxide (mg/Nm ³)	Hydrocarbons (mg/Nm ³)	Hydrogen Sulphide (mg/Nm ³)	Hydrogen Chloride (mg/Nm ³)	Hydrogen Fluoride (mg/Nm ³)	Lead (mg/Nm ³)	Dioxins/Furans
	Opacity															
			NDA	DA	NDA	DA	NDA	DA								
Waste water treatment plants							NH ₃ (100-400)				400-2,000	50-200				

And any other parameter as may be prescribed by the Authority from time to time

Legend

SF: Suphur Fuel

* 1.5-3.0% only justified by project specific considerations i.e. add secondary treatment to meet levels of 1.5% Sulphur

** dependent on water availability for injection

CI: Compression Ignition

SI: Spark Ignition

DF: Dual Fuel

DA: Degraded Area

NDA: Non-degraded Area

The chimney or stack should have a minimum height of 10 metres above ground level and clear the highest of the building by not less than 3 metres for all roofs. The topography and height of adjacent buildings within 50 metres radius should be taken into account.

Toxic Equivalent (TEQ) is the sum of the toxic equivalent factors (TEF) of a mixture congeners contained in a compound. The compound 2,3,7,8-tetrachlorodibenzo-p-dioxin(TCDD) was assigned a TEF of 1 after being identified, by International Association of Radiology and Cancer (IARC) and World Health Organisation (WHO), as the most toxic of all compounds, and as carcinogenic to humans, based mainly on studies of cases involving accidental or occupational heavy exposure. Therefore the TEF is a weighting factor.

g - gram

µg- microgram

kg – kilogram (1,000g)

mg - milligram

µg- microgram

m³ – cubic metre

ppm – Parts per million

t – tonne

FOURTH SCHEDULE

GUIDELINE ON AIR POLLUTION MONITORING PARAMETERS FROM STATIONARY SOURCES

Industry Air Pollutant	Opacity	Particulate (Dust)	Sulphur oxide (SO _x)	Nitrogen oxides (NO _x)	Carbon monoxide	Carbon dioxide	Hydrocarbons	Hydrogen Sulphide (H ₂ S)	Hydrogen Chloride		Dioxins/Furan s
Aluminium recycling plants		*					*		*		*
Asphalt batch plants		*	*	*	*	*	*				
Boilers	*	*	*	*	*	*	*				*
Cement plants		*	*		*	*	*				*
Ceramics manufacturing plants		*		*							
Coke & coal plants		*	*	*	*	*	*	*	*		
Fertilizer plant		*	*	*			*	*		*	
Galvanizing plants		*			*	*					
Glass manufacturing plants		*	*	*					*	*	
Iron Foundry plant		*	*		*	*				*	
Kraft pulp mills		*	*	*	*	*	*	*	*	*	*
Lead Recycling plant		*	*								*
Mineral Processing plants		*									
Mining & Quarry	*	*									
Municipal and Industrial incinerators	*	*	*	*	*	*	*		*		*
Non-ferrous smelters, secondary	*	*	*	*	*	*	*	*			*
Paint and varnish		*					*	*	*		

Industry Air Pollutant	Opacity	Particulate (Dust)	Sulphur oxide (SO _x)	Nitrogen oxides (NO _x)	Carbon monoxide	Carbon dioxide	Hydrocarbons	Hydrogen Sulphide (H ₂ S)	Hydrogen Chloride		Dioxins/Furan s
manufacturing											
Pesticides formulation		*					*		*		
Pesticide Manufacturing plants		*					*				
Petroleum Refineries			*		*		*				*
Pharmaceuticals manufacturing plants		*					*		*		
Printing industry							*		*		
Steel mills	*	*	*	*	*						
Sugar manufacturing plants		*	*	*							
Sulphuric acid Plants		*	*								
Salt & Soda ash processing plants		*							*		
Thermal Power Plants		*	*	*	*	*					*
Geothermal Power Plants			*	*			*	*			
Tanneries		*	*	*			*	*	*		*
Textile		*					*				
Waste water Treatment Plants				*			*	*			

And any other parameter as may be prescribed by the Authority from time to time

Legend

- a) * - parameters to be monitored
- b) Frequency – dependent on parameter and reported on a quarterly basis

- c) “dioxins” includes any of the chlorinated hydrocarbon compounds known chemically as dibenzo-p-dioxins, chlorinated dibenzofurans and certain polychlorinated biphenyls;
- d)

FIFTH SCHEDULE

GENERAL GUIDELINES

Part I:- Exempted Equipment and Activities

- a) Air pollutant detector, air pollutant recorder, combustion controller or combustion shut-off.
- b) Air conditioning or comfort ventilating systems.
- c) Vacuum cleaning systems used exclusively for office applications or residential housekeeping.
- d) Ventilating or exhaust systems for print storage room cabinets.
- e) Exhaust systems for controlling steam and heat.
- f) Maintenance, repair, or replacement in kind of equipment for which a permit to operate has been issued.
- g) Equipment which emits only nitrogen, oxygen, *carbon dioxide*, and/or water vapour.
- h) Ventilating or exhaust systems used in eating establishments where food is prepared for the purpose of consumption.
- i) Equipment used to liquefy or separate oxygen, nitrogen or the rare gases from the air.
- j) Fireworks display.
- k) Outdoor painting and sand blasting equipment.
- l) Lawnmowers, tractors, farm equipment and construction equipment.
- m) Fire schools or fire fighting training.
- n) Residential wood burning stoves and wood burning fireplaces.
- o) Buildings, cabinets, and facilities used for storage of chemicals in closed containers.
- p) Sewage treatment facilities.
- q) Water treatment units.
- r) Inactive wastewater treatment systems.
- s) Non-contact water cooling towers (water that has not been in direct contact with process fluids).
- t) Laundry dryers, extractors, or tumblers used for fabrics cleaned with a water solution of bleach or detergents.
- u) Equipment used for hydraulic or hydrostatic testing.
- v) Blueprint copiers and photographic processes.
- w) Inorganic acid storage tanks equipped with an emission control device.
- x) Any fuel burning equipment used exclusively for providing domestic electrical power of a capacity not greater than 8KVA.

Part II:- Guideline on Conversion factors

a) ppm to mg/m³ - air

The conversion between ppm and mg/m³ is dependent on both the molecular weight of the substance and the temperature at which the conversion is made. The assumption is that the pollutant behaves as an ideal gas and as such, 1 mole of the substance occupies 22.4 litres at standard temperature (273K) and pressure (101.3 kPa). This is consistent with normalised concentrations, and it is therefore not normally necessary to take account of the temperature or pressure difference in the conversion. However, when converting ppm to mg/m³ at actual discharge conditions, it is important to take account of the necessary factors.

To convert from ppm to mg/m³, the following formula should be used:
mg/m³ = ppm x (MW/22.4) x (273/T) x (P/101.3)

Where MW is the molecular weight of the substance (in grams)
T is the temperature at which the conversion is to be made (degrees Kelvin)
P is the pressure at which the conversion is to be made (kPa)

To convert from mg/m³ to ppm, the following formulae should be used:
ppm = mg/m³ x (22.4/MW) x (T/273) x (101.3/P)

Part III:- Factors to be considered when setting ambient air quality limits

These factors include:

- (1) Degree of exposure of sectors of the population, and in Particular sensitive sub-groups.
- (2) Climatic conditions and meteorology.
- (3) Sensitivity of flora and fauna and their habitats.
- (4) Historic heritage exposed to pollutants.
- (5) Transboundary movement.

Part IV:- *Emission Reduction Measures of Dark Smoke from Chimneys*

- 1) Avoid overloading burners with fuel oil.
- 2) Use the correct fuel to air ratio by proper adjustment of the air and fuel supplies.
- 3) Avoid flame impingement on any cold surface.
- 4) Avoid carbon build-up in the boiler and furnace tubes and maintain the boiler and furnace settings in good condition.
- 5) Clean the burner at regular intervals and remove the carbon deposits from the nozzle with soft article after soaking, the nozzle in Kerosene.
- 6) Use the correct atomizing nozzle and atomizing pressure.
- 7) Check for worn or distorted Parts of the burner and replace the damaged Parts.
- 8) Allow sufficient time in lighting up the burners from cold and adopt the correct start-up procedures as recommended by the burner manufacturers.
- 9) Keep the mesh at the inlet of the air blower clear at all times

Part V:- *Guideline on emissions report format* –

The emissions report format shall include:-

- (a) an estimate of the emissions for the relevant calendar year; and
- (b) all the data applicable to the emissions sources, in respect of the licensed facility.

(c) Estimates of annual emissions shall be made based on the following methods, in order of preference –

- (1) continuous emission monitoring data;
- (2) calculation of SO₂ emissions based on fuel use and sulphur content data including combustion processes in which exhaust gases do not come in contact with products;
- (3) most recent and representative stack monitoring measurements conducted in the previous five years and activity data for the year for which emissions are estimated;
- (4) emission factor or equivalent methods and activity data for the year;
- (5) emission factor or equivalent methods and plant capacity data;

- (6) mass balance (including fuel use data) based on the two previous years or the most recent representative year;
- (7) other approved methods supported by calculation and documentation, and the procedures set out in the *guideline document*.

Part VI:- *Measures or operating procedures to control fugitive emissions*

The following measures or operating procedures may be used to control fugitive emissions:-

- (a) from storage piles through use of enclosures, covers or stabilisation, minimising the slope of the upwind face of the pile, confining as much pile activity as possible to the downwind side of the pile and such other methods or techniques as are approved by the Authority
- (b) by enclosing, covering, watering, or otherwise treating loaded haul trucks and railroad cars, or limiting size of loads, to minimise loss of material to wind and spillage
- (c) by minimising the area of disturbed land or tailings
- (d) by planting special wind break vegetation at critical points
- (e) by prompt removal of coal, rock minerals, soil, and other dust-forming debris from paved roads and scraping and compaction of unpaved roads to stabilise the road surface as often as necessary to minimise re-entrainment of fugitive Particulate matter from the road surface
- (f) by minimising the period of time between initially disturbing the soil and re-vegetating or other surface
- (g) by restricting the areas to be blasted at any one time
- (h) by restricting the speed of vehicles in or around mining, tailing or quarrying operations
- (i) by re-vegetating, mulching, or otherwise stabilising the surface of all areas adjoining roads that are a source of fugitive Particulate emissions
- (j) by substituting covered conveyor systems for haul trucks
- (k) by using synthetic or re-vegetative covers
- (l) by restricting vehicular travel to established paved roads
- (m) by watering or chemical stabilisation of unpaved roads as often as necessary to minimise re-entrainment of fugitive Particulate matter from the road surface, or paving of roads

Where "fugitive emission" means an emission that cannot or is not reasonably likely to pass through a stack, chimney, vent or other functionally equivalent opening;

Part VII:- Opacity Measurement Guidelines

The darkness of smoke is determined by comparing the shade of smoke to the shades on a Ringelmann Chart which consists of four squares with grids, which denoted shade 1 to shade 4. The darkness covered in each of these four squares represents twenty percent, forty percent, sixty percent and eighty percent opacity respectively. Ringelmann shade 0 is completely white and shade 5 is totally black. Therefore, Ringelmann shade 1 corresponds to smoke of twenty percent opacity.

The regulations stipulate that dark smoke emission from any chimney or relevant plant must not exceed: -

- i) 8 minutes in any period of four hours; or
- ii) 3 minutes continuously at any one time.

Part VIII:- Guideline on sources of fugitive emission air pollutants

The following are the sources of fugitive emissions:

- (a) construction activities;
- (b) storage and handling, including loading and unloading, of materials such as bauxite, alumina, gypsum, or Portland cement or the raw materials therefore;
- (c) mining and quarrying activities;
- (d) haul roads;
- (e) haul trucks;
- (f) tailings piles and ponds;
- (g) demolition activities;
- (h) blasting activities; and
- (i) Sandblasting operations.
- (n) wind breaks; and
- (o) the paving of roads.
- (p) conveyor belts

Part IX:- Occupational Air Quality Guidelines

The owner or operator shall control the exposure to employees by: -

- 1) limiting the amount of harmful substances used which may pollute the indoor environment;
 - 2) limiting the number of employees who will be exposed or may be exposed;
 - 3) limiting the period during which an employee will be exposed or may be exposed;
 - 4) introducing engineering control measures for the control of exposure, which may include the following:
 - a. Process separation, automation or enclosure;
 - b. Installation of local extraction ventilation systems to process and equipment;
 - c. tools for the control of emission of an air borne hazardous substances;
 - d. Use of wet methods; and
 - e. Substituting hazardous substances with less hazardous ones
 - 5) Providing suitable respiratory protective breathing equipment.
- 6) Where respiratory protective equipment is provided, the employer shall ensure-
- a) that the relevant equipment is capable of controlling the exposure to below the Occupational Exposure Level for the relevant harmful substance;
 - b) that the relevant equipment is correctly selected and properly used;

- 1) C)that information, instructions, training and supervision which is necessary with regard to the use of the equipment is known to the employees; and
- 2) d)that the equipment is kept in good condition and efficient working order.

Part X:-Guideline on NOxs

- a) Existing fuel burning equipment shall be presumed to meet the definition of Best Available Technology if the owner or operator proves to the satisfaction of the Authority that the emission levels in the Third Schedule can be met.
- b) If the owner or operator does not prove as described in paragraph (a) of this section, Best Available Technology shall be installed by the owner with the goal of achieving the presumptive emission limits as set forth in the Third **Schedule**.
- c) If actual achievable emission levels following installation of such combustion modification technology are greater than the presumptive emission limits in the Third **Schedule** these actual emission levels will become Best Available Technology for those sources.
- d) If the owner or operator does not comply with paragraphs a or b of this section, alternative NO control technology and emission X limitation proposals shall be required and approved by the Authority.
- e) Compliance with the emission levels as determined above is based upon twenty-four hour rolling averaging period, Continuous Emission Monitoring Systems approved by the Authority will be used.

Part XI:- Guideline on contents of a compliance plan

A compliance plan shall include: –

- (a) a description of the current compliance status of the facility with respect to all applicable requirements, including all sources that exceed emission standards or targets or are predicted to exceed ambient air quality monitoring locations at which ambient air quality standards or guideline concentrations are exceeded, and any other administrative or other requirements that have not been satisfied;
- (b) a statement of the methods used to determine the facility's compliance status, including a description of all monitoring, record keeping, reporting and test methods, and any other information necessary to verify compliance with or to enforce applicable requirements;
- (c) a statement that the facility will continue to comply with each applicable requirement in respect of which compliance is currently achieved at the facility; and
- (d) in respect of each applicable requirement for which compliance is not currently achieved at the facility –
- (i) a detailed statement of how the facility will achieve compliance;
 - (ii) a proposed compliance schedule setting forth the remedial measures to be taken, including a sequence of actions with milestones leading to compliance;
 - (iii) if the facility is subject to a control order, the proposed schedule of remedial measures shall incorporate the order and shall be at least as stringent as the order;
 - (iv) a schedule for submission of progress reports to the Authority at least once in every six months or more frequently if so required by the licence; and

(v) a schedule for the submission of compliance reports to the Authority, at least once in every six months or more frequently if so required by the licence, indicating what, if any, progress has been made in relation to the schedule and the milestones.

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Part XII:- Guideline for Assessment of Air Quality

(1) Such assessments, firstly, shall establish actual levels of the given pollutants based on representative measurements, surveys or assessments.

(2) For areas where actual levels of a given pollutant are above the standard values stipulated for that pollutant, the preliminary assessment shall include the following:

- a) establish source contributions to ambient air concentrations of the pollutant of concern;
- b) characterize future trends in ambient air concentrations of the pollutant of concern given a “business as usual” scenario;
- c) identify emission reduction measures suited to reduce contributions from major sources and associated time frames for implementation;
- d) assess the environmental benefit of measures to reduce and maintain air quality within limit values;
- e) determine the technical feasibility of measures to reduce and maintain air quality within limit values;
- f) evaluate the economic viability of measures to reduce and maintain air quality within limit values;
- g) assess the social acceptability and policy applicability measures to reduce and maintain air quality within standard values;
- h) prioritize emission reduction measures on the basis of their environmental benefits, technical feasibility, economic viability, and social acceptability;
- i) determine the time required to reduce air pollutant concentrations to fall within the standard values taking into account the implementation of prioritized emission reduction measures.

Part XIII:- Guideline on Results of Emissions Sampling and Analysis

Results of emissions sampling and analysis shall be as follows:-

(1) Results of emissions sampling and analysis shall be expressed in metric units consistent with the emission standards or targets set out in these Regulations or in the conditions, if any, imposed in the relevant licence.

(2) Measurements of emissions into the atmosphere from stacks, vents or other air pollutant sources, which are reported to the Authority whether voluntarily or as a requirement of these Regulations or of any condition of a licence, shall be reported to the Authority in the form of a test report that includes the following information –

- (a) the testing methods and results, certified as being true, accurate, and in compliance with these Regulations by the person responsible for conducting the emissions test;

- (b) the name and location of the facility, the name and location of the source tested, the purpose of the tests, the test Participants and their titles, and the date of the performance test;
- (c) a summary of the results, setting out emission rates for each pollutant and a comparison with applicable emission standards or targets and with any emission limits in the licence;
- (d) a description of the facility tested and the type of process and control equipment utilised;
- (e) a description of the process sampled and associated emission control devices referenced to process, and locations at which sampling took place consistent with information provided in the relevant licence application or licence, as the case may be;
- (f) a schematic of each location sampled including duct diameter, direction of flow, dimensions to nearest upstream and downstream disturbances , including the number of duct diameters, location and configuration of the sampling ports, nipple length and port diameters, and the number and configuration of traverse points;
- (g) confirmation that sampling locations meet the criteria in the test methods set out in the Fifth Schedule, or the reasons why those locations do not meet such criteria and a discussion of the effect on results;
- (h) a discussion of special traversing or measurement schemes (if any);
- (i) a process flow diagram, maximum design capacities, a fuel analysis and heat value for heat input rate determinations, process and control equipment operating conditions, stack height, exit diameter, volumetric flow rate, exit temperature, exit velocity and a discussion of variations from normal plant operations;
- (j) a description of the sampling methods used;
- (k) a brief discussion of the analytical procedures, with justifications for any variance from prescribed method procedures;
- (l) the number of sampling points, time per point and the total sampling time per run;
- (m) a cross-sectional diagram showing sampling points and a diagram of the sampling train;
- (n) a diagram showing stack dimensions, sampling location and the distance from the nearest flow disturbance upstream and downstream, respectively, of the sampling points;
- (o) results and calculations in units consistent with the applicable emission limits with one complete calculation using actual data for each type of test performed;
- (p) the tabulated data and results of the process weight rate or heat input rate in metric units, the referenced or derived conversion factors, the stack gas flow rate, the measured emissions given in units consistent with the applicable emission limits, the visible emissions observations or six consecutive minute average continuous opacity monitor readings, and the average value of emissions from any continuous gaseous emissions monitoring system in units consistent with applicable emission limits;

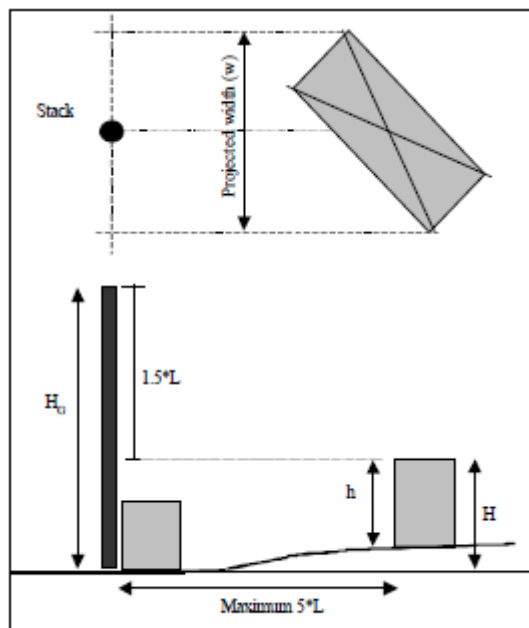
(q) quality assurance procedures;

(r) appendices with raw data and details of calculations, including –

- (i) raw production data signed by the source official;
- (ii) photocopies of all raw data;
- (iii) a chain of custody report; and
- (iv) copies of all calibration data;

(s) for Particulate matter tests, copies of visible emissions evaluations or opacity monitor readings, and, for gaseous pollutant tests, copies of any continuous gaseous emissions monitoring system readings during the tests.

Part XIV: Guideline on Minimum Stack Height



$H_g = H + 1.5L$: where

H_g = Good Engineering Practice stack height measured from the ground level elevation at the base of the stack

H = Height of nearby structure(s) above the base of the stack

L = Lesser dimension, height(h) or width(w), of nearby structures

'Nearby Structures' = Structures within/touching a radius of $5L$ but less than 800m

SIXTH SCHEDULE

LIST OF CONTROLLED AREAS

- a) Residential areas, Hospitals,
- b) National Parks,
- c) Reserves and Sanctuaries,
- d) conservation areas,
- e) Central Business Districts
- f) Any other area declared by the Authority from time to time

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SEVENTH SCHEDULE

ACCEPTABLE EMISSION CONTROL TECHNOLOGIES

List of Acceptable Emission Control Technologies

	Air Pollutants	Emission Control technologies	Remarks
1.	Particulate Matter	Mechanical collectors (dust cyclones, multicyclones)	
		Electrostatic precipitators	
		Fabric filters (baghouses)	
		Particulate scrubbers	
2.	Nitrogen Oxides (Nox) *	Low NOx burners	
		Selective catalytic reduction (SCR)	
		Selective non-catalytic reduction (SNCR)	
		NOx scrubbers	
		Exhaust gas recirculation	
		Catalytic converter	
3.	Volatile Organic Compounds (VOC), hydrocarbons	Adsorption systems, such as activated carbon	
		Flares	
		Thermal oxidizers	
		Catalytic oxidizers	
		Biofilters	
		Absorption (scrubbing)	
		Cryogenic condensers	
4.	Sulphur Oxides (SOx)	Wet scrubbers	
		Dry scrubbers	
		Flue gas desulphurization	
5.	Carbon Oxides	Thermal oxidizers	
6.	Hydrogen Sulphides	Absorption (scrubbing)	
7.	Hydrogen Chloride	Dry Scrubbers,	
		Adsorption systems, such as activated carbon	
8.	Dioxins & Furans	Cyclone	
		Electrostatic precipitator	
		Bag filter	
		Wet scrubber	

	Air Pollutants	Emission Control technologies	Remarks
		Quenching & subsequent wet scrubber	
		Catalytic oxidation (selective catalytic reaction)	
		Catalytic bag filter	
		Dry absorption in resins (carbon Particles dispersed in a polymer matrix)	
		Entrained flow reactor with added activated carbon or coke/lime or limestone solutions and subsequent fabric filter	
		Fixed bed or circulating fluidized bed reactor, adsorption with activated carbon or open hearth coke	
9.	Metals (Hg, Pb,)	Sorbent Injection Technology	
		Electro-Catalytic Oxidation (ECO)	
		K-Fuel	
10.	Any other technology approved by the Authority from time to time		

*** Notes**

Best Available Technology (BAT) for this category of equipment will consist of combustion modification technology including either:

- (a) low NO burner technology with low excess air
- (b) Air if technically feasible; or
- (c) flue gas re-circulation with low excess air.

EIGHTH SCHEDULE

EMISSION MONITORING REPORT

- 1. Name of Industry.....
- 2. Name of contact person.....
- 3. Position of contact person.....
- 4. Business registration No.
- 5. Address
- Telephone No. Fax.....
- Email:.....

6. Source of pollutants

.....
.....
.....
.....

7. Emission concentrations and Quantities (mg/l, kg/day)

.....
.....
.....
.....

8. Emission Control Technology

.....
.....
.....
.....

9. Status of Compliance to Emission Limits

.....
.....
.....

Signaturedatedday of.....20.....
Position

10. Official use only

Recommendations

.....
.....
.....

Dated this.....day of 20.....

Signature.....

(Seal)

NINTH SCHEDULE

EMISSION LICENCES

Form I:

Application Form for Provisional Emission Licence

1. Name of Company

2. Address

Fax..... E-mail.....

Name of Contact Person

3. Location

LR No..... Street..... Area..... .Division.....

Town.....District..... Province

4. Activity

5. Duration:

From.....day/...../month...../year

7. *Maximum allowable pollutant concentrations*

(a) *Normal operational conditions*

(i)

(ii)

(iii)

(iv)

(b) *Start-up, maintenance and shut-down conditions*

(i)

(ii)

(iii)

(iv)

8. Other relevant information on non-point sources or fugitive emissions any other operating requirements relating to atmospheric discharges

9. Ambient air quality reporting

(i) on-site point source emission measurement

10. Anticipated Date of complianceday.....month.....year.

11. Road map to compliance with standards under Seventh Schedule

(i)

(ii)

(iii)

(iv)

Signature of ApplicantDate

Position

13. Review Period (To be filled out by the Authority)

From.....day/...../month...../year

Upto.....day/...../month...../year

From.....day/...../month...../year

Upto.....day/...../month...../year

Approved/Not approved.....

Dated this.....day.....of 20.....

Signature.....

(Seal)

Form II:

Reporting on Emission Limit Exceedence

1. Name of Company

2. Address

P.O.Box.....
Tel.....Fax..... E-mail.....
Name of Contact Person

3. Location

LR No..... Street..... Area..... .Division.....
Town.....District..... Province.....

4. Source(s) that Caused the Excess Emissions.

- a)
- b)
- c)

5. First observation of the excess emissions.

a) The time..... date..... ofYear

6. The cause and expected duration of the excess emissions.

- (a) Cause.....
- (b) Expected Duration of Exeedence (No.).....hours (No.).....days
(No.).....months

7. Estimated rate of emissions for sources subject to numerical emission limitations
.....(mg/m³) (expressed in the units of the applicable emission limitation) and the
operating data and calculations used in determining the magnitude of the excess emissions

8. The proposed corrective actions and schedule to correct the conditions causing the excess
emissions.

- a)
- b)

9. The test methods listed under the Fifth Schedule or any other approved by the Authority shall be
used. The results of the tests shall be submitted to the Authority within 45 days after completing the
test.

Signature of ApplicantDate.....
Position

Form III:

Provisional Emission Licence

THE ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT
PROVISIONAL EMISSION LICENCE

Application Reference No.

Licence No.

FOR OFFICIAL USE

This is to certify that the application for emission into the atmosphere received from (name of applicant) of (address) to the National Environment Management Authority in accordance with Air Quality Regulations for (facility) located at (locality, district and province) has been evaluated and a licence is hereby issued for emission, subject to the attached conditions.

Dated this day of..... 20.....

Signature:

(Official Stamp)

Director General
The National Environment Management Authority

Conditions of Licence

1. This Licence is valid for a period of from the date hereof.
2. Frequency of Monitoring (Daily/Weekly/Monthly/Quarterly)
3.
4.

Form IV:

Application for Initial Emission Licence

- 1. Name of Company
- 2. Address
 - P.O. Box.....
 - Tel.....Fax..... E-mail.....
 - Name of Contact Person
- 3. Location
 - LR No..... Street..... Area..... Division.....
 - Town.....District..... Province.....
- 4. Type of Industry.....
- 5. Name(s) of emitting Equipment.....
.....
.....
.....
.....
- 6. Site Plan Layout, (attach sketch)
 - (a) Distance of the equipment to the nearest building.....
 - (b) Height of the above referred building.....
 - (c) Nearest sensitive area or facility.....
 - (d) Immission (fall-out) point.....
- 7. Operating Emission levels
 - (i)
 - (ii)
 - (iii)
 - (iv)
- 8. Proposed Emission Control Mitigation Measures
 - (v)
 - (vi)
 - (vii)
 - (viii)
- 9. Additional information required
- 10. Start-up, and shut-down of the equipment

- a) Methods.....
- b) Expected Frequency of Occurrence
- c) Duration of occurrence.....
- d) Projected emitted Pollutants
 - (i)
 - (ii)
 - (iii)
 - (iv)

11. (a).Nature of emissions (gaseous, Particulates)

- (i)
- (ii)
- (iii)
- (iv)

(b) Concentration of the emissions

- (i)
- (ii)
- (iii)

Signature of ApplicantDate.....
 Position

FOR OFFICIAL USE

Approved/Not approved.....
 Dated this.....day.....of 20.....

Signature.....
 (Seal)

Form V:

Initial/Renewal Emission Licence

THE ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT

EMISSION LICENCE

Application Reference No.

Licence No.

FOR OFFICIAL USE

This is to certify that the application for emission into the atmosphere received from (name of applicant) of (address) to the National Environment Management Authority in accordance with Air Quality Regulations for (facility) located at (locality, district and province) has been evaluated and a licence is hereby issued for emission, subject to the attached conditions.

Dated this day of 20.....

Signature:

(Official Stamp)

**Director General
The National Environment Management Authority**

Conditions of Licence

1. This Licence is valid for a period of from the date hereof.
2. Frequency of Monitoring (Daily/Weekly/Monthly/Quarterly)
3.
4.
5.

Form VI:

Application for Renewal of Emission Licence

1. Name of industry

2. Name of contact person.....

3. Position of contact person

4. Business registration No.

5. Previous Licence No.....

6. Address

 Telephone No. Fax.....

 Email:.....

6. Emission source(s).

.....
.....
.....
.....

7. Emission control measures (Environmental Management Plan)

Signature of ApplicantDate.....

Position

Official use

Approved/Not approved.....

Dated this.....day.....of 20.....

Signature.....

(Seal)

FORM VII:

Notification of Transfer of Emission Licence

1.0. Details of Current Licence

Name of current emission licence holder.....
PIN No.
Address
Telephone No. Fax.....
Email:.....
Application No. of current emission licence.....
Date of issue of the current emission licence.....

2. Details of the Transferee

2.1. Name of facility.....
2.2. PIN No.
2.5. Address
2.6. Telephone No. Fax.....
2.7. Email:.....
2.8. Name of contact person.....

3.0. Capacity of transferee to operate the facility (financial, technological, manpower) (Conditions)

.....
.....

4.0. Reasons for transfer of licence

.....
.....

5.0. Declaration by transferor and transferee

It is hereby notified thatofon this day of
.....transferred emission licence No.to
.....ofwho will assume his responsibility for all liability
under this project.

Transferor	Transferee
Name	Name
Address.....	Address.....
Signed.....	Signed.....
Date.....	Date.....

6.0. For Official Use

Approved/Not Approved.....

.....
Comments.....
.....
Officer.....Signature.....Date.....

FORM VIII:

Certificate of Transfer of Emission Licence

This is to certify that the Emission Licence No.issued on(date) to(name of previous holder) of(address) regarding(type of facility) whose activities include.....located at.....(town, district) has been transferred to(name of new holder).....
.....
...(nature of variation) with effect from(date of transfer) in accordance with the provisions of the Act.

Dated this.....day of 20.....

Signature.....
(Seal)

FORM IX:

Application of Variation of Emission Licence

1. Previous Applications

(If any).....
.....
.....

2. Details of Applicant

- 2.1. Name of Industry
- 2.2. Name of contact person.....
- 2.3. Position of contact person
- 2.4. Business registration No.
- 2.5. Address
- 2.6. Telephone No. Fax.....
- 2.7. Email:.....

3. Details of Current Emission Licence

- 3.1. Name of current holder.....
- 3.2.No. of current emission licence.....
- 3.3. Date of issue of the current emission licence.....

4.0. Proposed Variations

- 4.1. Current emission limits.....
.....
.....
- 4.2. Proposed variations.....
- 4.3. Reasons for variations.....
- 4.4. Describe the atmospheric effects.....
- 4.5. Describe the effects on ambient air quality.....
- 4.6. Describe the effects on the performance of the equipment.....
- 4.7. Describe the measures proposed to reduce emission impacts.....

5.0. Declaration by Applicant

I hereby certify that the Particulars given above are correct and true to the best of my knowledge and belief. I understand the emission licence may be suspended, varied or cancelled if any information given above is false, misleading, wrong or incomplete.

Name..... position..... signature.....
On behalf of(company name and seal).....date.....

Official use

Approved/Not approved.....
Dated this.....day.....of 20.....
Signature.....
(Seal)

FORM X:

Certificate of Variation of Emission Licence

This is to certify that the emission Licence No.issued on(date) to
.....(name of firm) of(address) regarding
.....(type of facility) whose activities
include.....located at.....(town, district) has
been varied to
.....
.....
.....(nature of variation) with effect from(date of
variation) in accordance with the provisions of the Act.

Dated this.....dayof 20.....

Signature.....
(Seal)

**Form XI:
Register of Emission Licence**

Type of Industry	Name of proponent	Location of facility	Emission licence No.	Date of Issue	Conditions attached to Licence	Licence Serial No. if	Status of Licence	Name of filing officer	Date and Signature of filing officer	Remarks

TENTH SCHEDULE

RECORD OF POLLUTION EXPOSURE RESULTS

Form I: Record of Pollution Exposure Results.

Record of Pollution Exposure Assessment				
1.	Name of facility.....			
2.	Contact Address.....			
	Contact person.....			
3.	Location			
4.	Date.....			
5.	Time of the assessment.....			
6.	Type of Work Place.....			
7.	Measuring methods (i)..... (ii)..... (iii)..... (iv).....			
8.	Type of measurements (e.g. gases, dust, fumes....) (i)..... (ii)..... (iii).....			
9.	Tabulated results of the measurements and compliance limits			
	Pollutant	Measured result	Exposure limit	Remarks
	(i)			
	(ii)			
	(iii)			
	(iv)			
9.	Number of persons exposed.....			
10.	Recommended remedial measures (i)..... (ii)..... (iii).....			
11.	Name of the assessor.....			
	Signature of the Assessor.....			
	Organization/Company/Firm.....			

ELEVENTH SCHEDULE**METHODS OF TEST AND MEASUREMENT OF AIR POLLUTANTS****List of methods of test and measurement of air pollutants**

	Standard
1	KS ISO 10155 Stationary source emissions -- Automated monitoring of mass concentrations of Particles -- Performance characteristics, test methods and specifications
2	KS ISO 10397 Stationary source emissions -- Determination of asbestos plant emissions -- Method by fibre count measurement
3	KS ISO 10780 : Stationary source emissions -- Measurement of velocity and volume flow rate of gas streams in ducts
4	KS ISO 10849 : Stationary source emissions -- Determination of the mass concentration of nitrogen oxides -- Performance characteristics of automated measuring systems
5	KS ISO 11338-1 : Stationary source emissions -- Determination of gas and Particle-phase polycyclic aromatic hydrocarbons -- Part 1: Sampling
6	KS ISO 11338-2 : Stationary source emissions -- Determination of gas and Particle-phase polycyclic aromatic hydrocarbons -- Part 2: Sample preparation, clean-up and determination
7	KS ISO 11564 : Stationary source emissions -- Determination of the mass concentration of nitrogen oxides -- Naphthylethylenediamine photometric method
8	KS ISO 11632 : Stationary source emissions -- Determination of mass concentration of sulfur dioxide -- Ion chromatography method
9	KS ISO 12039 : Stationary source emissions -- Determination of carbon monoxide, carbon dioxide and oxygen -- Performance characteristics and calibration of automated measuring systems
10	KS ISO 12141 : Stationary source emissions -- Determination of mass concentration of Particulate matter (dust) at low concentrations -- Manual gravimetric method
11	KS ISO 14164 : Stationary source emissions -- Determination of the volume flow rate of gas streams in ducts -- Automated method
12	KS ISO 15713 : Stationary source emissions -- Sampling and determination of gaseous fluoride content
13	KS ISO 7708 : Air quality -- Particle size fraction definitions for health-related sampling
14	KS ISO 11041 : Workplace air -- Determination of Particulate arsenic and arsenic compounds and arsenic trioxide vapour -- Method by hydride generation and atomic absorption spectrometry
15	KS ISO 11174 : Workplace air -- Determination of Particulate cadmium and cadmium compounds -- Flame and electrothermal atomic absorption spectrometric method
16	KS ISO 15202-1 : Workplace air -- Determination of metals and metalloids in airborne Particulate matter by inductively coupled plasma atomic emission spectrometry -- Part 1: Sampling
17	KS ISO 15202-2 : Workplace air -- Determination of metals and metalloids in airborne Particulate matter by inductively coupled plasma atomic emission spectrometry -- Part 2: Sample preparation
18	KS ISO 15202-3 : Workplace air -- Determination of metals and metalloids in airborne

	Standard
	Particulate matter by inductively coupled plasma atomic emission spectrometry -- Part 3: Analysis
19	KS ISO 15767 : Workplace atmospheres -- Controlling and characterizing errors in weighing collected aerosols
20	KS ISO 16107 : Workplace atmospheres -- Protocol for evaluating the performance of diffusive samplers
21	KS ISO 16200-1 : Workplace air quality -- Sampling and analysis of volatile organic compounds by solvent desorption/gas chromatography -- Part 1: Pumped sampling method
22	KS ISO 16200-2 : Workplace air quality -- Sampling and analysis of volatile organic compounds by solvent desorption/gas chromatography -- Part 2: Diffusive sampling method
23	KS ISO 16702 : Workplace air quality -- Determination of total isocyanate groups in air using 2-(1-methoxyphenyl) piperazine and liquid chromatography
24	KS ISO 16740 : Workplace air -- Determination of hexavalent chromium in airborne Particulate matter -- Method by ion chromatography and spectrophotometric measurement using diphenyl carbazide
25	KS ISO 17733 : Workplace air -- Determination of mercury and inorganic mercury compounds -- Method by cold-vapour atomic absorption spectrometry or atomic fluorescence spectrometry
26	KS ISO 17734-1 : Determination of organonitrogen compounds in air using liquid chromatography and mass spectrometry -- Part 1: Isocyanates using dibutylamine derivatives
27	KS ISO 17734-2 : Determination of organonitrogen compounds in air using liquid chromatography and mass spectrometry -- Part 2: Amines and aminoisocyanates using dibutylamine and ethyl chloroformate derivatives
28	KS ISO 20552 : Workplace air -- Determination of mercury vapour -- Method using gold-amalgam collection and analysis by atomic absorption spectrometry or atomic fluorescence spectrometry
29	KS ISO 4224 : Ambient air -- Determination of carbon monoxide -- Non-dispersive infrared spectrometric method
30	KS ISO 6767 : Ambient air -- Determination of the mass concentration of sulfur dioxide -- Tetrachloromercurate (TCM)/pararosaniline method
31	KS ISO 7996 : Ambient air -- Determination of the mass concentration of nitrogen oxides -- Chemiluminescence method
32	KS ISO 8186 : Ambient air -- Determination of the mass concentration of carbon monoxide -- Gas chromatographic method
33	KS ISO 10312 : Ambient air -- Determination of asbestos fibres -- Direct transfer transmission electron microscopy method
34	KS ISO 10313 : Ambient air -- Determination of the mass concentration of ozone -- Chemiluminescence method
35	KS ISO 10473 : Ambient air -- Measurement of the mass of Particulate matter on a filter medium -- Beta-ray absorption method
36	KS ISO 10498 : Ambient air -- Determination of sulfur dioxide -- Ultraviolet fluorescence method
37	KS ISO 12884 : Ambient air -- Determination of total (gas and Particle-phase) polycyclic aromatic hydrocarbons -- Collection on sorbent-backed filters with gas chromatographic/mass spectrometric analyses
38	KS ISO 13794 : Ambient air -- Determination of asbestos fibres -- Indirect-transfer transmission electron microscopy method

	Standard
39	KS ISO 13964 : Air quality -- Determination of ozone in ambient air -- Ultraviolet photometric method.
40	KS ISO 14965 : Air quality -- Determination of total non-methane organic compounds -- Cryogenic pre-concentration and direct flame ionization detection method
41	KS ISO 14966 : Ambient air -- Determination of numerical concentration of inorganic fibrous Particles -- Scanning electron microscopy method
42	KS ISO 16362 : Ambient air -- Determination of Particle-phase polycyclic aromatic hydrocarbons by high performance liquid chromatography
43	KS ISO 7168-1 : Air quality -- Exchange of data -- Part 1: General data format
44	KS ISO 7168-2 : Air quality -- Exchange of data -- Part 2: Condensed data format
45	KS ISO 9169 : Air quality -- Definition and determination of performance characteristics of an automatic measuring system
46	KS ISO 11222 : Air quality -- Determination of the uncertainty of the time average of air quality measurements
47	KS ISO 13752 : Air quality -- Assessment of uncertainty of a measurement method under field conditions using a second method as reference
48	KS ISO 14956 : Air quality -- Evaluation of the suitability of a measurement procedure by comparison with a required measurement uncertainty
49	KS ISO 20988 : Air quality -- Guidelines for estimating measurement uncertainty
50	KS ISO 16622 : Meteorology -- Sonic anemometers/thermometers -- Acceptance test methods for mean wind measurements
51	KS ISO 17713-1 : Meteorology -- Wind measurements -- Part 1: Wind tunnel test methods for rotating anemometer performance
52	KS ISO 17714 : Meteorology -- Air temperature measurements -- Test methods for comparing the performance of thermometer shields/screens and defining important characteristics
53	KS ISO 16000-1 : Indoor air -- Part 1: General aspects of sampling strategy
54	KS ISO 16000-2 : Indoor air -- Part 2: Sampling strategy for formaldehyde
55	KS ISO 16000-3 : Indoor air -- Part 3: Determination of formaldehyde and other carbonyl compounds -- Active sampling method
56	KS ISO 16000-4 : Indoor air -- Part 4: Determination of formaldehyde -- Diffusive sampling method
57	KS ISO 16000-5 : Indoor air -- Part 5: Sampling strategy for volatile organic compounds (VOCs)
58	KS ISO 16000-6 : Indoor air -- Part 6: Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA sorbent, thermal desorption and gas chromatography using MS/FID
59	KS ISO 16000-8 : Indoor air -- Part 8: Determination of local mean ages of air in buildings for characterizing ventilation conditions
60	KS ISO 16000-9 : Indoor air -- Part 9: Determination of the emission of volatile organic compounds from building products and furnishing -- Emission test chamber method
61	KS ISO 16000-10 : Indoor air -- Part 10: Determination of the emission of volatile organic compounds from building products and furnishing -- Emission test cell method
62	KS ISO 16000-11 : Indoor air -- Part 11: Determination of the emission of volatile organic compounds from building products and furnishing -- Sampling, storage of samples and preparation of test specimens
63	KS ISO 16017-1 : Indoor, ambient and workplace air -- Sampling and analysis of volatile

	Standard
	organic compounds by sorbent tube/thermal desorption/capillary gas chromatography -- Part 1: Pumped sampling
64	KS ISO 16017-2: Indoor, ambient and workplace air -- Sampling and analysis of volatile organic compounds by sorbent tube/thermal desorption/capillary gas chromatography -- Part 2: Diffusive sampling
65	KS ISO 4219: Air quality - Determination of gaseous sulphur compounds in ambient air - Sampling equipment
66	KS ISO 4220: Ambient air - Determination of a gaseous acid air pollution index - Titrimetric method with indicator or potentiometric end-point detection.
67	KS ISO 4221: Air quality - Determination of a mass concentration of sulphur dioxide in ambient air - Thorin spectrophotometric method
68	KS ISO 4225: Air quality - General aspects - Vocabulary
69	KS ISO 4226: Air quality - General aspects - Units of measurement
70	KS ISO 6768: Ambient air - Determination of the mass concentration of nitrogen dioxide - modified Griess - Saltzman method
71	KS ISO 7934: Stationary source emissions - Determination of the mass concentration of sulphur dioxide - Hydrogen peroxide / barium perchlorate – Thorin method
72	KS ISO 8518: Workplace air - Determination of Particulate lead and lead compounds - Flame or electrothermal atomic absorption spectrometric method
73	KS ISO 8672: Air quality - Determination of the number concentration of airborne inorganic fibres by phase contrast optical microscopy - Membrane filter method
74	KS ISO 8756: Air quality - Handling of temperature, pressure and humidity data
75	KS ISO 8760: Workplace air - Determination of mass concentration of carbon monoxide - Method using detector tubes for short -term sampling with direct indication
76	KS ISO 8761: Workplace air - Determination of mass concentration of nitrogen dioxide - Method using detector tubes for short -term sampling with direct indication
77	KS ISO 8762: Workplace air - Determination of vinyl chloride - Charcoal tube / gas chromatographic method
78	KS ISO 9096: Stationary source emissions - Determination of the concentration and mass flow rate of particulate material in gas-carrying ducts – Manual gravimetric method
79	KS ISO 9359: Air quality - Stratified sampling method for assessment of ambient air quality
80	KS ISO 9486: Workplace air - Determination of vaporous chlorinated hydrocarbons - Charcoal tube / solvent desorption / gas chromatographic method
81	KS ISO 9487: Workplace air - Determination of vaporous aromatic hydrocarbons -Charcoal tube / solvent desorption / gas chromatographic method
82	KS ISO 9835: Ambient air - Determination of a black smoke index
83	KS ISO 9855: Ambient air - Determination of the particulate lead content of aerosols collected on filters - Atomic absorption spectrometric method
84	KS ISO 10396: Stationary source emissions - Sampling for the automated determination of gas concentrations
85	KS 2060: Motor gasolines - Specification
86	KS 1515: Code of practice for inspection of road vehicles
87	KS 03-1289: Specification for illuminating kerosene
88	KS 1309-1: Specification for diesel fuels - Part 1: Automotive gas oil.
89	KS 03-1309-2: Specification for diesel fuels - Part 2: Industrial diesel oil (IDO).
90	KS 03-1310: Specification for fuel oils

	Standard
91	KS 03-91: Specification for liquefied petroleum gases (LPG).
92	KS 13301:2002:Sensory analysis -- Methodology -- General guidance for measuring odour, flavour and taste detection thresholds by a three-alternative forced-choice (3-AFC) procedure

TWELFTH SCHEDULE
ACCEPTABLE MOBILE EMISSION CONTROL TECHNOLOGIES

Mobile Sources

The aim of these guidelines is without sacrificing performance, improve engine performance through understanding pollutant formation mechanism, ensure precise control of engine parameters, such as air/fuel ratio, spark timing, airflow, optimize on exhaust gas treatment.

List of mobile emission control technologies.

	Pollutant	Control measures
	NO _x Exhaust	Exhaust Gas Recirculation (EGR) Valves
	HC, CO Exhaust	Three Way Catalyst (TWC), 2 nd Air Pumps
	Evaporative Emissions	Canisters
	Crankcase e/m s	Positive Crankcase Valve PCV valves
	On Board Display (Obd-2)	Precise a/f control
		Dual Oxygen Sensors
		Individual cylinder a/f control
		Adaptive fuel control
		Electronic throttle control
		Improved induction
		Heat optimized exhaust system
		Leak-free exhaust system
	Particulate matter	Diesel Oxidation Catalyst (DOC)
		Diesel Particulate filter (DPF)
		Flow Through Filter (FTF)
		Retrofit, Repower, or Replace

And any other technology that may be approved by the Authority from time to time

List of evaporative emission control technologies

	Cause	Measure
1	Diffusion	Precise purge control and optimization of canister structure
2	Leakage	Modification of designs for locking Parts and fuel filler cap
3	Permeation	Material changes for hoses in fuel line
4	Evaporation while fueling	Improve sealing by putting elastic cap around the nozzle of fueling gun
		Create negative pressure while fuelling by using the

		venturi effect
5	Fuel Temperature	Reduce the fuel amount returning to fuel tank Limit the fuel tank temperature

THIRTEENTH SCHEDULE**FEEES**

The fees chargeable under these Regulations shall be as specified hereafter.

- (a) Application for:
 - (i) Emission Licence for listed emitting facility :- *KShs.5,000/=*
 - (ii) Emission Licence for other emitting facility than (i) above:- *KShs.5,000/=*
 - (iii) Variation of emission licence : *KShs.3,000/=*
 - (iv) Transfer of emission licence :- *KShs.3,000/=*

- (b) Annual Licence fee for Emission into the atmosphere
 - (i) Facility listed in 6th schedule under category I :- *KShs.50,000/=*
 - (ii) Facility listed in 6th schedule under category II :- *KShs.30,000/=*
 - (iii) Polluting facility not in 6th Schedule other than (i) and (ii) above :- *KShs.20,000/=*

- (c) Inspection of emission monitoring records/emission licence register :- *KShs.200/=*

- (d) Variation of emission Licence is 10% of the Annual Licence fee

FOURTEENTH SCHEDULE

LIST OF CONTROLLED FACILITIES

Part I

- (a) Fertiliser manufacturing plants
- (b) Lead recycling plants
- (c) Grain millers
- (d) Hot mix asphalt batching plants
- (e) Incinerators
- (f) Iron and steel mills;
- (f) Kraft pulp mills;
- (g) Manufacture of soda ash
- (h) Mineral processing plants;
- (i) Paint manufacturing plants
- (j) Pesticide formulation and manufacturing plants
- (k) Petroleum refineries and depots;
- (l) Pharmaceutical industries
- (m) Phosphate rock processing plants;
- (n) Portland cement plants (clinker plants included);
- (o) Sulphur recovery plants;
- (p) Sulphuric, or nitric acid plants;
- (q) Thermal power plants
- (r) Thermal and Geothermal power plants
- (s) Any other chemical processing industry

Part

- (a) Iron recycling plants;
- (b) Secondary aluminium production plants;
- (c) Plastic recycling plants;

Part III

Any other facility that the Authority may identify

Dated,2014

JUDI WAKHUNGU
CABINET SECRETARY FOR ENVIRONMENT, WATER AND NATURAL
RESOURCES.