

Authorisation Page



		
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مدينة مسبعيد الصناعية
MESAIEED INDUSTRIAL CITY

Environmental Guidelines &
Protection Standards
For
Mesaieed Industrial City
Rev 02 - June 2011

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INTRODUCTION

Environmental impacts are inevitable by-products of human activities. To avert the harmful impact of the human activities on the Environment, all such activities shall be controlled to ensure sustainable development and to maintain harmony with nature. The Management of MIC is responsible for controlling pollution associated with the development and operation of Mesaieed Industrial City. MIC has developed an Environmental guideline for the existing industrial set-up in MIC, new projects and modified facilities based on the Ministry of Environment's Environmental Protection Law and Environmental Standards to control substances emitted, discharged, or deposited, and noise generated within MIC. The environmental regulations, standards and guidelines presented here are specific. These are intended to clearly state the environmental requirements of MIC. All industries need to demonstrate adherence to ensure that each activity is planned, directed, and controlled in line with defined MIC's Environmental Guideline and Protection Criteria to minimize environmental risk.

This document is divided into the following sections:

- Section 1 - General
- Section 2 - Water Environment.
- Section 3 - Waste Management.
- Section 4 - Noise.
- Section 5 - Air Environment
- Section 6 - Hazardous Material
- Section 7 - Reporting & Record Keeping

1.0 GENERAL

Environmental problems associated with industrial zones are the consequence of rapid industrialization. In the absence of mitigation measures, physical deterioration of the surrounding environment takes place. Degradation of natural environment such as soils, water, air and marine dominates the environmental problems associated with industrial zones. Some impacts are significant on areas of high environmental value that may be of global importance. Damage to these natural assets can be irreversible, thus deserves special efforts of prevention or mitigation.

The guideline described herein is designed to enable Qatar Petroleum (MIC) to assess the impact of industries' discharges and emissions in the environment and to ensure that environmental protection criteria for Mesaieed Industrial City are achieved.

- a. This guideline and standard calls for end-user operators/owners/asset holders/developers/tenants and their contractors/sub-contractors/agents (herein referred to as "**Entity**" or "**Entities**") to:
 - i. Submit environmental impact assessments before commencing with a new development, executing a policy or plan or making any major modifications to existing facilities;
 - ii. Perform environmental quality monitoring (for parameters specific to the nature of their operations and/or as agreed with MIC); and
 - iii. Prepare data analyses and report to MIC.
- b. The Environmental Guidelines and Protection Criteria for Mesaieed Industrial City may be periodically updated, upon change in the existing regulations, permits or standards issued by an appropriate regulatory authority such as the Ministry of Environment (MoE).
- c. Listed criteria are minimum values and are provided for guidance only. The absolute limits / criteria values (applied limits) shall be decided / provided after review of an Entity's EIA, and taking into consideration the nature of processes and operations of such Entity.
- d. Criteria values, limits or levels not specifically addressed in this document shall be decided on case by case basis.
- e. Where clarification and/or variance/exemption are required, MIC shall be contacted.
- f. Environmental issues specific to a certain Entity or Entities will be addressed as specific environmental clauses/requirements within their contractual document/s.
- g. Entities shall adopt measures to develop and present their environmental monitoring plan, waste management plan, environmental emergency plan and an environmental

management system; and shall undertake annual/seasonal ecological monitoring in the region of their effluent outfall.

- h. Any violation / exceedance of the standard / criteria are subject to penalty.
- i. The entities shall utilize Best Available Techniques (BAT) for environmental control and Best Environmental Practice (BEP) for environmental performance. The BAT concept shall apply for technology selection giving due consideration to environmental factors / parameters like Air Emission, Wastewater Generation, Waste Generation, Fugitive Emission, Energy Usage etc. The BEP is defined as "the application of the most appropriate combination of environmental control measures and strategies".

1.1 Environmental Impact Assessments (EIA)

At least six months prior to any new development (i.e. award of engineering & construction contract) or two months prior to any major modification, relocation or alteration of existing sites, entities shall carry out an environmental impact assessment (EIA) and modeling studies to identify the impacts of the proposed / modified facility. Prior to preparing the Environmental Impact Assessment Study, an EIA Scoping shall be submitted to MIC for review & approval. The report shall demonstrate that environmental control procedures are applied to ensure the adherence to environmental criteria set forth by MoE and/or in this document. It shall also describe the Environmental Monitoring and Management Plan. For the expansion of an existing installation or facility, an applicant shall include the environmental performance details of the existing facilities as baseline details in the EIA. Entities shall coordinate the scoping, execution, and submittal of the EIA with MIC. Entities are advised to include the processed infrared imagery (for summer & winter seasons) of the coastal areas of Mesaieed Industrial City within the scope of their environmental impact assessment in addition to any other aerial (vector) image of the site. This shall include the following as minimum:

- 1- Image produced on photo stain paper
- 2 - Acetate overlay map sheet of relative sea surface temperature contours (differential 2.5 deg C).
- 3 - Acetate overlay map sheet of relative bathymetric depths (differential 1m).
- 4 - Acetate overlay map sheet of coastal interpretation of coastline, suspended sediment, alongshore drift and coral distribution.

The image maps and overlays may be created using any suitable software with clear enough resolution. The information shall be used to develop a database to show changes over time and allow prediction of impacts from future development in MIC. MIC end-users are allowed to share the use of the database information.

1.2 Environmental Impact Factors and Areas of Consideration

The choice of impacts to be considered in performing an environmental impact analysis generally varies according to the type of project, development, or action under evaluation. However, the effects to be considered should include the following as applicable:

- Air Quality,
- Air Pollution Control,
- Energy Development, Conservation, Generation, and Transmission;
- Hazardous / Toxic Materials Handling, Storage and Transportation,
- Aesthetics;
- Coastal Area;
- Sea Currents;
- Soil and Plant Life;
- Erosion and Hydrologic Conditions;
- Noise Control and Abatement;
- Chemical Contamination of Food Products;
- Radiation and Radiological Health;
- Sanitation and Waste Systems;
- Rodent Control;
- Water Quality and Water Pollution Control;
- Marine Pollution; and
- Wildlife Preservation.

1.3 Top Soil

MIC reserves its right to require any Entity to remove, collect and transport the top soil from its allocated/assigned area/s prior to commencing its earthwork/s to a MIC designated site without any cost to MIC. MIC shall allocate/assign a site for the Entity to remove, collect and transport an equivalent amount of free backfill material (if required). After the completion of their works, the Entity shall return the collection area to its original state, to the satisfaction of MIC. Areas, where the top soil is considered good and recoverable (approximately 15 to 20 cm), are shown on a map (Figure 1). It is the responsibility of Entities to ensure that all good top soil is transferred to an allocated area unless an exemption is granted by MIC.

1.4 Excavated/Dredged Material

Any surplus excavated/dredged material (rock, desert fill etc.) is the property of MIC and the excess material from any contract or activity should not be transferred to any other third party or taken outside the area of MIC. MIC will allocate an area for the material to be deposited by the party responsible for initiating the excavation work or importation of backfill material. All cost related to collection, transportation and dumping for such works is for the account of the Entity.

1.5 Natural Vegetation

Entities are required to exercise all due care to avoid any unnecessary disturbance to natural vegetation that are existing within their right-of-way (ROW). Any plant/bush measuring 50cm or above (height) and/or any plant specifically identified by MIC shall be removed and transplanted to an area allocated by MIC. All costs related to the removal and transplantation shall be on the account of the Entity.

1.6 Natural Resources

Entities shall exercise all due care to avoid damage to environmentally sensitive habitat such as coral reefs, tidal lagoons, mangrove swamps, sea-grass covered areas, turtle nesting, bird feeding/breeding areas that may exist within their right-of-way. Entities causing disturbance (through trenching, dredging etc.) in coastal / marine areas shall be liable to place a minimum of one reef ball for every 100 m or 10m² (in disturbed areas at water depth between 2-15m). MIC shall allocate/identify/approve the site for the placement of reef balls.

1.7 Environmental Association

It is mandatory for Entities to join Mesaieed Industrial City Environmental Association (MIC-EA) when the association is created. An exemption of joining the association will be based on the nature of the industry, the associated environmental impact and the quantity / nature of emission & discharges.

1.8 Landscaping

Entities shall allocate a minimum of 3.5% of the total leased land area for landscaping within the leased areas. The allocated area shall be clearly defined in the planning stage. The vegetation/ plantation shall be preferably of indigenous evergreen species requiring least amount of water and are compatible with the prevailing environmental conditions such as salinity, soil composition, wind speed and temperature. End-user operators / owners / asset holders / developers/ tenants shall be responsible to maintain the plantation through out the period of their lease or ownership of the facility. MIC's prior approval is required on selecting plants for landscaping. MIC's review requires information on the common & scientific name, a brief description of the plant or plants and a photograph of the matured plant species.

1.9 Environmental Data

Entities shall make available to MIC, copies of all data collected prior to, during and after any environmental impact assessment and environmental quality monitoring, in each case as applicable. MIC shall have the right to use such data, for use in MIC sponsored studies, and to provide such information to third parties, provided that if such data includes confidential information belonging to the Entity, that appropriate

undertakings to preserve confidentiality is requested by the provider and is agreed by the recipient.

1.10 Environmental Co-ordination

MIC recommends that all entities in MIC have a competent and qualified employee to address and manage their environmental issues directly with the MoE, MIC and any other government agency. However, copies of all correspondence shall be marked to MIC on environmental issues related to entities within MIC.

1.11 Environmental Incident/Emergency Reporting

The objective of this requirement is to enable MoE and MIC to assess environmental impacts due to accidental excess emissions or releases.

- 1.11.1** An environmental incident shall include but not limited to the following:
 - 1.11.1.1** Any process upsets or breakdowns/emergency conditions which result in abnormal environmental emissions, discharges or exceedance of emission or discharge standards.
 - 1.11.1.2** Oil or Hazardous / non hazardous chemical / waste releases / spillage more than 200 litres or those spills which have the potential to contaminate coastal area, marine environment, soil or groundwater.
 - 1.11.1.3** Smokey flare for more than 5 minutes per hour.
 - 1.11.1.4** Flaring of sour gas for more than 30 minutes per day.
- 1.11.2** An incident notification shall be submitted to MoE and MIC within 24 hours of an incident in the incident report format provided in Appendix-I. If it has caused injuries, harm to human health or harm to the environment, a written detailed report explaining the circumstances of the event shall be provided within 3 working days.
- 1.11.3** Based on the nature and impact of the Environmental Incident, MIC may request the entities to carry out a detailed investigation to establish the basic root cause. An investigation report shall be submitted to MIC within 30 days of the incidents.
- 1.11.4** Cost associated with investigation carried out by MIC shall be borne by the Entities engaged in the incident.
- 1.11.5** An environmental incident report shall include as a minimum the following:
 - 1.11.5.1** Description of the Incident
 - 1.11.5.2** Extent of the impact and possible hazards to human health and the environment.
 - 1.11.5.3** Duration

- 1.11.5.4 Estimated quantity and type of emissions or discharges
- 1.11.5.5 Immediate action taken
- 1.11.5.6 Remedial action taken
- 1.11.5.7 Immediate cause & basic root cause
- 1.11.5.8 Preventive action taken to avoid the reoccurrence
- 1.11.6 All planned start-ups, shutdowns and maintenance activities which may give rise to abnormal environmental emissions, discharges or result in excess of emission or discharges of applicable standards shall be reported to MIC at least 5 working days prior to the planned event.
- 1.11.7 MIC Environmental Compliance Official shall be granted unrestricted access to inspect, sample and/or check the environmental setup of the Entities.
- 1.11.8 MIC may request any information as necessary to initiate and complete special studies on environmental matters. Such information may include, without limitation, nonproprietary process, monitoring, operation, maintenance, or other records that are needed in the calculation of parameters that may effect emissions or environmental impact of any regulated pollutant.

1.12 Environmental Training

Entities shall develop and sustain an environmental conscious work culture amongst all their staff levels. Appropriate training shall be imparted to all staff.

2.0 Water Environment

2.1 General

The water quality criteria have been developed / adopted to protect the long term resources of marine life and water supply in Mesaieed Industrial City. These criteria have been established to minimize the impact of industrial / municipal discharges on ground, Gulf water quality, the Gulf ecosystem and the local fisheries.

General guidelines are as follows:

- 2.1.1 Industrial and municipal wastewater shall be segregated to increase the potential for use of each stream. The Entity shall explore the alternatives for wastewater recycling and reuse.
- 2.1.2 The Entity shall not dilute the wastewater discharge as a substitute for treatment to achieve compliance with MIC/MoE standards. The Entity shall submit a self monitoring report for the raw and treated wastewater to MIC on either quarterly or monthly basis (based on mutual agreement).
- 2.1.2 Treated wastewater meeting the irrigation criteria as defined by MoE and MIC in this document shall be used for landscaping. Efforts shall be made to achieve zero discharge goals.
- 2.1.3 Entities shall have adequate storage capacity (i.e. evaporation pond) to retain industrial wastewater generated in the event of the emergency plant shutdown or treated wastewater which is not meeting the discharge criteria. Wastewater retained in purpose-built ponds shall be regularly treated and discharged so that the ponds are normally remaining empty to provide containment for emergencies and to minimize fugitive emissions. Such ponds shall be impervious.
- 2.1.4 Industrial wastewater stream shall be pre-treated (if it exceeds the relevant discharge criteria) to an acceptable level before discharge/reuse for landscaping. Direct discharge of untreated or partially treated water in any receiving body, exceeding the relevant criteria values, (including polluted ballast and ship wastewater, hazardous materials, and contaminated storm water) is prohibited.

2.2 General Discharge Quality Criteria

The receiving water shall be adequate to maintain marine life, fisheries, human health, benthic flora & fauna and other amenities. All receiving water shall be free from substances attributable to wastewater or other discharges that:

- Settle or form objectionable deposits;
- Floats as debris, scum, oil or other matter to form nuisance;
- Produce objectionable colour, odour or turbidity;

- Result in impact on the adjacent open Gulf waters in violation of Gulf water quality criteria.

2.3 Seawater Cooling Intake

- 2.3.1 To minimize the impact of the withdrawal of sea water for cooling purposes, biological material that is screened and filtered shall not be returned to the sea except for live aquatic organisms.
- 2.3.2 To achieve sustainable use of seawater, the quality of withdrawn water should not be altered. MoE standards should be followed for discharge.

2.4 Storm Water Runoff

The impact of storm water runoff may be significant because the dry period proceeding precipitation is usually long, potentially resulting in accumulation of pollutants in the collection system. The first-flush from this system could have an unacceptable impact on the receiving water body (recommended monitoring parameters are listed in Table 2-F).

General guidelines are as follows:

- 2.4.1 Entities shall provide an impervious storm water management system, to collect the storm water from industrial process areas, hazardous material storage and handling areas. The collected storm water shall be treated appropriately to meet the MoE treated wastewater discharge standard.

2.5 Water Point Source Discharges

- 2.5.1 Waters used as cooling water for once through non-contact cooling or desalinization unit brine may be discharged to cooling water outfall provided that the chemical characteristics of the water are not altered above the background characteristics except for temperature, dissolved solids and residual chlorine. In case of any change in chemical composition of returned cooling water as compared to intake cooling water, returned cooling water shall be treated within plant premises prior to discharge to cooling water outfall channel.
- 2.5.2 The location of the new outfall shall be at least 200 meters away from the existing outfall, otherwise Entities shall demonstrate through the modeling study that cumulative impact on the marine environment is insignificant.
- 2.5.3 Water used for hydro testing of pipelines / tanks shall not be discharged to the environment unless written approval from MIC is obtained.
- 2.5.4 Direct discharge of industrial wastewater to the cooling canal or marine environment is prohibited unless prior written approval from MIC is obtained.

2.6 Groundwater Quality

- 2.6.1 The objectives of groundwater quality monitoring include the determination of background water quality characteristics and determination of potential sources of contamination and contaminants. Entities are obliged to install a one up gradient and three down gradient monitoring wells as a minimum. Entities shall provide MIC the following information as a minimum:
- Location maps, location coordinates, direction of groundwater movement, and background quality of groundwater in aquifer/s;
 - Quarterly groundwater quality monitoring data (recommended parameters are listed in Table 2-D).
 - Water Table level shall be monitored once in a quarter.
 - At least one monitoring parameter shall be specific to the nature of the industry.
- 2.6.2 The operator of any facility handling hazardous materials / products / raw materials / by-products in quantities exceeding 5000 kg at any one time, shall install a minimum of four permanent ground water monitoring wells prior to facility operation as defined in section 2.6.1. These wells shall be located so that representative sample of the groundwater that may be impacted by the proposed facility operation can be obtained. The design and installation of any groundwater monitoring wells shall be subject to review and approval by the MIC.
- 2.6.3 Ground water withdrawn from the MIC area is prohibited without appropriate authorization from MIC.
- 2.6.4 The operator of a facility / Entities shall not discharge any extracted groundwater to the Marine Environment, Cooling Water Canal, Surface Water Drainage channels or on land without prior authorization from the MIC / Competent authority. To obtain approval / authorization, Entities / Facility Operator shall submit an application for dewatering along with a detailed analysis report of the ground water and a method statement including features like storage of extracted water, disposal of extracted water etc to MIC for review, comments and further processing to MoE.
- 2.6.5 In case a groundwater contamination is detected and proven to be imitated as a consequence of an Entities' operation, the entities shall initiate the site remediation and cleanup action under MIC's supervision.

2.7 Landscaping Practices

The intent of these criteria is to establish acceptable levels of constituents of reclaimed water and to prescribe means for assurance reliability in the production and use of reclaimed water. This will ensure that the use of reclaimed water for the specified purpose does not impose undue risks to health. Landscaping practices must ensure that treated

wastewater used for irrigation purposes is not injurious to the public health or vegetation (recommended monitoring parameters for vegetation are listed in Table 2-G).

The following conditions shall be observed:

- 2.7.1 Treatment plant effluent shall conform to the point source discharge criteria (Table 2- C) or as agreed with MIC;
- 2.7.2 Distribution system designed for landscaping shall be well marked;
- 2.7.3 Water utilized for irrigation shall be applied to landscaping only, and shall not be used for food crops, public park / garden or forage production;
- 2.7.4 Application of irrigation water shall not result in the contamination of other water bodies, contamination of soils, groundwater resources etc. (recommended monitoring parameters are given in Tables 2-G and 2-E).

2.8 Marine -Related Discharges

To minimize the impact of the ships coming to the MIC port on the surrounding marine environment, the following guidelines shall be followed:

- 2.8.1 Discharge of hazardous materials, oil, untreated shipboard effluent, wastes and refuse to sea from ships is prohibited. Such materials shall be retained aboard ship and disposed of at appropriate onshore facilities.
- 2.8.2 Ballast water, which does not meet the standards, specified in Table 2B shall not be discharged to sea. Contaminated ballast water shall be pre-treated by either on-board or on-shore treatment facilities to the standards specified in Table 2B before discharge to sea.
- 2.8.3 Used / Waste oils or machinery drippings shall be collected and discharged to appropriate onshore Entities. Catch pans shall be installed at all valve and hose connections.
- 2.8.4 Floating booms and cleanup equipment shall be maintained on board to contain, collect and clean oil spills from the vessels, at all times.
- 2.8.5 Shipboard ballast sludge shall not be discharged to the sea.
- 2.8.6 The Entities undertaking loading or unloading operations with the potential for polluting the marine environment shall take all necessary precautionary measures to prevent any spillage from its operations and is responsible for the containment and clean up of any spills to the marine environment. The Entity shall notify MIC and the relevant agencies of any incident.

In addition to the above guidelines, Regional Organization for the Protection of Marine Environment (ROPME) protocols shall be followed.

2.9 Sanitary Wastewater Discharge

2.9.1 All sanitary wastewater produced within the Industrial City shall be transported to the Sanitary Wastewater Treatment Plant (SWTP) via one of the following methods:

- a) Sewer / Sanitary Wastewater pipe line network
- b) Tanker delivery to SWTP

2.9.2 Installation of a septic disposal system is prohibited within MIC and the closure of an existing septic disposal system requires an approval from MIC.

2.9.3 Direct discharge of untreated or partially treated sanitary wastewater is prohibited.

2.9.4 Installation of a soak pit for the treatment of the sanitary wastewater is prohibited.

2.10 Holding & Storage Tank Sites

2.10.1 Below-ground holding tank storage sites shall be lined to make provision for leak monitoring in order to prevent seepage of holding substance/s into the soil and/or groundwater.

2.10.2 Placement of below ground gasoline and diesel fuel tanks require prior written approval from MIC and are generally discouraged.

2.10.3 Transfer and loading points for all chemical or hydrocarbon tanks shall have appropriate spill containment basins or curbs.

2.10.4 New tanks shall be placed on a concrete pad/slab with walls (block work) and plaster/sealant inside to ensure that any leakage/spillage shall not contaminate the groundwater/soil.

2.10.5 Holding tanks will be emptied on a regular basis. Tanks shall be inspected on a daily basis to avoid overflow or spillages. Entities are required to ensure that all effluent holding and other storage tanks are designed and constructed to comply with these requirements.

2.10.6 Periodic inspection / testing of the holding / storage tank shall be carried out for any leakage.

2.11 Water Injection for Disposal

Discharge of wastewater, process water, cooling water, liquid hazardous / non-hazardous waste or any other form of water / waste into an injection well is prohibited within MIC under any circumstances.

2.12 Water Quality Monitoring and Reporting

This section establishes reporting, testing, monitoring and analysis requirements for sources of water pollution located or proposing to locate at Mesaieed Industrial City. The objective of these requirements is to enable MIC to assess water quality impacts and ensure the compliance with water quality criteria as defined above.

2.12.1 Discharge Monitoring

- 2.12.1.1 Entities shall undertake effluent and discharge monitoring of all sources prior to their discharge to the Industrial Wastewater Treatment Plant, seawater cooling canals, drainage ditches, or Sea. Such monitoring shall be in accordance with the applicable standards established in these Guidelines and any specific requirements established in the Environmental Permit and Consent to Operate issued by MoE.
- 2.12.1.2 Entities generating process wastewater shall monitor the flow, temperature and waste water parameters specific to their operation prior to discharge and shall develop the monitoring protocol.
- 2.12.1.3 The operator of a facility shall monitor variance streams prior to dilution by the main cooling water return.
- 2.12.1.4 The MIC may waive or reduce the frequency of the effluent or discharge testing requirements if the operator of the facility can demonstrate to the satisfaction of the MIC that the effluent is consistently in compliance with the applicable standard.
- 2.12.1.5 All continuous effluent or discharge monitoring systems as required shall be in continuous operation except for system breakdowns, repairs, calibration checks, and zero and span adjustments.
- 2.12.1.6 Entities shall develop a monitoring protocol for wastewater parameters characteristic to their operation.

2.12.2 Reporting & Record Keeping

- 2.12.2.1 A monthly self monitoring report for the wastewater discharged, sea cooling water discharged and variance stream discharged to sea water shall be submitted to MIC.
- 2.12.2.2 Entities employing continuous discharge monitoring system shall
 - 2.12.2.2.1 Maintain a register of all measurements, monitoring systems, monitoring device, calibration records and system malfunctioning.
 - 2.12.2.2.2 Report all monitoring processed data, describing any excess discharges / equipment failure and any other information requested by MIC on regular basis and
 - 2.12.2.2.3 Develop and submit the quality assurance plan.
- 2.12.2.3 Maintain the records of the flow measurement and daily analysis results.

2.12.2.4 Any violations / exceedance in the any of the discharges shall be reported as defined in Section 1.19.

TABLE 2-A: Quality Criteria for Point Source Discharge to Marine Water

PARAMETER	SYMBOL	UNITS	MONTHLY AVERAGE	MAXIMUM ALLOWABLE
Physical Tests				
Total Dissolved Solids	TDS	mg/l	1500	1500
Total Suspended Solids	TSS	mg/l	30	50
pH	pH	units	6-9	6-9
Turbidity		NTU	40	50
Floating Particles / Oil		mg/l	Nil	Nil
Temperature Increase ₍₁₎		°C	≤ 3 °C	
1. Metallic Species				
Aluminium	Al	mg/l	3	3
Arsenic	As	mg/l	0.1	0.5
Barium	Ba	mg/l	1	2
Boron	B	mg/l	1.5	1.5
Cadmium	Cd	mg/l	0.05	0.05
Chromium total	Cr	mg/l	0.1	0.2
Cobalt	Co	mg/l	0.1	2
Copper	Cu	mg/l	0.2	0.5
Iron	Fe	mg/l	0.5	1
Lead	Pb	mg/l	0.1	0.1
Manganese	Mn	mg/l	0.2	0.2
Mercury	Hg	mg/l	0.001	0.001
Nickel	Ni	mg/l	0.2	0.5
Zinc	Zn	mg/l	1	2
Silver	Ag	mg/l	0.005	0.005
Selenium	Se	mg/l	0.02	0.02
2. Non-Metallic Species				
Ammonia, as NH ₃	NH ₄ ⁺	mg/l	3	3
Chlorine Residual	Cl ⁻	mg/l	0.05	0.1
Cyanide	CN ⁻	mg/l	0.05	0.1
Dissolved Oxygen	DO	mg/l	2.0 min	-
Fluoride	F ⁻	mg/l	10	15
Phosphate	PO ₄ ⁻³	mg/l	1	2
Sulfide	S ⁻²	mg/l	0.05	0.1
Biochemical Oxygen Demand	BOD ₅	mg/l	25	50
Total Kjeldahl Nitrogen (as N)	TKN	mg/l	5	10
Chemical Oxygen Demand	COD	mg/l	75	100
3. Organic Species				
Oil & Grease		mg/l	5	10
Phenols		mg/l	0.1	0.5
Total Organic Carbon	TOC	mg/l	50	75
4. Biological Species				
Total Coliform		MPN/100ml	2.3	23

PARAMETER	SYMBOL	UNITS	MONTHLY AVERAGE	MAXIMUM ALLOWABLE
Egg Parasite			None	
Warm Parasite			None	

Note:

1. The effluent should not result in a temperature increase of more than 3° C at the 100 m distance from the point of discharge.

TABLE 2-B: BALLAST WATER DISCHARGE CRITERIA ^a

Variable	Units	Maximum Allowable
Ammonia Total (as N)	mg/l	3.0
Biochemical Oxygen demand (5 day) 20° c	mg/l	50
Chemical Oxygen Demand	mg/l	150
Floatable Oil and Grease	mg/l	NIL
pH	pH units	6-9 ^b
Suspended solids	mg/l	35
Total Oil (Hexane Extractable)	mg/l	15
Total Organic Carbon	mg/l	100

NOTES :

- a) There are no restrictions on discharges of clean segregated ballast water which meet these criteria.
- b) Inclusive range not to be exceeded.

TABLE 2-C

Quality Criteria for Treated Wastewater Used for Irrigation

PARAMETER	SYMBOL	UNITS	MAXIMUM ALLOWABLE	
			Landscaping	Food Crops
Total Dissolved Solids	TDS	mg/l	1500	1500
Total Suspended Solids	TSS	mg/l	20	20
pH	pH	units	6-9	6-9
Floating Particles / Oil		mg/l	Nil	Nil
1. Metallic Species				
Aluminium	Al	mg/l	5	5
Arsenic	As	mg/l	0.1	0.1
Barium	Ba	mg/l	1	1
Boron	B	mg/l	0.75	0.75
Cadmium	Cd	mg/l	0.01	0.01
Chromium total	Cr	mg/l	0.1	0.01
Cobalt	Co	mg/l	0.2	0.05
Copper	Cu	mg/l	0.2	0.2
Iron	Fe	mg/l	1	1
Lead	Pb	mg/l	0.1	0.1
Manganese	Mn	mg/l	0.05	0.05
Mercury	Hg	mg/l	0.001	0.001
Nickel	Ni	mg/l	0.2	0.2
Zinc	Zn	mg/l	0.5	0.5
Sodium Absorption Ratio	SAR	mg/l	10	10
2. Non-Metallic Species				
Ammonia	NH ₄ ⁺	mg/l	15	15
Chlorine Residual	Cl ⁻	mg/l	0.1	0.1
Cyanide	CN ⁻	mg/l	0.05	Nil
Dissolved Oxygen	DO	mg/l	2.0 min	2.0 min
Fluoride	F ⁻	mg/l	15	15
Phosphate	PO ₄ ³⁻	mg/l	30	30
Sulphate	SO ₄ ²⁻	mg/l	400	400
Sulfide	S ²⁻	mg/l	0.1	0.1
Biochemical Oxygen Demand	BOD ₅	mg/l	15	10
Total Kjeldahl Nitrogen (as N)	TKN	mg/l	35	35
Chemical Oxygen Demand	COD	mg/l	50	50
3. Organic Species				
Oil & Grease (Hexane Extractable)		mg/l	5	5
Phenols		mg/l	0.1	0.1
Total Organic Carbon	TOC	mg/l	40	40
4. Biological Species				
Total Coliform		MPN/100ml	23	2.2
Egg Parasite		Count/100ml	< 1	< 1
Worm parasite		Count/100ml	Nil	Nil

NOTE: The concentration of any identifiable chlorinated hydrocarbon or pesticide shall not exceed 10% of the 96 h LC50 value for the commercial shrimp (*Penaeus Semisulcatus*).

TABLE 2-D**RECOMMENDED GROUNDWATER QUALITY MONITORING PARAMETERS**

PARAMETER	PARAMETER
Temperature	Arsenic
pH	Barium
Specific Conductance	Chromium (Hexavalent)
Ammonia / Total Kjeldhal Nitrogen	Lead
Nitrate-Nitrogen	Mercury
Total Phosphorus	Selenium
Chlorides	Silver
Total dissolved Solids	Copper
Total Petroleum Hydrocarbon	Sodium
Sulphate	Nickel
Coliforms, if applicable	Zinc
Cobalt	Boron
Iron	Manganese
Oil & Grease	Poly Aromatic Hydrocarbon
Total Organic Carbon	Volatile Organic Carbon
At least one parameter specific to nature of industry	

TABLE 2-E**RECOMMENDED PARAMETERS FOR SOIL ANALYSIS**

Parameter	Parameter
pH	Copper
Cation Exchange Capacity	Lead
Total Nitrogen	Nickel
Total Phosphorus	Zinc
Total Potassium	Chromium
Total Organic Carbon	Petroleum Hydrocarbon
Mercury	Cobalt
Sodium Absorption Ratio	Boron
Cadmium	Arsenic
Poly Aromatic Hydrocarbon	Oil & Grease
Radioactivity, if applicable	Fluoride

TABLE 2-F**RECOMMENDED PARAMETERS FOR STORM WATER RUNOFF MONITORING**

Parameter	Parameter
pH	Arsenic
Specific Conductance	Cadmium
Total Suspended Solids	Chromium
Chloride	Copper
Total Nitrogen	Mercury
Total Phosphorus	Lead
Chemical Oxygen Demand	Cobalt
Oil & Grease (Hexane Extractable)	Total Organic Carbon

TABLE 2-G**RECOMMENDED PARAMETERS FOR VEGETATION MONITORING**

Parameter	Parameter
Boron	Molybdenum
Cobalt	Nickel
Cadmium	Zinc
Copper	Mercury
Fluoride	

NOTE : Additional parameters may be necessary depending on the materials applied to the soil and specific types of vegetation.

3.0 Waste Management

3.1 General

A waste is any refuse, garbage, other discarded materials or waste, including solids, semisolids and liquid material resulting from industrial, commercial or community activities which are discarded removed or intended to be discarded. Any discharge of wastes/contaminants to the air, land, or water is prohibited unless approval is obtained from MIC. The waste management incorporates the handling, storage, collection and disposal of wastes.

3.2 Waste Classification

All wastes shall be characterized as per US EPA 846 or other equivalent methods, prior to shipment out of generator facility and MIC.

Non-hazardous Waste

These wastes include solid, liquid, semi-liquid or contained gaseous materials or wastes resulting from industrial, mining, and agricultural operations and sludge from industrial, agricultural or mining, water supply treatment, wastewater treatment or air pollution control facilities, provided that they are not hazardous, municipal or inert wastes as otherwise defined in these guidelines.

A non-hazardous waste is any waste that is not hazardous and can be classified as:

Municipal Waste

Municipal wastes include garbage, refuse, office waste, garden waste and other materials resulting from operations of residential, commercial and municipal, institutional establishments and from community activities.

Inert Waste

Inert wastes are those waste which are not biologically or chemically active in the natural environment such as glass, concrete and demolished building materials, clay (from residential area), manufactured rubber products etc.

Hazardous Waste

Hazardous wastes are as those wastes which by the virtue of its quantity, concentration of constituents and physical or chemical characteristics (such as ignitibility, corrosiveness, reactivity, toxicity, radioactivity etc.) pose a hazard or potential hazard to human health or environment and well being if improperly managed. These wastes also include:

- i. Any wastes which shows properties ignitability, corrosiveness, reactivity, toxicity, or radioactivity including chemical wastes identified as discarded commercial chemical products, off-specification products/chemicals, container residues and spill residues.
 - ii. Any waste, if after application of the test method 1311-SW-864 EPA Method Toxic Characteristic Leachate Procedure (TCLP), as established in U.S. EPA 40CFR Part 261 Appendix II, the extract from the waste contains contaminant concentrations equal to or greater than those listed in Table 3B
 - iii. For wastes where specific contaminants concentration is more than as defined in USEPA 40 CFR 268 and restricted for the land disposal are considered as hazardous waste. Such wastes may have to undergo physico-chemical treatment so that they become land disposable. After the treatment waste characteristics shall be verified through laboratory analysis in order to define it as non-hazardous waste.
- 3.2.1 Waste generators shall, through testing of the waste or knowledge of the process by which the waste is generated, classify their wastes according to Section 3.2.
- 3.2.2 A hazardous waste or its container may be reclassified as non-hazardous provided it is treated in such a way that the resulting material or container no longer exhibits the characteristic that made it hazardous.
- 3.2.3 A hazardous waste or its container is not considered a waste once it has been acceptably recycled.
- 3.2.4 Generated hazardous and non-hazardous waste shall be disposed of within 180 days from the date of its generation.

3.3 Waste Management

- 3.3.1 All hazardous / non-hazardous wastes generated within the Mesaieed Industrial City and not intended for treatment, recycle or reuse shall be disposed of at appropriate facility approved by the MIC.
- 3.3.2 Any hazardous / non-hazardous waste found to be disposed of illegally shall be retrieved by the generator and disposed of at the generators cost in accordance with these guidelines.
- 3.3.3 Export or import of any waste from MIC area for any purpose such as disposal, recovery, recycling is prohibited unless it is approved by MoE and MIC.
- 3.3.4 Stockpiles of Solid Hazardous / Non-Hazardous Materials / Cement / Sand / Soil which may give rise to suspended solids in event of surface wind shall be protected adequately by taking appropriate measures like covering stockpiles with tarpaulin / plastic sheet, water spray on stockpile at periodic interval, installing wind barkers etc to avert the suspension of stock piles in form of suspended solid in ambient air.
- 3.3.5 Entities shall take all necessary precaution to avert the spillage / airborne of Solid Hazardous / Non-Hazardous Materials / Cement / Sand / Soil from top surface / back door / side door of truck by taking appropriate measures like covering with

tarpaulin / plastic sheet, wetting top surface by water at periodic interval, transporting in close container etc during bulk transportation.

3.3.6 Non-hazardous Waste Management

The collection of non-hazardous waste includes specification for containers, storage procedures, collection frequency, method of collection and responsibility for disposal of waste.

3.3.6.1 Storage

Storage areas shall be selected and designated to prevent the accumulation of refuse and outbreak of health and fire hazards. The following guidelines shall apply:

- a) The storage area shall be readily accessible to collection vehicles.
- b) The reception areas shall be designed to prevent the spread of fire, emission of airborne pollutants, odour and vectors throughout the area.
- c) Storage areas shall be of adequate size and capacity to accommodate required number of containers consistent with waste generation routine and collection schedules.
- d) Containers shall be marked and labeled for the specific intended service and equipped with lids.
- e) Containers and storage area shall be cleaned on a regular basis.
- f) The waste material shall be removed to the disposal site at the earliest opportunity.

3.3.6.2 Collection Frequency

The waste collection frequency shall be in line with the prevailing health and safety regulations.

3.3.6.3 Disposal

Inert and non-hazardous industrial waste shall be disposed of at duly approved locations.

3.3.7 Hazardous Waste Management

Improperly managed hazardous wastes pose hazards to human and environmental health. These materials have the potential to create flammable, toxic, corrosive, and reactive conditions.

3.3.7.1 Storage

The following guidelines shall apply for the storage of hazardous wastes:

- a) Hazardous waste storage areas shall have primary & secondary containment facility with spill collection systems.
- b) Hazardous waste storage areas shall be protected to avoid run off to and from the storage area and have facilities to monitor and pre treat any run off.
- c) Containment curbs shall be maintained around the loading and unloading area.
- d) Containers and storage tanks shall be comprised of suitable / compatible material to permanently contain the hazardous waste and have an identification label.
- e) Storage facilities shall be inspected regularly for leakage and structural / operational integrity.
- f) Incompatible materials (as defined by the IMO Dangerous Goods Code) should not be stored or placed in either common containment areas or containers.
- g) The storage facility for volatile substances shall be covered and ventilation system shall be provided to capture air born contaminants.
- h) The surface impoundment used to store hazardous wastes shall be adequately lined and leakage monitoring and detection systems shall be installed.
- i) The surface impoundment of the organic, flammable and explosive waste is prohibited.
- j) Access to a hazardous material storage area shall be controlled to prevent entry of unauthorized persons or vehicles.
- k) Where groundwater pollution potential exists the monitoring of the ground water shall be carried out and contingency plans shall be established to deal with emergencies arising from the accidental discharge of hazardous wastes.
- l) The storage areas shall be paved, fenced, marked, locked and illuminated.
- m) Hazardous waste stored in drums or other moveable storage containers shall be stored with sufficient aisle spacing to allow inspection and movement of the drums or containers. Drums may be stacked on pallets or skids, no more than two (2) drums high.
- n) Hazardous waste storage area or in its close proximity, entities shall install safety shower / eye wash facility with proper water pressure at all times.
- o) Hazardous waste storage area shall have a fire fighting system such as fire hydrants / monitors / fire extinguishers compatible with the stored waste.
- p) Employees engaged in the handling & management of the hazardous waste shall be trained and competent.
- q) Hazardous wastes shall not be stored in the storage area for more than 90 days . To store hazardous waste for more than 90 days prior permission to extend the allowable storage time from MIC is required.
- r) At the expiry of the storage time-limit, Entities shall transport/remove the material to a approved hazardous waste management facility. If such facility is not available within the State of Qatar the hazardous waste shall be taken out of the State in accordance with the provisions of the Basel Convention.

3.3.7.2 Transportation

The transportation of hazardous wastes shall be carried out in accordance with the following requirements, as a minimum:

- a) Waste shall be transported in suitable containers and vehicles (such as tankers) that are secure and prevents spillage of waste during transit. Loose materials should be covered in transit to prevent it being blown out of the vehicle.
- b) Entities shall label and mark the consignments of hazardous wastes before its transportation.
- c) The storage, handling and transportation of all hazardous wastes shall be documented with records of quantities, characteristics, associated hazards and emergency procedures.
- d) Hazardous waste transportation shall be done with help of the hazardous waste transport vehicles which is in the possession of valid permit from MoE.
- e) All employees and contractors handling and transporting the hazardous waste shall be appropriately trained.

3.3.8 Waste Manifest System

Entities shall maintain a manifest system to provide MIC with a thorough trail of waste movement leaving the Entity's facilities.

3.3.8.1 Before transportation of hazardous and non-hazardous industrial waste away from a generator's facility, either for recycle, reuse, treatment, storage or disposal the generator shall complete a waste manifest as attached in Appendix -IV.

3.3.8.2 The generator entities shall sign the manifest certifying that the waste is properly classified, described, packaged, marked and labeled according to the requirements of these guidelines, obtain the signature of the transporter on the manifest and issue 3 copies of the manifest to the transporter.

3.3.8.3 Transporter shall retain one copy of the manifest with him up on delivering the waste to the disposal / recycling facility.

3.3.8.4 Up on receiving the waste, disposal / recycling facility shall sign on the manifest and return one copy to the generator within 30 days of receiving the waste.

3.3.8.5 Records

3.3.8.5.1 Entities shall conduct waste storage area inspections on a regular basis and make these findings available to the MIC as and when

requested. Entities shall track and summarize all offsite shipments of waste.

- 3.3.8.5.2 Entities shall retain a copy of the manifest and completed manifest for a period of time not less than three (3) years from the date of transportation of the waste from the entities facility.

3.3.9 Waste Oil

Entities producing waste oils are required to ensure proper disposal of waste oil and seek an approval from MIC prior to transporting waste oils from MIC. MIC may assist waste oil generators finding an environmentally acceptable solution through the provision of central collection / accumulation tanks, oil analyses, and shipment to recyclers.

3.4 Landfill Disposal Restrictions

The following waste / material shall not be disposed off by landfill method.

- a) Ignitable wastes with a flash point of less than 60°C; any material which is liable to cause fire through friction, absorption of moisture, spontaneous chemical change or retained heat from the manufacturing process; an ignitable compressed gas; or an oxidizer,
- b) Corrosive waste with pH less than or equal to 2, or greater than or equal to 12.5,
- c) A reactive waste which is normally unstable, reacts violently with water, generates toxic gases, vapours or fumes when mixed with water, is a sulphur or cyanide bearing waste which can generate toxic gases, fumes or vapours when exposed to mild acid or basic conditions, or is capable of detonation or explosion,
- d) Toxic waste whose leachate exceeds the limits as mentioned in Table 3-B,
- e) Radioactive wastes that has activity greater than 20,000 pCi/g,
- f) Medical wastes,
- g) Wastes containing Polychlorinated biphenols (PCBs),
- h) Liquid wastes,
- i) Process sludge that fail the U.S. EPA paint filter test for moisture

The landfill sites shall be designed to prevent the spread of pollutants from one medium to another medium.

3.5 Classification of Disposal Sites

All landfill sites should be classified in terms of wastes that may be deposited the degree of security provided against the escape of the pollutants.

Class I Landfill Site:

The site should be designed to isolate wastes from surface water and groundwater by means of a double lining system. Any generated leachate and surface runoff should be collected and treated prior to their disposal. The site should be used for the disposal of hazardous wastes that are physically and chemically compatible with landfill liners and the wastes deposited.

Class II Landfill Site:

The site should be designed above the groundwater elevation and lined with an impervious material to prevent direct contact of the waste with surface water and / or ground water. The site should be for municipal and industrial wastes that are physically and chemically compatible with the liner and waste deposited.

Class III – Disposal Site:

This unlined disposal site should be used to dispose of non-industrial inert wastes only. Industrial inert waste may be also disposed at this landfill facility with prior approval from MIC.

All disposal sites should be fenced, marked, secured and periodically inspected in line with the regulation governing disposal sites.

3.6 Hazard Minimization

The waste handling, storage, transportation and disposal procedures should prevent the occurrence of the following hazards as minimum safety levels:

- Contamination of surface water and groundwater;
- Emission of airborne pollutants;
- Nuisance created by noise, dust and odour;
- Health hazards created by breeding vector; and
- Injuries to workers and public health & safety.

3.7 Specific Criteria for Sediments and Supernatant Water

The U.S. EPA leachate concentration limits for toxicity (Table 3-B) will serve as guidelines in evaluating the state of pollution in sediments to be dredged. The level of pollution shall either not exceed these limits or not exceed ten percent of the toxic levels as determined by bioassay. The permitted level of pollutants, not contained in the Table 3-B, will be determined on a case by case basis.

Supernatant water containing high levels of suspended fine material, even if not polluted, shall not be disposed of directly to the near shore water. Such water shall be retained with impermeable dikes until obtaining visual clarity of at least 1m and then returned to the coastal water. Silt or mud shall not be disposed of directly to the near shore water.

3.8 Dredging Material Disposal Criteria

- 3.8.1 No dredging or disposal of dredged material shall take place outside the MIC without specific approval being granted by the MIC. Approval will be subject to an assessment of the environmental impact of the proposed dredging and dredged material disposal activities for the protection of natural environment. The criteria will serve following purposes:

- a) Assures the physical features, sediment qualities and biological communities are identified so dredging can proceed without significant impact on the environment; and
- b) Off-shore and on-shore disposal sites are identified which can accept dredged material with minimal environmental impact.
- c) Temporary disposal site for dredged materials shall be constructed according to accepted engineering standards as minimum following shall be taken into consideration:
 - i. It shall support and contain the maximum potential height and volume of dredged materials at the site;
 - ii. It shall form a sufficiently large containment area to encourage proper ponding and to prevent entry of dredged materials into the waterway or estuary.
 - iii. Dredged materials containment ponds and outfall weirs shall be designed to maintain adequate retention time to ensure that TSS in the overflow is less than 50 mg/l all the times.
- d) The height and slope of dredged material at disposal site shall prevent the spreading of dredged material by sloughing, and does not loose materials from the site during storms.
- e) The disposal sites which are not intended for disposal of dredged material or development use than within a two year period after disposal area shall be re-vegetated with native plant species unless MIC agreed upon that open sand areas should remain at the site.

3.8.2 If it is established that an environmentally significant community is likely to be damaged, or the dredged material is contaminated, pre-operational site screening of alternative sites to determine baseline site conditions, and/or characteristics of the dredged material shall be conducted. The operational screening shall:

- a) Determine the practicality of optional dredging and disposal sites, methods and equipment;
- b) Characterize the dredged material;
- c) Determine the seasonal factors such as weather, spawning, migration and so forth, that could influence the timing of dredging and disposal;
- d) Establish the estimate volume of dredge material and the duration of the proposed activity; and
- e) Determine the physical variables which will affect the distribution of sediments during the proposed dredging and disposal operations, including water currents and circulation, and wave action where applicable.

3.8.3 No dredged materials shall be disposed of within enclosed bays, inlets or within the 20m low tide depth contour unless the dredged material is being used for approved construction purposes.

3.8.4 The dredged material may be considered clean if it meets the following criteria:

- a) The dredged material is composed of sand and/or gravel, or any other sedimentary material composed of particles larger than 0.50 mm;
- b) The water at or near the dredging site is capable of supporting fish, shellfish and other aquatic organisms and the associated biota;
- c) The material is subjected to a series of chemical and bioassay analysis, and found to be environmentally safe at the disposal site.

3.8.5 Surface runoff water decanted from dredged material shall not be disposed of within enclosed bays or inlets or within the 20m low tide depth contour unless a visual clarity of at least 0.5m has been achieved or supernatant has TSS concentration less than 50 mg/l.

3.9 Construction Waste Material

Minimum reinforced concrete, non-reinforced concrete, cement blocks, material waste generated from either construction, demolition/clearing operations, and concrete test cubes from batching plants or concrete casting operations may be allowed to be recycled into either land reclamation operations or filling low areas within MIC boundaries provided that the concrete solid waste material is within acceptable dimensions. MIC may allocate/assign a site for the Entity to deposit the material for a nominal charge. These charges will be based on the quantity, quality, size of the waste material and will be decided on case by case basis mainly to cover the administration and suppression overheads. Only concrete waste material within an acceptable size, i.e. approximately 80% of total material pieces shall be equal or less than 50 cm in any dimension per piece and free from any other waste material such as organic, domestic or hazardous waste. All cost related to collection, transportation, dumping, disposal and leveling of such works is deemed to be on the account of the Entity. For any clarification MIC shall be contacted.

3.10 Recycling

Entities shall develop their waste management plan and procedure to ensure that waste materials are segregated (paper, wood, glass, plastic, metal, oil etc.) to facilitate material re-use and recycling to the extent possible.

TABLE 3A - POTENTIALLY INCOMPATIBLE MATERIALS

The mixing of Group - A materials with those identified Group B materials may produce the noted hazardous reactions resulting in unsafe or unhealthy conditions.

Group I: Potential Consequences: Heat generation violent reaction	
Group I - A	Group I - B
Acetylene sludge	Acid sludge
Alkaline caustic liquids	Acid and water
Alkaline cleaner	Battery acid
Alkaline corrosive liquids	Chemical cleaners
Alkaline corrosive battery fluid	Electrolyte acid
Caustic wastewater	Etching acid liquid or solvent
Lime sludge; other corrosive alkalis	Pickling liquor; other corrosive acids
Lime wastewater	Spent acid
Lime and water	Spent mixed acid
Spent caustic	Spent sulphuric acid

Group II Potential Consequences: Fire or explosion; generation of flammable hydrogen gas	
Group II - A	Group II - B
Aluminium, Beryllium, Calcium, Lithium, Magnesium, Potassium, Sodium, Zinc powder, Other reactive metals and metal hydrides	Any waste in Group I-A or I-B

Group III : Potential Consequences: Fire, explosion or heat generation; generation of flammable or toxic gases	
Group III - A	Group III - B
Alcohols Water	Any concentrated waste in Group I-A/I-B Calcium, Lithium, Potassium, Metal Hydrides, Sodium, Sulfuryl chloride (SO ₂ Cl ₂), Thionyl Chloride, (SOCl ₂), Phosphorus trichloride (PCl ₃), Methyl trichlorosilane (CH ₃ SiCl ₃) and other water reactive wastes

TABLE 3A - POTENTIALLY INCOMPATIBLE MATERIALS (cont.)

The mixing of Group A materials with those identified Group B materials may produce the noted hazardous reactions resulting in unsafe or unhealthy conditions.

Group IV : Potential Consequences: Fire explosion or violent reaction	
Group IV - A	Group IV - B
Alcohols	Concentrated Group I-A or I-B wastes
Aldehydes	or
Halogenated hydrocarbons	Group II-A wastes
Nitrated hydrocarbons, Unsaturated hydrocarbons, Other reactive organic compounds and solvents	

Group V : Potential Consequences: Generation of toxic hydrogen cyanides or hydrogen sulphide gas	
Group V- A	Group V - B
Spent cyanide and sulphide solutions	Group I-B wastes

Group VI : Potential Consequences: Fire explosion or violent reaction	
Group VI - A	Group VI - B
Chlorates	Acetic acid; other organic acids
Chlorine,	Concentrated mineral acids
Chlorites	Group II-A wastes
Chromic Acid	Group IV-A wastes
Hypochlorites	Other flammable and combustible wastes
Nitrates	
Nitric acid, fuming,	
Perchlorates,	
Permanganates,	
Peroxides,	
Other strong oxidisers	

Group VII: Potential Consequences: Release of toxic substances in case of fire or explosion	
Group VII - A	Group VII - B
Asbestos waste, other toxic waste	Cleaning solvents
Beryllium wastes	Data processing liquid
Un-rinsed pesticide containers	Obsolete explosives
Waste pesticides	Refinery or petroleum waste,
	Retrograde explosives,
	Solvents,
	Waste oil, other flammable and explosive wastes

A solid waste exhibits the characteristic of toxicity if, using the Toxicity Characteristic Leaching Procedure, test Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW -846, the extract from a representative sample of the waste contains any of the contaminants listed in Table 3-B at the concentration equal to or greater than the respective value given in that table. Where the waste contains less than 0.5 percent filterable solids, the waste itself, after filtering using the methodology outlined in Method 1311, is considered to be the extract.

TABLE 3B - MAXIMUM CONCENTRATION OF CONTAMINANTS FOR TOXICITY CHARACTERISTIC

EPA HW No.\1\	Contaminant	CAS No.\2\	Regulatory Level (mg /L)
D004	Arsenic.....	7440-38-2	5.0
D005	Barium.....	7440-39-3	100.0
D018	Benzene.....	71-43-2	0.5
D006	Cadmium.....	7440-43-9	1.0
D019	Carbon tetrachloride...	56-23-5	0.5
D020	Chlordane.....	57-74-9	0.03
D021	Chlorobenzene.....	108-90-7	100.0
D022	Chloroform.....	67-66-3	6.0
D007	Chromium.....	7440-47-3	5.0
D023	o-Cresol.....	95-48-7	\4\ 200.0
D024	m-Cresol.....	108-39-4	\4\ 200.0
D025	p-Cresol.....	106-44-5	\4\ 200.0
D026	Cresol.....	\4\ 200.0
D016	2,4-D.....	94-75-7	10.0
D027	1,4-Dichlorobenzene...	106-46-7	7.5
D028	1,2-Dichloroethane.....	107-06-2	0.5
D029	1,1-Dichloroethylene....	75-35-4	0.7
D030	2,4-Dinitrotoluene.....	121-14-2	\3\ 0.13
D012	Endrin.....	72-20-8	0.02
D031	Heptachlor (and its epoxide).	76-44-8	0.008
D032	Hexachlorobenzene.....	118-74-1	\3\ 0.13
D033	Hexachlorobutadiene...	87-68-3	0.5
D034	Hexachloroethane.....	67-72-1	3.0
D008	Lead.....	7439-92-1	5.0
D013	Lindane.....	58-89-9	0.4
D009	Mercury.....	7439-97-6	0.2
D014	Methoxychlor.....	72-43-5	10.0
D035	Methyl ethyl ketone.....	78-93-3	200.0
D036	Nitrobenzene.....	98-95-3	2.0
D037	Pentachlorophenol....	87-86-5	100.0
D038	Pyridine.....	110-86-1	\3\ 5.0
D010	Selenium.....	7782-49-2	1.0
D011	Silver.....	7440-22-4	5.0
D039	Tetrachloroethylene...	127-18-4	0.7
D015	Toxaphene.....	8001-35-2	0.5
D040	Trichloroethylene.....	79-01-6	0.5
D041	2,4,5-Trichlorophenol..	95-95-4	400.0
D042	2,4,6-Trichlorophenol..	88-06-2	2.0
D017	2,4,5-TP (Silvex).....	93-72-1	1.0
D043	Vinyl chloride.....	75-01-4	0.2

\1\Hazardous waste number.

\2\Chemical abstracts service number.

\3\Quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level.

\4\If o-, m-, and p-Cresol concentrations cannot be differentiated, the total cresol (D026) concentration is used. The regulatory level of total cresol is 200 mg/l.

[55 FR 11862, Mar. 29, 1990, as amended at 55 FR 22684, June 1, 1990; 55 FR 26987, June 29, 1990; 58 FR 46049, Aug. 31, 1993; 67 FR 11254, Mar. 13, 2002]

4.0 Noise

Noise criteria values are designed to protect the general public from physiological impairment resulting from excessive levels of noise. The criteria include environmental noise exposure limits to protect the general public and to provide guidance for land use planning.

4.1 Noise Criteria

Entities setting-up the facility in MIC area shall ensure at design stage that noise level doesn't exceed the noise criteria defined in Table-4.

**TABLE 4:
NOISE CRITERIA FOR RESIDENTIAL, BUSINESS & INDUSTRIAL AREAS^a**

Category of Zoning District	Maximum Noise Measured at Property Line; Not to be Exceeded More than 10% of the Time (dBA)
1. Residential and Institutional	55
2. Small Business and Commercial	65
3. Industrial	75

^a Road side Areas Excluded.

- 4.2 The rotating equipment, control valves, flares, furnaces, heaters, blowers, pipe lines, electrical motors, fin fan coolers, cooling tower, etc shall be design such that noise level doesn't exceed 90.0 dBA at 1.0 M distance from the source.
- 4.3 Inlet / outlet of the blowers / air compressors, PRVs outlet in high pressure service, Safety valve outlets on steam network / boiler shall be equipped with silencers / noise dampening device to ensure that noise level in work place area is less than 90 dBA at 1.0 M distance from source.
- 4.4 Entities shall carry out the annual perimeter noise level monitoring and submit the report to MIC. The record of the perimeter noise level monitoring shall be retained at least for 3 years.

5.0 Air Environment

5.1 Ambient Air Quality Criteria

- 5.1.1 Ambient air is defined as any air on the external side of Entity's boundary fence to which the public have access.
- 5.1.2 Table 5A lists the ambient air quality standards for the Industrial City areas. The standards for each pollutant consist of one or more concentration limits, each with an associated averaging period. These standards do not apply to individual facilities or sources, but are considered an objective, which should be met in order to protect the health and well being of the general public.
- 5.1.3 Entities setting-up an industry / plant shall ensure through modeling study that due to their overall emission, background ambient air quality doesn't exceed the Ambient Air Quality Criteria define in Table-5A. Table 5A-1 lists the ambient air quality guideline values for additional compounds with health impact and odor annoyance based on WHO guidelines.
- 5.1.4 Open pit burning / uncontrolled burning of the any material / chemicals / waste is prohibited.

5.2 Abrasive Blasting

Abrasive blasting is defined as an operation in which materials are cleaned by the abrasive action of any metal shot or mineral particulate propelled within a gas or liquid.

- 5.2.1 Entities involved in abrasive blasting shall operate such that they are able to meet the clean air requirements for the ambient and work place (occupational) environments.
- 5.2.2 An abrasive blasting medium must contain no more than 2% wt free silica (crystalline silicon dioxide) which shall pass through a United States Standard Number 200 sieve e.g. garnet.
- 5.2.3 Abrasive blasting medium shall be re-used only after separating dust and other particles which contaminate the abrasive medium from previous blasting. Metal contents must not exceed TCLP limits define in Table 3B otherwise wastes must be disposed of as hazardous waste.
- 5.2.4 If abrasive blasting is performed in other than a blasting enclosure i.e. outdoors, measures shall be taken by the owner or operator to ensure that ambient air and occupational standards for dust are met. This will require that fugitive dust from abrasive blasting activities shall not cause a nuisance or health risk to employees, and neighbours. The following isolation distances shall be maintained:
 - 0.5 kilometer from any roadway where visibility from dust may be impaired;
 - 1 kilometer or more from any residence or business; and
 - 2 kilometers from boundary of any city, town, village, or hamlet.

- 5.2.5 Blasting activities shall be contained in an area, which will substantially reduce the incidence of airborne dust in the workplace.
- 5.2.6 The outdoor abrasive blasting area shall be on paved area with containment walls, which will reduce the loss of abrasive medium and where possible and allow its re-use. The height of the containment wall shall be such that it can retain abrasive blasting medium after use.
- 5.2.7 Prevent paint chips, abrasive blast material (before blasting) and grit waste from coming in contact with storm water runoff and surface water bodies. Collected mentioned materials must be disposed of appropriately.

5.3 Flares

- 5.3.1 There shall not be any visible emission from flare for more than 5 minutes in any hours.
- 5.3.2 Flares shall be operated with a pilot flame present at all times which is to be monitored by a thermocouple or an equivalent device to detect the presence of a flame.
- 5.3.3 Flares shall be used to combust only those gases which have a net heating value equal to or greater than 11.2 MJ/SCM (300 Btu/scf) if the flare is steam-assisted or air-assisted and greater than 7.45 MJ/SCM (200 Btu/scf) if the flare is non-assisted.
- 5.3.4 The maximum thermal radiation level (including solar radiation) at ground level shall not exceed 4.73 kW/m^2 (1500 Btu/hr-ft^2)₍₁₁₎ at the edge of the flare area and 3 kW/m^2 at the property line. The thermal radiation levels from flares shall be monitored on a quarterly basis unless otherwise specified by MIC.

5.4 General Air Environment Requirements

- 5.4.1 The existing plants / entities shall phase out chlorofluorocarbons (CFC), Halons and any other substances defined in the Montreal Protocol (and subsequent amendments) which are capable of depleting stratospheric ozone. The total phase out of ozone depleting substances shall be completed in accordance with the schedule and deadline stated in the protocol.
- 5.4.2 Entities shall make every effort to control, minimize or eliminate the Green House Gases (GHG) emission.
- 5.4.3 New equipment / plant shall not contain ozone depleting substance.
- 5.4.4 Venting of CFC's and other ozone depleting substances to the atmosphere during service or disposal of air conditioners and refrigerators is prohibited except in the case of firefighting.

5.4.5 Use of asbestos products is prohibited with the exception of asbestos -cement water pipes, asbestos -containing materials shall not be used for replacement in maintenance, when suitable and technically feasible alternative products are available.

5.4.6 New equipment / plant shall be free of asbestos except as stated in 5.4.5.

5.4.7 Turbine, boiler and process heater combustion sources shall use low NO_x technology. Emissions from combustion sources must comply with the criteria defined in Table 5-B.

5.4.8 Installation of oil fired process equipment is prohibited.

5.4.9 All flares shall be at least 65 meters high and stack height at least 40 meters high unless MIC specifically agrees otherwise. However flare stack height shall be such that the thermal radiation at flare base is less than 4.73 kW/m^2 (1500 Btu/hr-ft^2)₍₁₁₎.

5.4.10 A BAT / BATNEEC analysis shall be performed for the selection of the air pollution control equipment and shall be form a part of EIA.

5.5 Air Emission Performance Tests

5.5.1 The Entities shall undertake annual performance testing of the following point sources:

- a) Affected sources that, after the use of abatement equipment, have the potential to emit more than 50 t/y of any regulated air pollutant, or
- b) Affected sources that have the potential to emit more than 10 t/y of any hazardous air pollutant listed in Table 5C.

5.5.2 The Entities subject to Section 5.5.1 shall, as a minimum measure the applicable parameters that are regulated for the affected sources at the facility. Testing of sources subject to Section 5.5.1b shall include individual measurement of each applicable hazardous air pollutant.

5.5.3 The Entities with several identical process streams each with similar point source emissions which are subject to Section 5.5.1 may restrict the annual emission testing to the following number of sources providing all sources are tested at least once every 4 years:

No. of Identical Sources	No. Tested Annually
1-3	1
4-8	2
>8	3

5.5.4 The Entities subject to Section 5.5.1 shall undertake initial performance testing of all point sources within 90 days of the facility achieving the normal production rate or within 180 days of initial start up, whichever is earlier.

- 5.5.5 Emission testing shall be conducted and reported in accordance with methods and procedures that are approved by the U.S. EPA or equivalent international standard.
- 5.5.6 Emission testing shall be conducted under conditions of maximum intended use of the affected facility. Operations during periods of shutdowns, startups, and malfunctions shall not constitute representative conditions for the purpose of the emission tests.
- 5.5.7 A written report shall be submitted within 60 days of conducting any required emission testing. The report shall contain all pertinent information which shall include as a minimum:
- a) Analytical data - pollutants, moisture content, oxygen content
 - b) Physical data - flow rate, stack emission velocity, temperature, pressure, stack dimensions, isokinetic flow conditions
 - c) Process operating conditions at time of testing
 - d) One example calculation for each method
 - e) Emission results - emission data in same unit as the relevant emission standard in Table 2B, mass emission data and concentration emission data.
- 5.5.8 QP / MIC may waive or reduce the frequency of the emission testing requirements if the Entities demonstrate to the satisfaction of the QP / MIC that the source is consistently in compliance with the applicable standard.

5.6 Continuous Air Emission Monitoring

- 5.6.1 MIC may, at any time, require that the sources listed in Table 5-B continuously monitor the specified pollutants or parameters.
- 5.6.2 In addition to the sources listed in Table 5-B, continuous emission monitoring is required for any source deemed to have the potential to cause an odour nuisance, a health hazard, a detriment to the public welfare, or harm to the environment.
- 5.6.3 All continuous monitoring systems shall be in continuous operation except for system breakdowns, repairs, calibration checks, and zero and span adjustments. With the exception of the particulate monitor, data shall be logged from the monitors at a minimum rate of 4 samples per hour. Hourly average shall be calculated from the arithmetic means of all these samples. The particulate monitor may log one hour bulk concentrations.
- 5.6.4 Any hour with less than 75% of the possible data capture shall be discarded as bad data. A minimum annual data capture rate of 90% is required to demonstrate compliance. The 10% of lost data shall include calibration time and maintenance time.
- 5.6.5 The operator of continuous monitoring systems shall maintain the following records on site for a minimum period of three years. These records shall be available for inspection by QP / MIC or its designee at any time shall include as a minimum:
- a) All measurements

- b) All performance evaluations
- c) Verification of calibration and maintenance checks
- d) Manufacturers' recommended maintenance and calibrations frequencies.
- e) Occurrences and duration of any startups, shutdowns or malfunctions in the operation of the affected source or emission control device
- f) Periods when the continuous monitoring system is inoperative
- g) Type of fuel used along with specification and consumption (upon request)
- h) Vendor manual with calibration details and technical specification of equipment used.

5.6.6 The operator of continuous monitoring systems shall submit a report electronically to the QP / MIC every six months (unless otherwise specified) summarizing the continuous emission monitoring data for affected sources at their facility. The report shall include, as a minimum, the following information:

- a) Monitoring period
- b) Actual Monitoring data along with results of the Statistical analysis including
 - Average, minimum, maximum and standard deviation.
 - The number of times that the specific pollutants being monitored exceeded the source emission standards established in Table 5B.
 - An explanation for the occasions when the source emission standards were exceeded and the corrective action taken to prevent recurrence
 - Occurrences and duration of any startups, shutdowns or malfunctions in the operation of the affected source or emission control device
- c) Periods when the continuous monitoring system was inoperative

5.6.7 Quality Assurance Program

5.6.7.1 Point-sources subjected to continuous source monitoring shall prepare a Quality Assurance Manual to instruct personnel involved in these activities. This manual shall include as minimum:

- Standard operational procedures (SOPs) for instrumentation, installation, calibration and maintenance schedules;
- Define calibration and preventive maintenance schedules;
- Establish standard forms and check-list to be used during calibration and maintenance;
- Define responsibilities for all personnel; and
- Define criteria to be followed during review and validation of data (quality control criteria).

5.6.7.2 Certificates of traceability for all calibration equipment shall also be maintained in the central document file.

5.6.7.3 Calibration equipment and standards shall conform to the U.S. National Bureau of Standards or its equivalent.

5.7 Fugitive Emission

This section is applicable to all components in VOCs service or organic Hazardous Air Pollutants (HAPSs) service (see Table 5C), unless stated otherwise.

- 5.7.1 All affected components in VOCs or organic HAPSs services shall be individually identified by a specific number, service and location (e.g. metal tags, bar code, P&ID's). An updated master list containing all of the affected components shall be kept on site at all times.
- 5.7.2 Open-ended valves shall be equipped with a cap, blind flange, plug, or a second valve. The second valve shall always be closed except during sampling.
- 5.7.3 Pressure relief valves equipped with rupture disks shall be equipped with a sensor between the valve and the disk to detect leaks.
- 5.7.4 The Entities shall monitor all affected components in VOC service or in organic HAPs service, on a minimum of semi-annual basis, starting within 180 days of initial startup of operations. Following two (2) consecutive *semi-annual* leak detection periods when the number of leaking components is found to be less than 2% of the total, the operator revert to annual leak detection monitoring. If the total number of leaking components ever exceeds 2%, then the facility shall revert to semi-annual monitoring.
- 5.7.5 Less frequent monitoring of difficult or unsafe to monitor components shall be permitted as determined by the ENTITIES, subject to verification and approval by the QP / MIC.
- 5.7.6 All components in VOC service or organic HAPs service that register more than 10,000 ppm VOC and valves, flanges or connectors in organic HAPs service which register more than 500 ppm VOC shall be defined as leaking components.
- 5.7.7 All leaking components shall be tagged immediately and replaced or repaired within 15 calendar days or, if a unit or plant shutdown is required, at the next scheduled shutdown.
- 5.7.8 Any leak from pressure relief valves shall be arrested within 24 hours of detection.
- 5.7.9 All leaking or returned to service components shall be monitored after maintenance is performed.
- 5.7.10 Entities shall prepare an annual report for submittal to the QP / MIC summarizing the facility fugitive emissions. This report shall include the following information:
 - a) Total number of each type of component monitored
 - b) Number of leaking components of each type
 - c) Number of components of each type awaiting repair
 - d) Number of components of each type repaired and returned to service.

- 5.7.11 Entities shall maintain semi-annual records of fugitive emissions monitoring and maintenance activities. The records shall be maintained on site for a minimum period of three years.
- 5.7.12 For all new facility / modification in existing facility, the concerned project director / manager shall ensure that all manual isolation valves, block valves, control valves and remote operated valves in hydrocarbon service have low emission type stem packing / expandable valve stem packing (EVSP).
- 5.7.13 The sample purge and / or out let of the online process analyzer in the hydrocarbon service shall be returned to the process or flare header.
- 5.7.14 The sampling system in hydrocarbon services shall be closed loop. The venting of the sample purge or vent in hydrocarbon service to atmosphere is prohibited.

5.8 Storage of Volatile Organic Compounds

- 5.8.1 The entities shall not place, store, or hold in any stationary tank, reservoir, or any other container any volatile organic compound (VOC) unless such container is equipped with a control device as specified in Table 2F.
- 5.8.2 The operator of a facility storing VOC compounds in tanks or containers which fall under the following categories are exempt from this section and the requirements of Table 2F:
 - a) All vessels at gasoline service stations.
 - b) All vessels those are permanently mobile.
 - c) All vessels which maintain a pressure of at least 204.9 kPa.
 - d) All vessels with capacities less than 75 m³.
- 5.8.3 The entities installing or operating a fixed roof storage tank with an internal floating roof shall:
 - a) Visually inspect the internal floating roof primary seals prior to initial filling of the tank. The primary seal shall be inspected each time the tank is taken out of service and at a minimum of once every ten (10) years.
 - b) Visually inspect the secondary seal from the nearest manway after the tank is placed in service and on an annual basis thereafter.
 - c) Repair any major defect discovered during an inspection within 45 days of the date of inspection or remove the tank from service. If the operator cannot complete the repair within the specified time frame then a written justification explaining the delay and expected completion date shall be provided to the QP / MIC.
- 5.8.4 The entities with having external floating roofs storage tanks shall:
 - a) Determine that the total gap width and areas for each of the primary and secondary seals are consistent with manufacturer's design and installation specifications. This determination shall be verified annually for secondary seals.

For primary seals this shall be verified each time the tank is removed from service and at a minimum of once every ten (10) years.

- b) Measure during hydrostatic testing or within sixty (60) days of initial fill the gaps between the tank wall and the primary seal (seal gaps) and the gaps between the tank wall and the secondary seal.
- c) Repair any major defect discovered during an inspection within 45 days of the date of inspection or remove the tank from service. If the operator cannot complete the repair within the specified time frame then a written justification explaining the delay and expected completion date shall be provided to the QP / MIC.

5.8.5 All results of the visual inspections of storage tank primary and secondary seals shall be documented and records shall be maintained.

5.8.6 The operator of any facility using VOC storage vessels shall retain on site the following records:

- a) Chemical name of VOC stored.
- b) VOC storage tank capacity.
- c) Details of periods when any required control device is not functional.
- d) True vapor pressure of the material stored.

5.9 Loading and Unloading of Organic Chemical

Unless otherwise specified, this section applies to both land and marine based loading and unloading operations.

5.9.1 The entities which is loading or unloading VOC or organic HAPs compound with a true vapor pressure greater than or equal to 1.5 psia, in quantities greater than 75 m3 per day averaged over any consecutive 30 day period, shall install vapor control system to collect & treat the vapours generated during the loading and unloading operation.

5.9.2 The entities performing land-based loading and unloading subject to Section 5.9.1 shall perform the operations such that:

- a) All liquid and vapor lines shall be equipped with fittings which make vapor-tight connections and close automatically when disconnected.
- b) All liquid and vapor lines shall be equipped to allow residual VOC or organic HAPS in the loading line after loading is complete to discharge to the control system.
- c) All loading effected through the hatches of a transport vessel shall provide appropriate pneumatic, hydraulic or other mechanical means to force a vapor tight seal between the loading arm and the vessel hatch.
- d) Transfer operations shall cease if a vapor leak is detected greater than 20% of the lower explosive limit of the material being transferred.

- e) If a leak is detected during the transfer operations of more than 10,000 PPM VOC or 500 PPM organic HAPS, then repairs to the transfer system shall be made before the next loading operation.

5.9.3 The entities of a VOC loading or unloading vapor control system shall operate the system such that:

- a) Control efficiency of at least 95% (90% for existing facilities) is maintained for VOCs during loading when using a vapor recovery device.
- b) Control efficiency of at least 98% (97% existing facilities) during loading is maintained when using a combustion device for HAPSs as identified in Table 2C. However, in case of carcinogenic or acutely hazardous compounds, higher control efficiency may be applicable.

5.9.4 The entities which is effecting loading and unloading of VOC or organic HAPS shall maintain records and report emissions in accordance with the relevant point source and fugitive emission regulations as specified in Sections 5.5 and 5.7.

5.9.5 The operator of a facility involving Marine Tank vessel loading operations of crude oil with throughput of 200 Million barrels or more on a 24 month annual average basis or gasoline with throughput of 10 Million barrels or more on a 24 month annual average basis shall comply with the following:

- a) Equip each terminal with a Vapor Collection System (VCS) designed to collect VOC vapors displaced from marine tank vessels during loading and to prevent VOC vapors from passing through another loading berth or to the atmosphere.
- b) Limit marine tank vessel loading operations to those vessels that are equipped with Vapor Collection Equipment (VCE) compatible with the terminal's VCS.
- c) Limit marine tank vessel loading operations to those levels that are vapor tight and connected to the VCS
- d) Reduce emissions of captured VOC from marine tank vessel loading operations by 98-wt% when using a combustion device or by 95 -wt% when using a recovery device.
- e) Requirement of above paragraph (d) may be met by reducing gasoline-loading emissions to, at most, 1000-ppmv outlet VOC concentration.

Note: The standards given in item (d) and (e) as above, do not apply to marine tank vessel loading operations where emissions are reduced by using a Vapor Balancing System.

5.10 AIR EMISSION INVENTORY

To enable MIC to assess ambient air quality, prior to commencing construction or modification, operator of facility are required to prepare and submit an ambient air quality analysis and an air emissions inventory. Thereafter the inventory should be updated and submitted once in 2 years, upon major modification / plant expansion or upon change in the air emission level by more than 10%. The inventory report shall contain the following information:

- a. Identification of all emission sources by facility.
- b. Emission loads obtained from measured pollutant emissions for all point sources subject to Section 5.5 or Section 5.6.
- c. Estimated emission loads obtained from calculations or engineering design information for all other point sources.
- d. Fugitive emissions estimates based on calculations utilizing procedures, methodologies and appropriate air quality emission factors as provided in USEPA AP-42: Protocol for Equipment Leak Estimates (latest edition - <http://www.epa.gov/ttn/chief/ap42/>).
- e. An estimate of emissions from storage tanks and transfer operations.
- f. An estimate of emissions from wastewater treatment operations.
- g. All emissions data should be expressed in kg/h and t/y.
- h. If the emissions data are calculated it shall be necessary to cite and include the calculations in support of such data.
- i. The inventory of VOCs emissions may be combined as one pollutant (total VOCs) with the exception of emissions of any HAPs as listed in Table 2C.

TABLE 5-A: AMBIENT AIR QUALITY CRITERIA

Pollutant	Criteria Concentration Limit		Averaging Period
	$\mu\text{g}/\text{m}^3$	PPM	
Ammonia	1,800	2.6	1 hr
Carbon Monoxide (CO)	40,000	35	1 hr *
	10,000	9	8 hrs *
Chlorine (Cl_2)	300	0.10	1 hr
Hydrochloric Acid (HCl)	7	-	3
Total Hydrogen Fluoride (HF)	14	-	1 hr
	9.3	-	12 hrs
	4.6	-	24 hrs
Hydrogen Sulphide (H_2S)	40	0.029	1 hr
	20	0.014	24 hrs
Lead (Pb)	1.5	-	3 months
Nitrogen Oxides as NO_2	400	0.195	1 hr *
	150	0.073	24 hrs *
	100	0.049	annual ave.
Non-Methane Hydrocarbons (NMHC) **	160	0.24	3 hrs *
Ozone (O_3)	235	0.11	1 hr *
	120	0.056	8 hrs *
Particulate Matter (<10 micron) ***	150 ****	-	24 hrs *
	50	-	annual ave.
Sulphur Dioxide (SO_2)	1,300	0.300	1 hr *
	365	0.14	24 hrs *
	80	0.03	annual ave.
Vinyl Chloride Monomer (VCM)	26	0.01	24 hrs *

* Maximum concentration not to be exceeded more than once/year.

** Corrected for Methane

*** Inhalable Particles < 10 microns equivalent aerodynamic diameter.

**** Exceeding of 24-hours particulate criteria only if man-made.

TABLE 5-B: SOURCE EMISSION CRITERIA

SOURCE	POLLUTANT	EMISSION LIMIT
GENERAL		
All facilities	Asbestos Particulates	No emission Best practicable control technology. For dusty stock piles, water spray at suitable intervals.
Flares	Smoke	Smokey flare for less than 5 minutes per hour at density less than Ringleman #2.
INDUSTRIAL BOILERS & FURNACES (HEAT INPUT CAPACITY > 30 MW)		
Gas Fired	Particulate	43 ng/j (0.1 lb/ MMBTU)
	Sulphur Dioxide	340 ng/j (0.8 lb/MMBTU)
	Nitrogen Oxides	55 mg/NM ³ @ 3% O ₂ dry basis.
Oil Fired	Installation Not Permitted	
INDUSTRY SPECIFIC		
Abrasive Blasting		
	Silica	< 2% silica in abrasive used in outdoor blasting.
	Metal Content	< TCLP limit defined in Table 3B.
Aluminum Reduction Plants		
– Pot lines	Opacity	10 %.
	Total Fluoride	0.6 kg/MT of Al produced.
	Poly Cyclic Organic Matter	0.32 kg/MT of Al produced.
	CO	40 kg/MT of Al produced.
	SO ₂	Same as the combustion standard
	VOCs	20 PPM corrected to 7% O ₂ content
	CO ₂	3000 kg/MT of Al produced.
– Paste Production	Polycyclic Organic Matter (15)	0.005 kg/MT of Al produced for plant with continuous mixer.
		0.011 kg/MT of Al produced for plants with batch mixers.
– Anode bake furnaces	Total Fluorides	0.03 kg/MT of Al produced.
	Polycyclic Organic Matter	0.025 kg/MT of Al produced.
– Bauxite Grinding	Particulates	0.06 kg/T of bauxite grinded
– Pitch Storage Tanks	Polycyclic Organic Matter	Reduce POM emission by 95 % or greater.
– Calcinations of aluminum hydroxide	Particulates	2.0 kg/t
	Opacity	20 %
– Over all plant	CF ₄	0.30 kg / MT of Al produced.
	C ₂ F ₆	0.05 kg / MT of Al produced.
Ammonia Fertilizer Manufacturing (Including Urea)		
	Ammonia	150 mg /NM ³
	Nitrogen Oxides	55 mg /NM ³ for New / Modified facility
		125 mg /NM ³ for existing facilities

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SOURCE	POLLUTANT	EMISSION LIMIT
– Prilling Tower	Particulate Matter	150 mg /NM ³
– Granulation	Particulate Matter	50 mg /NM ³
Asphalt / Concrete Manufacture		
– All emission points	Particulate Matter	90 mg /NM ³
Cement Manufacture		
– Kilns	Particulate Matter	0.15 kg/MT ₍₁₉₎ of cement produced
	Opacity	< 20 %
	Dioxin & Furans	0.40 ng TEQ/dscm corrected to 7% O ₂ content
	Total Hydrocarbon – THC	50 ppmvd as propane, corrected to 7% O ₂ .
– Clinker coolers	Particulate Matter	0.05 kg/MT ₍₁₉₎ of cement produced
	Opacity	<10 % ₍₁₉₎
– Other than Boiler & Furnace	Sulphur Dioxides	35 mg/NM ³ @ 3% O ₂ dry basis
	Nitrogen Oxides	240 mg/NM ³ @ 3% O ₂ dry basis
Ferro Alloy Manufacturing (Producing silicon metal, ferrosilicon, calcium silicon, silicon manganese, zincronism, other)		
– Open submerged Arc Furnace	Particulate Matter	0.45 kg/MW-hr or 50 mg/dscm for existing plants. 0.23 kg/MW-hr or 35 mg/dscm for new plants.
– Semi-sealed submerged arc furnace	Particulate Matter	11.2 kg/hr when producing ferromanganese.
– Metal Oxygen Refining Process	Particulate Matter	69 mg/dscm.
– Crushing & screening equipment	Particulate Matter	69 mg/dscm - for existing plants 50 mg/dscm - for new plants
– All sources / areas	Opacity	< 20 % - six min average period.
– Other than Boiler & Furnace	Sulphur Dioxide	35 mg/NM ³ @ 3% O ₂ dry basis
	Nitrogen Oxides	240 mg/NM ³ @ 3% O ₂ dry basis
Formaldehyde Manufacturing		
– Storage of formaldehyde solution with vapour pressure ≤ 570 mm Hg	Formaldehyde	Floating roof storage tank is permitted if it can be demonstrated that the emission from all vents of storage tan do not exceed 0.1 kg/hr OR A floating roof even still permitted if the concentration of formaldehyde in the vent does not exceed 20 mg/M ³ (STP). Otherwise fixed roof storage tank with vapour recovery system is required ₍₂₎ .
Storage of formaldehyde solution with vapour pressure ≥ 570 mm Hg	Formaldehyde	Fixed roof storage tank with vapour recovery system.
Glass Fibre Manufacturing		
	Particulate Matter	5.5 kg/T of fibre glass produced .

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SOURCE	POLLUTANT	EMISSION LIMIT
Lime Manufacturing		
– Kiln	Particulate Matter	0.20 kg/T of stone feed
	Opacity	< 20 % in case of dry scrubbing only.
– Stack Emission from process stone handling (PSH)	Particulate Matter	50 mg/dscm .
	Opacity	< 7%
– Fugitive emission from all PSH	Opacity	< 10 %
Petroleum & Petrochemical Manufacturing Units		
– Gas Turbine	Sulphur Oxides	500 mg/NM ³ @ 15 % O ₂ dry basis.
	Nitrogen Oxides	55 mg/NM ³ @ 15 % O ₂ dry basis for new or modified facilities. 125 mg/NM ³ @ 15 % O ₂ dry basis for existing facilities.
– Petroleum storage vessel having capacity > 1000 bbl		
– For liquid with vapour pressure 78~570 mm (1.5~11 psi)	VOCs	Floating roof with double seal or equivalent (2).
– For liquid with vapour pressure > 570 mm (>11 psi)	VOCs	Vapour recovery system or equivalent.
– For Crude Oil (disregard of vapour pressure)	VOCs	Floating roof with double seals and periodic inspection.
– Fluid Catalytic cracking unit catalyst regenerator.	Particulate	1.0 kg/t of coke burn-off.
	CO	500 PPM
	SO ₂	50 PPM with an add-on control device OR 9.8 kg/t of coke burn-off without an add-on control device.
– Fuel Gas Combustion	SO ₂	Limit H ₂ S content of fuel gas to 230 mg/dsf OR use equivalent SO ₂ removal system .
– Sulphur removal / recovery plants – Existing Plants	SO ₂	Minimum 98 % removal.
	H ₂ S	10 PPM H ₂ S calculated as SO ₂ at 0% O ₂ on a dry basis if emission are controlled by reduction control system not followed by incineration.
– Sulphur removal / recovery plants – New Projects	Acid injection is minimum requirement.	
– Process Vents	Organic HAPs	Reduce emission of TOC by 98% by wt. OR to a concentration of 20 PPMv on a dry basis corrected to 3 % oxygen which ever is less.
– Product / Material Loading / Unloading	VOCs	Min. 95% vapour capture & recovery system OR Exit concentration less than 20 PPMv.
Power Plant		
– Gas Turbine	Sulphur Oxides	Sweeten Natural Gas shall be used as fuel OR 500 mg/NM ³ @ 15 % O ₂ dry basis.
	Nitrogen Oxides	55 mg/NM ³ @ 15 % O ₂ dry basis for new or modified facilities.

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SOURCE	POLLUTANT	EMISSION LIMIT
		125 mg/NM ³ @ 15 % O ₂ dry basis for existing facilities.
Fugitive Emission (Applicable to all industries)		
○ Pumps*	VOCs	<10,000 PPMv instrument reading. No visible dripping. Upon detection of the leak repair within 15 days.
○ Pumps*	Organic HAPs	< 500 PPMv instrument reading. No visible dripping.
○ Compressors*	VOCs / Organic HAPs	< 500 PPMv instrument reading except during pressure release.
○ Pressure relief devices – gas / vapour service*	VOCs / Organic HAPs	< 500 PPMv instrument reading. No visible dripping. After each pressure release return PRV to a normal condition in 5 days.
○ Valves*	VOCs	< 10,000 PPMv instrument reading.
	Organic HAPs	< 500 PPMv instrument reading.
○ Open ended valves*	VOCs	< 10,000 PPMv instrument reading.
	Organic HAPs	< 500 PPMv instrument reading.
○ Connectors / Flanges*	Organic HAPs	< 500 PPMv instrument reading.

* To be repaired up on detection of the leak within 15 calendar days.

TABLE 5-C: LIST OF HAZARDOUS AIR POLLUTANTS

CAS No.	Chemical Name	CAS No.	Chemical Name
60355	Acetamide	75070	Acetaldehyde
98862	Acetophenone	75058	Acetonitrile
107028	Acrolein	53963	2-Acetylaminofluorene
79107	Acrylic acid	79061	Acrylamide
107051	Allyl chloride	107131	Acrylonitrile
62533	Aniline	92671	4-Aminobiphenyl
1332214	Asbestos	90040	o-Anisidine
92875	Benzidine	71432	Benzene (including benzene from gasoline)
100447	Benzyl chloride	98077	Benzotrichloride
117817	Bis(2-ethylhexyl)phthalate (DEHP)	92524	Biphenyl
75252	Bromoform	542881	Bis(chloromethyl)ether
106990	1,3-Butadiene	156627	Calcium cyanamide
133062	Captan	105602	Caprolactam
75150	Carbon disulfide	63252	Carbaryl
463581	Carbonyl sulfide	56235	Carbon tetrachloride
133904	Chloramben	120809	Catechol
7782505	Chlorine	57749	Chlordane
532274	2-Chloroacetophenone	79118	Chloroacetic acid
510156	Chlorobenzilate	108907	Chlorobenzene
107302	Chloromethyl methyl ether	67663	Chloroform
1319773	Cresols/Cresylic acid (isomers and mixture)	126998	Chloroprene
108394	m-Cresol	95487	o-Cresol
98828	Cumene	106445	p-Cresol
3547044	DDE	94757	2,4-D, salts and esters
132649	Dibenzofurans	334883	Diazomethane
84742	Dibutylphthalate	96128	1,2-Dibromo-3-chloropropane
106467	1,4-Dichlorobenzene(p)	91941	3,3-Dichlorobenzidine
111444	Dichloroethyl ether (Bis(2-chloroethyl)ether)	542756	1,3-Dichloropropene
62737	Dichlorvos	111422	Diethanolamine
121697	N,N-Diethyl aniline (N,N-Dimethylaniline)	64675	Diethyl sulfate
119904	3,3-Dimethoxybenzidine	60117	Dimethyl aminoazobenzene
119937	3,3'-Dimethyl benzidine	79447	Dimethyl carbamoyl chloride
57147	1,1-Dimethyl hydrazine	68122	Dimethyl formamide
77781	Dimethyl sulfate	131113	Dimethyl phthalate
51285	2,4-Dinitrophenol	534521	4,6-Dinitro-o-cresol, and salts
123911	1,4-Dioxane (1,4-Diethyleneoxide)	121142	2,4-Dinitrotoluene
106898	Epichlorohydrin (1-Chloro-2,3-epoxypropane)	122667	1,2-Diphenylhydrazine
140885	Ethyl acrylate	106887	1,2-Epoxybutane
51796	Ethyl carbamate (Urethane)	100414	Ethyl benzene
106934	Ethylene dibromide (Dibromoethane)	75003	Ethyl chloride (Chloroethane)
107211	Ethylene glycol	107062	Ethylene dichloride (1,2-Dichloroethane)
75218	Ethylene oxide	151564	Ethylene imine (Aziridine)
75343	Ethylidene dichloride (1,1-Dichloroethane)	96457	Ethylene thiourea
76448	Heptachlor	50000	Formaldehyde
87683	Hexachlorobutadiene	118741	Hexachlorobenzene
67721	Hexachloroethane	77474	Hexachlorocyclopentadiene
		822060	Hexamethylene-1,6-diisocyanate

MIC Environmental Guidelines and Protection Standards

CAS No.	Chemical Name	CAS No.	Chemical Name
680319	Hexamethylphosphoramide	110543	Hexane
302012	Hydrazine	7647010	Hydrochloric acid
7664393	Hydrogen fluoride (Hydrofluoric acid)	7783064	Hydrogen sulfide
123319	Hydroquinone	78591	Isophorone
58899	Lindane (all isomers)	108316	Maleic anhydride
72435	Methoxychlor	67561	Methanol
74873	Methyl chloride (Chloromethane)	74839	Methyl bromide (Bromomethane)
78933	Methyl ethyl ketone (2-Butanone)	71556	Methyl chloroform (1,1,1-Trichloroethane)
74884	Methyl iodide (Iodomethane)	60344	Methyl hydrazine
624839	Methyl isocyanate	108101	Methyl isobutyl ketone (Hexone)
1634044	Methyl tert butyl ether	80626	Methyl methacrylate
75092	Methylene chloride (Dichloromethane)	101144	4,4-Methylene bis(2-chloroaniline)
101779	4,4'-Methylenedianiline	101688	Methylene diphenyl diisocyanate (MDI)
98953	Nitrobenzene	91203	Naphthalene
100027	4-Nitrophenol	92933	4-Nitrobiphenyl
684935	N-Nitroso-N-methylurea	79469	2-Nitropropane
59892	N-Nitrosomorpholine	62759	N-Nitrosodimethylamine
82688	Pentachloronitrobenzene (Quintobenzene)	56382	Parathion
87865	Pentachlorophenol	108952	Phenol
106503	p-Phenylenediamine	75445	Phosgene
7803512	Phosphine	7723140	Phosphorus
85449	Phthalic anhydride	1336363	Polychlorinated biphenyls (Aroclors)
1120714	1,3-Propane sultone	57578	beta-Propiolactone
123386	Propionaldehyde	114261	Propoxur (Baygon)
78875	Propylene dichloride (1,2-Dichloropropane)	75569	Propylene oxide
75558	1,2-Propylenimine (2-Methyl aziridine)	91225	Quinoline
106514	Quinone	100425	Styrene
96093	Styrene oxide	1746016	2,3,7,8-Tetrachlorodibenzo-p-dioxin
79345	1,1,2,2-Tetrachloroethane	127184	Tetrachloroethylene (Perchloroethylene)
7550450	Titanium tetrachloride	108883	Toluene
95807	2,4-Toluene diamine	584849	2,4-Toluene diisocyanate
95534	o-Toluidine	120821	1,2,4-Trichlorobenzene
8001352	Toxaphene (chlorinated camphene)	79016	Trichloroethylene
79005	1,1,2-Trichloroethane	88062	2,4,6-Trichlorophenol
95954	2,4,5-Trichlorophenol	1582098	Trifluralin
121448	Triethylamine	108054	Vinyl acetate
540841	2,2,4-Trimethylpentane	75014	Vinyl chloride
593602	Vinyl bromide	1330207	Xylenes (isomers and mixture)
75354	Vinylidene chloride (1,1-Dichloroethylene)	108383	m-Xylenes
95476	o-Xylenes	106423	p-Xylenes
COMPOUNDS			
Antimony Compounds		Arsenic Compounds (inorganic including arsine)	
Beryllium Compounds		Cadmium Compounds	
Chromium Compounds		Cobalt Compounds	
Coke Oven Emissions		Cyanide Compounds ¹	
Glycol ethers ²		Lead Compounds	
Manganese Compounds		Mercury Compounds	
Fine mineral fibers ³		Nickel Compounds	
Polycyclic Organic Matter ⁴		Radionuclides (including radon) ⁵	
Selenium Compounds			

NOTE:

For all listings above which contain the word "compounds" and for glycol ethers, the following applies:

- 1 Unless otherwise specified, these listings are defined as including any unique chemical substance that contains the named chemical (i.e., antimony, arsenic, etc.) as part of that chemical's infrastructure.
- 2 1 X'CN where X = H' or any other group where a formal dissociation may occur. For example KCN or Ca(CN)₂
- 3 Includes mono- and di- ethers of ethylene glycol, diethylene glycol, and triethylene glycol
 $R-(OCH_2CH_2)_n-OR'$
 where n = 1, 2, or 3
 R = alkyl or aryl groups
 R' = R, H, or groups which, when removed, yield glycol ethers with the structure: R-(OCH₂CH)_n-OH. Polymers are excluded from the glycol category.
- 4 Includes mineral fiber emissions from facilities manufacturing or processing glass, rock, or slag fibers (or other mineral derived fibers) of average diameter 1 micrometer or less.
- 5 Includes organic compounds with more than one benzene ring, and which have a boiling point greater than or equal to 100°C.
- 6 A type of atom which spontaneously undergoes radioactive decay.

6.0 Hazardous Materials

A hazardous material is defined as any material in a quantity or concentration that, if improperly managed, may pose a hazard to public health or the environment. Hazardous materials may be solids, semi-solids, liquids or gases and also include hazardous wastes.

6.1 Hazardous Materials Classification

The classification of hazardous materials includes materials with the following characteristics:

- 6.1.1 **Ignitable** - a material is considered ignitable if a representative sample of the material has any of the following properties:
- a) It is a liquid, other than an aqueous solution which contains less than 24% alcohol by volume; and has a flash point less than 60 °C (1400F).
 - b) It is not a liquid and is capable under standard temperature and pressure, of causing fire through friction, absorption of moisture or spontaneous chemical changes, and when ignited, burns so vigorously and persistently that it creates a hazard.
 - c) It is an ignitable compressed gas.
 - d) It is an oxidizer that can cause or contribute to the combustion of other materials by yielding oxygen or other oxidizing substances, whether or not the substance is itself combustible.
- 6.1.2 **Corrosive** - a material is considered corrosive if a representative sample of the material has either of the following properties:
- a) It is aqueous and/or its aqueous solution has a pH less than 2 or greater than or equal to 12.5.
 - b) It is a liquid and corrodes steel (SAE 1020) at a rate greater than 6.35 mm per year at a test temperature of 55 °C (130°F).
- 6.1.3 **Reactive** - a material is considered reactive if a representative sample of the material has any of the following properties:
- a) It is normally unstable and readily undergoes violent change without detonating.
 - b) It reacts violently with water.
 - c) It forms a potentially explosive mixture with water.
 - d) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to public health or the environment.
 - e) It is a cyanide or sulfide bearing material which, when exposed to pH between 2 and 12.5 can generate toxic gases, vapors or fumes in quantity sufficient to present a danger to health and the environment.
 - f) It is capable of detonation, explosive decomposition or reaction at standard temperature or pressure.
- 6.1.4 **Toxic** - a material is considered toxic if it is present in quantities and concentrations, which based on available human, animal or botanical toxicity testing data have the

potential to be harmful to human health or living organisms in their natural environment.

6.1.5 **Radioactive** - radioactive materials are any materials which spontaneously emit either alpha particles, beta particles, gamma or x-rays, neutrons and or other atomic particles above natural background levels.

6.1.6 **Biohazard** - biohazard materials are those materials which contain biological materials that are capable of causing harm to human health or the environment. Included in the classification of biohazard materials are etiologic materials, which are capable of harboring or transmitting disease. Also included in the classification of biohazard materials are materials which contain plants, animals, or other organisms that would cause harmful effects if released into the environment.

6.2 The entities are not permitted for the installation of any equipment / unit within MIC which contains the PCBs.

6.3 Hazardous Materials Storage and Handling Regulations

6.3.1 Any hazardous material shall be managed in such a manner as to minimize to the fullest extent possible the potential for harm to human health or the environment.

6.3.2 Containers, storage tanks, storage areas and impervious barriers used to contain or store hazardous materials shall be designed, constructed and maintained to permanently contain the hazardous materials.

6.3.3 All containers used to hold hazardous materials shall be kept closed at all times except when adding or removing materials from the container.

6.3.4 Access to a hazardous material storage area shall be controlled to prevent entry of unauthorized persons or vehicles.

6.3.5 Incompatible materials shall not be placed in common containment areas, the same containers or on the same vehicles. Table 3A provides a list of materials that are presumed to be incompatible.

6.3.6 The entities handling hazardous material containing drum, tanks or other moveable container storage areas shall provide these areas with primary and secondary containment. The secondary containment shall be provided by:

- a. an outer shell or multiple-wall tank, where the volume of secondary containment shall be at least 100% of the volume held in the primary container, or
- b. a banded or bermed area which is impervious to the hazardous material being stored and where the volume inside the secondary containment shall be 110% of the volume of the largest container within the

containment area plus the water accumulation from a 100mm storm event.

- c. The secondary containment shall be other than clay and earthen materials.
- d. A flexible liner material which is chemically resistance, puncture resistance, temperature resistance, UV resistance and having minimum thickness 30 mils +/-2 mils (1mils = 0.0254 mm).

6.3.7 Stockpiles of solid hazardous materials which may produce a hazardous leachate with hazardous properties as defined in Sections 4.1 shall be stored, loaded and unloaded in impervious areas equipped with dikes, bunds, curbs or collection systems designed to retain leachate and precipitation. The containment system shall be of sufficient size to retain the accumulation from a 100mm storm.

6.3.8 Any spilled materials collected by secondary containment shall be removed in a timely manner and recycled or disposed in accordance with the requirements of Chapter 3.

6.3.9 Entities handling & storing hazardous material shall maintain hazardous material stockpiles to prevent wind dispersion of the material.

6.3.10 Hazardous materials stored in drums or other moveable storage containers shall be stored with sufficient aisle spacing to allow inspection and movement of the drums or containers. Drums may be stacked on pallets or skids, no more than two (2) drums high.

6.3.11 Containers holding hazardous materials shall be individually labeled to reflect the actual contents of the container.

6.3.12 Entities storing and handling hazardous materials shall maintain on-site adequate spill control equipment and chemicals to cope with realistic and probable emergencies associated with the hazardous materials.

6.3.13 Entities storing, handling or transporting hazardous materials in the Industrial City shall prepare and implement a contingency plan to address emergencies involving those hazardous materials. At a minimum the contingency plan shall include:

- a) realistic and probable accident, spill or emergency scenarios
- b) procedures for accessing emergency services
- c) identification of safety, control and alarm equipment associated with the storage, transport or disposal of hazardous materials
- d) nominated responsible individuals and roles for the facility emergency response team and facility contact personnel
- e) nominated responsible individuals for co-ordination with external emergency services
- f) procedures for initial and annual update training to address plant emergencies

- g) procedures for inspection and maintenance of emergency and spill control equipment
 - h) provisions for review and update of the contingency plan
- 6.3.14 Entities shall periodically inspect the hazardous material storage areas and associated monitoring, safety and emergency equipment.
- 6.3.15 Entities storing and handling hazardous materials shall immediately notify the QP / MIC of any emergency involving the hazardous materials stored at the facility consistent with Section 1.20.
- 6.3.16 Hazardous liquids shall be transferred from one container to another in paved, dike area or other wise contained to prevent the escape of any material from the area.

6.4 Underground Storage Tank (UST)

- 6.4.1 Installation of the underground storage tanks for hazardous materials without prior approval of MIC is prohibited.
- 6.4.2 Entities installing under ground storage tank shall provide at a minimum the following:
- a) leak detection or secondary containment provisions.
 - b) corrosion protection
 - c) overfill and overspill protection
- 6.4.3 Entities having underground storage tanks shall perform tank tightness testing at a minimum of once every three years. Such tightness testing shall include the entire tank system, and shall be capable of detecting a leak of 12.5 ml/min or greater from the UST system. The results of the latest tank tightness testing shall be kept on record at all times.
- 6.4.4 At least thirty days before permanently closing a UST or removing it from service, operators shall notify the MIC of their intent to permanently close the system and the methods or procedures to be used to close or remove the system from service.

6.5 Above Ground Storage Tank (AST)

- 6.5.1 The entities having intent to install hazardous material above ground storage tanks, containing materials which are liquid at standard conditions (0C, 101,325 Pa) shall provide primary containment, secondary containment, overfill protection and leak detection system.
- 6.5.2 All valves, fittings, and other appurtenances associated with hazardous materials storage tanks or hazardous materials transfer (other than those associated with fill and discharge pipelines) shall be located within secondary containment.
- 6.5.3 A dyke shall be provided as per the section 6.3.6.

- 6.5.4 A flexible liner material which is chemically resistance, puncture resistance, temperature resistance, UV resistance and having minimum thickness 30 mils \pm 2 mils (1mils = 0.0254 mm) beneath tank bottom and emergency containment (dyke) area shall be provided.
- 6.5.5 Aboveground storage tank systems shall provide method of leak detection capable of detecting release. The leak detection system shall be monitored periodically.
- 6.5.6 The area beneath the tank bottom shall be monitored for leakage by visual, mechanical or electronic leak detection method.

7.0 Reporting and Record Keeping

7.1 Quality Control/ Quality Assurance

- 7.1.1 The Entities shall establish a Quality Control/Quality Assurance program for the reporting, monitoring and recordkeeping requirements established in these guidelines. Elements of such a program shall include but not be limited to:
- a) Defining standard operating procedures for instrumentation installation, calibration, and maintenance.
 - b) Define calibration and preventive maintenance schedules and establish recordkeeping procedures to be used during calibration, maintenance and reporting of results and data.
 - c) Define responsibilities for all personnel
 - d) Define quality control criteria to be followed during review and validation of data
 - e) Establishing documentation on specified forms for all laboratory and field activities

7.2 Reporting Requirements

The objective of reporting requirements is to assess the compliance level of the Entities operation. This will also help the MIC to assess the pollutant carrying capacity of the MIC and plan future industrial expansion accordingly.

- 7.2.1 The operator of a facility shall provide the MIC with at least thirty (30) days notice of any start-up of a new or modified facility.
- 7.2.2 The operator of a facility shall submit periodic monitoring reports in accordance with any monitoring schedules developed in conjunction with the Environmental Permit to Operate.
- 7.2.3 The operator of a facility shall submit to the MIC all relevant reports, and at the specific frequency referenced in Table 7A. The submitted reports shall contain as a minimum all of the specific information requested in the relevant sections of these guidelines.
- 7.2.4 The operator of a facility shall report all required monitoring data in units specified in the relevant standards.
- 7.2.5 Facility Compliance Status Reporting Operators of existing facilities shall submit a preliminary compliance status report for their facilities 6 months after the effective date of these guidelines. Subsequent facility compliance status reports shall be submitted as part of the application for land lease renewal. The compliance report shall:
- a) identify the regulations and standards in this document which cannot be met consistently by the facility at the time of reporting.
 - b) include a schedule of actions proposed to correct the non-compliance issues identified in a).

- c) identify any measures specifically taken to bring the facility into compliance with these Regulations.

7.2.6 Reporting of Non-Compliance Events

The operator of a facility shall report to the MIC all non-compliance events as follows:

- a) All planned start-ups, shutdowns and maintenance activities which may give rise to abnormal environmental emissions or discharges or exceedance of emission or discharge standards shall be reported in advance.
- b) All major upsets and emergencies which give rise to abnormal environmental emissions or discharges or exceedance of emission or discharge standards shall be reported as described in section 1.11.

7.2.7 Reporting of Hazardous Material Releases

The operator of a facility shall report as soon as possible to the MIC all incidents which result in spills or releases of hazardous materials in quantities which may impact groundwater, marine environment or the environment outside the plant boundaries as defined in section 1.11.

7.3 Recordkeeping Requirements

7.3.1 The operator of a facility shall, as a minimum, maintain true and correct records required by these guidelines in accordance with the relevant sections of these guidelines. All data and records required by these guidelines shall be maintained on site in an organized and legible fashion.

7.3.2 Records for monitoring information shall include as a minimum the following information:

- a) The dates, places and time of sampling or measurements.
- b) The date analyses were performed,
- c) The analytical techniques used

7.3.3 The owner operator of the subject facility shall retain records of all monitoring information, copies of all records required by these guidelines for a period of at least three (3) years from the date of the information.

7.3.4 The operator of a facility shall upon reasonable notification make available for inspection all data and records required in connection with compliance with these guidelines.

TABLE 7
REPORTING REQUIREMENTS

The following table summarizes the required reports and their frequency as dictated in the relevant parts of these guidelines.

REQUIRED REPORT	FREQUENCY OF REPORTING REFERENCE	SECTION	REPORTING DUE DATE
1. Environmental Incidents / Emergencies	As & when occurred.	1.11.2	Within 24 hrs of the occurrence.
2. Planned shutdown, start-up and maintenance activities	As & when occurred.	1.11.6	Prior to 5 days of the activity.
3. Industrial Wastewater Discharges	Monthly	2.12.1	weeks following end of the calendar month
4. Seawater Cooling Discharge	Monthly	2.12.2	weeks following end of the calendar month
5. Variance Streams	Monthly	2.12.3	weeks following end of the calendar month
6. Treated Effluent (SWTP)	Monthly	2.12.1	weeks following end of the calendar month
7. Groundwater Monitoring	Annually	2.6	90 days after sampling
8. Perimeter Noise level monitoring	Annually	4.4	By 31 st January for the previous year.
9. Point Source Emission Data	Annually for each source	5.5.7	Within 60 days from the date of monitoring
10. Continuous Monitoring Summary	Once every six months	5.6.6	Apr/Oct of each year
11. Fugitive Emission Report	Annual	5.7.10	By 31 st March for previous year.
12. Air Emission Inventory	2 years from the effective date of the guidelines, then with EPO renewal	5.10	

APPENDIX I
Environmental Incident Reporting Form



ENVIRONMENTAL INCIDENT REPORT

INCIDENT No:
(To be assigned by MIC)

DATE:...../...../.....
TIME :.....hrs

A. Type of Incident:

Gas Release <input type="checkbox"/>	Smokey Flare <input type="checkbox"/>	Oil Spill <input type="checkbox"/>	Chemical Spill <input type="checkbox"/>
Haz. waste spill <input type="checkbox"/>	Non-Haz. Waste Spill <input type="checkbox"/>	Excessive Noise <input type="checkbox"/>	Other <input type="checkbox"/>
Pl. specify.....			

B. Location of Incident:

C. Domain of Incident: Air / Water / Soil / Other

If other please specify:.....

D. Brief Description of Incident :

E. Cause of Incident:

F. Immediate Action Taken:

G. Duration of Incident:

FromAM/PM	Total Duration Min/Hrs/Day
ToAM/PM		

H. Name of material released / spilled

I. Quantity

 MT/Lit/M³
J. Laboratory Analysis Performed : Yes / No (if yes attached a copy of lab report)

K. External Assistance Requested: Yes / No (if yes from whom assistance was obtained)

.....

L. Describe the Type of External Assistance Aailed:

.....

.....

M. Preventive action taken to prevent recurrence:

.....

.....

.....

.....

.....

.....

N. Recommendations / Remedial Actions:

Sr. No	Recommendation / Remedial Action	Action By	Target Date

O. Reported By: Name: Signature:

This section to be completed by MIC – Environmental Services

P. Incident Class: Major ☐ Moderate ☐ Minor ☐

Q. Impact on: Soil ☐ Ground Water ☐ Air ☐ Marine Water ☐ Other ☐

If other please specify:.....

R. Review & Comments:

.....

.....

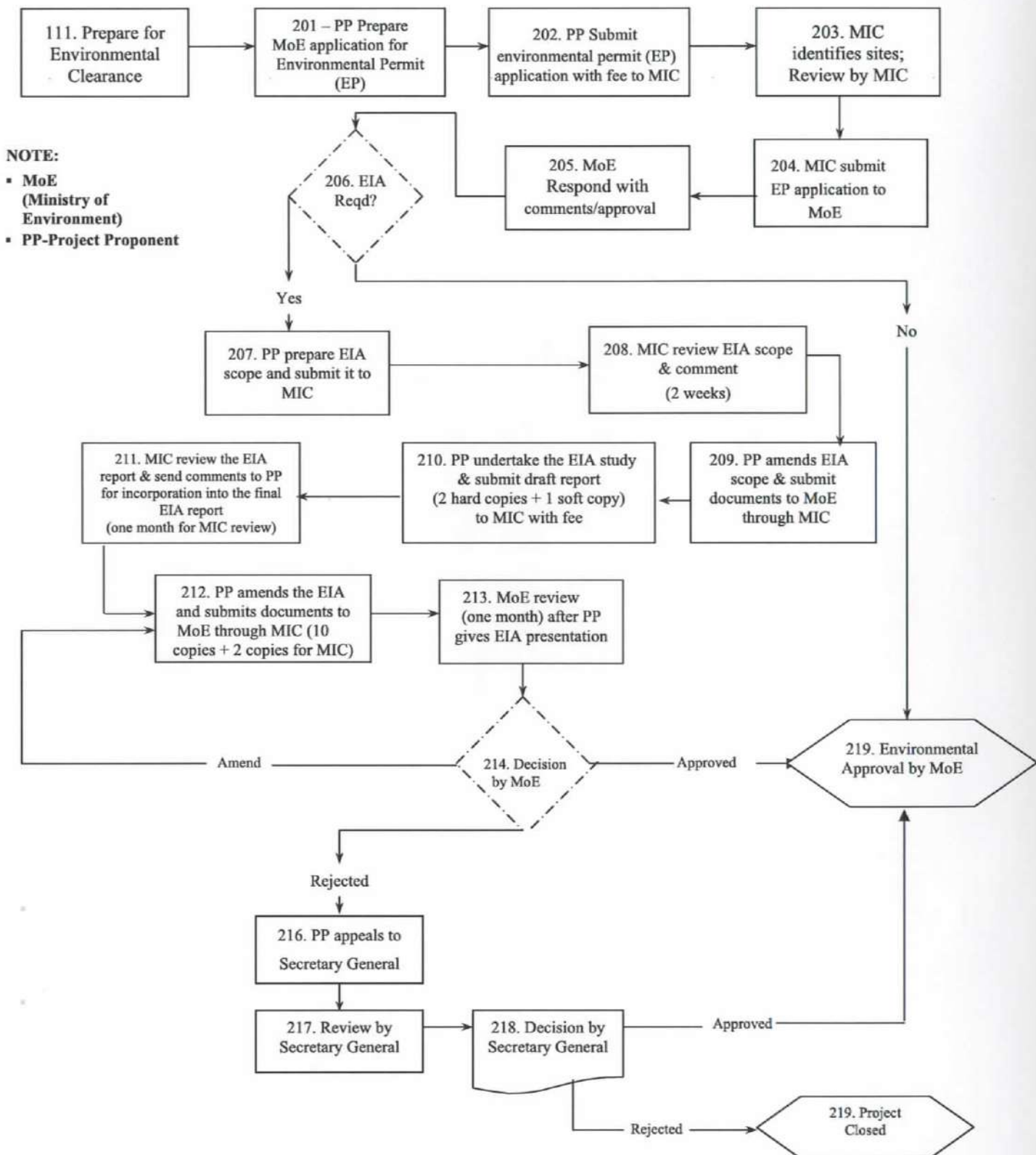
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R. Incident Reviewed by | Name: | Sign. | Date:...../...../.....

Appendix – II Environmental Approval Process Flow Diagram

APPENDIX III
Waste Manifest Form



WASTE MANIFEST



Waste Manifest Document No:

1. Generator's Name and Address:					
2. Contact Person & Phone No:					
3. Waste Details:					
Shipping Name / Waste Type / Hazard Class	Containers		Total Qty.	Unit Wt. / Vol.	WPS NO
	Nos.	Type			
4. GENERATOR'S CERTIFICATE: This is to certify that above materials are properly classified, described, packed, marked and labeled and are in proper condition for transportation according to the applicable regulations of MIC and MoE.					
Name of Authorized Representative:			Day	Month	Year
5. Transporter's Details:					
Name					
Telephone No.					
Address					
6. Transporter's Certificate: This is to certify that I am the primary transporter and have accepted the described shipment in proper condition for the transport to the identified recycle / reuse / disposal facility in accordance with the applicable regulations of MoE.					
7. Transporter's Acknowledgement of Receipt of Materials					
			Day	Month	Year
Name			Signature		
8. Recycling / Reuse / Disposal Facility Details:					
Name					
Telephone No.					
Address					
9. Discrepancies found between manifest and waste:					
10. Facility Owner / Operator Certificate: This is to certify that the described material as delivered by the named transporter, and the information on the manifest is correct to the best of my knowledge and that the wastes have been received for recycle / reuse / treatment & disposal.					
			Day	Month	Year
Name			Signature		

1. Disposal agency copy. 2. To be returned to generator. 3. Transporter's copy. 4. Generator's copy.

MIC/MW/F/02

TEL: 44773211/3212-FAX:44773213 -P.O.BOX 3212, DOHA, QATAR

APPENDIX-IV

GLOSSARY

Abatement	Reduction or lessening (of pollution) or doing away with (a nuisance) by legislative or technical means, or both.
Acid gas flare	A flare used exclusively for the incineration of hydrogen sulfide and other acidic gases derived from natural gas sweetening processes
Affected facility	any stationary source that is affected by a standard regulation
Ambient air	air outside a facility boundary
Appurtenance	an adjunct or appendage which is an integral part of a tank, unit or apparatus
BAT	Best Available Techniques (BAT) is the application at facilities of the most effective and advanced production processes, methods/ technologies or operational practices to prevent and, where that is not practicable, to reduce emissions or discharges and other impacts to the environment as a whole. BAT must as a minimum achieve emission or discharge standards in these Regulations taking into account energy, environmental and economic impacts and other costs to the facility.
BEP	<p>Best Environmental Practice is the application at facility. It consists of the following as minimum:</p> <p>High standards of maintenance: to maintain the efficiency of the unit operations and the associated pollution abatement technologies at a high level</p> <p>Emissions monitoring: Development and implementation of protocols for monitoring the performance of pollution abatement facilities and compliance with environmental permits.</p> <p>Environmental Management System: a system which clearly defines the responsibilities for environmentally relevant aspects of the industry. It raises awareness of issues and includes goals and measures, process and job instructions, check lists and other relevant documentation</p> <p>Planning: Co-ordination of process improvements to reduce technical bottlenecks and to introduce Available Modern Technology</p> <p>Process control monitoring and optimization: To be able to reduce different pollutants simultaneously and to maintain low emissions, Raw materials specification and monitoring of raw materials for precursor materials</p> <p>Substitution of Hazardous Substances: Identification and substitution of potentially harmful compounds with less harmful alternatives, Use of a detailed inventory of raw materials used, chemical composition, quantities, fate and environmental impact</p> <p>Training, education and motivation of personnel: Training of staff can be a very cost-effective way to reduce environmental impact and use of resources.</p>
Component (VOC service)	Pumps, valves, compressors and pressure relief valves which are in contact with streams containing >10 wt% VOC

Component (organic HAP service)	flanges, connectors, pumps, valves, compressors and pressure relief valves which are in contact with streams containing >5 wt% organic HAP Connector flanged, screwed, welded, or other joined fittings used to connect two pipe lines or a pipe line and a piece of equipment.
Ecosystem	A dynamic complex of plant, animal, fungal and microorganism communities and associated non-living environment interacting as an ecological unit.
Emission	the process of discharging into the atmosphere or the material being discharged
Emission inventory	the systematic compilation, either by measurement or estimation, of detailed information on pollutant emissions in a given area or facility
Emission Standard	the amount of pollutant permitted to be discharged from a pollutant source
Environmental Management System (EMS)	A structured approach for determining, implementing and reviewing environmental policy through the use of a system which includes organizational structure, responsibilities, practices, procedures, processes and resources. Often formally carried out to meet the requirements of the ISO 14000 series.
Environmental Monitoring	Refers to the systematic collection of environmental data through a series of repetitive measurements.
Environmental Standards	Guidelines that have statutory force to maintain a desired quality of some part of the environment, such as 'drinking water standards' or 'soil quality standards' Standards should be based on sound scientific data, however the desired level of 'quality' is also a political and social decision. Therefore, environmental standards provide the foundation for achieving the objectives of environmental legislation.
Facility	any apparatus, installation, equipment or grouping thereof which is subject to an applicable standard or regulation
Flare	the flame produced by the disposal, in an arrangement of piping and a burner, of surplus or residual combustible gases
Fossil fuel	coal, petroleum, natural gas and any form of solid, liquid or gaseous fuel derived from such materials for the purpose of creating useful heat
Fugitive emission	any gaseous or particulate contaminant entering the atmosphere which could not reasonably pass through a stack, chimney vent, or other functionally equivalent opening designed to direct or control its flow
Generator	any operator of a facility whose process produces hazardous waste as defined in these Regulations or whose act first causes the hazardous waste to become subject to regulation.
Guideline	Guideline values are for information, reference and study purposes
HAP	Hazardous air pollutant (as specified in Table 2C).
Inhalable particulate	Any substance dispersed in the atmosphere in the form of individual solid or liquid particles each of which is less than 10 microns in diameter.
Leachate	Any liquid, including any suspended components in the liquid, that has percolated through or drained from solid waste.

Major upset	an unscheduled occurrence or excursion of a process or operation that results in an emission that contravenes the regulations or standards and is beyond immediate control, or a release that is initiated to protect life in the immediate or adjacent areas.
Modification	Any physical change to, or change in the method of, an existing facility which increases the unit capacity or contribution to pollution emitted into the atmosphere OR results in an impact to the environment not previously occurring.
Modified facility	Any facility which is subject to modification as follows: a. production increases greater than 10% b. 10% increase in emissions or discharges from a facility c. new pollutants are emitted or discharged.
New facility	Any new facility/ project or plant
NOx	Oxides of nitrogen, representing nitric oxide and nitrogen dioxide.
Nuisance	An act which causes material inconvenience, discomfort or harm and is persistent and likely to re-occur.
Opacity	The degree to which an emission of air contaminants obstructs the transmission of light expressed as a percent of light obstructed as per EPA Method 21.
Operator	Any entity that operates or controls a facility at a given location to which decisive economic power over the technical functioning of the facility has been delegated.
Organic Persistent Pollutants (POPs)	Organic (carbon based) substances that persist in the environment, bio-accumulate in living tissue, and pose a risk to human health and the environment.
Point source	An individual air emission / pollutant source originating from a specific location.
POM	Polycyclic organic matter.
TEQ	Releases of dioxins and furans are reported in units of toxic equivalence (TEQ) relative to the most toxic type of dioxin, 2,3,7,8-tetrachlorodibenzo-p-dioxin.
TOC	Total organic carbon.
True vapor pressure	The vapor pressure of a volatile substance under actual conditions of storage or transfer.
Used oil	Any oil that has been refined from crude oil, or any synthetic oil, that has been used and as a result of such use is contaminated by physical or chemical impurities.
Variance Stream	A non-cooling water discharge to the seawater cooling system.
VOC	<p>Volatile Organic Compound - any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions. The following have been determined to have negligible photochemical reactivity, and are not VOCs:</p> <ul style="list-style-type: none"> methane; ethane; acetone; cyclic, branched or completely methylated siloxanes; methylene chloride (dichloromethane);

	<p>perchloroethylene (tetrachloroethylene); 1,1,1-trichloroethane (methyl chloroform); 1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113); trichlorotrifluoromethane (CFC-11); dichlorodifluoromethane (CFC-12); chlorodifluoromethane (HCHC-22); trifluoromethane (HFC-23); 1,2-dichloro 1,1,2,2-tetrafluoroethane (CFC-114); Chloropentafluoroethane (CFC-115); 1,1,1-trifluoro 2,2- dichloroethane (HCFC-123); 1,1,1,2-tetrafluoroethane (HFC-134a); 2-chloro-1,1,1,2-tetrafluoroethane (HCFC- 124); 1,1,2,2- tetrafluoroethane (HFC-134); 1,1,1 trifluoroethane (HCFC- 143a); 1,1-difluoroethane (HFC-152a); parachlorobenzotrifluoride (PCBTF); 3,3-dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca); 1,3-dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb); 1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC 43-10mee); and perfluorocarbon compounds which fall into these classes:</p> <ul style="list-style-type: none"> – cyclic, branched or linear completely fluorinated alkanes – cyclic, branched or linear completely fluorinated ethers with no unsaturations – cyclic, branched or linear completely fluorinated tertiary amines with no unsaturations – sulphur containing perfluorocarbons with no unsaturations and with sulphur bonds only to carbon and fluorine.
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APPENDIX-V

ABBREVIATIONS

MIC	Mesaieed Industrial City (Qatar Petroleum)
MIC-EA	Mesaieed Industrial City Environmental Association
MoE	Ministry of Environment
QP	Qatar Petroleum
ROPME	Regional Organization for the Protection of Marine Environment
SCENR	Supreme Council for the Environment & Natural Reserves
SWTP	Sanitary Wastewater Treatment Plant
WHO	World Health Organization

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