DUBAI MUNICIPALITY

ENVIRONMENT DEPARTMENT

ENVIRONMENT PROTECTION & SAFETY SECTION

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ENVIRONMENTAL STANDARDS AND ALLOWABLE LIMITS OF POLLUTANTS ON LAND, WATER, AND AIR ENVIRONMENT

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INTRODUCTION

Environmental Standards are set as measures of a segment of environment against waste discharges and pollution. They also serve as benchmark to which the environment is protected and in maintaining the best quality of air, water and land for the beneficial use of man at present as well as for future generations.

Wastes and pollution are the undesirable results of man's quest for convenience. Man produces goods such as clothes, cars, electronic appliances, chemicals, medicine, food, and even potable water for his own use and convenience. Once used, these goods are discarded and turned out into wastes. Wastes are also produced during the manufacture of these goods, during the extraction of fuel, and in conversion of fuel into usable form of energy. Wastes, therefore, are being generated in all stages of man's activity - wastes that cause pollution and gradually destroying our environment.

The effect of pollution could be temporary, severe or permanent depending on the concentration of pollutant present in the waste stream and on the assimilative capability of the receiving segment of environment. Each segment of environment, such as the Dubai Creek, any plot of land, workplaces inside manufacturing premises, or even the air in an enclosed commercial building has its distinct features different from the other. Each requires different degree of control or set of environmental standards.

Protection of environment requires legislative tools – legislation that defines the basis as well as the requisites of a healthy environment. The Dubai Municipality has issued the key legislation in the Local Order on the Environment Protection Regulations in the Emirate of Dubai. The Local Order prescribes not only the basics of environmental protection but it also empowers the competent department, i.e., Environment Department to further issue environmental standards and relevant guidelines for implementation.

This Bulletin features quick reference of the various environmental standards issued by the Environment Protection and Safety Section (EPSS) of the Environment Department. Tables 1 through 5 indicate the allowable and objective values with supplementary notes below each. All concerned parties, agencies and establishments operating in Dubai are required to comply with these environmental standards.

Within the context of and for the purpose of this Bulletin, the following words and phrases shall bear the meanings given opposite each unless specifically stated otherwise. These definitions shall not be interpreted for use in other issues or forum without consultation and consent from Environment Protection and Safety Section (EPSS)

DEFINITIONS

Assimilative Capability	The ability of a segment of environment to absorb and neutralize wastes without impairing the quality of the environment or harming any life forms, inflict damaged to property, or reducing the beneficial use of that segment of environment.
Emission	Means any gaseous, smoke, fumes, mist, heat, noise, particulate or airborne dust being released into the air environment.
Environment	The living ecosystem of the Emirate. It encompasses all of the external conditions and influences affecting the life, development and the survival of any lifeform. With respect to man, environment covers all the things around him including land, air, water, plants, animals or substances in the natural system, and all form of energy, as well as, the things or structures that man introduced around him such as buildings, roadways, means of transportations, machines and all form of technology.
Environment, Segment of	Is that portion of environment with or without fixed and contagious boundary such as, the air inside a building or manufacturing premises, a plot of land, a water body such as a river or creek, or the fenced environment around an industrial plant or commercial premises that has distinct features from the general environment outside of it.
Environmental Standards	Within the context of this document and pursuant to Local Order on the Environment Protection Regulations in the Emirate of Dubai, are the specified values of environment quality indicators or allowable limit of pollutants in the waste stream when discharge into a segment of environment, beyond which, it can cause pollution and impair the quality of the environment.
Pollutant	Any substance, matter or energy that impairs the quality of a segment of environment or that makes other substance or product undesirable.
Pollution	The presence of pollutant in a segment of environment at sufficient quantity or in excess of the specified environmental standards and which, over time, can cause undesirable effect on man, animals, vegetation or property. It is the state of environment being unsafe and its beneficial use has been compromised.
Sludge	The residual solids generated from treatment of wastewater. Generally it is considered a hazardous waste unless proven otherwise. It may include semi-solid residues that collect at the bottom of storage tanks or reservoir.
Waste	Any solid, liquid or gaseous matter being discharged into the environment as an excess material having no direct beneficial use to man and environment. It includes any product that is over its useful life and unwanted.
Hazardous Waste	Any waste that exhibits one or more hazardous characteristics, such as being corrosive, flammable, oxidizing, poisonous, radioactive or ecotoxic.
Wastewater	All spent water discharged from any activity of man or industrial process. For the purpose of this document it is further classified into 2 types namely; a) domestic wastewater, and b) trade wastewater.
Domestic wastewater	All water-borne human wastes, also called sewage, arising from residential premises as well as from, industrial, commercial and institutional buildings.
Trade wastewater	Any wastewater generated and discharged from industrial operations or commercial activities.

Table 1 – Dubai Wastewater Discharge Limits

INDICATORS		*Maximum Allowable Limits for Discharge to		
		Sewerage System	Land as for Irrigation	
Physico-Chemical	***Units***		**Drip**	**Spray**
Biochemical Oxygen Demand	*mg/l*	1,000	20	10
Chemical Oxygen Demand	*mg/l*	3,000	100	50
Chlorides	*mg/l*		500	350
Chlorine – residual	*mg/l*	10	Not less than 0.5 mg/l after 30 min contact time	
Cyanides as CN	*mg/l*	1	0.05	0.05
Detergents	*mg/l*	30		
Fluorides	*mg/l*		1	1
Nitrogen, ammoniacal	*mg/l*	40	5	1
Nitrogen, organic (Kjeldhal)	*mg/l*		10	5
Nitrogen, total	*mg/l*		50	30
Oil & Grease – Emulsified	*mg/l*	150		
Oil & Grease – Free oil	*mg/l*	50	5	5
pH (range)	*units*	6 – 10	6.0 – 8.0	6.0 – 8.0
Pesticides, non-chlorinated	*mg/l*	5		
Phenols	*mg/l*	50	0.1	0.1
Phosphorous (P)	*mg/l*	30	20	20
Sulfates, total	*mg/l*	500	200	200
Sulfides as S	*mg/l*	10	0.05	0.05
Surfactants	*mg/l*			
Suspended Solids (SS)	*mg/l*	500	50	10
Temperature	^0C	45 or > 5 of ambient		
Total Dissolved Solids (TDS)	*mg/l*	3,000	1,500	1,000
Metals				
Total Metals	*mg/l*	10		
Aluminum (Al)	*mg/l*		2	2
Arsenic (As)	*mg/l*	0.50	0.05	0.05
Barium (Ba)	*mg/l*		1	1
Beryllium (Be)	*mg/l*		0.1	0.1
Boron (B)	*mg/l*	2.0	2.0	2.0
Cadmium (Cd)	*mg/l*	0.3	0.01	0.01
Chromium (Cr)	*mg/l*	1.0	0.1	0.1
Cobalt	*mg/l*		0.1	0.1
Copper (Cu)	*mg/l*	1.0	0.2	0.2
Iron (Fe)	*mg/l*		2.0	2.0
Lead (Pb)	*mg/l*	1.0	0.5	0.5
Magnesium (mg)	*mg/l*		100	100
Manganese (Mn)	*mg/l*	1.0	0.2	0.2
Mercury (Hg)	*mg/l*	0.01	0.001	0.001
Molybdenum (Mo)	*mg/l*		0.01	0.01
Nickel (Ni)	*mg/l*	1.0	0.2	0.2
Selenium (Se)	*mg/l*		0.02	0.02
Silver (Ag)	*mg/l*	1.0		
Sodium (Na)	*mg/l*		500	200
Zinc (Zn)	*mg/l*	2.0	0.5	0.2
Bacteriological				
Fecal Coliforms	MPN/100 ml.	500	20	

** Discharge limits to marine environment will be determined on case basis and through a mathematical modeling study. Based on the result of the modeling study, the EPSS would issue Disposal Permit specifying the allowable limits which, in no case, shall compromise the Marine Water Quality Objectives as given in Table 2.*

Table 2 - Marine Water Quality Objectives

INDICATORS	**Sea and Coastal Zone**	**Dubai Creek**
Physico-Chemical		
BOD_5	20 mg/l	10 mg/l
Chlorine, total residual	0.01 mg/l	0.01 mg/l
Dissolved Oxygen	Not less than 5 mg/l or 90% saturation	Not less than 5 mg/l or 90% saturation
Nitrogen -ammonia (NH_3-N)	0.1 mg/l	0.1 mg/l
Nitrogen – nitrate	0.5 mg/l	0.5 mg/l
Nitrogen- total	2.0 mg/l	2.0 mg/l
Petroleum hydrocarbons	0.001 mg/l (aromatic fraction)	0.001 mg/l (aromatic fraction)
pH	1 pH unit from ambient level	1 pH unit from ambient level
Phosphate-Phosphorus	0.05mg/l	0.05mg/l
Temperature	2 ^{0}C from background level	2 ^{0}C from background level
Total Dissolved Solids	2% from background levels	2% from background levels
Turbidity/Color	75 NTU or none that will reduce light penetration by more than 20% from background levels.	75 NTU or none that will reduce light penetration by more than 20% from background levels.
Surfactants	0.02 mg/l	0.02 mg/l
Suspended Solids	10 mg/l mean 25 mg/l maximum	10 mg/l mean 15 mg/l max.
Trace Metals		
Aluminium	0.2 mg/l	0.2 mg/l
Arsenic	0.01 mg/l	0.01 mg/l
Cadmium	0.003 mg/l	0.003 mg/l
Chromium	0.01 mg/l	0.01 mg/l
Copper	0.005 mg/l	0.005 mg/l
Iron	0.2 mg/l	0.2 mg/l
Mercury	0.001 mg/l	0.001 mg/l
Zinc	0.02 mg/l	0.02 mg/l
Bacteriological		
Bacteria (E. Coli)	200 Organisms per 100 ml water	200 Organisms/100 ml water

i) The following are prohibited for discharge into the water environment of Dubai:

- Pesticides and herbicides.
- Oil and/or solvent waste.
- Radioactive waste.
- Residues from the removal of TBT anti-fouling paints.

ii) Any person, commercial establishment or industrial facility discharging waste into the water environment must obtain Permit from EPSS. The Permit would specify the maximum allowable concentrations of substance/pollutant in the waste stream, and taking into consideration of the source, the discharged waste shall not lead to:

- Visible floating particulates, grease or oil.
- Aesthetically undesirable discoloration in the receiving waters.
- Visible residual effects in water or on beaches, rocks or onsite structures.
- Objectionable odors emanating from receiving waters at point of disposal.
- Alteration of the natural taste, odor, color and overall quality of marine resources used for human consumption.
- Objectionable aquatic growth, which degrades indigenous biota.
- Alteration of organic matter in adjacent sediments, which may lead to the degradation of benthic marine life.

iii) All discharge point to the water environment must be located 1 meter below the lowest low water level and all discharges must be equipped with a sampling point to provide an access for taking representative samples of the waste being discharged.

Table 3 – Limits of Trace Metals in Sludge Intended for Disposal on Land*

Parameters	Maximum Limits (mg/kg)	10 year cumulative loading on land (kg/hectare)
Cadmium	30	20
Chromium	1,000	200
Cobalt	100	30
Copper	1,000	50
Lead	1,000	125
Mercury	10	5
Molybdenum	20	5
Nickel	200	100
Zinc	1,000	250

N.B.
** Where disposal is for the purpose of soil conditioning as in the use of compost or fertilizer for agricultural activity. In any case, disposal to land must have prior written approval from EPSS.*

Table 4 – Land Contamination Indicator Levels

Indicator	****Concentration (mg/kg)**
Arsenic	50
Barium	400
Cadmium	5
Chromium	250
Copper	100
Lead	200
Manganese	700
Mercury	2
Selenium	2
Zinc	500
Pesticides (total)	2
Cyanide	10
Fluoride	500
Phenol	1
Benzene	1
BTEX (total)	100
Chlorinated Hydrocarbons	1
Polychlorinated Biphenyls	0.5
Total Petroleum Hydrocarbons < C9 > C9	 1,000 10,000

N.B.
*** Depending on the source, location and intended land use, the EPSS may specify stringent level where the health of expected receptors will be at risk or to maintain the background quality of the site.*

Table 5 – Allowable Emission Limits From Stationary Sources

Waste	**Sources to which limit is applicable**	**Emission limits***	**Notes**
Visible emissions	Combustion sources Other sources	Ringlemann 1 or 20% opacity No visible emissions	1. Does not apply to emissions of water vapor and a reasonable period for cold startup, shutdown or emergency operation 1. as above
Total Particulate Matter	All combustion sources Large sources	0.25 g/Nm^3 0.1 g/Nm3	Gas Volumes calculated to 12% CO_2
Sulfuric acid mist and sulfur trioxide	All sources	0.1 g/Nm^3 as SO_3	
Sulfur dioxide	All fuel burning sources	0.50 g/Nm^3	
Hydrogen sulfide	All sources	5 mg/Nm^3	
Oxides of Nitrogen	Fuel burning units having a gross heat input above 100,000 MJ, excluding glass furnaces Gas turbines for power generation Power generation by other fuels	0.35 g/Nm^3 for gaseous fuels 0.5 g/Nm^3 for liquid fuels 0.07 g/Nm^3 for gaseous fuels 0.15 g/Nm^3	@ 7% O_2 reference Not applicable to small units less than 30MW and @ 15 % O_2 Reference
Carbon Monoxide	All Stationary sources	1.5 g/Nm^3	
Lead and its compounds	All stationary sources	10 mg/Nm3 as Pb	
Fluorine compounds	Aluminum smelters All other sources	0.02 g/Nm^3 0.05 g/Nm^3	
Chlorine & Chlorine compounds	All stationary sources	0.2g/Nm^3 as Cl_2	
Metal fumes in total	All stationary sources	10mg/Nm^3	Excluding iron oxide fume
Iron Oxide fume	Iron and steel foundries.	0.1 g/Nm^3	

N.B.

***** As may be required by EPSS, all Proponents and/or Owners of emission sources are required to carry out air quality mathematical modeling study. The scope of study varies according to source and on case basis. Based on the result of the modeling study, EPSS then will specify the allowable emission limits of the source being studied.

Further information on environmental matters is available at EPSS office on phone no: (+9714) 2064244, or fax no: 2270160 or through email address: ***rhsalman@dm.gov.ae***

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