

## Guidelines – Water Environment

Issued by: Inspection Department – Operations Section

- 1.0 Water Environment General Guidelines
  - 1.1 All the A.C drains to be discharged into a properly designed soak-pit.
  - 1.2 Septic tank details shall comply with PCFC standard guidelines (See relevant EG).
  - 1.3 A linear soak-away (see relevant EG) to be adopted for all areas in the Free Zone without PCFC sewerage facilities.
  - 1.4 The area above the linear soak-away to be utilized for plantation purposes only and it should not be compacted to maintain the permeability of the soil as well as to prevent the soak-away from any damage. The number of branches and dimensions of the linear soak-away shall be checked by Health, Safety and Environment Section prior to backfilling.
  - 1.5 Proper treatment plants to be constructed for the industrial waste effluent to meet PCFC harbour standards.
  - 1.6 Periodic sampling and analysis of final waste effluent should be carried out for those companies discharging to the harbour/open sea. Any sampling/analysis of wastewater effluent should be carried out by a third party laboratory.
  - 1.7 The drain from the compressor to be connected to a proper holding tank of suitable capacity for testing/further assessment and the same to be shown in the drainage layout drawing.
  - 1.8 A 2 mm mesh to be provided for all the wash basins in the restaurant.
  - 1.9 A proper Wade Actimatic grease trap should be installed for restaurants/canteens
  - 1.10 Groundwater Monitoring Wells should be installed as per PCFC guideline (see relevant EG).
  - 1.11 Surface impoundments and storage tanks of trade waste (non-volatile) shall be designed to prevent the potential leakage. Use of impermeable (2mm HDPE) liner is mandatory.
- 2.0 Treated Wastewater Disposal in Harbour

PCFC discourages disposal of treated wastewater in to the marine environment as a matter of policy. However, if an industrial liquid waste can be treated so as to meet the criteria for marine



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disposal then on a case-by-case basis the effluent may be assessed /evaluated by Trakhees Inspection Department – Operations Section for disposal to the harbour. Otherwise, industrial liquid effluents, hazardous or non-hazardous, have to be sent to the Dubai Municipality's disposal systems, with or without pre-treatment as decided by the Municipality. Samples, analyses and rates of production have to be submitted to the Municipality and forms have to be completed for decision as to where the effluents may be taken for disposal, either to the sewerage system or to the Jebel Ali waste site, if accepted. Relevant criteria which have to be met for disposal to the Municipality sewage treatment plant. The Municipality will issue certificates to companies and the Authority must issue gate passes to carriers to enable them to leave the Free Zone with their loads and be acceptable at the disposal sites. Industries should ensure that at least two days storage capacity of waste water is available on site, as contingency plan in the event that the wastewater cannot be removed as planned.

### 3.0 Elements to be Taken into Account in the Issue of the Authorization for Discharge of Treated Waste into Harbour

With a view to the issue of an authorization for the discharges of treated waste containing chemical substances, particular account will be taken, as the case may be, of the following factors:

#### 3.1 Characteristics and Composition of the Discharges

- a. Type and size of point or diffuse source (e.g., industrial process)
- b. Type of discharges (e.g., origin, average composition)
- c. State of wastes (e.g., solid, liquid, sludge, slurry)
- d. Total amount (volume discharged, e.g., per year)
- e. Discharge pattern (continuous, intermittent, seasonally variable, etc.)
- f. Concentrations with respect to relevant constituents of substances as appropriate
- g. Physical, chemical and biochemical properties of the waste discharges

#### 3.2 Characteristics of Discharge Constituents with Respect to their Harmfulness

- a. Persistence (physical, chemical, biological) in the marine environment
- b. Toxicity and other harmful effects
- c. Accumulation in biological materials or sediments
- d. Biochemical transformation producing harmful compounds



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- e. Adverse effects on the oxygen content and balance
- f. Susceptibility to physical, chemical and biochemical changes and interaction in the aquatic environment with other seawater constituents which may produce harmful biological or other effects on any of the users listed in section 3.5 below

### 3.3 Characteristics of Discharge Site and Receiving Environment

- a. Hydrographic meteorological, geological and topographical characteristics of the coastal area
- b. Location and type of the discharge (outfall, canal, outfall, etc.) and its relation to other areas (such as amenity areas, spawning, nursery and fishing areas, shellfish grounds) and other discharges
- c. Initial dilution achieved at the point of discharge into the receiving environment
- d. Dispersion characteristics such as effects of currents, tides and wind on horizontal transport and vertical mixing
- e. Receiving water characteristics with respect to physical, chemical, biological and ecological conditions in the discharge area
- f. Capacity of the receiving marine environment to receive waste discharges without undesirable effects

### 3.4 Availability of Waste Technologies

- a. Alternative treatment process
- b. Re-use or elimination methods
- c. On-land disposal alternatives
- d. Appropriate low-waste technologies

### 3.5 Potential Impairment of Marine Ecosystems and Seawater Uses

- a. Effects on human health through pollution impact on edible marine organisms, bathing waters and aesthetics.
- b. Effects on marine ecosystem, in particular the living resources, endangered species and critical habitats



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c. Effects on other legitimate users of the sea

### 4.0 Wastewater Criteria at Point of Discharge to Marine Environment / Harbour: Standards for Discharge of Wastewater to Harbour

PARAMETERS <sup>(2)</sup>	SYMBOL	UNIT	MAXIMUM ALLOWABLE STANDARD <sup>(7)</sup>
<i>Physical Properties</i>			
Color	-	Color units	50
Total Suspended Solids	TSS	mg / l	50
Floating Particles	-	mg / m <sup>3</sup>	None

pH	-	pH units	6-9 <sup>(6)</sup>
Temperature <sup>(3)</sup>	T	°C	35 – maximum
Total Dissolved Solids	TDS	mg / l	1,500
Turbidity	-	NTU	75
<i>Inorganic Chemical Properties</i>			
Ammonia Total as (N)	NH <sub>4</sub> <sup>+</sup>	mg / l	2
Biochemical Oxygen Demand	BOD <sub>5</sub>	mg / l	50
Chemical Oxygen Demand	COD	-	100
Chlorine Residual <sup>(4)</sup> Total	Cl <sup>-</sup>	mg / l	1.0
Dissolved Oxygen <sup>(5)</sup>	DO	mg / l	> 3
Nitrate	NO <sub>3</sub> -N	mg / l	40
Sulfide	S <sup>-2</sup>	mg / l	0.1
Total Kjeldahl Nitrogen as (N)	TKN	mg / l	10
Total Phosphorous as (P)	PO <sub>4</sub> <sup>-3</sup>	mg / l	2
<i>Trace Metals</i>			
Aluminum	Al	mg / l	20
Antimony	Sb	mg / l	0.1
Arsenic	As	mg / l	0.05
Barium	Ba	mg / l	2
Beryllium	Be	mg / l	0.05
Cadmium	Cd	mg / l	0.05
Cyanide	CN	mg / l	0.05



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Chromium, total	Cr	mg / l	0.2
Chromium, VI	Cr <sup>+6</sup>	mg / l	0.15
Cobalt	Co	mg / l	0.2
Copper	Cu	mg / l	0.5
Iron	Fe	mg / l	2
Fluoride	F	mg / l	25
Lead	Pb	mg / l	0.1
Manganese	Mn	mg / l	0.2
Mercury	Hg	mg / l	0.001
Nickel	Ni	mg / l	0.1
Selenium	Se	mg / l	0.02
Silver	Ag	mg / l	0.005
Zinc	Zn	mg / l	0.5

<i>Organic Chemical Properties</i>			
Halogenated Hydrocarbons and Pesticides		mg/l	Nil
Hydrocarbons	HC	mg/l	15
Oil & Grease	O & G	mg/l	10
Phenols	-	mg/l	0.1
Solvent	-	mg/l	none
Total Organic Carbon	TOC	mg/l	75
<i>Biological Properties</i>			
Colon Group	TC	No. / 100 cm <sup>2</sup>	5,000
Egg Parasites	-	-	None
Fecal Coliform Bacteria	-	Cells / 100 mL	1,000
Total Coliform	-	MPN / 100 mL	1,000
Warm Parasites	-		None

Notes:

- 1) Any discharge to surface drainage must be authorized by JAFZA and shall only be permitted in exceptional circumstances.
- 2) For any parameters not identified, specific standards will be determined on a case-by-case basis.



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- 3) The temperature increment standard for harbour discharge applies to treated wastewater/cooling water discharges.
- 4) Chlorine residual is after 30 minutes contact and is total residual chlorine
- 5) Dissolved oxygen requirement is a minimum concentration requirement
- 6) Inclusive range not to be exceeded.
- 7) With respect to Harbour Discharge Standard, FZ Companies should concentrate on full compliance of Harbour Discharge Standard.

### 5.0 Wastewater Pre-treatment Criteria for Industrial Effluent into Dubai Municipality Sewerage System

Parameters	Maximum Limit (mg / L or as noted)
<i>Physico – Chemical</i>	
Biochemical Oxygen Demand	1,000
Chemical Oxygen Demand	3,000
Chlorine – Residual	10
Cyanides as CN	1
Detergents	30
Ammoniacal Nitrogen	40
Oil and Grease – Emulsified	150
Oil and Grease – Free Oil	50
pH (range)	6.0 – 10.0
Pesticides – Non-chlorinated	5
Phenols	50
Phosphorus (P)	30
Sulfates – Total	500
Sulfides as S	10
Suspended Solids (SS)	500
Temperature	45°C or > 5°C of ambient
Total Dissolved Solids (TDS)	3,000
<i>Metals</i>	
Total Metals	10
Arsenic (As)	0.50
Boron (B)	2.0
Cadmium (Cd)	0.3



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Chromium (Cr)	1.0
Copper (Cu)	1.0
Lead (Pb)	1.0
Manganese (Mn)	1.0
Mercury (Hg)	0.01
Nickel (Ni)	1.0
Silver (Ag)	1.0
Zinc (Zn)	2.0
<i>Bacteriological</i>	
Fecal Coliforms	500 MPN / 100 ml

Notes:

- Parameters which will change if wastewater, after treatment, is not used for irrigation.
- A well-drained sandy soil is assumed for irrigation water receiving areas which will not be used for forage.
- Inclusive range not to be exceeded.
- The total amount of the above metals shall not exceed ten (10) mg/l of effluent.
- Zinc equivalent is defined as the sum of the concentrations in milligrams per liter of the following after application of toxicity factors.

Toxicity Factors:

$$\text{Zn} = \text{X1}$$

$$\text{Cu} = \text{X2}$$

$$\text{Ni} = \text{X3}$$

$$\text{Zinc equivalent} = 1\text{X (Zn)} + 2\text{X (Cu)} + 3\text{X (Ni)}$$

- The effluent shall not at any time include the following substances:
  - 1 : Calcium Carbide
  - 2 : Compounds which in its state or in combination produce in the sewers an inflammable or toxic vapor
  - 3 : Chlorinated Hydrocarbon or related compounds
  - 4 : Radioactive Materials
  - 5 : Volatile Petroleum Products