Lao People's Democratic Republic
Peace Independence Democracy Unity Prosperity

Prime Minister's Office
Water Resources and Environment Administration No2734 /PMO.WREA
Vientiane Province, dated 7 Dec 2009

Agreement on the National Environmental Standards

- Based on the Environmental Protection Law No. 02/99/NA, dated 3 April 1999.
- Based on decree on mandate of Water Resources and Environmental Administration dated 149/PM, dated 10 May 2007.

Minister to Prime Minister's Office,
Head of Water Resources and Environment Administration agreed that:

Chapter I
General Provisions

Article 1: Objective

This Agreement defines the National Environmental Standards as the basis for environmental monitoring and pollution control on water, soil, air and noise.

Article 2: Definitions

Ambient Environmental Standard means a value which specifies the quality of the ambient environment in terms of concentration or level of a parameter in an environmental media, generally soil, water, air and noise.

Emission Standard means a value which specifies the concentration or level of a parameter as the acceptable emission emitted from a source.

Pollution means chemical, toxic, hazardous, substances, radiation, dust, smoke, noise, smell, vibrations and heat contaminated in the air, water and soil with excessive concentration specified in the National Environmental Standards, which resulted from human activity or nature that may be harmful to human health, animal, biodiversity and other natural environments.

Concentration means the quantity of a chemical substance contaminated in water, soil or air and level of noise calculated according to measurement unit (E.g. weight per volume).

Parameters means indicators used to measure the level of concentration against the standards. The result of measurement could be shown in either numeric or alpha form.

Article 3: Scope of Application

This Agreement applies to any relevant person, enterprise and organization in order to protect the environment and to control pollution in Lao PDR.

Chapter II
Type of National Environmental Standards

Article 4: Ambient Standards

4.1 Water Quality Standards includes: drinking water standards, drinking water in covered container standards, groundwater standards and surface water standards.

4.1.1 Drinking Water Quality Standards

A. Bacteriological Parameters

Parameters	Units	Concentration
Faecal Coliform	MPN/100ml	0
Total Coliform	MPN/100ml	<2.2
Entero virus	MPN/100ml	0

B. Physical -Chemical Parameters

No.	Parameters	Symbol	Unit	Concentration	
				Minimum	Maximum
1	Aluminum	Al	mg/l	0.1	0.2
2	Ammonia	NH_3	mg/l	0.5	1.5
3	Chloride	Cl^-	mg/l	200	250
4	Copper	Cu	mg/l	1.0	2.0
5	Iron	Fe	mg/l	0.3	<1
6	Manganese	Mn	mg/l	0.1	0.5
7	Sodium	Na	mg/l	200	250
8	Sulphate	SO_4^{2-}	mg/l	200	250
9	Hydrogen Sulphide	H_2S	mg/l	0.05	0.1
10	Conductivity	Ec	µs/cm	-	<1,000
11	Total dissolved solids	TDS	mg/l	500	600
12	Sodium Chloride	NaCl	mg/l	100	300-350
13	Potential of Hydrogen	pH	-	6.5	8.5
14	Temperature	T	^0C	25	35
15	Hardness	-	mg/l	50	300
16	Turbidity	-	NTU	-	<10
17	Taste and Odour	-	-	-	Acceptable
18	Colour	-	TCU	-	5
19	Residual Chloride (if Chlorine disinfection is used)	Cl_2	mg/l	-	<0.2

C. Health Significant Chemical Parameters

No.	Parameters	Symbol	Unit	Maximum Concentration
1	Antimony	Sb	mg/l	0.005
2	Arsenic	As	mg/l	0.01-0.05
3	Barium	Ba	mg/l	0.7
4	Boron	B	mg/l	0.50
5	Cadmium	Cd	mg/l	0.003
6	Chromium	Cr	mg/l	0.05

No.	Parameters	Symbol	Unit	Maximum Concentration
7	Cyanide	CN^-	mg/l	0.07
8	Fluoride	F^-	mg/l	1.5
9	Lead	Pb	mg/l	0.01
10	Mercury	Hg	mg/l	0.001
11	Nitrate	NO^-_3	mg/l	50
12	Nitrite	NO^-_2	mg/l	3
13	Selenium	Se	mg/l	0.01

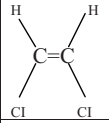
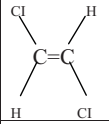
D. Priority Parameters

No.	Parameters	Symbol	Unit	Maximum Concentration
1	Iron	Fe	mg/l	<1
2	Manganese	Mn	mg/l	<0.5
3	Arsenic	As	mg/l	<0.05
4	Fluoride	F^-	mg/l	<1.5
5	Nitrate	NO_3^-	mg/l	50
6	Nitrite	NO_2^-	mg/l	3
7	Nitrite Nitrogen	NO_2^-N	mg/l	1
8	Potential of Hydrogen	pH	-	6.5-8.5
9	Coliform	-	MPN/100ml	0
10	Conductivity	Ec	µs/cm	1000
11	Residual Chloride (if Chlorine disinfection is used)	Cl_2	mg/l	0.2
12	Total Hardness	-	mg/l	<300
13	Turbidity	-	NTU	<10
14	Taste and Odour	-	-	Acceptable

4.1.2 Drinking Water Quality in Covered Container

No.	Parameters	Symbol	Unit	Permitted Concentration
1	Arsenic	As	mg/l	0.01-0.05
2	Barium	Ba	mg/l	0.7
3	Boron	B	mg/l	0.5
4	Cadmium	Cd	mg/l	0.003
5	Chromium	Cr	mg/l	0.05
6	Copper	Cu	mg/l	2
7	Fluoride	F^-	mg/l	1.5
8	Lead	Pb	mg/l	0.01-0.05
9	Manganese	Mn	mg/l	0.5
10	Mercury	Hg	mg/l	0.001
11	Nitrate	NO_3^-	mg/l	50
12	Iron	Fe	mg/l	0.3
13	Potential of Hydrogen	pH	-	6.5-8.5
14	Hardness	-	mg/l	100-300

4.1.3 Groundwater Quality Standards

No.	Substances	Symbol	Unit	Standard Value	Method of Measurement
I. Volatile Organic Compound					
1	Benzene	C_6H_6	mg/l	0.005	Purge and Trap Gas Chromatography or Purge and Trap Gas Chromatography/ Mass Spectrometry
2	Carbon Tetrachloride	CCI_4	mg/l	0.005	
3	1.2-Dichloroethane	CH_2CI-CH_2CI	mg/l	0.005	
4	1.1-Dichloroethylene	$CCI_2=CH_2$	mg/l	0.007	
5	Cis-1.2-Dichloroethylene		mg/l	0.070	
6	Trans-1.2-Dichloroethylene		mg/l	0.1	
7	Dichloromethane	CH_2CI_2	mg/l	0.005	
8	Ethly benzene	C_6H_5-C_2H_5	mg/l	0.7	
9	Styrene	C_6H_5-$CH=CH_2$	mg/l	0.1	
10	Tetrachloroethylene	$CI_2C=CCI_2$	mg/l	0.005	
11	Toluene	C_6H_5-CH_3	mg/l	1	
12	Trichloroethylene	$CI_2C=CHCI$	mg/l	0.005	
13	1.1.1 Trichloroethane	CI_3C-CH_3	mg/l	0.2	
14	1.1.2 Trichloroethane	CI_2CH-CH_2CI	mg/l	0.005	
15	Total Xylenes	o, m, p (CH_3-C_6H_4-CH_3)	mg/l	10	
II. Heavy Metals					
1	Cadmium	Cd	mg/l	0.003	Direct Aspiration/ Absorption Spectrometry or Inductively Coupled Plasma/Plasma Emission Spectroscopy
2	Hexavalent Chromium	Cr^{+6}	mg/l	0.05	
3	Copper	Cu	mg/l	1	
4	Lead	Pb	mg/l	0.01	
5	Manganese	Mn	mg/l	0.5	
6	Nickel	Ni	mg/l	0.02	
7	Zinc	Zn	mg/l	5	
8	Arsenic	As	mg/l	0.01	Hydride Generation/ Atomic Absorption Spectrometry or Inductively Coupled Plasma/ Plasma Emission Spectroscopy
9	Selenium	Se	mg/l	0.01	
10	Mercury	Hg	mg/l	0.001	Cold-Vapour Atomic Absorption Spectrometry/ Plasma Emission Spectroscopy
III. Pesticides					
1	Chlordane	$C_{10}H_5CI_8$	mg/l	0.0002	Liquid-Liquid Extraction

No.	Substances	Symbol	Unit	Standard Value	Method of Measurement
2	Dieldrin	$C_{12}H_8Cl_6O$	mg/l	0.00003	Gas Chromatography/ Mass Spectrometry or Liquid-Liquid Extraction Gas Chromatography (Method I)
3	Heptachlor	Cl_7	mg/l	0.0004	
4	Heptachlor Epoxide	-	mg/l	0.0002	
5	DDT	DDT	mg/l	0.002	
6	2,4 D	2, 4 D	mg/l	0.03	Liquid-Liquid Extraction Gas Chromatography
7	Atrazine	$C_8H_{14}ClN_5$	mg/l	0.003	
8	Lindane	C_6Cl_6	mg/l	0.0002	Liquid-Liquid Extraction Gas Chromatography (Method I)
9	Pentachlorophenol	$Cl_5C_6H_5OH$	mg/l	0.001	Liquid-Liquid Extraction Chromatography or Liquid-Liquid Extraction Gas Chromatography/ Mass Spectrometry
IV. Others					
1	Benzo (a) pyrene	-	mg/l	0.0002	Liquid-Liquid Extraction Chromatography or Liquid-Liquid Extraction Gas Chromatography/ Mass Spectrometry
2	Cyanide	CN^-	mg/l	0.2	Pyridine Barbituric Acid or Colorimetric or Ion Chromatography
3	PCBs	PCB	mg/l	0.0005	Liquid-Liquid Extraction Gas Chromatography (Method II)
4	Vinyl Chloride	CH_2 =CHCl	mg/l	0.002	Purge and Trap Gas Chromatography or Purge and Trap Gas Chromatography/ Mass Spectrometry

4.1.4 Groundwater Standards for Drinking Purposes

Characteristics	Parameters	Symbol	Unit	Permitted Standard Value	
				Suitable	Maximum
Physical	1. Colour	-	Platinum-Cobalt (Pt-Co)	5	15
	2. Turbidity	-	JTU	5	20
	3. Potential of Hydrogen	pH	-	7.0-8.5	6.5-9.2
Chemical	4. Iron	Fe	mg/l	≤0.5	1
	5. Manganese	Mn	mg/l	≤0.3	0.5
	6. Copper	Cu	mg/l	≤1.0	1.5
	7. Zinc	Zn	mg/l	≤5.0	15
	8. Sulphate	SO_4^{2-}	mg/l	≤200	250
	9. Chloride	Cl^-	mg/l	≤250	600
	10. Fluoride	F^-	mg/l	≤0.7	1
	11.Nitrate	NO_3^-	mg/l	≤15	45
	12. Total Hardness as CaCO3	Total $CaCO_3$	mg/l	≤300	500

Characteristics	Parameters	Symbol	Unit	Permitted Standard Value	
	CaCO3				
	13.Non-carbo-nate hardness as CaCO3	Non $CaCO_3$	mg/l	≤200	250
Toxic chemical substances	14. Total solids	TS	mg/l	≤600	1,200
	15. Arsenic	As	mg/l	None	0.05
	16. Cyanide	CN^-	mg/l	None	0.1
	17. Lead	Pb	mg/l	None	0.05
	18. Mercury	Hg	mg/l	None	0.001
	19. Cadmium	Cd	mg/l	None	0.01
	20. Selenium	Se	mg/l	None	0.01
Bacteria	21. Coliform bacteria	Coliform	MPN/100 ml	<2.2	<2.2
	22. E. coli bacteria	E. coli	-	None	None
	23. Standard plate count	-	Colonies/ml	≤500	-

4.1.5 Surface Water Quality Standards

No	Substances	Symbol	Unit	Standard Value	Method of Measurement
1	Colour, Odour and Taste	-	-	N	-
2	Temperature	t	°C	N'	Thermometer
3	Potential of Hydrogen	pH	-	5-9	Electronic pH Meter
4	Dissolved Oxygen	DO	mg/l	6	Azide Modification
5	COD	COD	ml/l	5	Potassium permanganate
6	BOD_5	BOD_5	mg/l	1,5	Azide Modification at 20 degree C, 5 days
7	Total Coliform Bacteria	Coliform Bacteria	MPN/100 ml	5000	Multiple Tube Fermentation
8	Faecal Coliform Bacteria	Faecal Coliform	MPN/ 100 ml	1000	
9	Nitrate-Nitrogen	NO_3-N	mg/l	<5.0	Cadmium Reduction
10	Ammonia-Nitrogen	NH_3-N	mg/l	0.2	Distillation Nesslerization
11	Phenols	C_6H_3-OH	mg/l	0.005	Distillation, 4-Amin anti-pyrenne
12	Copper	Cu	mg/l	0.1	Atomic Absorption Direct Aspiration
13	Nickel	Ni	mg/l	0.1	
14	Manganese	Mn	mg/l	1.0	
15	Zinc	Zn	mg/l	1.0	
16	Cadmium	Cd	mg/l	0.005	
17	Chromium, Hexavalent	Cr^{6+}	mg/l	0.05	
18	Lead	Pb	mg/l	0.05	
19	Mercury	Hg	mg/l	0.002	Atomic Absorption Cold Vapour

No	Substances	Symbol	Unit	Standard Value	Method of Measurement
20	Arsenic	As	mg/l	0.01	Atomic Absorption Direct Aspiration
21	Cyanide	CN^-	mg/l	0.005	Pyridine-Barbituric
22	Alpha ¬Radioactive	α	Becquere l/l	0.1	Counting machine
23	Beta ¬ Radioactive	β	Becquere l/l	1.0	
24	Total Organochlorine	-	mg/l	0.05	Gas Chromatography
25	DDT	$C_{14}H_9Cl_5$	mg/l	1.0	
26	Alpha -BHC	αBHC	mg/l	0.02	
27	Dieldrin	$C_{12}H_8Cl_6O$	mg/l	0.1	
28	Aldrin	-	mg/l	0.1	
29	Heptachlor and Heptachlor Epoxide	-	mg/l	0.2	
30	Endrin	-	mg/l	None	

4.2 Soil Quality Standards

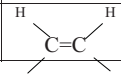
4.2.1 Soil Quality Standards for Residential and Agriculture

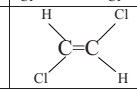
No.	Substances	Symbol	Unit	Standard Value	Method of Measurement
I. Volatile Organic Compound					
1	Benzene	C_6H_6	mg/kg	0.5	Gas Chromatography or Gas Chromatography/. Mass Spectrometry (GC/MS) or other methods approved by WREA
2	CarbonTetrachloride	CCI_4	mg/kg	89	
3	1,2 Dichloroethane	CH_2CI-CH_2CI	mg/kg	230	
4	1,1 Dichloroethylene	CCI_2=CH_2	mg/kg	1,700	
5	Cis 1,2 Dichloroethylene	CHCl=CHCl	mg/kg	57	
6	Trans-1.2-Dichloroethylene	CHCl=CHCl	mg/kg	520	
7	Dichloromethane	CH_2CI_2	mg/kg	28	
8	Ethly benzene	lC_2ClC-CH_3	mg/kg	630	
9	Styrene	C_6H_5-$CH=CH_2$	mg/kg	8.4	
10	Tetrachloroethylene	C_2Cl_4	mg/kg	210	
11	Toluene	C_6H_5-CH_3	mg/kg	6.5	
12	Trichloroethylene	CI_2C=CHCl	mg/kg	2.5	
13	1.1.1 Trichloroethane	CI_3C-CH_3	mg/kg	3.5	
14	1.1.2 Trichloroethane	CI_2CH-CH_2CI	mg/kg	43	
15	Total Xylenes	(CH_3-C_6H_4-CH_3)	mg/kg	63	
II. Heavy Metals					
1	Arsenic	As	mg/kg	3.9	Inductively Coupled Plasma-Atomic Emission Spectrometry or Inductively Coupled Plasma-Mass Spectrometry or Atomic Absorption, Gaseous Hydride or Atomic Absorption, Borohydride Reduction or other Methods Approved
2	Cadmium and its compounds	Cd	mg/kg	37	

No.	Substances	Symbol	Unit	Standard Value	Method of Measurement
					by WREA
3	Hexavalent Chromium	Cr^{+6}	mg/kg	300	Coprecipitation or Colorimetric or Chelation/ Extraction or other Methods Approved by WREA
4	Lead	Pb	mg/kg	400	Inductively Coupled Plasma-Atomic Emission Spectrometry or Inductively Coupled Plasma-Mass Spectrometry or Atomic Absorption, Direct Aspiration or Atomic Absorption, Furnace Techniques or other Methods Approved by WREA
5	Manganese and its compounds	Mn	mg/kg	1,800	
6	Mercury and its compounds	Hg	mg/kg	23	Cold-Vapour Technique or other Methods Approved by WREA
7	Nickel, soluble salts	Ni	mg/kg	1,600	Inductively Coupled Plasma-Atomic Emission Spectrometry or Inductively Coupled Plasma-Mass Spectrometry or Atomic Absorption, Direct Aspiration or Atomic Absorption, Furnace Techniques or other Methods Approved by WREA
8	Selenium	Se	mg/kg	390	
III. Pesticides					
1	Atrazine	$C_8H_{14}CIN_5$	mg/kg	22	Gas Chromatography or other Methods Approved by WREA
2	Chlordane	-	mg/kg	16	Gas Chromatography/ Mass Spectrometry (GC/MS) or other Methods Approved by WREA
3	2,4 D	-	mg/kg	690	Gas Chromatography or High Performance Liquid Chromatography/ Thermal Extraction/ Gas Chromatography/Mass Spectrometry (TE/GC/MS) or other Methods Approved by WREA
4	DDT	DDT	mg/kg	17	Gas Chromatography or Gas Chromatography/ Mass Spectrometry (GC/MS) or other Methods Approved by WREA
5	Dieldrin	$C_{12}H_8Cl_6O$	mg/kg	0.3	
6	Heptachlor	Cl_7	mg/kg	1.1	
7	Heptachlor Epoxide	-	mg/kg	0.5	
8	Lindane	-	mg/kg	4.4	
IV. Others					
1	Benzo(a)pyrene	-	mg/kg	0.6	Gas Chromatography/ Mass Spectrometry (GC/MS) or Thermal Extraction Gas Chromatography/ Mass Spectrome-

No.	Substances	Symbol	Unit	Standard Value	Method of Measurement
					try (TE/GC/MS)Chromato-graphy/ Fourier Transform Infrared (GC/FT-IR) Spec-trometry or other Methods Approved by WREA
2	Cyanide and its compounds	CN^-	mg/kg	11	Total and Amenable Cyanide: Distillation, or Total Amenable Cyanide (Automated Colorimetric, with off-line Distillation), or Cyanide Extraction Procedure for Solids and Oils or other Methods Approved by WREA
3	PCBs	-	mg/kg	2.2	Gas Chromatography or other Methods Approved by WREA
4	Vinyl Chloride		mg/kg	1.5	Gas Chromatography or Gas Chromatography/ Mass Spectrometry (GC/MS) or other Methods Approved by WREA

A. Soil Quality Standards for Other Purposes

No.	Substances	Symbol	Unit	Standard Value	Method of Measurement
I. Volatile Organic Compound					
1	1,1 Dichloroethylene	$CCl_2=CH_2$	mg/kg	0.5	Gas Chromatography or Gas Chromatography/ Mass Spectrometry (GC/MS) or other methods approved by WREA
2	Dichloromethane	CH_2Cl_2	mg/kg	89	
3	Ethly benzene	$C_6H_5–C_2H_5$	mg/kg	230	
4	Styrene	C_6H_5-$CH=CH_2$	mg/kg	1,700	
5	Tetrachloroethylene	$Cl_2C=CCl_2$	mg/kg	57	
6	Toluene	$C_6H_5–CH_3$	mg/kg	520	
7	Trichloroethylene	$Cl_2C=CHCl$	mg/kg	28	
8	1,1,1 Trichloroethane	$Cl_2ClC-CH_3$	mg/kg	630	
9	1,1,2 Trichloroethane	Cl_2CH-CH_2Cl	mg/kg	8.4	
10	Total Xylenes	*o, m, p* (CH_3-$C_6H_4CH_3$)	mg/kg	210	
11	Benzene	C_6H_6	mg/kg	6.5	
12	Carbon Tetrachloride	CCl_4	mg/kg	2.5	
13	1,2 Dichloroethane	CH_2Cl-$CHCl$	mg/kg	3.5	
14	Cis 1,2 Dichloroethylene		mg/kg	43	

No.	Substances	Symbol	Unit	Standard Value	Method of Measurement
15	Trans 1,2 Dichloroethylene		mg/kg	63	
II. Heavy Metals					
1	Arsenic	As	mg/kg	27	Inductively Coupled Plasma-Atomic Emission Spectrometry or Inductively Coupled Plasma-Mass Spectrometry or Atomic Absorption Furnace Technique or Atomic
2	Cadmium and its compounds	Cd	mg/kg	810	
3	Hexavalent Chromium	Cr^{+6}	mg/kg	640	Co precipitation or Colorimetric or Chelation/Extraction or other Methods Approved by WREA
4	Lead	Pb	mg/kg	750	Inductively Coupled Plasma-Atomic Emission Spectrometry or Inductively Coupled Plasma-Mass Spectrometry or Atomic Absorption, Direct Aspiration or Atomic Absorption, Furnace Techniques or other Methods Approved by WREA
5	Manganese and its compounds	Mn	mg/kg	32,000	
6	Mercury and its compounds	Hg	mg/kg	610	Cold-Vapour Technique or other Methods Approved by WREA
7	Nickel, soluble salts	Ni	mg/kg	41,000	Inductively Coupled Plasma-Atomic Emission Spectrometry or Inductively Coupled Plasma-Mass Spectrometry or Atomic Absorption, Direct Aspiration or Atomic Absorption, Furnace Techniques or other Methods Approved by WREA
8	Selenium	Se	mg/kg	10,000	Inductivity Coupled Plasma-Atomic Emission Spectrometry or Atomic Absorption, Furnace Technique or Atomic Absorption, Gaseous Hydride or Atomic Absorption, Borohydride Reduction or other Methods Approved by WREA
III. Pesticides					
1	Atrazine	$C_8H_{14}ClN_5$	mg/kg	110	Gas Chromatography or other Methods Approved by WREA
2	Chlordane	$C_{10}H_5Cl_8$	mg/kg	110	Gas Chromatography/ Mass Spectrometry (GC/MS) or other Methods Approved by

No.	Substances	Symbol	Unit	Standard Value	Method of Measurement
					WREA
3	2,4 D	2.4D	mg/kg	12,000	Gas Chromatography or High Performance Liquid Chromatography/Thermal Extraction/ Gas Chroma-tography/ Mass Spectrometry (TE/GC/ MS) or other Methods Approved by WREA
4	DDT	DDT	mg/kg	120	Gas Chromatography or Gas Chromatography/ Mass Spectrometry (GC/MS) or other Methods Approved by WREA
5	Dieldrin	$C_{12}H_8Cl_6O$	mg/kg	1.5	
6	Heptachlor	Cl_7	mg/kg	5.5	
7	Heptachlor Epoxide	$C_{10}H_5Cl_7O$	mg/kg	2.7	
8	Lindane	C_6Cl_6	mg/kg	29	
9	Pentachlorophenol	$Cl_5C_6H_5OH$	mg/kg	110	Gas Chromatography or Gas Chromatography/ Mass Spectrometry (GC/MS) or Gas Chromatography/ Fourier Transform Infrared (GC/FT-IR) Spectrometry or other Methods Approved by WREA
IV. Others					
1	Benzo(a)pyrene	-	mg/kg	2.9	Gas Chromatography/ Mass Spectrometry (GC/MS) or Thermal Extraction/ Gas Chromatography/ Mass Spectrometry (TE/GC/MS) or Gas Chromatography/ Fourier Transform Infrared (GC/FT-IR) Spectrometry or other Methods Approved by WREA
2	Cyanide and its compounds	CN^-	mg/kg	11	Total and Amenable Cyanide: Distillation, or Total Amenable Cyanide (Automated Colorimetric, with off-line Distillation), or Cyanide Extraction Procedure for Solids and Oils or other Methods Approved by WREA
3	PCBs ($C_{12}H_7Cl_3$)	PCBs ($C_{12}H_7Cl_3$)	mg/kg	10	Gas Chromatography or other Methods Approved by WREA
4	Vinyl Chloride	CH_2=CHCl	mg/kg	8.3	Purge and Trap Gas Chromatography or Purge and Trap Gas Chromatography Mass Spectrometry

4.3 Ambient Air Quality Standard

Parameters	Symbol	Average Time Unit: mg/m3					Method of Measurement
		Hours			1 month	1 year	
		1 hr	8 hr	24 hr			
Carbon monoxide	CO	30	10.26	-	-	-	Non dispersive infrared detection
Nitrogen dioxide	NO_2	0.32	-	-	-	-	Chemilumine scene method
Sulphur dioxide	SO_2	0.78	-	0.30	-	0.10	UV Fluorescence (1hr, 24hr, 1yr) or Pararosaniline (1hr,4hr)
Total Suspended Particulate	TSP	-	-	0.33	-	0.10	Gravimetric
Particulate Matter less than 10 microns	PM-10	-	-	0.12	-	0.05	Gravimetric or Beta Ray or Taper Element Oscillating Microbalance or Dichotomous
Ozone	O_3	0.20	-	-	-	-	Chemiluminescence or UV Absorption Phoptometry
Lead	Pb	-	-	-	1.5	-	Atomic Absorption Spectrometer

4.4 Noise Standard

Standards	Method of Measurement
Maximum Sound Level (L_{max}) should not exceed 115 dB(A)	Equivalent Sound Level (L_{eq}) from Fluctuating Noise
L_{eq} 24 hour not exceeding 70 dB(A)	Equivalent Sound Level (L_{eq}) from Steady Noise

4.4.1 Noise Standards for Other Places

Type of Area	Standard Value in dB(A)		
	6.00-18.00	18.00-22.00	22.00-6.00
Quiet areas: hospitals, libraries, treatment places, kindergarten and schools	50	45	40
Residential areas: hotels and houses	55	55	45
Commercial and service areas	70	70	50
Small industrial factories located in residential areas	70	70	50

Article 5: Emission Standards

5.1 General Industrial Wastewater Discharge Standards

5.1.1 Standards for General Industries

No.	Parameters	Symbols	Unit	Maximum Concentration
1	BOD_5	BOD_5	mg/l	40
2	Ammonia Nitrogen	NH_3-N	mg/l	4
3	Total Suspended Substances	TSS	mg/l	40
4	Potential of Hydrogen	pH	-	6-9.5
5	Total Dissolved Substances	TDS	mg/l	3,500
6	Phenols	C_6H_5OH	mg/l	0.3
7	Phosphorous	P	mg/l	1.0
8	Silver	Ag	mg/l	0.1
9	Zinc	Zn	mg/l	1.0
10	Sulphide	S	mg/l	1.0
11	Free Chlorine	Cl_2	mg/l	1.0
12	Chloride	Cl^-	mg/l	500
13	Iron	Fe	mg/l	2.0
14	Fluoride	F	mg/l	15
15	Cyanide	CN^-	mg/l	0.1
16	Copper	Cu	mg/l	0.5
17	Lead	Pb	mg/l	0.2
18	Oil and Grease	-	mg/l	5
19	Nickel	Ni	mg/l	0.2
20	Mercury	Hg	mg/l	0.005
21	Manganese	Mn	mg/l	1.0
22	Arsenic	As	mg/l	0.25
23	Barium	B	mg/l	1.0
24	Cadmium	Cd	mg/l	0.03
25	Chromium	Cr^{+6}	mg/l	0.1
26	Total Chromium	Total Cr	mg/l	0.5

5.1.2 Sugar Cane Factories

No.	Parameters	Symbols	Unit	Maximum Concentration
1	BOD_5	BOD_5	mg/l	60
2	Total Suspended Substances	TSS	mg/l	100
3	Potential of Hydrogen	pH	-	6-9.5

5.1.3 Textiles and Garments Factories with Dyeing of Yarns

No.	Parameters	Symbols	Unit	Maximum Concentration
1	BOD_5	BOD_5	mg/l	40
2	Phenols	C_6H_5OH	mg/l	1
3	Total Suspended Substances	TSS	mg/l	40
4	Potential of Hydrogen	pH	-	6-9.5

5.1.4 Pulp Products

No.	Parameters	Symbols	Unit	Maximum Concentration
1	BOD_5	BOD_5	mg/l	90
2	Ammonia-Nitrogen	NH_3-N	mg/l	7
3	Phenols	C_6H_5OH	mg/l	1
4	Total Suspended Substances	TSS	mg/l	60
5	Potential of Hydrogen	pH	-	6-9.5

5.1.5 Paper Products

No.	Parameters	Symbols	Unit	Maximum Concentration
1.	BOD_5	BOD_5	mg/l	30
2.	Total Suspended Substances	TSS	mg/l	30
3.	Potential of Hydrogen	pH	-	6-9.5

5.1.6 Slaughtering Factories

No.	Parameters	Symbols	Unit	Maximum Concentration
1.	BOD_5	BOD_5	mg/l	40
2.	Ammonia-Nitrogen	NH_3-N	mg/l	4
3.	Total Suspended Substances	TSS	mg/l	40
4.	Potential of Hydrogen	pH	-	6-9.5

5.2 Standards for Specific Industries

5.2.1 Factories that Contain Organic Substances

No.	Types of Factories	Parameters		
		Max BOD5	Max pH	Max TSS
1.	Canned fish	40	6-9.5	50
2.	Beer	30	6-9.5	30
3.	Starch	70	6-9.5	80
4.	Tannery	40	6-9.5	40
5.	Yarn Dyeing	40	6-9.5	40
6.	Pharmacy	40	6-9.5	40

5.2.2 Factories that Contain Inorganic Substances: Metal Plating

No.	Parameters	Symbols	Unit	Permitted Concentration
1.	Potential of Hydrogen	pH	-	6-9.5
2.	Zinc	Zn	mg/l	5.0
3.	Cyanide	CN^-	mg/l	0.2
4.	Total Suspended Substances	TSS	mg/l	30
5.	Chrome	Cr^{+6}	mg/l	0.3
6.	Total Chrome	Total Cr	mg/l	2.0
7.	Nickel	Ni	mg/l	0.2
8.	Copper	Cu	mg/l	1.0
9.	Total Heavy Metals	-	mg/l	6.0
10.	Oil and Grease	-	mg/l	30

5.2.3 Battery Producing

No.	Parameters	Symbols	Unit	Permitted Concentration
1.	Lead	Pb	mg/l	0.2
2.	Copper	Cu	mg/l	0.5
3.	Zinc	Zn	mg/l	1
4.	Antimony	Sb	mg/l	1
5.	Cadmium	Cd	mg/l	0.03
6.	Chromium	Cr	mg/l	0.5
7.	Nickel	Ni	mg/l	1.0
8.	Mercury	Hg	mg/l	0.005
9.	Potential of Hydrogen	pH		6-9.5

5.3 Effluent Standards for Pig Farms

No.	Parameters	Symbol	Unit	Maximum Permitted Value		
				Standard A	Standard B	Method for Examination
1.	Potential of Hydrogen	pH	-	5.5-9	5.5-9	pH Meter
2.	Biochemical Oxygen Demand	BOD_5	mg/l	60	100	Aside Modification or Membrance Electrode
3.	Chemical Oxygen Demand	COD	mg/l	300	400	Potassium Dichromate Digestion, Open Reflux or Closed Reflux
4.	Suspended Solids	SS	mg/l	150	200	Glass Fibre Filter Disc, Dry Evaporation 103-105 degree Celsius
5.	Total Kjeldahl Nitrogen	TKN	mg/l	120	200	Kjeldahl; Colorimetric or Ammonia Selective Electrode

Standard A: 1. Large Farm is more than 400 Livestock Units (LU)
2. Medium Farm is 60-400 LU.

Standard B: 1. Small Farm is 6-<60 LU.
2. 1 LU equals 500 kg.
3. Weight of breeding pig = 170 kg/head
4. Weight of fattened pig = 60 kg/head
5. Weight of nursling pig = 12 kg/head

5.4 Gas Station Effluent Standards

No.	Parameters	Symbol	Unit	Range or Maximum Permitted Values	Method of Examination
1.	Potential of Hydrogen	pH	-	5.5-9	pH Meter
2.	Chemical Oxygen Demand	COD	mg/l	200	Potassium Dichromate Digestion
3.	Suspended Solid	SS	mg/l	60	Glass Fibre Filter Disc
4.	Oil and Grease	-	mg/l	15	Extract with solvent

5.5 Wastewater Discharge Standards from the Urban Area

5.5.1 Wastewater Discharge Standards

No.	Parameters	Symbol	Standards				
			A	B	C	D	E
1.	Biochemical Oxygen Demand	BOD_5	Not more than (mg/l)				
			30	40	50	60	200
2.	Suspended Solids	SS	Not more than (mg/l)				
			30	40	50	50	60
3.	Settle able Solids	-	Not more than (mg/l)				
			0.5	0.5	0.5	0.5	-
4.	Total Dissolved Solids	TDS	Not more than (mg/l)				
			3000	2500	2000	1500	-
5.	Chemical Oxygen Demand	COD	Not more than (mg/l)				
			120	130	150	350	400
6.	Sulphide	S^{2-}	Not more than (mg/l)				
			1.0	1.0	3.0	4.0	-
7.	Total Kjeldahl Nitrogen	TKN	Not more than (mg/l)				
			35	35	40	40	-
8.	Fat Oil and Grease	-	Not more than (mg/l)				
			20	20	20	20	100
9.	Temperature	t	Not more than (degree Celsius)				
			40	40	40	40	40
10.	Potential of Hydrogen	pH	Not more than				
			6-9.5	6-9.5	6-9.5	6-9.5	6-9.5

5.5.2 Classification of buildings according to the Wastewater Discharge Standards

No.	Types of Buildings	Size of Buildings	Standard
1.	Buildings	Less than 100 rooms From 101 to 500 rooms Above 501 rooms	D C B
2.	Hotels	Less than 60 rooms From 61 to 200 rooms Above 201 rooms	D C B
3.	Dormitories	From 10 to 50 rooms From 51 to 250 rooms Above 251 rooms	D C B
4.	Medical Centers, Hospitals, Clinic	No bed From 1to 30 beds. Above 31 beds.	C B A
Classification of buildings per Area			
5	Residential, temple	From 5,000 to 10000 sq m Above 10001 sq m	E D
6	Entertainment zone, health center swimming pool, Fitness Center	From 1000 to 5000 sq m Above 5001 sq m	D B
7	School, Educational institutions, College, Universities	From 5000 to 25000 sq m Above 25001 sq m	B A
8.	Office, enterprises, foreign and private buildings, Hall	From 5000 to 10000 sq m. From 10001 to 55000 sq m Above 55001 sq m	C B A
9.	Commercial centers and Supermarkets	From 5000 to 25000 sq m Above 25001 sq m	B A
10.	Markets	From 500 to 1,000 sq m From 1001 to 1500 sq m From 1501 to 2500 sq m Above 2501 sq m	D C B A
11	Restaurants	Less than 100 sq m From 500 to 1000 sq m From 1001 to 1500 sq m From 1501 to 2500 sq m Above 2501 sq m	E D C B A
12	Auto service center (Motorbike, car)	From 500 to 1000 sq m From 1,001 to 1500 sq m From 1,501 to 2500 sq m Above 2501 sq m	D C B A
13	Terminal Stations, Airport.	From 5000 to 10000 sq m From 10001 to 55000 sq m Above 55001 sq m	C B A
14	Slaughterhouse in City	From 500 to 1000 sq m From 1001 to 1500 sq m From 1501 to 2500 sq m Above 2501 sq m	D C B A

5.5.3 Wastewater Treatment Standards for Public Areas

No.	Parameters	Symbol	Standards					Method of Examination
			A	B	C	D	E	
1	Biochemical Oxygen Demand	BOD_5	Not more than (mg/l)					Manometric method at 20 Celsius for 5 consecutive days
			30	40	50	60	200	
2	Suspended Solids	Suspended solids	Not more than (mg/l)					Evaporation at about 150 Celsius during 1 hour
			30	40	50	50	60	
3	Settle able Solids	Settle able solids	Not more than (mg/l)					Glass fibre filter disc
			0.5	0.5	0.5	0.5	-	
4	Total Dissolved Solids	TDS	Not more than (mg/l)					Glass fibre filter disc
			3000	2500	2000	1500	-	
5	Chemical Oxygen Demand	COD	Not more than (mg/l)					Potassium Digestion
			120	130	150	350	400	
6	Sulphide	S^{2-}	Not more than (mg/l)					Titration method
			1.0	1.0	3.0	4.0	-	
7	Total Kjeldahl Nitrogen	TKN	Not more than (mg/l)					Kjeldahl method
			35	35	40	40	-	
8	Fat Oil and Grease	Oil and Grease	Not more than (mg/l)					Extraction by solvents and separation of the weight of fat and grease
			20	20	20	20	100	
9	Temperature	t	Not more than (degree Celsius)					Thermometer
			40	40	40	40	40	
10	Potential of Hydrogen	pH	Not more than					pH Meter
			6-9.5	6-9.5	6-9.5	6-9.5	6-9.5	

5.5.4 Type of Public Areas for Wastewater Discharge

Public Areas			
1	History and cultural tourism place	From 5000 to 10000 sq m From 10001 to 55000 sq m Above 55001 sq m	E D C
2	Public Park	From 5000 to 10000 sq m From 10001 to 55000 sq m Above 55001	C B A
3	Amusement Park	From 5000 to 10000 sq m From 10001 to 55000 sq m Above 55001 sq m	C B A
4	Water Park	From 5000 to 10000 sq m From 10001 to 55000 sq m above 55001 sq m	C B A
5	Marsh, Pond	From 5000 to 10000 sq m From 10001 to 55000 sq m Above 55001	C B A
6	Main water drainage, second water drainage, water drainage along the road	From 5000 to 10000 sq m From 10001 to 55000 sq m Above 55001 sq m	C B A

5.6 Air Emission Standards for Industrial Factories

5.6.1 Air Emission Standards for Industrial Factories

No.	Parameters	Type of Factories	Emission Limits
1.	Ammonia and ammonium compounds	Trade, Industrial or producing process	76 mg/Nm^3
2.	Antimony and its compounds	Trade, Industrial or producing process	5 mg/Nm^3
3.	Arsenic and its compounds	Trade, Industrial or producing process	1 mg/Nm^3
4.	Benzene	Trade, Industrial or producing process	5 mg/Nm^3
5.	Cadmium and its compounds	Trade, Industrial or producing process	3 mg/Nm^3
6.	Carbon monoxide	Trade, Industrial or producing process	625 mg/Nm^3
7.	Chlorine	Trade, Industrial or producing process	32 mg/Nm^3
8.	Copper and its compounds	Trade, Industrial or producing process	5 mg/Nm^3
9.	Dioxins and furans	Fuel burning equipment or wood industry	1.0 mg/TEZ/Nm^3
10.	Ethylene Oxide	Trade, Industrial or producing process	5 mg/Nm^3
11.	Fluorine, hydrofluoric acid or inorganic fluorine compounds	Trade, Industrial or producing process	50 mg/Nm^3
12.	Formaldehyde	Trade, Industrial or producing process	20 mg/Nm^3

No.	Parameters	Type of Factories	Emission Limits
13.	Hydrogen Chloride	Trade, Industrial or producing process	200 mg/Nm^3
14.	Hydrogen Sulphide	Trade, Industrial or producing process	7.6 mg/Nm^3
15.	Lead and its compounds	Trade, Industrial or producing process	5 mg/Nm^3
16.	Mercury and its compounds	Trade, Industrial or producing process	3 mg/Nm^3
17.	Oxides of nitrogen	Trade, Industrial, producing process, fuel burning equipment or wood industry	700 mg/Nm^3 Material
18.	Particulate substances	Trade, industrial, producing process, fuel burning equipment or wood industry	I. 100 mg/Nm^3 II. 100 mg/Nm^3 200 mg/Nm^3
19.	Smoke	Fuel burning equipment or wood industry	Rangeland No.1 or equivalent opacity
20.	Styrene monomer	Trade, Industrial or producing process	100 mg/Nm^3
21.	Sulphur dioxide	Trade, Industrial or producing process	500 mg/Nm^3
22.	Sulphur dioxide and other acid greases	Fuel burning equipment or wood industry	500 mg/Nm^3
23.	Sulphur dioxide or Sulphuric acid mist	Trade, Industrial, producing process, fuel burning equipment or wood industry	100 mg/Nm^3
24.	Vinyl chloride monomer	Trade, Industrial or producing process	20 mg/Nm^3

5.6.2 Air Emission Standards for Cement Factories

Type of Cement Factory	Permitted Air Emission Standard Value		
	Particulate matter (mg/m^3)	Sulphur dioxide (ppm)	Dioxide of Nitrogen calculated in the form or Nitrogen dioxide (ppm)
Existing cement factories emitted air pollution			
(a) General cement burning plant	Not more than 300	Not more than 50	Not more than 600
(b) White cement burning plant	Not more than 300	Not more than 600	Not more than 600
(c) Cooling plant, cement crushing and coal crushing plant	Not more than 200	-	-

Type of Cement Factory	Permitted Air Emission Standard Value		
	Particulate matter (mg/m^3)	Sulphur dioxide (ppm)	Dioxide of Nitrogen calculated in the form or Nitrogen dioxide (ppm)
New cement factories emitted air pollution			
(a) General cement burning plant	Not more than 120	Not more than 50	Not more than 500
(b) White cement burning plant	Not more than 120	Not more than 500	Not more than 500
(c) Cooling plant, cement crushing and coal crushing plant	Not more than 120	-	-

5.6.3 Air Emission Standard for Power Plants

No.	Type of Substances or pollutant	Source	Permitted Emission Value	
		Coal or Gas Power Plant	ppm	mg/m^3
1	Sulphur dioxide	1. With the capacity of not more than 300 MW.	640	-
		2. With the capacity above 300 MW, not more than 500 MW	450	-
		3. With the capacity above 500 MW	320	-
2	Sulphur dioxide	Natural Gas Power Plant	20	-
3	Oxide of Nitrogen	Power Plant Generating Electricity From:		
		1. Coal	350	-
		2. Fuel	180	-
		3. Natural Gas	120	-
4	Particulate Substances	Power Plant Generating Electricity From:		
		1. Coal	-	120
		2. Fuel	-	120
		3. Natural Gas	-	60

5.6.4 Pollution Emission Standard for Iron Factory

Type of cement factories	Permitted Air Emission Standard Value		
	Dioxide of Nitrogen calculated in the form or Nitrogen dioxide (ppm)	Sulphur dioxide (ppm)	Dust (mg/m^3)
New Sources	800	180	120
Existing Sources	800	200	240

5.7 Air Emission Standards in the Workplace

5.7.1 Chemical Concentration in the Workplace

No.	Parameters	Symbols	Chemical Concentration mg/m^3
1	Aldrin	Aldrin	0.25
2	Azinphos-methyl	Azinphos-methyl	0.2
3	Chlordane	Chlordane	0.5
4	DDT	DDT	1
5	DDVP	DDVP	1
6	Dichlorvos	Dichlorvos	1
7	Dieldrin	Dieldrin	0.25
8	Dimethyl 1.2-dibromo 2.2dichloroethyl phosphate (Dibrom)	Dimethyl 1,2-dibromo 2,2dichloroethyl phosphate (Dibrom)	3
9	Endrin	Endrin	0.1
10	Guthion	Guthion	0.2
11	Lead asenate	Lead asenate	0.15
12	Lindane	Lindane	0.5
13	Melathion	Malathion	15
14	Methoxychlor	Methoxychlor	15
15	Nicotine	Nicotine	0.5
16	Systox	Systox	0.1
17	Thalium (soluble compounds)	Thalium (soluble compounds) as Ti	0.1
18	Thiram	Thiram	5
19	Toxaphene	Toxaphene	0.5
20	Parathion	Parathion	0.11
21	Phosdrin	Phosdrin	0.1
22	Pyrethum	Pyrethum	5
23	Warfarin	Warfarin	0.1
24	Carbaryl (sevin (R))	Carbaryl (sevin (R))	5
25	2.4-D	2,4-D	10
26	Paraquat	Paraquat	0.5
27	2.4.5-T	2,4,5-T	10
28	Acetic Acid	CH_3-COOH	25
29	Ammonia	NH_3	35
30	Arsenic and its compounds	As and its compounds	0.5
31	Arsine	Arsine	0.2

32	Biphenyl	Biphenyl	1
33	Bisphenol	Bisphenol	2.8
34	Carbon dioxide	CO_2	9,000
35	Carbon monoxide	CO	55
36	Chlorine	Cl_2	3
37	Chlorine dioxide	ClO_2	0.3
38	Chromium and its compounds	Cr and its compounds	1
39	Copper fume	Copper fume	0.1
40	Dust or mist of copper	Dust or mist of copper	1
41	Cotton dust (raw)	Cotton dust (raw)	1
42	Cyanide	CN^-	5
43	Ethyl alcohol	C_2H_5OH	1,900
44	Fluoride	F^-	2.5
45	Fluorine	F_2	0.2
46	Hydrogen cyanide	HCN	11
47	Iron oxide fume	Iron oxide fume	10
48	Methyl alcohol	CH_3OH	260
49	Nikel carbonyl	Nikel carbonyl	0.007
50	Nickel, metal and soluble compounds	Ni, Metal and soluble compounds as Ni	1
51	Nitric acid	HNO_3	5
52	Nitric oxide	Nitric oxide NO_x	30
53	Nitrogen dioxide	NO_2	9
54	Nitrogylcerin	Nitroglycerin	2
55	Sodium hydroxide	NaOH	2
56	Sulphur dioxide	SO_2	13
57	Sulphuric acid	H_2SO_4	1
58	Tetraethyl Lead	Tetra ethyl Lead (as Pb)	0.075
59	Tetra methyl Lead	Tetra methyl Lead(as Pb)	0.07
60	Tin and Inorganic compounds of tin	Tin and Inorganic compounds of Tin	2
61	Tin and Organic compounds of tin	Tin and Organic compounds of Tin	0.1
62	Phenol	C_6H_5OH	19
63	Phosgene (Carbonyl chloride)	Phosgene (Carbonyl chloride)	0.4
64	Phosphine	Phosphine	0.4
65	Posphoric acid	H_3PO_4	1
66	Phosphorus (yellow)	P (yellow)	0.1
67	Phosphorus pentachloride	$P\text{-}Cl_5$	1
68	Phosphorus pentasulfide	$P\text{-}(SO_4)_5$	1
69	Phosphorus	P	3
70	Xylene	Xylene	435
71	Zinc chloride fume	$ZnCl_2$	1
72	Zinc oxide fume	ZnO	5

5.7.2 Atmospheric Chemical Substance Concentration in the Workplace

No.	Parameters	Symbols	Chemical Concentration mg/m^3
1.	Ally glycidyl ether	AGE	45
2.	Boron trifluoride	Boron trifluoride	3
3.	Butylamine	Butylamine	15
4.	Tert-Butyl chromate	Tert-Butyl chromate (as CrO_3)	0.1
5.	Chlorine trifluoride	Chlorine trifluoride	0.4
6.	Chloroacetaldehyde	Chloroacetaldehyde	3
7.	Chroroform (trichloromethane)	Chroroform (trichloromethane) Chloroform	240
8.	o-Dichlorobenzen	o –Dichlorobenzen	300
9.	Dichloethyl ether	Dichloethyl ether	90
10.	1.1-Dichloro-1-nitroethane	1,1-Dichloro-1-nitroethane	60
11.	Diglycidyl ether	Diglycidyl ether (DGE)	2.8
12.	Ethyl mercaptan	Ethyl mercaptan	25
13.	Ehylene mercol glycol dinitrate and/or Nitroglycerin	Ethylene mercol glycol dinitrate and /or Nitroglycerin	1
14.	Hydrogen chloride	Hydrogen chloride	7
15.	Iodine	Iodine	1
16.	Manganese	Manganese	5
17.	Methyl bromide	Methyl bromide	80
18.	Methyl mercaptan	Methyl mercaptan	20
19.	α-Methyl styrene	∝-Methyl styrene	480
20.	Methylene bisphenyl isocyanate	Methylene bisphenyl isocyanate	0.2
21.	Monomethyl hydrazine	Monomethyl hydrazine	0.35
22.	Terphenyls	Terphenyls	9
23.	Toluene-2.4-Diisocyanate	Toluene-2,4-Diisocyanate	0.14
24.	Vinyl chloride	Vinyl chloride	2.8

5.7.3 Atmospheric Chemical Substance Concentration in the Workplace

No.	Materials	Average Concentration during normal Work Period	Concentration for a Specified Time		Permitted Concentration Value
			Concentration	Permitted Exposure Period	
1	Benzene	10 ppm	50 ppm	10 min	25 ppm
2	Beryllium and its compounds	2 mg/m^3	25 mg/m^3	30 min	5 mg/m^3
3	Cadmium fume	0.1 mg/m^3	-	-	0.3 mg/m^3
4	Cadmium dust	0.2 mg/m^3	-	-	0.6 mg/m^3
5	Carbondisulfide	20 ppm	100 ppm	30 min	30 ppm
6	Carbontetrachloride	10 ppm	200 ppm	5 min in	25 ppm

No.	Materials	Average Concentration during normal Work Period	Concentration for a Specified Time		Permitted Concentration Value
			Concentration	Permitted Exposure Period	
				any 4 hours	
7	Ethylene dibromide	20 ppm	50 ppm	5 min	30 ppm
8	Ethylene dichloride	50 ppm	200 ppm	5 min in any 3 hours	100 ppm
9	Formaldehyde	3 ppm	10 ppm	30 min	5 ppm
10	Fluoride as dust	2.5 mg/m^3	-	-	-
11	Lead and its inorganic compounds	0.2 mg/m^3	-	-	-
12	Methyl chloride	100 ppm	300 ppm	5 min in any 3 hours	200 ppm
13	Methyl chloride	500 ppm	2000 ppm	5 min in any 2 hours	1000 ppm
14	Organo mercury	0.01 mg/m^3	-	-	0.04 mg/m^3
15	Styrene	100 ppm	600 ppm	5 min in any 3 hours	200 ppm
16	Trichloro ethylene	100 ppm	300 ppm	5 min in any 2 hours	200 ppm
17	Tetrachloro ethylene	100 ppm	300 ppm	5 min in any 3 hours	200 ppm
18	Toluene	200 ppm	500 ppm	10 min	300 ppm
19	Hydrogen Sulfide	-	50 ppm	10 min	20 ppm
20	Mercury	-	-	-	0.05 mg/m^3
21	Chromic acid and chromate salt	-	-	-	0.1 mg/m^3

5.8 Emission Standards from Mobile Sources

5.8.1 Emission Standards for New Vehicles

Type of vehicle	Standard Values			
New public transport and light vehicles	Particulate Matters (PM) (mg/km)	Nitrogen Oxide (NOx) (mg/km)	Hydrocarbon (HC) (mg/km)	Carbon Monoxide (mg/km)
Benzene Engine Vehicle	-	150	200	2,300
Diesel Engine Vehicle	50	500	-	640

5.8.2 Emission Standard for Used Motor Vehicles (Motorcycles)

Pollutants	Standards	Equipment	Methods of Measurement
Carbon monoxide (CO)	4.5%	Non-dispersive Infrared Detection	Measure while parking the motorcycle at idle and no load
Hydrocarbon (HC)	10,000 ppm		
White Smoke	30%	Smoke Meter, Full Flow Opacity System	Measure while parking the motorcycle at idle and no load by quid acceleration the engine to 75% of maximum power rpm

5.8.3 Emission Standards for Used Motor Vehicles (Benzene Vehicles)

Type	Pollutants	Standard	Equipment	Method of Measurement
	Carbon monoxide CO (%)	Hydrocarbon HC (ppm)		
Benzene Vehicle	4.5	600	Non-Dispersive Infrared Detection	Measure while parking the car at idle and no load

5.8.4 Emission Standards for Used Motor Vehicles (Diesel Vehicles)

Type	Smoke SHU	Equipment	Method of Measurement
Diesel Vehicle	50%	Filter System	Measure while parking the car at load by quick acceleration the engine to maximum rpm
	45%	System Opacity	
	40%	Filter System	Measure while the car running steady on the roller at 60% of maximum power rpm
	35%	System Opacity	

5.9 Noise Pollution Standards

5.9.1 Noise Standards for Motor Boats

Standards	Method of Measurement
100 dB(A) at 5 meters from the boat's exhaust pipe	Diesel engines; accelerate until the engine reaches its highest rounds per minute.
Conduct the test twice and use the highest standard measured. If the difference is higher than 2 dB(A), perform the test again	Benzene engine; accelerate to 3/4 of the maximum round

5.9.2 Noise Standards for Vehicles

Type of Vehicles	Standards	Method of Measurement
Diesel vehicle	Measured at 7.5 meters: not exceeding 85 dB(A)	Accelerate until the engine reaches maximum speed.
	Measured at 0.5 meters: not exceeding 100 dB(A)	
Benzene vehicle	Car used in ways while it stays still and its engine is running without sound of horn	Measuring while parking the car at no load by acceleration the engine to 3/4 of maximum rpm.

5.9.3 Noise Standards for Motorcycles

Standards	Methods of Measurement
Measured at 0.5 meters: not exceeding 95 dB(A) for a car used in ways, while it stays still and its engine is running without sound of horn	- The engine shall be accelerated to be at 3/4 of the maximum rounds if the engine has the maximum rounds of not more than 5000 rpm. - The engine shall be accelerated to be at 1/2 of the maximum rounds if the engine has the maximum rounds of more than 5000 rpm.

Chapter III
Organizations Responsible for the Implementation and Monitoring of the National Environmental Standards

Article 6: Implementation Responsible Organizations

The implementation responsible organization is divided into two levels as follows:

6.1 Central Level; and

6.2 Provincial Level.

Article 7: Central Level Organizations

Central level organizations include the following:

7.1 Department of Environment, Water Resources and Environmental Administration (WREA)

7.2 Department of Water Resources, Water Resources and Environmental Administration (WREA)

7.3 Environmental and Social Impact Assessment Department, Water Resources and Environmental Administration (WREA)

7.4 Water and Environment Research Institute, Water Resources and Environmental Administration (WREA)

7.5 Other sectors at central level.

Article 8: Rights and Duties of Central Level Organizations

8.1 Department of Environment

Department of Environment, Water Resources and Environmental Administration shall be a focal point for coordination with other relevant divisions and local authorities to implement the administration and monitoring activities of this Agreement throughout the country.

8.2 Water and Environment Research Institute

Water and Environment Research Institute shall have the responsibilities to conduct further research, monitor, analyze and provide other services in relation to water and environmental quality throughout the country.

8.3 Department of Water Resources

Department of Water Resources shall have the responsibility to coordinate with other authorities to conduct surveys, and evaluate and monitor the quantity, quality and utilization of surface water and groundwater.

8.4 Environmental and Social Impact Assessment Department

The Environmental and Social Impact Assessment Department shall have the responsibility to review, monitor and evaluate the implementation of Environmental and Social Management and Monitoring Plans of each state or private investment project.

8.5 Other Sectors at Central Level

Other sectors at central level have duty of responsible to monitor and review the technical standards related to its responsibility in order to ensure the implementation of this Environmental Standard.

Article 9: Implementing Organization at Provincial Level

The implementing organizations at provincial level include:

10.1 Water Resources and Environment Offices in Vientiane Capital and all provinces; and
10.2 Other divisions at provincial level.

Article 10: Rights and Duties of Provincial Level Organizations

10.1 Water Resources and Environmental Office in Vientiane Capital and all provinces shall be a focal point to coordinate with other divisions and other local authorities to implement the administration and monitoring activities in respect of environment within their authority and jurisdiction.

10.2 Other sectors at provincial have duty of responsible to monitor and review the technical standards related to its responsibility in order to ensure the implementation of the National Environmental Standards.

Chapter IV

Rewards and Sanctions

Article 11: Rewards

The Individuals, consumers, producers and other related organizations that facilitate or provide any services in good compliance with this agreement will be commended and will receive the compliment certificate from Water Resources and Environmental Administration.

Article 12: Sanctions

Individuals, consumers, producers and other related organizations violating the provision of this agreement will be warned, be fined or subject to criminal punishment, depending on the severity of the violation.

Chapter V
Final Provisions

Article 13: Dissemination

Department of Environment shall have the duty to coordinate with other relevant organizations from the central level to the local level in order to disseminate this Agreement.

Other related organizations can research and issue additional specific standards subject to consultation and agreement with WREA.

Article 14: Implementation

Offices, departments, institutions, other sectors in central level and local authority shall acknowledge and perform strictly in compliance with this agreement.

Article 15: Effective

This agreement is affective since its promulgation, every term and provisions inconsistent with this agreement are hereby terminated.

Minister to Prime Minister's Office
Head of Water Resources and Environmental Administration

Khempheng Pholsena