Chapter 1: Environmental Problems and Their Legislative Control in the Philippines Today

This chapter describes the latest information about environmental problems and their legislative control in the Philippines today. Specifically, it covers regulatory values for water and air pollution, and explains the "Environmental Users Fee System" in the Laguna Lake area, which has been reported in the newspapers, and so on. For the provisions of environment-related legislation, refer to Appendix 2.

1. Outline of the Philippines

Situated southwest of Japan, the Philippines is a constitutional republic comprising about 7,000 islands including Luzon, the main island, Mindanao, Samar, Negros, Panay and Palawan. The Philippines has a long history of exchanges with Japan. Since it takes only about three and a half hours by air from Japan to the Philippines today, the country attracts many tourists and companies from Japan.

The total area of the Philippines is about 300,000 square km with a population of approximately 70 million. The principal people are Malays, which are divided into Visayans, Tagalogs and several dozen other ethnic groups. More than 80 languages are spoken in the country. The official languages are Pilipino and English. Among Southeast Asian countries, the Philippines is one of only a few nations where English is spoken by people in daily life. Most of the people are devout Roman Catholics. The capital of the Philippines is Metropolitan Manila.

Figure 1-1 Rough Map of the Philippines

2. Government Environmental Policies and Organization

Because various government departments were separately responsible, government environmental policies in the Philippines could not be described as "integrated." However, the new constitution was adopted in 1986, environmental administrative bodies were reformed in accordance with Executive Order No. 192 in the following year. The Department of Environment and National Resources (DENR) took charge of all environmental administration. The DENR is a body that has the integrated and strengthened authority of the former Department of Natural Resources and the Ministry of House Settlements. Its task is to make policy decisions on environment and natural resources and to balance development activities with environmental management, with the aim to achieve sustainable development.

The DENR consists of 8 staff offices, 6 staff bureaus, 4 attached agencies and 13 regional offices in the administrative districts.

The 8 staff offices are: the Special Concerns Office, Public Affairs Office, Planning and Policy Studies Office, Foreign-Assisted and Special Projects Office, Field Operations Office, Management Services Office, Legislative Affairs Office and Legal Affairs Office. The 6 staff bureaus are: Forest Management Bureau, Mines and Geosciences Bureau, Environmental Management Bureau, Ecosystems Research and Development Bureau, Protected Areas and Wildlife Bureau and Lands Management Bureau. The attached 4 agencies are: Pollution Adjudication Board, National Mapping and Resource Information Authority, Natural Resources Development Corporation and National Electrification Bureau.

The total number of staff at the DENR today is about 35,000. About 5,000 are assigned to the headquarters, and the remaining 30,000 work at the regional offices. About 7,000 of the regional office staff are forest rangers.

Within the DENR is the newly established Environmental Management Bureau (EMB) with jurisdiction over environmental management, pollution prevention, and environmental assessment, established on the Executive Order No. 192, which took over the responsibilities of the Environment Center of the Philippines, the National Pollution Control Commission, and the National Environment Protection Council. It administers control over air and water quality and conducts environmental assessments as well as coordinates with other governmental bodies. The EMB consists of four divisions, the Legal Division, Research & Development Division, Environmental Quality Division and Environmental Education Division, as well as sections under direct control of the director of the bureau, such as the Administrative Division, Management and Financial Affairs Division, Secretariat and the like. The number of full-time staff is about 170.

Of special significance among the other environmental ministries and departments is the Laguna Lake Development Authority (LLDA). The LLDA is an environmental policy implementation body with jurisdiction over development and the environment in the Laguna Lake region southeast of the capital, Manila. All applications with regard to development activities in the Laguna Lake area must go through LLDA.

The DENR issued "The Philippine Environmental Quality Report, 1990-1995" in November 1996, which described the environmental situation and environmental policies of the government in the Philippines for the six years from 1990 through 1995. This was the first publication of the DENR as an environmental white paper and is expected to be published continuously in the future.

3. Overview of Environmental Legislation

As with other Southeast Asian nations, the Philippines is experiencing rapid population growth in its cities. The air is being polluted in the metropolitan area around Manila, rivers and inland waters in urban areas are suffering water pollution, waste products are increasing in volume and creating environmental pollution resulting from their disposal, and natural environments are increasingly under threat. These are the environmental problems the country is confronting and their resolution is a pressing task.

Legislation equivalent to the Philippines Basic Environment Law which deals with environmental issues in general are the Presidential Decree 1151: the Philippine Environmental Policy, and the Presidential Decree 1152, the Philippine Environmental Code, both adopted under the Marcos regime in 1977. However, these environmental laws had shortcomings: for example, multiple executive bodies were designated to be in charge of one specific problem, creating reduplication and necessitating coordination among bodies concerned. Also, shortage of personnel, equipment, and financial resources meant difficulty in implementing these laws.

Under the administration of President Aquino, who took office in 1986, a new constitution was adopted and environmental rights became part of constitutional rights. In this regard, the basic principles enshrined in the Presidential Decrees 1151 and 1152 were upheld. With respect to the environmental administrative system, the DENR was put in sole charge, and the environmental laws are now undergoing review in the form of legislation being passed through the national assembly, with many bills having been presented and debated since 1992. Some bills are equivalent to a new Basic Environment Law, but have not yet been passed because in the national assembly, the group giving priority to development and economic growth holds a majority over the group giving priority to environment preservation, according to a responsible persons at the DENR.

The bills presented to the national assembly are said to contain higher monetary penalties and incentives under which companies that more than satisfy environmental criteria will be exempt from some taxes. This should improve the present situation, under which those who do not satisfy the criteria and pay the penalties enjoy an economic advantage.

Because bills for amending environmental laws have not yet been passed to respond to the actual state of the environment today, the DENR has reviewed the former environment standards and emission standards and is promulgating urgent items in the form of administrative decrees without approval from the legislature.

Presidential Decree 1151 lays down the national environmental policies, national environmental targets, the right to enjoy a healthy environment, guideline for the Environmental Impact Statement (EIS), and guidelines for implementation bodies. Of interest to private corporations among these is the guideline relating to EIS. When engaging in activities and projects that is bound to have a major impact on the environment, all organizations, including government organizations and private enterprises, are required to draw up and submit an EIS. Presidential Decree 1152, which follows on in the policy principles of PD 1151, stipulates the management system to be adopted in the five areas of air quality, water quality, land use, natural resources, and waste products.

The following is a summary of the ongoing situation with regard to the three problems of water pollution, air pollution, and waste products, which are the main environmental areas affected especially by the activities of corporations, and the legislative measures that are being taken to control them.

4. Countermeasures against Water Pollution

1) The Present Situation of Water Pollution

Water pollution of rivers and lakes in the Philippines is now in a very serious state, especially in the Manila metropolitan area, where the major rivers are heavily polluted with industrial and domestic effluent, agricultural chemicals included in agricultural effluent, heavy metals, and other toxic substances.

The Laguna Lake, located to the south of Manila, is now at crisis point, because of pollution caused by effluent from surrounding factories. Pollution in Laguna Lake consists of 40 percent agricultural effluents, 30 percent industrial effluents and 30 percent domestic effluents. An LLDA survey shows that 700 factories (equivalent to 47 percent of about 1,500 factories around the Lake) have waste water treatment equipment, but waste water from such equipment is still thought to contribute significantly to water pollution in Laguna Lake. As for domestic effluents, approximately 60 percent of the 8.4 million people living in the surrounding area discharge unprocessed waste water and garbage straight into Laguna Lake.

Meanwhile, in rural areas, water quality is deteriorating due to agricultural chemicals, chemical fertilizers, effluent from mining operations, and waste water flowing in from wider areas because of such problems as deforestation. Marine pollution has also dramatically worsened over the past decade, owing to dumping of untreated water, industrial effluent, waste water from mining, oil spills from shipping, soil erosion because of deforestation and agriculture.

In order to prevent such pollution of rivers, lakes and the sea and in order to improve water quality, effluent standards must be tightened, but it is also important to make companies and others concerned to adhere strictly to effluent standards and regulations which are in force. Moreover, improvements must be made in sewerage and waste disposal and changes must be made in the national lifestyle so that domestic effluent can

also be put under control.

2) Overview of Legislative Controls Relating to Countermeasures against Water Pollution

The latest legislation relating to countermeasures against water pollution, which has been amended many times, is the DENR Administrative Order No. 34, Series of 1990, "Revised Water Usage and Classification/Water Quality Criteria Amending Section Nos.: 68 and 69, Chapter III of the 1978 NPCC Rules and Regulations" and the DENR Administrative Order No. 35, Series of 1990, "Revised Effluent Regulations of 1990, Revising and Amending the Effluent Regulations of 1982," which were promulgated on March 20, 1990.

DENR Administrative Order No. 34 divides water usage into: 1) fresh waters such as rivers, lakes and reservoirs, and 2) coastal waters and sea areas. Fresh waters are classified into five categories, Class AA, A, B, C and D. Coastal waters and sea areas are classified into four categories, Class SA, SB, SC and SD. The Order sets water quality criteria for organic pollutants, etc. for each category. Figures 1-2 through 1-6 show the criteria.

The DENR Administrative Order No. 35 lays down the maximum figures for effluent criteria relating to harmful materials and other severe poisons for the protection of public hygiene. The criteria are classified into five categories: protected waters I (class AA and SA), protected waters II (class A, B and SB), fresh waters class C, sea class SC and sea class SD. Each category is divided between existing facilities and new facilities. Similarly, the Order lays down maximum figures for effluent criteria relating to general and other pollutants, which are classified into six categories: protected waters I, protected waters II, fresh waters class C, fresh waters class D, sea class SC, sea class SD and other unclassified waters. Each category is divided between existing facilities and new facilities. Figures 1-7 and 1-8 show the criteria figures.

Factories and plants operating in the Philippines are required to satisfy these effluent criteria and to ascertain which effluent criterion apply to their facilities in accordance with the classifications, such as fresh waters, etc., laid down by the DENR.

As shown in Figure 1-9, BOD effluent criteria figures were put into force in January 1995. The BOD effluent criteria figures are applied to factory effluents with a BOD value for unprocessed effluent that exceeds 3,000 mg/l. Therefore the criteria are applied to the relevant factories. The prescribed official analysis method is shown in the DENR Administrative Order Nos.34 and 35.

Figure 1-2 Water Usage and Classification

(1) Fresh Surface Waters (rivers, lakes, reservoirs, etc.)

Classification	Beneficial Use
Class AA	Public Water Supply Class I. This class is intended primarily for waters having watersheds which are uninhabited and otherwise protected and which require only approved disinfection in order to meet the National Standards for Drinking Water (NSDW) of the Philippines.
Class A	Public Water Supply Class II. For sources of water supply that will require complete treatment (coagulation, sedimentation, filtration and disinfection) in order to meet the NSDW.
Class B	Recreational Water Class I. For primary contact recreation such as bathing, swimming, skin diving, etc. (particularly those designated for tourism purposes).
Class C	1) Fishery Water for the propagation and growth of fish and other aquatic resources; 2) Recreational Water Class II (Boating, etc.) 3) Industrial Water Supply Class I (For manufacturing processes after treatment).
Class D	1) For agriculture, irrigation, livestock watering, etc. 2) Industrial Water Supply Class II (e.g. cooling, etc.); 3) Other inland waters, by their quality, belong to this classification.

(2) Coastal and Marine Waters

Classification	Beneficial Use
Class SA	1) Waters suitable for the propagation, survival and harvesting of shellfish for commercial purposes; 2) Tourist zones and national marine parks and reserves established under Presidential Proclamation No. 1801; existing laws and/or declared as such by appropriate government agency. 3) Coral reef parks and reserves designated by law and concerned authorities.
Class SB	1) Recreational Water Class I (Areas regularly used by the public for bathing, swimming, skin diving, etc.); 2) Fishery Water Class I (Spawning areas for Chanos chanos or “Bangus” and similar species).
Class SC	1) Recreational Water Class II (e.g. boating, etc.); 2) Fishery Water Class II (Commercial and sustenance fishing); 3) Marshy and/or mangrove areas declared as fish and wildlife sanctuaries;
Class SD	1) Industrial Water Supply Class II (e.g. cooling, etc.); 2) Other coastal and marine waters, by their quality, belong to this classification.

DENR Administrative Order No.34 , Series of 1990; Revised Water Usage and Classification / Water Quality Criteria Amending Section Nos: 68 and 69, Chapter III of the 1978 NPCC Rules and Regulations Criteria of Water Use Regulation (EMB/DENR, March 20 1990)

Note for Figures 1-3 ~ 1-6.

(a) Except as otherwise indicated, the numerical limits in Figures 1-3 and 1-5 are yearly average values. Values enclosed in parentheses are maximum values.

(b) For irrigation purposes, SAR should have a minimum value of 8 and a maximum value not to exceed 18. Boron should not exceed 0.75 mg/L.

(c) No abnormal discoloration from unnatural causes

(d) The allowable temperature increase over the average ambient temperature for each month. This rise shall be based on the average of the maximum daily temperature readings recorded at the site but upstream of the mixing zone over a period of one (1) month.

(e) Sampling taken between 9:00 AM and 4:00 PM

(f) Not more than 30% increase

(g) Not more than 30 mg/L increase

(h) Not more than 60 mg/L increase

(i) Do not apply if natural background is higher in concentration. The latter will prevail and will be used as baseline.

(j) Applicable only to lakes, reservoirs, and similarly impounded water.

(k) When applied to lakes or reservoirs, the Phosphate as P, concentration should not exceed an average of 0.05 mg/L nor a maximum of 0.1 mg/L.

(l) Not present in concentrations to affect fish flavor/taste.

(m) These values refer to the geometric mean of the most probable number of coliform organism daring a 3-month period and that the limit indicated shall not be exceeded in 20 percent of the samples taken during the same period.

(n) For spawning areas for Chanoschanos and other similar species

(o) Limit is in terms of dissolved copper

nil Extremely low concentration and not detectable by existing equipment

-- Means the standard of these substances are not considered necessary for the present time, considering the stage of the country's development and DENR capabilities, equipment and resources.

nr Means No Recommendation made

Figure 1-3 Water Quality Criteria for Conventional and Other Pollutants Contributing to Aesthetics and Oxygen Demand for Fresh Waters [a]

PARAMETER	UNIT	CLASS AA	CLASS A	CLASS B	CLASS C	CLASS D[b]
Color	PCU	15	50	(c)	(c)	(c)
Temperature[d] (max. rise in deg. Celsius)	°C rise	--	3	3	3	3
pH (range)		6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.0-9.0
Dissolved Oxygen[c] (Minimum)	% satn	70	70	70	60	40
	mg/L	5.0	5.0	5.0	5.0	3.0
5-Day 20°C BOD	mg/L	1	5	5	7(10)	10(15)
Total Suspended Solids	mg/L	25	50	(f)	(g)	(h)
Total Dissolved Solids	mg/L	500[i]	1,000[i]	--	--	1,000[i]
Surfactants (MBAS)	mg/L	nil	0.2(0.5)	0.3(0.5)	0.5	--
Oil Grease (Petroleum Ether Extract)	mg/L	nil	1	1	2	5
Nitrate as Nitrogen	mg/L	1.0	10	nr	10[i]	--
Phosphate as Phosphorus	mg/L	nil	0.1[k]	0.2[k]	0.4[k]	--
Phenolic Substances as Phenols	mg/L	nil	0.002	0.005[l]	0.02[l]	--
Total Coliforms	MPN/ 100mL	50[m]	1,000[m]	1,000[m]	5,000[m]	--
or Fecal Coliforms	MPN/ 100mL	20[m]	100[m]	200[m]	--	--
Chloride as Cl	mg/L	250	250	--	350	--
Copper	mg/L	1.0	1.0	--	0.05[o]	--

DENR Administrative Order No.34 , Series of 1990;Revised Water Usage and Classification / Water Quality Criteria Amending Section Nos: 68 and 69, Chapter III of the 1978 NPCC Rules and Regulations Criteria of Water Use Regulation (EMB/DENR, March 20 1990)

Figure 1-4 Water Quality Criteria for Toxic and Other Deleterious Substances for Fresh Waters (For the Protection of Public Health)

PARAMETER	UNIT	CLASS AA	CLASS A	CLASS B	CLASS C	CLASS D
Arsenic(i)	mg/L	0.05	0.05	0.05	0.05	0.1
Cadmium(i)	mg/L	0.01	0.01	0.01	0.01	0.05
Chromium(i) (hexavalent)	mg/L	0.05	0.05	0.05	0.05	0.1
Cyanide	mg/L	0.05	0.05	0.05	0.05	--
Lead(i)	mg/L	0.05	0.05	0.05	0.05	0.5
Total Mercury(i)	mg/L	0.002	0.002	0.002	0.002	0.002
Organophosphate	mg/L	nil	nil	nil	nil	nil
Aldrin	mg/L	0.001	0.001	--	--	--
DDT	mg/L	0.05	0.05	--	--	--
Dieldrin	mg/L	0.001	0.001	--	--	--
Heptachlor	mg/L	nil	nil	--	--	--
Lindane	mg/L	0.004	0.004	--	--	--
Toxaphane	mg/L	0.005	0.005	--	--	--
Methoxychlor	mg/L	0.10	0.10	--	--	--
Chlordane	mg/L	0.003	0.003	--	--	--
Endrin	mg/L	nil	nil	--	--	--
PCB	mg/L	0.001	0.001	--	--	--

Note: 1 Limiting value of organophosphates and organochlorines may in the meantime serve as guidelines in the interim period pending the procurement and availability of necessary laboratory equipment. For Barium, Cobalt, Fluoride, Iron, Lithium, Manganese, Nickel, Selenium, Silver and Vanadium, the 1978 NPCC Rules and Regulations, Section 69 may be considered.

DENR Administrative Order No.34 , Series of 1990;Revised Water Usage and Classification / Water Quality Criteria Amending Section Nos: 68 and 69, Chapter III of the 1978 NPCC Rules and Regulations Criteria of Water Use Regulation (EMB/DENR, March 20 1990)

Figure 1-5 Water Quality Criteria for Conventional and Other Pollutants Affecting Aesthetics and Exerting Oxygen Demand for Coastal and Marine Waters.[a]

PARAMETER	UNIT	CLASS SA	CLASS SB	CLASS SC	CLASS SD
Color	PCU	(c)	(c)	(c)	(c)
Temperature[d] (max. rise in deg. Celsius)	°C rise	3	3	3	3
pH (range)		6.5-8.5	6.0-8.5	6.0-8.5	6.0-9.0
Dissolved Oxygen[e] (Minimum)	% satn	70	70	70	50
	mg/L	5.0	5.0	5.0	2.0
5-Day 20°C BOD	mg/L	3	5	7(10)	--
Total Suspended Solids	mg/L	(f)	(g)	(g)	(h)
Surfactants (MBAS)	mg/L	0.2	0.3	0.5	--
Oil Grease (Petroleum Ether Extract)	mg/L	1	2	3	5
Phenolic Substances as Phenols	mg/L	nil	0.01	(l)	--
Total Coliforms	MPN/ 100mL	70[m]	1,000[m]	5,000[m]	--
Fecal Coliforms	MPN/ 100mL	nil	200[m]	--	--
Copper	mg/L	--	0.02[n][o]	0.05[o]	--

DENR Administrative Order No.34 , Series of 1990;Revised Water Usage and Classification / Water Quality Criteria Amending Section Nos: 68 and 69, Chapter III of the 1978 NPCC Rules and Regulations Criteria of Water Use Regulation (EMB/DENR, March 20 1990 *)*

Figure 1-6 Water Quality Criteria for Toxic and Other Deleterious Substances for Coastal and Marine Waters (For the Protection of Public Health)

PARAMETER	UNIT	CLASS SA	CLASS SB	CLASS SC	CLASS SD
Arsenic [(i)]	mg/L	0.05	0.05	0.05	--
Cadmium [(i)]	mg/L	0.01	0.01	0.01	--
Chromium [(i)] (hexavalent)	mg/L	0.05	0.1	0.1	--
Cyanide	mg/L	0.05	0.05	0.05	--
Lead [(i)]	mg/L	0.05	0.05	0.05	--
Total Mercury[(i)]	mg/L	0.002	0.002	0.002	--
Organophosphate	mg/L	nil	nil	nil	--
Aldrin	mg/L	0.001	--	--	--
DDT	mg/L	0.05	--	--	--
Dieldrin	mg/L	0.001	--	--	--
Heptachlor	mg/L	nil	--	--	--
Lindane	mg/L	0.004	--	--	--
Toxaphane	mg/L	0.005	--	--	--
Methoxychlor	mg/L	0.10	--	--	--
Chlordane	mg/L	0.003	--	--	--
Endrin	mg/L	nil	--	--	--
PCB	mg/L	0.001	--	--	--

Note: 1 Limiting values of organophosphates and organochlorines may in the meantime serve as guidelines in the interim period pending the procurement and availability of necessary laboratory equipment. For Barium, Cobalt, Fluoride, Iron, Lithium, Manganese, Nickel, Selenium, Silver and Vanadium, the 1978 NPCC Rules and Regulations, Section 69 may be considered.

DENR Administrative Order No.34 , Series of 1990; Revised Water Usage and Classification / Water Quality Criteria Amending Section Nos: 68 and 69, Chapter III of the 1978 NPCC Rules and Regulations Criteria of Water Use Regulation (EMB/DENR, March 20 1990)

Figure 1-7 Effluent Standards: Toxic and Other Deleterious Substance (Maximum Limits for the Protection of Public Health)[a]

Parameter	Unit	Protected Waters Category I (Class AA & SA)		Protected Waters Category II (Class A, B, & SB)		Inland Waters Class C		Marine Waters Class SC		Marine Waters Class SD	
		OEI	NPI	OEI	NPI	OEI	NPI	OEI	NPI	OEI	NPI
Arsenic	mg/L	(b)	(b)	0.2	0.1	0.5	0.2	1.0	0.5	1.0	0.5
Cadmium	mg/L	(b)	(b)	0.05	0.02	0.1	0.05	0.2	0.1	0.5	0.2
Chromium (hexavalent)	mg/L	(b)	(b)	0.1	0.05	0.2	0.1	0.5	0.2	1.0	0.5
Cyanide	mg/L	(b)	(b)	0.2	0.1	0.3	0.2	0.5	0.2	--	--
Lead	mg/L	(b)	(b)	0.2	0.1	0.5	0.3	1.0	0.5	--	--
Mercury (Tot.)	mg/L	(b)	(b)	0.005	0.005	0.005	0.005	0.005	0.005	0.05	0.01
PCB	mg/L	(b)	(b)	0.003	0.003	0.003	0.003	0.003	0.003	--	--
Formal-dehyde	mg/L	(b)	(b)	2.0	1.0	2.0	1.0	2.0	1.0	--	--

NOTE:

(a) Except as otherwise indicated, all limiting values are maximum and shall not be exceeded.

(b) Discharge of sewage and/or trade effluents are prohibited or not allowed.

DENR Administrative Order No. 35, Series of 1990; Revised Effluent Regulations of 1990, Revising and Amending the Effluent Regulations of 1982 (EMB/DENR, March 20 1990)

Figure 1-8 Effluent Standards: Conventional and Other Pollutants [a]

Parameter	Unit	Protected Waters				Inland Waters Class C	
		Category I (Class AA & SA)		Category II (Class A, B, & SB)			
		OEI	NPI	OEI	NPI	OEI	NPI
Color	PCU	(b)	(b)	150	100	200[c]	150[c]
Temperature (max. rise in degree Celsius in RBW)	°C rise	(b)	(b)	3	3	3	3
pH (range)		(b)	(b)	6.0-9.0	6.0-9.0	6.0-9.0	6.5-9.0
COD	mg/L	(b)	(b)	100	60	150	100
Settleable Solids (1-hour)	mg/L	(b)	(b)	0.3	0.3	0.5	0.5
5-Day 20°C BOD	mg/L	(b)	(b)	50	30	80	50
Total Suspended Solids	mg/L	(b)	(b)	70	50	90	70
Total Dissolved Solids	mg/L	(b)	(b)	1,200	1,000	--	--
Surfactants (MBAS)	mg/L	(b)	(b)	5.0	2.0	7.0	5.0
Oil Grease (Petroleum Ether Extract)	mg/L	(b)	(b)	5.0	5.0	10.0	5.0
Phenolic Substances as Phenols	mg/L	(b)	(b)	0.1	0.05	0.5	0.1
Total Coliforms	MPN/ 100mL	(b)	(b)	5,000	3,000	15,000	10,000

Parameter	Unit	Inland Waters (Class D)		Coastal Waters (Class SC)		Class SD & Other Coastal Waters Not Classified	
		OEI	NPI	OEI	NPI	OEI	NPI
Color	PCU	--	--	(c)	(c)	(c)	(c)
Temperature (max. rise in degree Celsius in RBW)	°C rise	3	3	3	3	3	3
pH (range)		5.0-9.0	6.0-9.0	6.0-9.0	6.0-9.0	5.0-9.0	5.0-9.0
COD	mg/L	250	200	250	200	300	200
5-Day 20°C BOD	mg/L	150[d]	120	120[d]	100	150[d]	120
Total Suspended Solids	mg/L	200	150	200	150	(g)	(f)
Total Dissolved Solids	mg/L	2,000[h]	1,500[h]	--	--	--	--
Surfactants (MBAS)	mg/L	--	--	15	10	--	--
Oil / Grease (Petroleum Ether Extract)	mg/L	--	--	15	10	15	15
Phenolic Substances as Phenols	mg/L	--	--	1.0(i)	0.5(i)	5.0	1.0
Total Coliforms	MPN/ 100mL	(j)	(j)	--	--	--	--

NOTE

1. In cases where the background level of Total Dissolved Solids (TDS) in freshwater rivers, lakes, reservoirs and similar bodies of water is higher than the Water Quality Criteria, the discharge should not increase the level of TDS in the receiving body of water by more than ten percent of the background level.
2. The COD limits generally apply to domestic wastewater treatment plant effluent. For industrial discharges, the effluent standards for COD should be on a case to case basis considering the COD-BOD ratio after treatment. In the interim period that this ratio is not yet established by each discharger, the BOD requirement shall be enforced.
3. There are no effluent standards for chloride except for industries using brine and discharging into inland waters, in which case the chloride content should not exceed 500 mg/L.
4. The effluent standards apply to industrial manufacturing plants and municipal treatment plant discharging more than thirty (30) cubic meters per day.

(a) - Except as otherwise indicated, all limiting values are 90th percentile values. This is applicable only when the discharger undertakes daily monitoring of its effluent quality, otherwise, the numerical values in the tables represent maximum values not to be exceeded once a year.
(b) - Discharge of sewage and/or trade effluents is prohibited or not allowed.
(c) - Discharge shall not cause abnormal discoloration in the receiving waters outside of the mixing zone.
(d) - For wastewaters with initial BOD concentration over 1,000 mg/L but less than 3,000 mg/L, the limit may be exceeded up to a maximum of 200 mg/L or a treatment reduction of ninety (90) percent, whichever is more strict. Applicable to both old and new industries.
(e) - The parameters Total Suspended Solids (TSS) should not increase the TSS of the receiving water by more than thirty (30) percent during the dry season.
(f) - Not more than 30 mg/L increase (dry season)
(g) - Not more than 60 mg/L increase (dry season)
(h) - If effluent is the sole source of supply for irrigation, the maximum limits are 1,500 mg/L and 1,000 mg/L, respectively, for old industries and new industries.
(i) - Not present in concentration to affect fish flavor or taste or tainting
(j) - If effluent is used to irrigate vegetable and fruit crops which may be eaten raw, Fecal Coliforms should be less than 500 MPN/100mL.

DENR Administrative Order No. 35, Series of 1990; Revised Effluent Regulations of 1990, Revising and Amending the Effluent Regulations of 1982 (EMB/DENR, March 20 1990)

Figure 1-9 Effluent Standards for New Industries Producing Strong Wastes upon Effectivity of these Regulations, and for All Industries Producing Strong Wastes starting January 1, 1995.

Industry Classification Based on BOD of Raw Wastewater	Maximum Allowable Limits in mg/L Based on Receiving Body of Water	
	Inland Waters (Class C and D)	Coastal Waters (Class SC and SD)
1. Industries producing within 3,000 to 10,000 mg BOD/L	130 or 98% removal	200 or 97% removal
2. Industries producing within 10,000 to 30,000 mg BOD/L	200 or 99% removal	600 or 97% removal
3. Industries producing more than 30,000 mg BOD/L	300 or 99% removal	900 or 97% removal

Note: Including old or existing industries producing strong waste whose wastewater treatment plants are still to be constructed.

1. Use either numerical limits or percentage removal whichever is lower (or whichever is more strict).
2. For parameters other than BOD and COD Figure 1-8 Effluent Standards: Conventional and Other Pollutants shall apply.

DENR Administrative Order No. 35, Series of 1990; Revised Effluent Regulations of 1990, Revising and Amending the Effluent Regulations of 1982 (EMB/DENR, March 20 1990)

Figure 1-10 Approved Methods of Analysis

PARAMETER	METHOD OF ANALYSIS
ARSENIC	Silver Diethyldithiocarbamate Method (Colorimetric)
BOD	Azide Modification (Dilution Technique)
BORON	Carmine Method (Colorimetric Method)
CADMIUM	Atomic Absorption Spectrophotometry (Wet ashing with concentration HNO_3+HCl)
CHLORINATED HYDROCARBONS	Gas Chromatography (ECD)
CHROMIUM (Hexavalent)	Diphenyl Carbazide Colorimetric Method
COLOR	Visual Comparison Method (Platinum Cobalt Scal)
CYANIDE	Specific Ion Electrode Method
DISSOLVED OXYGEN	Azide Modification (Winkler Method), Membrane Electrode (DO meter)
FECAL COLIFORMS	Multiple-Tube Fermentation Technique or Membrane Filter
LEAD	Atomic Absorption Spectrophotometry
NITRATE AS NITROGEN	Bruccine Method for Saline Waters, specific Ion Electrode Meter for Fresh Water
OIL AND GREASE	Gravimetric Method (Petroleum Ether Extraction)
ORGANO PHOSPORUS COMPOUNDS	Gas Chromatography (FPD)
PCB	Gas Chromatography (ECD)
pH	Glass Electrode Method
PHENOLIC SUBSTANCES	Chloroform Extraction Method
PHOSPHATE AS PHOSPORUS	Stannous Chloride Method
SETTLEABLE SOLIDS	Imhoff Cone Method
SURFACTANT (MBAS)	Methylene Blue Method (Colorimetric)
TEMPERATURE	Use of Mercury-Filled Thermometer
TOTAL COLIFORMS	Multiple-Tube Fermentation Technique or Membrane Filter
TOTAL MERCURY	Cold Vapor Technique, (Mercury Analyzer, AAS)
TOTAL SUSPENDED SOLIDS	Gravimetric Method

NOTE: Other methods found in the Philippine Standard Methods for Air and Water Analysis, the "Standard Methods for the Examination of Water and Waste Waters," published jointly by American Public Health Association, the American Waterworks Association and the Water Pollution Control Federation of the U.S. or in accordance with such other method of analyses as the DENR may prescribe.

DENR Administrative Order No.34, Series of 1990;Revised Water Usage and Classification / Water Quality Criteria Amending Section Nos: 68 and 69, Chapter III of the 1978 NPCC Rules and Regulations Criteria of Water Use Regulation (EMB/DENR, March 20 1990)

DENR Administrative Order No. 35, Series of 1990; Revised Effluent Regulations of 1990, Revising and Amending the Effluent Regulations of 1982 (EMB/DENR, March 20 1990)

3) Environmental Users Fee System

Furthermore, since January 1997 a new countermeasure has been implemented in the Laguna Lake area, which is suffering serious water pollution caused by factory effluents, according to PD984, Section 6, item g (Pollution Control Law) and Executive Order No. 927 "Defining Certain Powers and Functions of the Laguna Lake Development Authority (LLDA)." This is a system of collecting "Environmental Users Fees" (pollution charges) in proportion to the burden on the environment.

PD 984 invests the DENR (then the NPCC) with "the authority to issue, renew or deny permits under such conditions as it may deem reasonable for the prevention and abatement of pollution for the discharge of sewage, industrial waste --- and impose reasonable fees and charges for the issuance or renewal of all permits herein required." The Executive Order No. 927 invests the LLDA with the authority "to collect fees for the use of the lake waters and its tributaries for all beneficial purposes including but not limited to fisheries and waste disposal purpose, --- the share of the LLDA shall form part of its corporate funds and shall not be remitted to the National Treasury." The sanction system has not changed. Under the new system, however, the previous "Authority to Construct" and "Permit to Operate" have been replaced by the "Permit to Discharge," which is based on the existing water and air quality standards to be renewed annually.

A brochure issued by the LLDA describes that "to ensure that the rapid economic growth of the country is environmentally sustainable, it is important to make environmental management efforts more effective. In this context, DENR plans to introduce a system of environmental users fee to complement its existing regulatory framework. Under the proposed system, in addition to meeting the existing discharge standards specified in the regulations, activities that utilize environmental resources would also be required to pay a fee for every unit of pollution they discharge. This would help the Government achieve its objectives of preserving the environment in a reliable and cost-effective manner."

This Environmental Users Fee system is expected to be applied not only to the area around Laguna Lake but also eventually to all polluting activities from industrial, commercial, domestic and agricultural sources in the country.

However, in the first year of introduction, the system is being applied to about 120 industrial sources discharging waste water into Laguna Lake, which is under the jurisdiction of the LLDA, based on BOD (Biochemical Oxygen Demand). These 120 factories contributes 90 percent of the total water pollution discharged into Laguna Lake by industries. These 120 factories would be selected from the following five industrial sectors:

- Food processing
- Piggeries / Slaughterhouse
- Beverages
- Dyes and textiles
- Paper and pulp

The fees consist of a fixed and a variable fee components for BOD concentration. The fixed charge covers the cost of processing the discharge permit, monitoring and

evaluation.

Total annual environmental users fee = Fixed fee + Variable fee
<Fixed fee>

- Waste water discharges greater than 150 m^3/day: 15,000 Philippine pesos
- Waste water discharges between 31 and 150 m^3/day: 10,000 Philippine pesos
- Waste water discharges 30 m^3/day or less: 5,000 Philippine pesos

<Variable fee>

- Total BOD concentration is 50 mg/l or less: 5 Philippine pesos per kg of total BOD
- Total BOD concentration is greater than 50 mg/l: 30 Philippine pesos per kg of total BOD

Total annual BOD (in kilogram)
= (Average BOD concentration (mg/l)) × (daily Amount of waste water (m^3/day)) × 300 (number of annual operating days) × 10^{-3} (Conversion factor (m^3/L/kg/mg))

In the second stage, application of the system will be extended to other organic wastes as the toxics and hazardous chemicals. Also the coverage will be expanded to the domestic and commercial sources across the country.

The brochure of the LLDA describes the effects of this system as follows.

Old system: 1. Command and control, Burden of proof was on government calling to question technical capability of regulators ; 2. Cheaper to pay fine than set up a treatment plant resulting in polluted water that affects production in other industries ; and 3. Domestic polluters not accountable for pollution.

New System : 1. Burden of proof is on industry. Ultimate measure is quality of outflow bringing about a real incentive to minimize pollution ; 2. Real economic incentive to set up a treatment plant. To avoid higher user's fee, companies may adopt waste minimization strategies and new cleaner technologies ; and 3. All polluters pay. Environmental management is a shared responsibility among the government, industry and community.

4) Prospective Trends in Environmental Control over the Area around Laguna Lake

Water quality criterion "Class C" is applied to the areas around Laguna Lake, such as Metropolitan Manila, Cavite, Laguna and Batangas. In Class C, a BOD effluent criteria value of 50 mg/l is applied to new plants. According to the LLDA person in charge, "Stricter criteria will be applied step by step to the areas around Laguna Lake, because the government is planning to use the water of the Laguna Lake as drinking water in the future." That suggests that companies coming into the area from now on will need to prepare treatment equipment in advance to be able to satisfy criteria stricter than the present ones. Though it is not clear how the criteria will be revised, they are expected to be upgraded from Class C to B and then to A.

However, regarding the revision of the criteria, the person in charge said, "We will not revise the criteria all at one time. We are planning to upgrade them step by step in

proportion to the degree of improvement of companies. We will tackle this with the cooperation of industry and sometimes NGOs, not in a form in which the government forces the criteria on companies unilaterally."

5) Analysis of Water Quality

There are no private laboratories (Analysis Organization) authorized by the DENR. The DENR is preparing guidelines for the government to authorize laboratories, and the guidelines are subject to approval by the concerned departments in the government. This is because the government laboratories alone cannot deal with the situation due to the development of new measures such as introduction of the Environmental Users Fee system.

6) Penalties for Violating the Criteria

Penalties for violating the criteria are less than 5,000 pesos per day, based on Presidential Decree No. 984.

5. Countermeasures against Air Pollution

The causes of air pollution in Philippine cities can be divided into two, according to type of source: mobile sources such as automobiles and fixed sources such as power plants and factories. Notably, research conducted in the Manila metropolitan area in 1990 revealed that an estimated 21% of particle-like substances, 83% of nitrogen oxides, 99% of carbon monoxides and 12% of sulfur oxides are due to automobile exhaust.

A program has been put in place to combat this automobile emission. Privately owned vehicles that are more than five years old are legally required to undergo exhaust tests when they are registered. Two testing sites have been established in Manila for this purpose, but improvements on diesel engines and jeepneys are insufficient and these are perpetrating air pollution.

To deal with fixed sources of pollution, newly built factories are required to have pollution preventive equipment. Before start of operation is approved, Environmental Management Bureau DENR conducts emission tests, lays down the pollution and environmental standards and assesses pollution control equipment.

The latest legislation relating to air pollution, which has been amended several times as has the legislation relating to water pollution, is the DENR Administrative Order No. 14 and No. 14a "Revised Air Quality Standards of 1992, Revising and Amending the Air Quality Standards of 1978," which were promulgated on March 18, 1993. The Order lays down quality guideline for criteria pollutants, which are divided into short term and long term. Concentrations, averaging exposure time and analysis methods are laid down for source specific air pollutants. Furthermore, the Order stipulates pollutants, sources, standard values and analysis methods relating to the national emission standards for source specific air pollutants.

For emission control of sulfur compounds, the Order also stipulates ratios for sulfur

contained in liquid and solid fuel used at existing fixed emission sources, as well as emission standards for sulfur oxides in stationary sources. These are shown in Figures 1-11 through 1-14.

Automobile emissions are controlled by PD1181; Prevention, Control & Abatement of Air Pollution from Motor Vehicles & for Other Purposes / Motor Vehicle Pollution Control, and Government Notice No. 551, which stipulates installation of pollution prevention equipment in automobiles.

Figure 1-11 National Ambient Air Quality Guideline for Criteria Pollutants

Pollutant	Short Term (a)			Long Term (b)		
	ug/Ncm	ppm	Averaging time	ug/Ncm	ppm	Averaging time
Suspended Particulate						
Matter (e)- TSP	230 (f)		24 hours	90	--	1 yr. (c)
PM-10	150 (g)		24 hours	60	--	1 yr. (c)
Sulfur Dioxide (e)	190	0.07	24 hours	80	0.03	1 yr.
Nitrogen Dioxide	150	0.08	24 hours	--	--	--
Photochemical Oxidants	140	0.07	1 hour	--	--	--
as Ozone	60	0.03	8 hours	--	--	--
Carbon Monoxide	35 mg/Ncm	30	1 hour	--	--	--
	10 mg/Ncm	9	8 hours	--	--	--
Lead (d)	1.5	--	3 months (d)	1.0	--	1 yr.

Note:

a. Maximum limits represented by ninety eight percentile (98%) values not to be exceeded more than once a year.
b. Arithmetic mean
c. Annual Geometric Mean
d. Evaluation of this guideline is carried out for 24-hour averaging time and averaged over three moving calendar months. The monitored average value for any three months shall not exceed the guideline value.
e. SO_2 and Suspended Particulates are sampled once every six days when using the manual methods. A minimum number of twelve sampling days per quarter or forty eight sampling days each year is required for these methods. Daily sampling may be done in the future once continuous analyzers are procured and become available.
f. Limits for Total Suspended Particulates with mass median diameter less than 25-50 um.
g. Provisional limits for Suspended Particulates with mass median diameter less than 10 microns until sufficient monitoring data are gathered to base a proper guideline.

DENR Administrative Order No.14;Revised Air Quality Standards of 1992, Revising and Amending the Air Quality Standards of 1978 (DENR, March 18 1993)

Figure 1-12 National Ambient Air Quality Standards for Source Specific Air Pollutants from Industrial Sources/Operations

*Pollutants (a)	Concentration (c)		Averaging time (min)	Method of Analysis/ Measurement (b)
	ug/Ncm	ppm		
1. Ammonia	200	0.28	30	Nesselerization
2. Carbon Disulfide	30	0.01	30	Tischer Method
3. Chlorine and Chlorine compounds expressed as Cl_2	100	0.03	5	Methyl Orange
4. Formaldehyde	50	0.04	30	Chromotropic acid method or MBTH-Colorimetric method
5. Hydrogen Chloride	200	0.13	30	Volhard Titration with Iodine solution
6. Hydrogen Sulfide	100	0.07	30	Methylene Blue
7. Lead	20		30	AAS[b]
8. Nitrogen Dioxide	375 260	0.20 0.14	30 60	Griess-Saltzman
9. Phenol	100	0.03	30	4-Aminoantipyrine
10. Sulfur Dioxide	470 340	0.18 0.13	30 60	Colorimeteric-Pararosaline
11. Suspended Particulate Matter				
TSP	300	--	60	Gravimetric
PM-10	200	--	60	-do-

Notes:

a. Pertinent ambient standards for Antimony, Arsenic, Cadmium, Asbestos, Nitric Acid and Sulfuric Acid Mists in the 1978 NPCC Rules and Regulations may be considered as guides in determining compliance.

b. Other equivalent methods approved by the Department may be used.

c. Ninety-eight percentile (98%) values of 30-min. sampling measured at 25°C and one atmosphere pressure.

DENR Administrative Order No.14；Revised Air Quality Standards of 1992, Revising and Amending the Air Quality Standards of 1978 (DENR, March 18 1993)

Figure 1-13 National Emission Standards for Source Specific Air Pollutants (NESSAP)

POLLUTANT*	STANDARD APPLICABLE TO SOURCE	MAXIMUM PERMISSIBLE LIMITS (mg/Ncm)	METHOD OF ANALYSIS[a]
Antimony & its Cmpds.	Any source	10 as Sb	AAS[b]
Arsenic & its Cmpds.	Any source	10 as As	AAS[b]
Cadmium & its Cmpds.	Any source	10 as Cd	AAS[b]
Carbon Monoxide	Any industrial source	500 as CO	Orsat Analysis
Copper & its Cmpds.	Any industrial source	100 as Cu	AAS[b]
Hydrofluoric Acid and Fluorine Cmpds.	Any source other than the manufacture of Aluminum from Alumina	50 as HF	Titration with Ammonium Thiocyanate
Hydrogen Sulfide	i) Geothermal power plants	c, d	Cadmium Sulfide Method
	ii) Geothermal Exploration and Well Testing	E	
	iii) Any source other than (i) and (ii)	7 as H_2S	Cadmium Sulfide Method
Lead	Any trade, industry or process	10 as Pb	AAS[b]
Mercury	Any source	5 as elemental Hg	AAS[b]/cold-Vapor Technique or Hg Analyzer
Nickel and its Cmpds. Except Nickel Carbonyl[g]	Any source	20 as Ni	AAS[b]
No_x	i) Manufacture of Nitric Acid	2,000 as acid and NO_x calculated as NO_2	Phenol-disulfonic acid Method
	ii) Fuel burning steam generators		-do-
	Existing Source	1,500 as NO_2	
	New Source		
	Coal-fired	1,000 as NO_2	
	Oil-fired	500 as NO_2	
	iii) Any source other than (i) and (ii)		-do-
	Existing Source	1,000 as NO_2	
	New Source	500 as NO_2	
Phosphorous Pentoxide	Any source	200 as P_2O_5	Spectrophotmetry
Zinc & its Cmpds.	Any source	100 as Zn	AAS[b]

a Other equivalent methods approved by the Department may be used.
b Atomic Absorption Spectrophotometry
c All new geothermal power plants starting construction by 01 January 1994 shall control H_2S emissions to not more than 150 g/GMW-Hr.
d All existing geothermal power plants shall control H_2S emissions to not more than 200 g/GMW-Hr. within 5 years from the date of effectivity of these revised regulations.
e Best practicable control technology for air emissions and liquid discharges. Compliance with air and water quality standards is required.
f Provisional Guideline
g Emission limit of Nickel Carbonyl shall not exceed 0.5 mg/Ncm.
* Limits of other air pollutants not included in this table but appearing in the 1978 regulations shall be maintained.

DENR Administrative Order No.14 ; Revised Air Quality Standards of 1992, Revising and Amending the Air Quality Standards of 1978 (DENR, March 18 1993)

Figure 1-14 Control of Sulfur Compound Emission

(1) Sulfur Content of Fossil Fuels for Existing Sources

(a). Liquid Fuel	Metro Manila	Outside Metro Mla
(i). Fuel Oil (All grades)		
July 1, 1993	3.5%	3.8%
January 1, 1996	3.0%	3.0%
(ii). Industrial Diesel		
July 1, 1993	0.7%	0.8%
January 1, 1996	0.5%	0.5%
(b). Solid Fuel (Coal)		
July 1, 1993	2.5%	2.5%
January 1, 1996	1.0%	1.0%

(2) Maximum Permissible Emission Limits for Sulfur Oxides in Stationary Sources

(1). Existing Sources	
(i). Manufacture of Sulfuric Acid and Sulf(on)ation Process	2.0 gm/Ncm as SO_3
(ii). Fuel Burning Steam Generators	1.5 gm/Ncm as SO_2
(iii). Other Stationary Sources except (i) and (ii)	1.0 gm/Ncm as SO_3
(2). New Sources	
(i). Manufacture of Sulfuric Acid and Sulf(on)ation Process	1.5 gm/Ncm as SO_3
(ii). Fuel Burning Steam Generators	
January 1, 1994	1.0 gm/Ncm as SO_2
January 1, 1998	0.7 gm/Ncm as SO_2
(iii). Other Stationary Sources except (i) and (ii)	0.2 gm/Ncm as SO_3

DENR Administrative Order No.14；Revised Air Quality Standards of 1992, Revising and Amending the Air Quality Standards of 1978 (DENR, March 18 1993)

6. Countermeasures against Solid Waste

The volume of solid waste produced per day in Metropolitan Manila is about 0.6 kg per capita (as of 1994) and has increased steadily each year, as shown in Figure 1-15. It is said that 77 to 90 percent of solid waste in Metropolitan Manila are processed at three treatment facilities or recycled, and the remaining 10 to 23 percent is dumped in vacant lots, roadsides, riverbanks and rivers.

Figure 1-15 Amount of Solid Waste Produced in Metropolitan Manila (per day)

Year	Amount
1982	2,633 t
1988	3,339 t
1993	4,911 t
1994	5,000 - 5,400 t

At present, almost all waste are disposed in open dumpsites without waste water treatment facilities or water barrier sheeting, but such disposal sites are going to be closed. For instance, the disposal site in Tondo known as "Smoky Mountain" was closed in May 1993, and the disposal site in Pasig was closed in September 1994. However, even the "sandwich method" of covering filled waste material with soil is not being used for reason of expense, nor are appropriate disposal sites being built. Such being the situation, waste disposal sites have given rise to various pollution including sanitation problems such as insect plague, as well as spontaneous combustion of refuse, malodor, and water pollution. Besides, there is considerable amount of refuse that goes without being collected and becomes illegally dumped in rivers and lakes. This is another big cause of water pollution. Meanwhile, a survey reveals that two existing sites will be able to process only about 40 percent of collected waste because enough substitute sites for the closed sites have not been built.

The collection and disposal of solid waste is the responsibility of local authorities, according to the law. Despite the methods of disposal adopted as described above, the increased cost of refuse disposal is now a problem.

Major laws dealing with waste are:- PD 825: Providing Penalty for Improper Disposal of Garbage and Other Forms of Uncleanliness and for Other Purposes, issued in 1975, which lays down penalties for illegal disposal of waste; PD 856: Code on Sanitation, which stipulates the waste disposal responsibility of local authorities. In this PD 856, standards for drinking water, sewage, and waste disposal are given. In Chapter 5 of the PD 1152, issued in 1977, a waste disposal plan and waste disposal methods are laid down.

In order to tackle these waste disposal problems, the construction of a waste relay station and a controlled landfill site is planned. Speedy execution of these projects are now urgently required.

As for industrial waste, Republic Act; RA 6969; Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990 was enacted in 1990. However, action is lagging behind. Research into what waste materials are produced by major industries and establishing a disposal plan based on these findings, construction of disposal sites and treatment facilities - all these are requiring swift attention. The problem is that landfilling with toxic waste is prohibited at present, yet there are no facilities to process

the waste.

Not only Japanese companies but also other foreign affiliate companies, are calling for the construction of facilities to process toxic solid waste. Presidential Task Force on Waste Management coordinated by the DENR, was established in 1987. The government is now beginning to tackle this problem. The World Bank and the European Union (EU) have already conducted a survey to identify locations for facilities to process toxic waste. The survey shows that when it comes to processing facility sites, many residents protest against the construction of facilities near their home, or in their town or province. The government at one point decided to prepare a landfill site in Carmona southwest of Manila, but this has not gone ahead due to strong opposition by the local authorities and municipalities. According to the DENR person in charge, the government will solve this problem within a couple of years, so companies are required to store sludge and the like.

7. Future Trends of Environmental Measures

The Philippine government now implements regulative measures based on laws and economic measures such as the environmental users fees. Furthermore, the government is planning to launch a project called "Ecowatch," a sociocultural approach, as a third measure from the end of 1997.

This project classifies companies by stage of pollution prevention by assigning them "symbolic colors." Names of companies are announced publicly, providing a kind of company version of the ecolabel system. Companies with no specific measures to prevent pollution are classified as "black." Companies addressing pollution issues to some degree but not satisfying the criteria are classified as "red." Companies satisfying the criteria are classified as "blue." Companies implementing measures that more than satisfy the criteria are classified as "green." Companies that stay green for 3 years or more are classified as "gold."

For the time being, the LLDA is running this project independently, and is planning to apply the project to the whole country in the future.

The government also has an Industrial Environmental Management Project (IEMP) to promote reductions in the amounts of effluent and environment inspections. The purposes of this project are: 1) to prevent or reduce pollution at the source; 2) to reclaim industrial wastes; and 3) to encourage cost-effective pollution abatement technologies. The details include 1) Pollution Reduction Initiative which involves promotion of pollution management appraisals, environmental risk assessment and technology transfer initiatives; 2) Policy Studies and Public/Private Dialogues which supports a wide range of policy analysis to institute improvements in the existing industrial regulatory framework; and; 3) the Capability Building Component which helps effect technology transfer to local organizations and professionals needing to improve their industrial pollution management skills.