

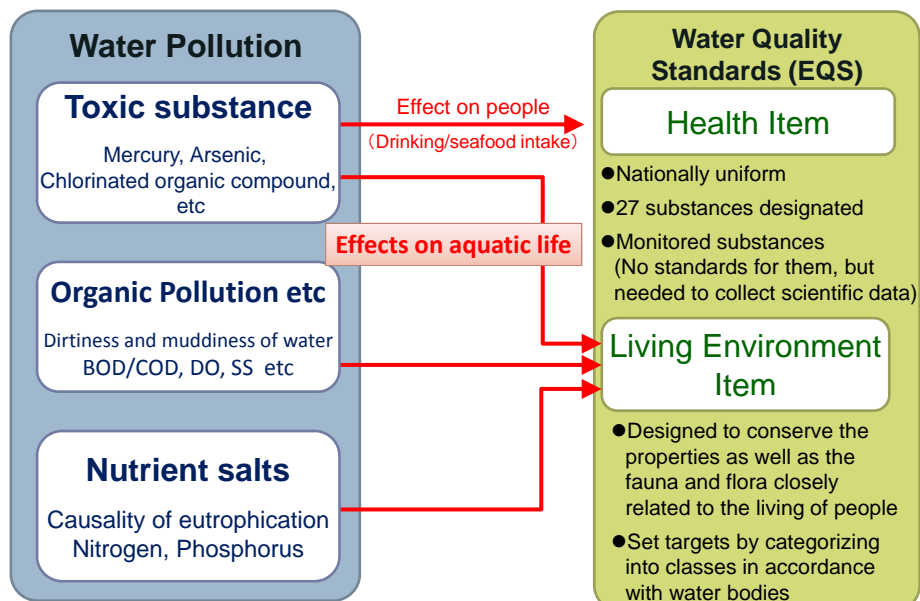
Industrial Wastewater Management in Japan

August , 2012

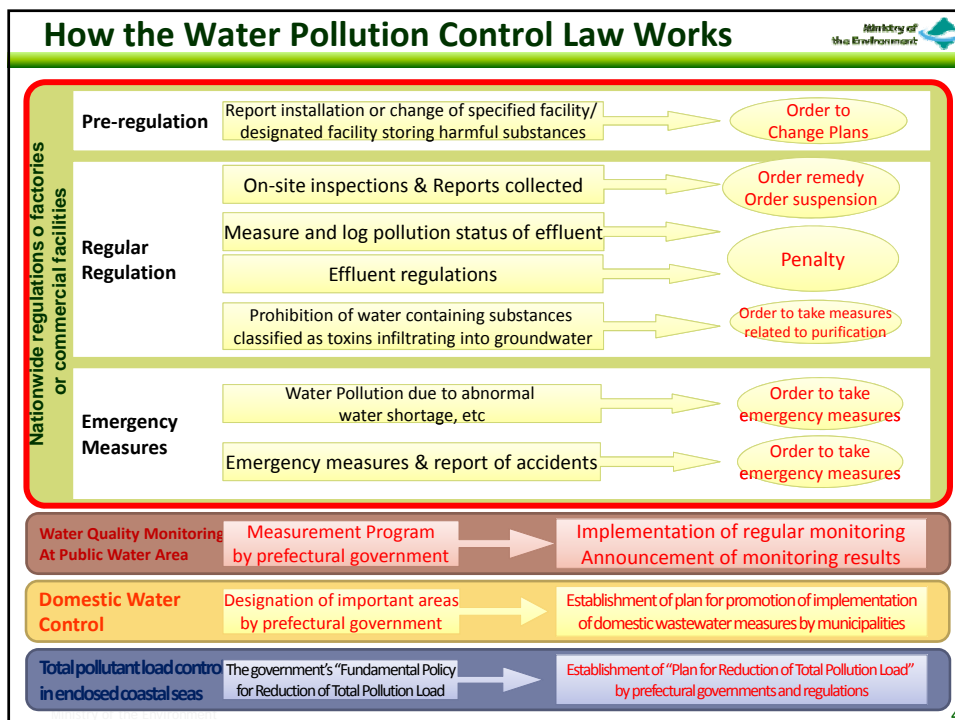
Takatoshi Wako

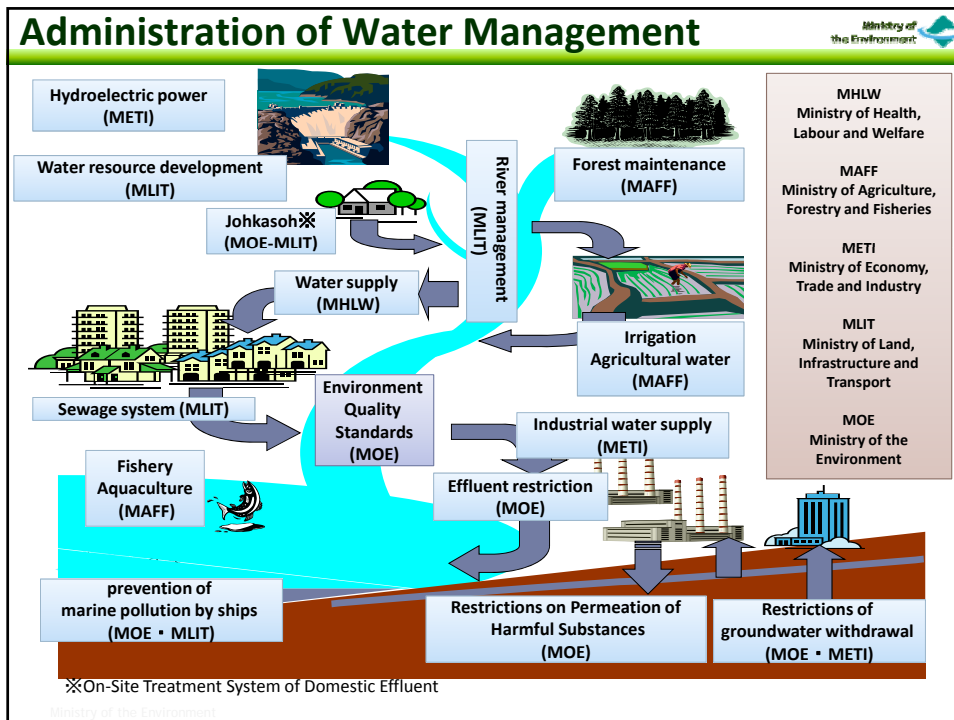
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Water Environment Quality Standards (EQS)



Items of Environmental Quality Standard for Water Pollution			
Health items			
Item	Standard Value	Item	Standard Value
Cadmium	0.01 mg/L or less	1,1,1-trichloroethane	1 mg/L or less
Total cyanide	Undetected	1,1,2-trichloroethane	0.006 mg/L or less
Lead	0.01 mg/L or less	Trichloroethylene	0.03 mg/L or less
Hexavalent chromium	0.05 mg/L or less	Tetrachloroethylene	0.01 mg/L or less
Arsenic	0.01 mg/L or less	1,3-dichloropropene	0.002 mg/L or less
Total mercury	0.0005 mg/L or less	Thiuram	0.006 mg/L or less
Alkylmercury	Undetected	Simazine	0.003 mg/L or less
PCB	Undetected	Thiobencarb	0.02 mg/L or less
Dichloromethane	0.02 mg/L or less	Benzene	0.01 mg/L or less
Carbon tetrachloride	0.002 mg/L or less	Selenium	0.01 mg/L or less
1,2-dichloroethane	0.004 mg/L or less	Nitrate nitrogen & Nitrite nitrogen	10 mg/L or less
1,1-dichloroethylene	0.02 mg/L or less	Fluoride	0.8 mg/L or less
Cis-1,2-dichloroethylene	0.04 mg/L or less	Boron	1 mg/L or less
		1,4-Dioxane	0.05mg/ or less
Living environment items			
	River	Lake	Sea Area
BOD	≤ 1 - 10 mg/L	-	-
COD	-	≤ 1 - 8 mg/L	≤ 2 - 8 mg/L
pH	6.0 - 8.5	6.0 - 8.5	7.0 - 8.3
SS	≤ 25 - 100 mg/L etc.	≤ 1 - 15 mg/L etc.	-
DO	2-7.5 mg/L ≤	2-7.5 mg/L ≤	2-7.5 mg/L ≤
Coliform bacteria count	≤ 50 - 5,000 MPN/100 mL	≤ 50 - 1,000 MPN/100 mL	≤ 1,000 MPN/100 mL
N-hexane extracts	-	-	Undetected.
Total nitrogen	-	≤ 0.1 - 1 mg/L	≤ 0.2 - 1 mg/L
Total phosphorous	-	≤ 0.005 - 0.1 mg/L	≤ 0.02 - 0.09 mg/L
All zinc	≤ 0.03 mg/L	≤ 0.03 mg/L	≤ 0.01 - 0.02 mg/L





Role and Responsibility of National/Local governments

Responsibility of National Government

- To develop basic policies and measures for environment protection, based on the fundamental principles regarding to environment protection, and to implement them

Major actions for environment protection by national government

- Development of the environmental basic plan
- Establishment of Environment Quality Standards
- Proposal of basic policies for actions against environment pollution
- Regulations to protect Environment from pollution
- To develop facilities and implement other projects for environment protection etc.

Responsibility of Local Governments

- To develop policies and to implement actions suitable to natural and social conditions of local government for environmental protection, along with fundamental principles regarding to environment protection

Major actions for environment protection by local governments

- To promote comprehensive and designed action necessary to environmental protection in natural and social condition of local governments
- Development and promotion of environment pollution protection plan etc.

Target Facilities of Effluent Control

Facility that discharges polluted water or wastewater is defined as a **specified facility** by the Water Pollution Control Law, and all factories or establishments in which specified facilities are installed are stipulated as the control subjects of Water Pollution Control Law.

Example :

- Facilities to be used for **mining**, etc.
- Facilities devoted to **stock raising, agriculture**, etc.
- Facilities to be used for various types of **food manufacturing**, etc.
- Facilities to be used for **forestry**, etc.
- Facilities to be used for **pulp manufacturing**, etc.
- Facilities to be used for **medical goods manufacturing**, etc.
- Facilities to be used for **cement products manufacturing**, etc.
- Facilities to be used for **steel or nonferrous metals manufacturing** and facilities to be used for **other types of manufacturing**
- **Hotel businesses, restaurants, laundry businesses, photograph development businesses, hospitals, scientific and technological research facilities**
- **Waste disposal sites**
- **Final sewage treatment facilities, joint waste water treatment plants,**
And so on...

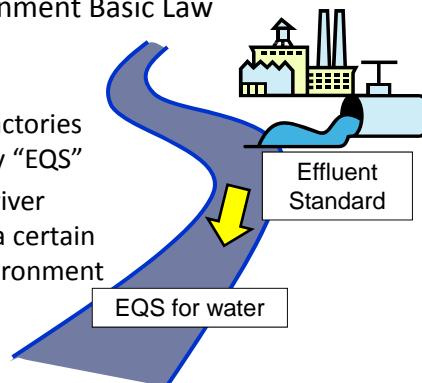


As of the end of FY2010, approx. **274,000** establishments are control subjects

EQS and Effluent standards for water

Environmental Quality Standard (EQS)

- Established as part of the government's objectives (standards that are to be followed) to prevent health hazards and conserve the living environment" by the Environment Basic Law
- "Effluent Standards" are applied on factories and establishments in order to satisfy "EQS"
- In consideration of dilution effect by river water, an effluent standard value for a certain item is decided as **10 times** as an environment quality standard for the same time.
- For some specific business categories that face difficulty to meet the uniform effluent standard for a specific item, **a provisional effluent standard** is applied by specifying a time limit



Wastewater standards

【Health item】

Kinds of harmful substances	Tolerable limit
Cadmium and its compounds	0.1 mg/L
Cyanide compounds	1 mg/L
Organic compound (limited to parathion, methyl parathion, methyl demeton and EPN (ethyl p-nitrophenyl phenylphosphorothioate))	1 mg/L
Lead and its compounds	0.1 mg/L
Hexavalent chromium compounds	0.5 mg/L
Arsenics and its compounds	0.1 mg/L
Mercury and alkyl mercury, and other mercury compounds	0.005 mg/L
Alkyl mercury compounds	Not detected
Polychlorinated biphenyl	0.003 mg/L
Trichloroethylene	0.3 mg/L
Tetrachloroethylene	0.1 mg/L
Dichloromethane	0.2 mg/L
Carbon tetrachloride	0.02 mg/L
1,2-dichloroethane	0.04 mg/L
1,1-dichloroethylene	0.2 mg/L
cis-1,2-dichloroethylene	0.4 mg/L
1,1,1-trichloroethane	3 mg/L
1,1,2-trichloroethane	0.06 mg/L
1,3-dichloropropene	0.02 mg/L
Thiram	0.06 mg/L
Simazine	0.03 mg/L
Thiobencarb	0.2 mg/L
Benzene	0.1 mg/L
Selenium and its compounds	0.1 mg/L
Boron and its compounds	Other than sea area: 10 mg/L Sea area: 230 mg/L
Fluorine and its compounds	Other than sea area: 8 mg/L Sea area: 1 mg/L
Ammonia, ammonium compounds, nitrite compounds and nitrate compounds	(*) 100 mg/L
1,4-dioxane	0.5mg/L

【Living environment item】

Kinds of harmful substances	Tolerable limit
Hydrogen ion concentration (pH)	Other than sea area: 5.8 – 8.6 Sea area: 5.0 – 9.0.
Biochemical oxygen demand (BOD)	160 mg/L (Daily mean value: 120 mg/L)
Chemical oxygen demand (COD)	160 mg/L (Daily mean value: 120 mg/L)
Suspended solids (SS)	200 mg/L (Daily mean value: 150 mg/L)
Normal-hexane extracts content (mineral oils content)	5 mg/L
Normal-hexane extracts content (animal and plant fats content)	30 mg/L
Phenols content	5 mg/L
Copper content	3 mg/L
Zinc content	2 mg/L
Soluble iron content	10 mg/L
Soluble manganese content	10 mg/L
Chromium content	2 mg/L
Coliform group number	Daily mean value: 3,000/cm ³
Nitrogen content	120 mg/L (Daily mean value: 60 mg/L)
Phosphorus content	16 mg/L (Daily mean value: 8 mg/L)

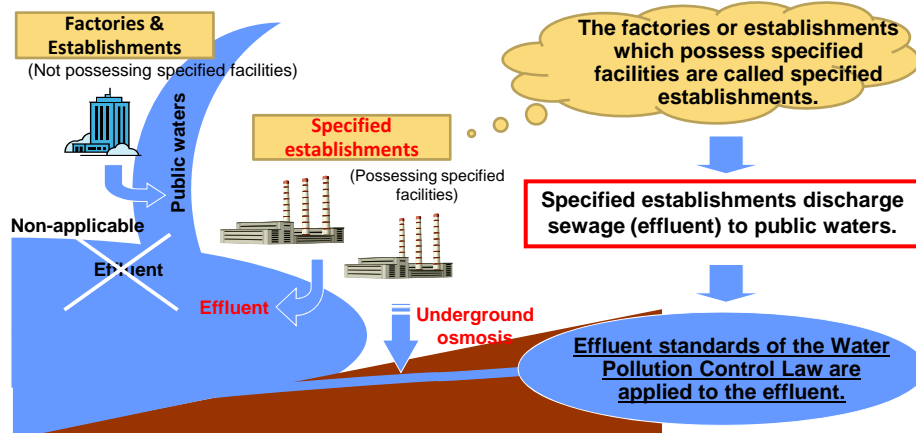
Note
The effluent standard shown in this table is applicable to the effluent water discharged by a plant, factory, or business establishment which discharges 50m³/day or more of effluent water on daily average.

(*) 0.4 times the ammonia nitrogen compound, and the total of nitrite nitrogen and nitrate nitrogen

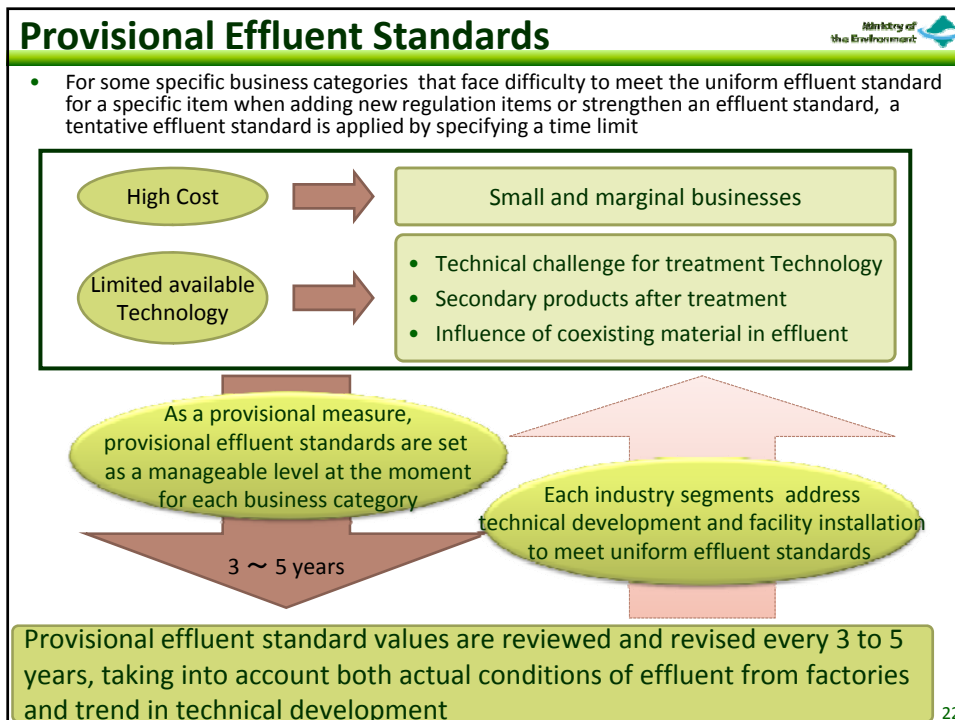
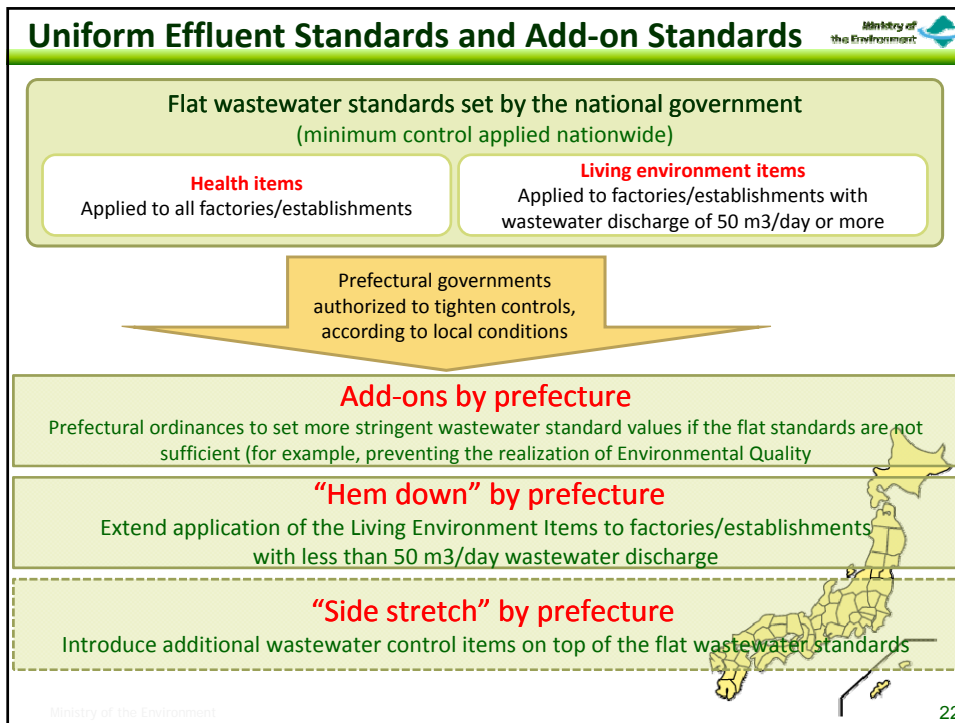
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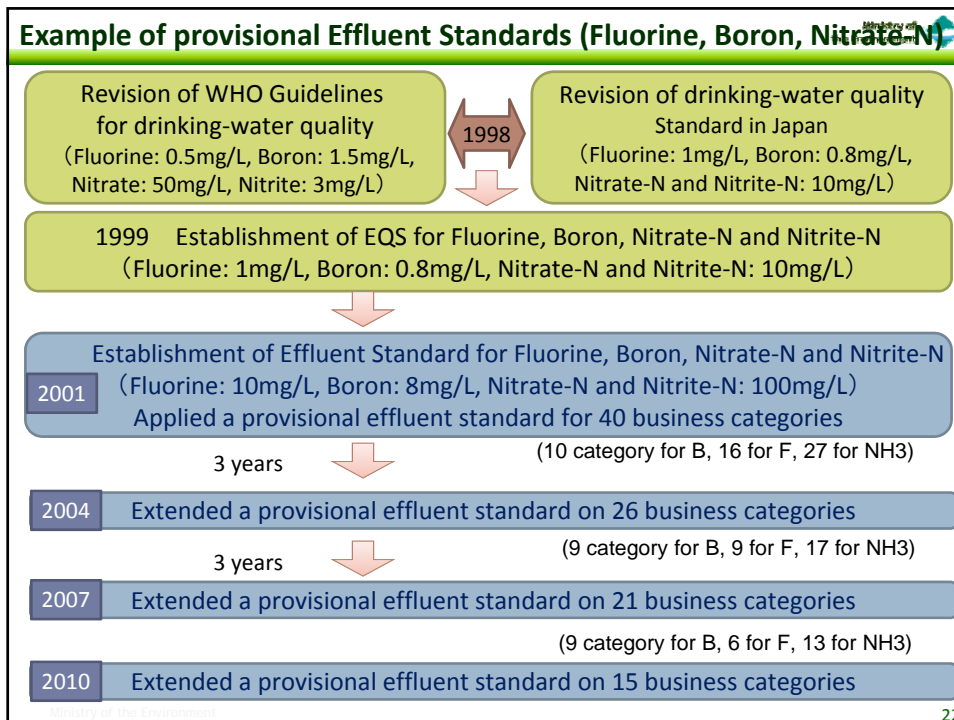
Uniform National Effluent Standards (Concentration Regulation)

- The effluent control of the Water Pollution Control Law stipulates effluent standards (Uniform National Effluent Standards) that are uniform across all industries for the specified establishments throughout the country.
- The control is carried out using the so-called **“direct penalty system”** by which **penalties can be applied simply because of excess concentrations.**



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Report Collection and Inspection

Water Pollution Control Law, Article 22

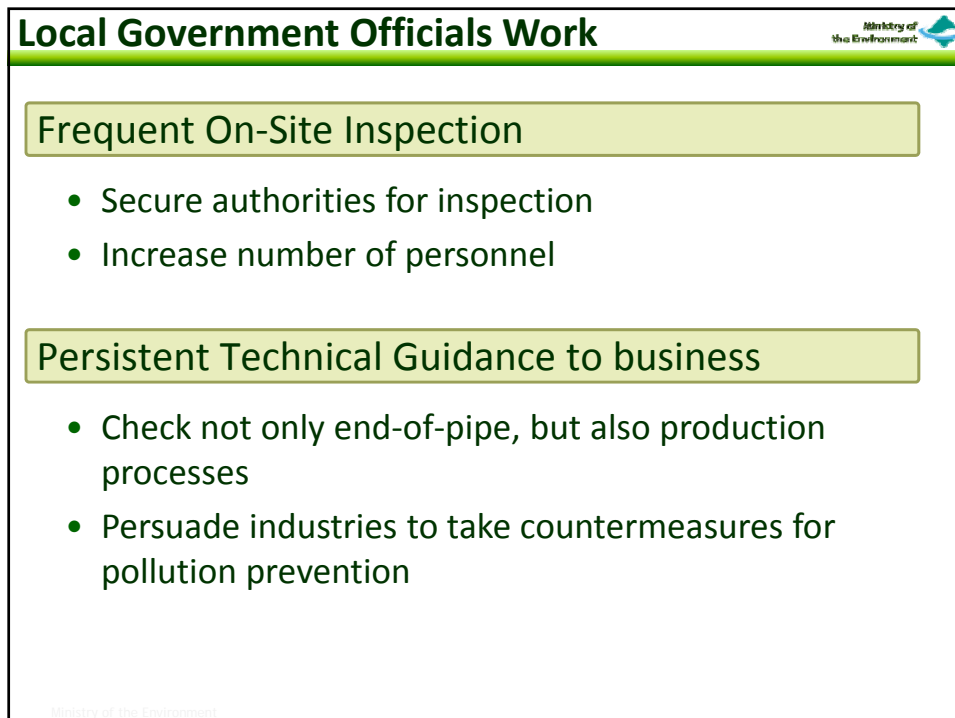
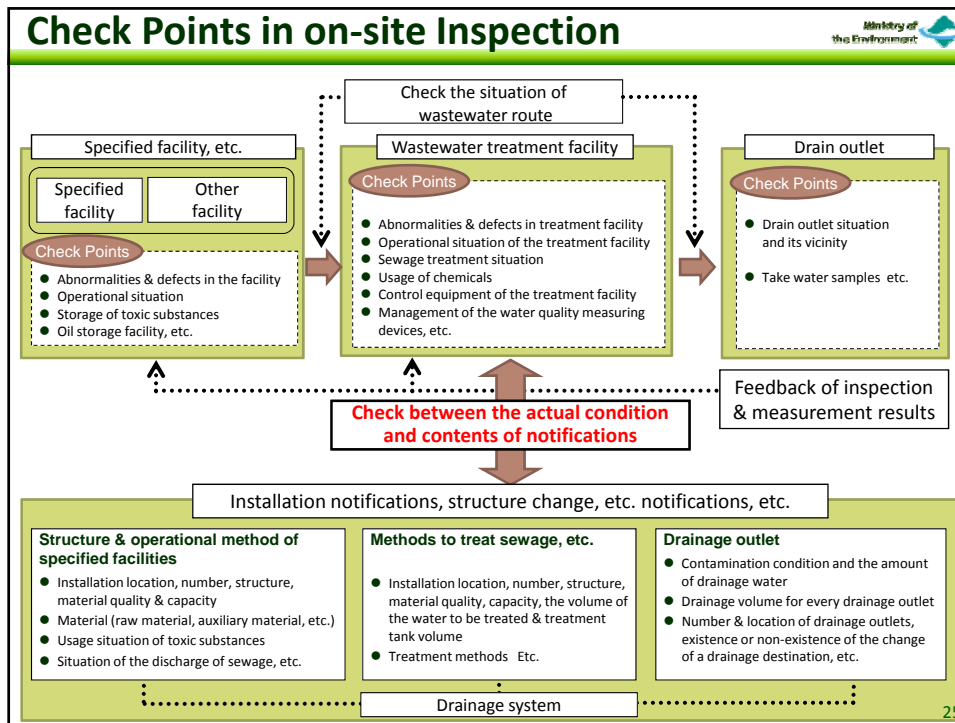
- The minister of the environment or the governor of a prefecture may in accordance with the cabinet order, call for a report from the owner of a Specified Facility concerning the condition of the Specified Facility, the method of treatment of polluted water, etc., and other necessary matters, within the limits required for the implementation of this Law; or may have his officials enter the Specified Factory and inspect the Specified Facility or other related matters.

Objective of on-site inspection

- To check whether rules for the compliance of regulation standards are operated properly in establishments so that owners always comply regulation standards, and implement necessary measures, if required.
- It is important to check not only compliance with standards by water sampling, but also comparing filed info and actual state, and self-management situation.

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Further development of pollution control system



- Increase in the number of officials in charge of pollution control (local governments)

1961: 300 persons → 1975: 12,317 persons

- Increase of pollution control related budget

at national level

73.3 billion yen (1970) → 333.1 billion yen (1975) ※about 5 times

at local level

373.5 billion yen (1970) → 1.4258 trillion yen (1975) ※about 4 times

- Spread of pollution control manager system

Increase in the number of pollution control organizations

1965: 5% → 1970: 40%

1971: establishment of "Law concerning the Improvement of Pollution Prevention Systems in Specified Factories"

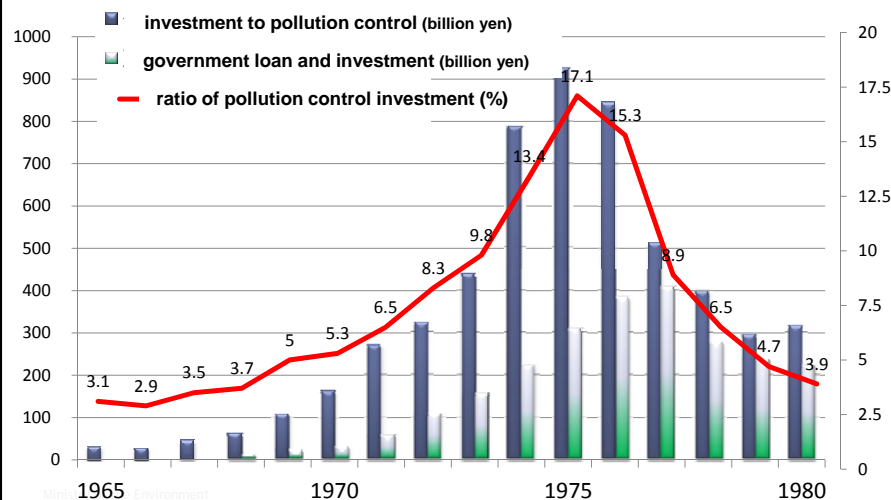
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Efforts made by Private Sector ①



- Investment to pollution control -

Increase in the investment to pollution control



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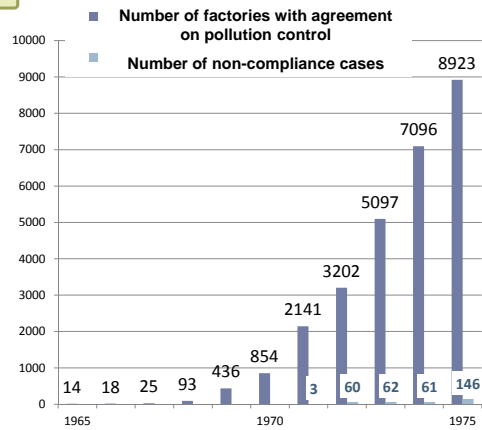
Efforts made by Private Sector ②

- Agreement on environmental pollution control -

Agreement between private sector and local governments/citizen's group

Functions of the agreement

- ① Supplement pollution control measure
- ② Implementation of pollution control with close attention to local conditions
- ③ Promotion of future pollution control measures and promote development of pollution prevention technologies
- ④ Prevention of protests against location of factories by getting agreement from local residents



Enforcement status of water pollution control law

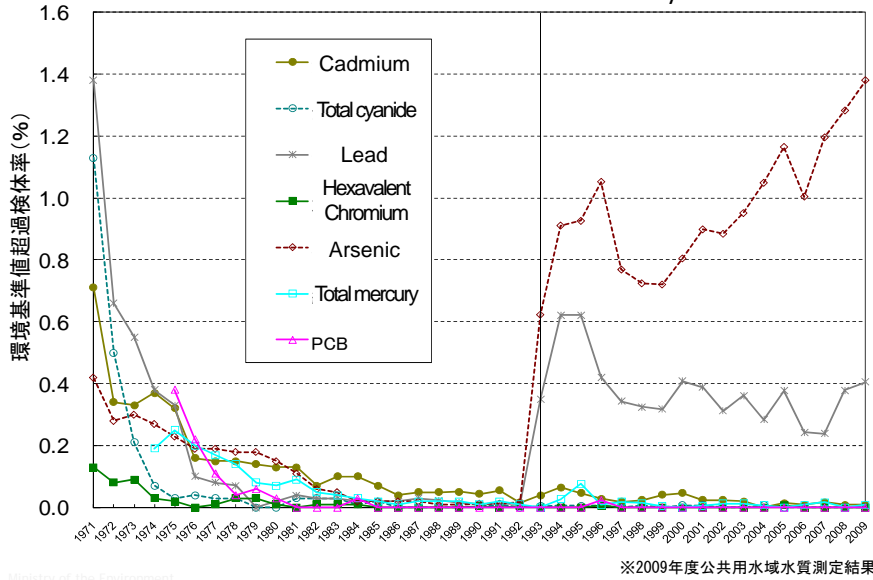
	2006	2007	2008	2009	2010
No. of specified establishments	289,091	280,517	276,952	274,039	271,242
average effluent more than 50m ³ /day	36,139	35,506	34,807	34,271	33,964
Notification					
Article 5 (Establishment of Specified facilities)	6,279	6,670	6,174	5,075	5,307
Article 7 (Structure changes etc.)	3,963	3,986	3,841	3,530	3,539
Article 8 (Order to change plans)	0	0	0	0	0
No of establishments inspected (Article 22.1)	46,764	47,410	43,509	42,367	41,260
inspection during night	768	686	575	581	588
Order for Improvement (Article 13)	37	27	23	26	16
Order to suspend operation (Article 13)	1	1	1	0	0
Order to purify groundwater (Article 14.3)	0	0	0	0	0
Number of administrative direction					
in writing	2,877	2,968	2,623	2,964	2,880
Oral	4,702	5,314	4,917	4,106	5,095
Total	7,579	8,282	7,540	7,070	7,975
Contents of administrative direction					
Installation or improvement of wastewater treatment facilities	2,347	2,731	2,515	2,506	2,206
temporary suppression of effluent	26	29	20	14	28
Others	5,380	5,849	5,346	4,943	6,010
total	7,753	8,609	7,881	7,463	8,244
Violation of effluent standards (Article 31.1.1)	12	11	13	6	11
Violation of order for improvement (Article 30)	0	0	0	0	0
Violation of water pollution control law (others)	0	0	0	0	0
Measures to be taken in case of an accident	500	526	458	375	433

State of Achievement of Environmental Standard



Health Items :

Achieved Environmental standard almost over the country



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Amendment of Water Pollution Control Law



Examples of Effluent standard excess and unsuitable cases of data manipulation

Outline of the main unsuitable cases in recent years

2005.2	A Corporation (Steel)	<ul style="list-style-type: none"> Discharge of water unsuited to the effluent standards For more than 5 years, values that is rewritten over the measurement data that exceeds the values decided in pollution control agreement
2009.3	B Corporation (Paper)	<ul style="list-style-type: none"> The water quality data were rewritten below the effluent standards Camouflage the effluent diluted with river water so that the water quality could meet effluent standards
2010.1	C Corporation (Chemical)	<ul style="list-style-type: none"> The measurement consignment company was instructed to rewrite the analysis data of exceeding effluent standards

Amendment of Water Pollution Control Law (2010.5) Strict actions against effluent data manipulation

- Establishment of penalty against negligence of records or false record of effluent

Measurement items	<ul style="list-style-type: none"> Items defined by effluent standards for specified establishments
Frequency of measurement	<ul style="list-style-type: none"> Items notified when established : more than once a year Other items : when required
Timing of measurement	<ul style="list-style-type: none"> Season and timing when quality of the effluents are estimated to be worst
Measurement record retention period	<ul style="list-style-type: none"> Record tables for water quality measurement and charts have to be kept for 3 years
Penalties	<ul style="list-style-type: none"> Less than 300 thousand yen

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Tips of Water Pollution Control

- Enhancement of laws and regulations
- Guidance for factories and establishments by public sector before punishment
- Wise use of water resources reduces cost and pollution
- The sooner, the better



Thank you for your attention