

Chapter 1. The System of Investigation of Persistence in the Environment Concerning Chemical Substances

The Environmental Health and Safety Division of the Environment Agency of Japan has been conducting successive investigation concerning the situation of persistence of chemical substances in the environment since fiscal year 1974, and is conducting the following 3 major investigation at present.

- General Inspection Survey of Chemical Substances on Environmental Safety
- Investigation and Survey of Designated Chemical Substances etc.
- Follow-up Survey of the Situation of Pollution by Unintentionally Formed Chemical Substances

These surveys originate in historical terms from that the Resolution accompanying the Law Concerning the Examination and Regulation of Manufacture etc. of Chemical Substances (hereinafter referred to as the Chemical Substances Control Law) in 1973 stated that safety investigation of existing chemical substances (Approximately more than 20,000 substances which were manufactured or imported for commercial purposes at the time of enactment of the Law, listed in the Existing Chemical Substances Inventory.) is conducted by the government, and the Environment Agency initiated grasping the situation of persistence of these substances in the general environment, based on this Resolution. Later, substances subject to the survey were expanded to include examined new chemical substances and unintentionally formed chemical substances.

(See Appendix A for the Chemical Substances Control Law)

1. General Inspection Survey of Chemical Substances on Environmental Safety

From the First General Inspection Survey of Chemical Substances on Environmental Safety during fiscal year 1979-1988, valuable data concerning environmental pollution by chemical substances have accumulated and solid results have been obtained such as the actual employment of various investigation methods for chemical substances. Moreover, many problems concerning environmental investigation methods etc. were clarified, through conduct of First General Inspection Surveys. Recently, environmental pollution by Dioxins formed unintentionally in the waste incineration process, and the possibility of ground water pollution by chlorinated organic compounds etc. have been pointed out. Although part of these problems have been taken measures by the amendment of the Chemical Substances Control Law, environmental pollution problems caused by new types of substances remained unresolved.

With this situation in the background, the Chemical Substances Investigation and Survey Committee consisting of experts reviewed the situation of conduct of General Inspection Surveys so far, and new measures for problems arising from chemical substances were considered, and the

Second General Inspection Survey was conducted from fiscal year 1989 on a 10 year plan. The system of this survey is indicated in Figure 1, and the main changes from the First Inspection Survey are as follows.

a. Expansion of Substances Subject to the Survey

In addition to the existing chemical substances subject to the survey in former general inspection surveys, examined new chemical substances and unintentionally formed chemical substances are included.

Actual substances subject to the survey are chosen from these 3 categories, from the revised Priority List (listing 1,145 substances).

b. Improvement of the Method for Environmental Investigation

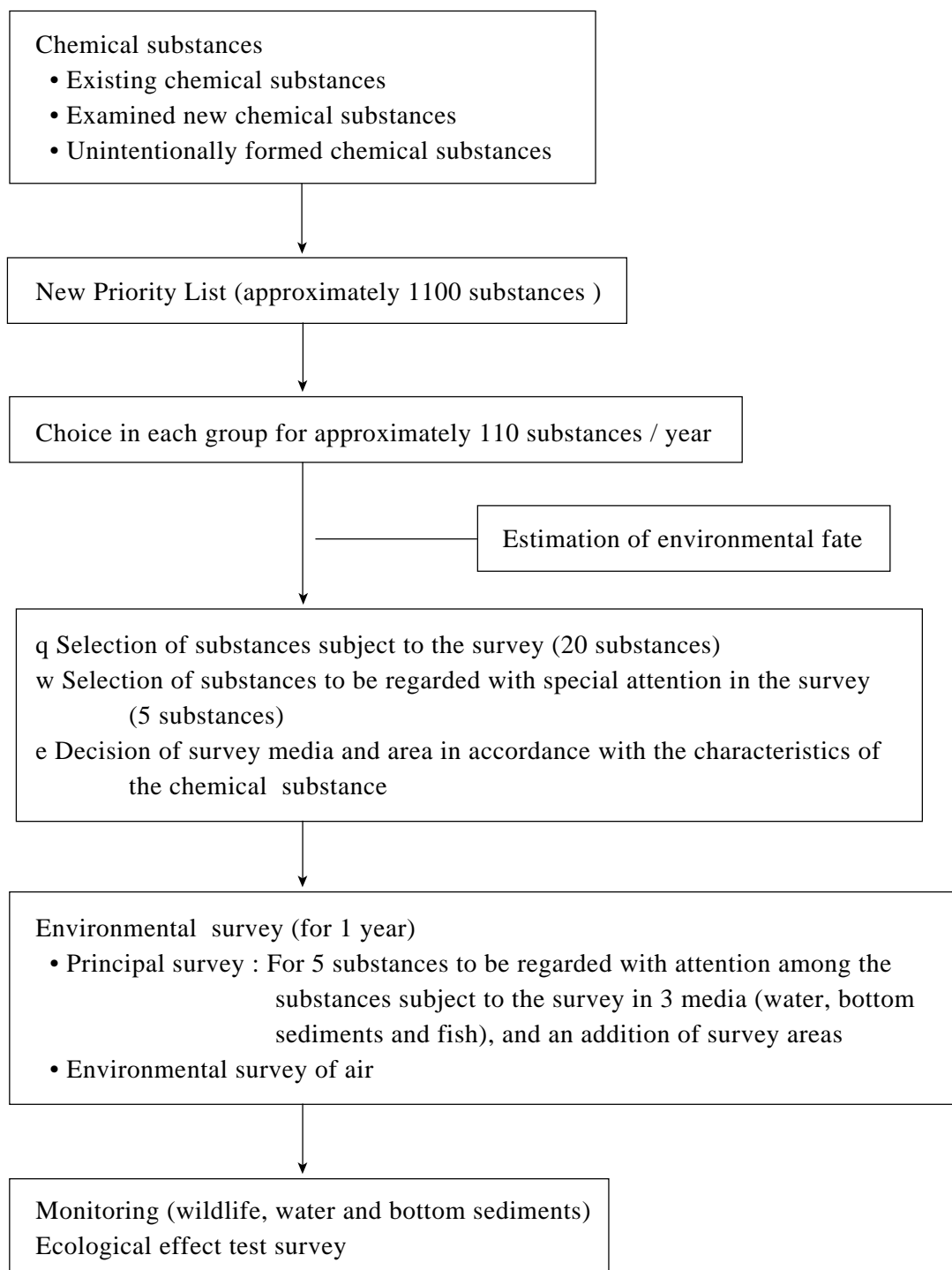
From the perspective of emphasizing the effectiveness of the survey and relation between mutual fields, substances subject to the survey are selected according to class such as chlorinated organic compounds, polycyclic aromatic compounds, organometallic compounds, etc.

The former environmental survey method which was uniform by fixing media and area was changed to the menu method, choosing media and area according to the characteristic of each substance, and emphasis was laid on higher precision in surveys for principal substances rather than conducting surveys for substances in wide scope.

c. Substantiation of the Evaluation of Environmental Safety

On preliminary evaluation, the priority list was revised considering mainly the effect, and chemical substances were classified according to structure etc., and representative substances for which environmental surveys should be conducted are chosen by the estimation method of environmental fate from the aspect of exposure in principle in each class. In evaluation based on the environmental survey, exposure is evaluated based on environmental survey results, and evaluation of effects is conducted based on known knowledge.

Fig. 1 The System of the Second General Inspection Survey



737 substances were examined through the environmental survey since fiscal year 1974 to 1994, and 262 substances were detected from the general environment. Persisting substances judged to be in need of special attention by yearly observation among the detected substances and Class 1 Specified Chemical Substances based on the Chemical Substances Control Law etc., are subject to the wildlife monitoring and the monitoring of water and bottom sediments.

The results of detection in environmental surveys (fiscal year 1974 ~ 1994)

	water	bottom sediments	fishes	air	total
Surveyed substances	720	701	219	160	737
Detected substances	129	205	84	88	262
Detection ratio (%)	17.9	29.2	38.4	55.0	35.5

2. Investigation and Survey of Designated Chemical Substances

Designated Chemical Substances will be designated as Class 2 Specified Chemical Substances if the substances are judged to be harmful from the result of the toxicity test instructed according to the situation of persistence in the environment. Class 2 Specified Chemical Substances are required prior notification of the scheduled production or importation volume, and if necessary, the production or importation volume is regulated.

For this purpose, the Environment Agency started the Investigation and Survey of the Persistence in the Environment of Designated Chemical Substances from fiscal year 1988, in order to grasp the situation of persistence in the environment of these substances. Furthermore, from fiscal year 1990, the Study of the Exposure Route (survey concerning the quantity of chemical substances humans are exposed to in daily life via each media) was newly initiated, and the name of the survey was changed to the Investigation and Survey of Designated Chemical Substances.

In “the Future of the Second General Inspection Survey (Final report)”, this survey was to ‘provide sufficient consideration for Designated Chemical Substances and Class 2 Specified Chemical Substances as substances subject to the survey’. Thus this survey has been conducted separately as part of the Second General Inspection Survey.

3. The Follow-Up Survey of the Situation of Pollution by Unintentionally Formed Chemical Substances

Environmental pollution caused by harmful substances formed artificially in the process of manufacture or waste disposal such as dioxins, or in the natural process of reaction in the environment, have become a social problem. Appropriate surveys became necessary for these sub-

stances which were not directly subject to the Chemical Substances Control Law, to take measures.

For this reason, the existence in the environment of unintentionally formed substances which were thought to affect human health and wildlife have been investigated since fiscal year 1985. This survey was named the Follow-Up Survey of the Situation of Pollution by Harmful Chemical Substances started in order to take preventive measures for environmental pollution by chemical substances. Since fiscal year 1988, environmental surveys which are concluded for each year and monitoring surveys which are continued have been conducted separately.

So far, surveys have been conducted for polychlorinated dibenzo-p-dioxin (PCDD), polychlorinated dibenzofuran(PCDF), polybrominated dibenzo-p-dioxin (PBDD), polybrominated dibenzofuran (PBDF) and nitrosoamines etc..

In fiscal year 1994, a monitoring survey was conducted concerning dioxins which have been surveyed continuously since fiscal year 1985. An environmental survey was conducted for coplanar PCBs which are PCBs (polychlorinated biphenyl) with a planar structure (no chlorine substituent in the ortho position).

Since the purpose of this survey was to grasp the environmental persistence of unintentionally formed chemical substances, the name of the survey was revised to the Follow-Up Survey of Pollution by Unintentionally Formed Chemical Substances since fiscal year 1993.

4. Results of surveys conducted so far

The main results of surveys conducted so far have been the amendment of the Chemical Substances Control Law in May, 1986, taking in consideration the results of the general Inspection Survey of Chemical Substances on Environmental Safety, and the designation of organotin compounds etc. as Class 1 Specified Chemical Substances based on this Law.

**Main results of the Follow-Up Survey
of Environmental Pollution by Chemical Substances**

Name of survey	Substance	Surveyed FY	Results
General Inspection Survey (Investigation)	Trichloroethylene	1974-1983	Amendment of the Chemical Substances Control Law in May, '86 (Initiation of Class 2 Specified Chemical Substances, Designated Chemical Substances system)
	Tetrachloroethylene	1974-1983	
	Carbon tetrachloride (solvent)	1974-1983	
General Inspection Survey (Investigation) (Wildlife monitoring)	Chlordane (antitermite agent)	1981,1982 1983-	Designation of Class 1 Specified Chemical Substances in Sep., '86
General Inspection Survey (Investigation) (Wildlife monitoring) Investigation and Survey of Designated Chemical Substances	Tributyltin compounds (paint for bottom of ships etc.)	1983,1984 1985- 1988-	Designation as Designated Chemical Substances in Apr., '88 TBTO: Designation as Class 1 Specified Chemical Substances in Jan., '90 Other TBTs: Designation as Class 2 Specified Chemical Substances in Sep., '90
General Inspection Survey (Investigation) (Wildlife monitoring)	Triphenyltin compounds (paint for bottom of ships)	1988 1989-	Designation as Designated Chemical Substances in Jul., '88 Designation as Class 2 Specified Chemical Substances in Sep., '90
Follow-Up survey of the pollution by unintentionally formed chemical substances	Dioxins (formed in the waste incineration process etc.)	1985-	Proposing a problem of wastewater in pulp factories and in the surrounding area of waste incineration factories