Surveillance of Endocrine Disrupters at Public Water Areas

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Water Quality Management Division
Environment Agency

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1. Overview

The following provides an overview of research carried out to study the presence and quantity of endocrine-disrupting chemicals in water sources.

In 1998, Japan's Environment Agency implemented SPEED (Strategic Programs on Environmental Endocrine Disrupters) '98, with responsibilities divided up among the relevant bureaus. The objective of this surveillance, which was conducted as part of SPEED, was to ascertain the presence and quantity of chemicals in water that may have endocrine disrupting properties. The surveillance tested public waters (surveillance of water quality, sediment quality and aquatic life) and groundwater (surveillance of water quality). The surveillance covered 22 non-pesticide substances from among the 67 substances listed in the "Strategic Programs on Environmental Endocrine Disrupters - SPEED '98" report.

Following is an overview of the surveillance results.

(1) Surveillance of Water Quality

Results of the water quality surveillance conducted in 405 locations showed that 16 of the 22 items subject to the surveillance were detected, with the detection rate covering 10% of the total sampling sites.

(2) Surveillance of Sediment

Results of the sediment quality surveillance conducted in 152 locations showed that 17 of the 22 items subject to the surveillance were detected, with a detection rate of 15%.

(3) Surveillance of Aquatic Life

Results of the surveillance of aquatic life conducted in 141 locations showed that 13 of the 22 items subject to the surveillance were detected, with a detection rate of 11%.

While the substances analyzed in this surveillance are suspected to have endocrine-disrupting properties, the endocrine-disrupting mechanisms and magnitude of any endocrine-disrupting properties have yet to be clarified sufficiently. As a result, the results of this surveillance alone should not be taken as a basis for evaluating the endocrine-disrupting properties of these substances.

The Environment Agency will continue with efforts to collect all relevant scientific information in order to establish a system for evaluating the environmental risk of these substances on living organisms. Additionally, the Environment Agency plans to study the results of this surveillance in greater detail and consider the necessity of conducting supplemental surveys, working in conjunction with the relevant local governments.

Detected Substances

No	Name of Substance	Detection Ratio			Common Uses
		Water Quality	Sediment Quality	Aquatic Life	
2	Polychlorinated biphenyls (PCB)	281/405 (69%)	126/152 (83%)	133/141 (94%)	Heat medium, non-carbon paper, electric products
33	Tributyltin	29/405 (7%)	81/152 (53%)	113/141 (80%)	Antifouling paints on ships, antiseptic for fish nets
34	Triphenyltin	1/405 (0.2%)	29/152 (19%)	70/141 (50%)	Antifouling paints on ships, antiseptic for fish nets
36	Alkyl phenols				Raw material for surface-active agents/ decomposition products
	4-t-butyl phenol	110/405 (27%)			
	4-n-butyl phenol	8/405 (2%)			
	Nonyl phenol	245/405 (60%)	36/152 (24%)	42/141 (30%)	
	4-t-octyl phenol	228/405 (56%)	11/152 (7%)	16/141 (11%)	
37	Bisphenol A	255/405 (63%)	55/152 (36%)	8/141 (6%)	Raw material for resins
38	Di-(2-ethylhexyl)phthalate	136/405 (34%)	125/152 (82%)	30/141 (21%)	Plasticizer for plastics
39	Butyl benzyl phthalate	1/405 (0.2%)	10/152 (7%)	3/141 (2%)	Plasticizer for plastics
40	Di-n-butyl phthalate	23/405 (6%)	67/152 (44%)		Plasticizer for plastics
41	Dicyclohexyl phthalate		4/152 (3%)		Plasticizer for plastics
42	Diethyl phthalate	9/405 (2%)	1/152 (0.7%)		Plasticizer for plastics
43	Benzo(a)pyrene	8/405 (2%)	122/152 (80%)		(Unintended product)
44	2,4-Diethylhexyl adipate	38/405 (9%)	4/152 (3%)	1/141 (0.7%)	Dye intermediate
45	Diethylhexyl adipate	42/405 (10%)	12/152 (8%)		Plasticizer for plastics
46	Benzophenone	71/405 (18%)	4/152 (3%)	3/141 (2%)	Synthetic raw material for medical products, perfume
47	4-Nitrotoluene	5/405 (1%)		1/141 (0.7%)	2,4-dinitrotoluene intermediate
48	Octachlorostyrene			2/141 (1%)	(By-product of organic chlorine compound)
63	Dipentyl phthalate		1/152 (0.7%)		(Not produced in Japan)
64	Dihexyl phthalate		1/152 (0.7%)		(Not produced in Japan)
66	Styren dimer	2/405 (0.5%)	4/152 (3%)	11/141 (8%)	Non-reacting substance of styrene-rubber plastic
	and trimer	8/405 (2%)	37/152 (24%)	39/141 (28%)	
67	n-Butylbenzene	1/405 (0.2%)		12/141 (9%)	Synthesis intermediate for liquid crystal manufacturing
	Styrene monomer	63/405 (16%)	5/152 (3%)	16/141 (11%)	Raw materials for plastics
	17-b-estradiol	260/405 (64%)	134/152 (88%)		Female hormone of human or animal origin

2. Objectives of Surveillance

This surveillance was conducted as part of SPEED (Strategic Programs on Environmental Endocrine Disrupters) '98, in order to ascertain the presence and quantity of 22 chemical substances which may have endocrine-disrupting properties in water sources. The surveillance analyzed groundwater and waters at public water areas.

3. Contents of Surveillance

The surveillance was conducted twice, once in summer and once in autumn. For this surveillance, downstream areas were selected for rivers, designated lakes and marshes were selected for lakes and marshes, and semi-enclosed sea areas were selected for ocean sites. Groundwater was sampled at sites located in agricultural, urban and industrial areas.

(1) Summer Surveillance (July - Sept.)

A surveillance of water quality was conducted in a total of 130 locations, with downstream sites (100 locations) selected for rivers, designated lakes and marshes (5 locations) selected for lakes and marshes, and semi-enclosed sea areas (17 locations) selected for ocean sites. Groundwater (8 locations) was sampled at sites located in agricultural areas, urban areas and industrial areas.

(2) Autumn Surveillance (Nov. - Jan.)

-1- Surveillance of General Aquatic Regions

A surveillance of water quality, sediment quality and aquatic life was conducted in a total of 174 locations, with downstream sites (139 locations) selected for rivers, designated lakes and marshes (5 locations) selected for lakes and marshes, and semi-enclosed sea areas (18 locations) selected for ocean sites. Groundwater (12 locations) was sampled at sites located in agricultural areas, urban areas and industrial areas.

-2- Surveillance of Priority Water Regions

In order to obtain a more detailed understanding of the presence and quantity of endocrine-disrupting chemicals in rivers and ocean waters, a surveillance of water quality was conducted at five major rivers (Tonegawa River: 23 locations, Arakawa River: 9 locations, Tamagawa River: 12 locations, Yodogawa River: 10 locations, Chikugogawa River: 17 locations), Tokyo Bay (18 locations) and Osaka Bay (12 locations).

An overview of the surveillance is shown in Table 1.

4. Substances Subject to Surveillance

The surveillance covered 22 non-pesticide substances from among the substances listed in the "Countermeasures of the Environment Agency Regarding the Problems of Exogenous Endocrine-Disrupting Chemicals: Strategic Programs on Environmental Endocrine Disrupters '98" (Environment Agency; May 1998). (Table 2)

5. Research Methodology

(1) Water Sampling Methods

-1- Water Samples for Water Quality

Surface water (from approximately 10cm below the water surface) was extracted with a stainless steel bucket (attached to a hemp rope) or dipper and was slowly and evenly poured into a sampling bottle, taking care not to allow any bubbles in the bottle. Bottles were completely filled with water and then sealed, leaving no air inside. The sampling of water for phthalates was done with bare hands.

For volatile substances such as n-butylbenzene and styrene monomer (hereinafter referred to as "

VOC"), the sampling bottle was slowly immersed in a bucket of water or immersed directly into the river water to fill it with sample water.

For alkyl phenol, bisphenol A and chlorophenol, 1 gram of L-ascorbic acid was added to one liter of sample water for fixation.

Each bottle containing water sampled and processed for fixation was sealed to prevent the contents from being polluted by the outside environment, and was then completely covered with unused aluminum foil to minimize photodecomposition. The bottles containing volatile substances, such as styrene monomer, were placed in a polyethylene bag with fastener to prevent the contents from being contaminated by outside matter.

For transportation, the bottles were placed in a cooling box with just enough ice or coolant to keep them chilled but not frozen. Cushions were placed around each bottle to prevent breakage.

Methods used to wash the sampling bottles are shown in Table 3. The volume of sample water taken is shown in Table 4.

-2- Sediment Quality Samples

Sediment samples were collected using an Ekman barge sediment sampling container or similar container. At each sediment sampling site, at least three sediment samples were taken. These samples were mixed and used as the surveillance sample. To mix the samples, a stainless steel or hollow vat was used, along with a stainless steel scoop. At the time of mixing, pebbles, twigs and other foreign objects were removed from the samples. The mixed samples were placed in a sampling bottle in such a way as to prevent air gaps.

Each bottle containing sample sediment was sealed to prevent the contents from being polluted by the outside environment, and was then completely covered with unused aluminum foil to minimize photodecomposition. The bottles containing volatile substances, such as styrene monomer, were placed in a polyethylene bag with fastener to prevent the contents from being contaminated by outside matter.

For transportation, the bottles were placed in a shipping container, padded to prevent breakage, and shipped via commercial refrigerated shipping.

The method used to wash the sampling bottles is shown in Table 5. The volume of sediment samples taken is shown in Table 6.

-3- Samples of Aquatic Life

Aquatic life which could be obtained at the surveillance sites was selected as the object of this surveillance. When obtaining the samples of aquatic life, efforts were made to avoid using materials which might contaminate the samples. After the samples were obtained, the samples were immediately wrapped heavily in aluminum foil, placed in a container (stainless steel container or cardboard box) large enough for frozen items, and the transported in a frozen state (-15 ° C).

The samples of aquatic life were then prepared to obtain 300g sections of muscle. When preparing the samples, great care was taken to prevent contamination. Hands, stainless steel instruments and knifes were washed carefully, and samples were cut on a wooden chopping block covered with aluminum foil. After preparation, samples were stored in reagent bottles.

(2) Surveillance Methods

Surveillance methods used for water quality, sediment quality and aquatic life are shown in Tables 7, 8 and 9, respectively.

Table 1 Overview of surveillance

		Summer surveillance		Autumn surveillance	
Water quality	General water areas	Rivers:	100 sites	Rivers:	139 sites
		Lakes:	5 sites	Lakes:	5 sites
		Groundwater:	8 sites	Groundwater:	12 sites
		Sea areas:	17 sites	Sea areas:	18 sites
	Priority water areas			Rivers:	71 sites
				Sea areas:	30 sites
Sediment quality	General water areas			Rivers:	128 sites
				Lakes:	5 sites
				Sea areas:	19 sites
Aquatic life	General water areas			Rivers:	119 sites
				Lakes:	5 sites
				Sea areas:	17 sites

Table 2 Substances investigated

Number	SPEED '98	Substances	Use
1	2	Polychlorinated biphenyl (PCB)	Heat medium, non-carbon paper, electric product
2	3	Polybromobiphenyl (PBB)	Fire retardant
3	33	Tributyltin	Antifouling paints on ships, antiseptic for fishnets
4	34	Triphenyltin	Antifouling paints on ships, antiseptic for fishnets
5	36	Alkyl phenol (from C4 to C9)	Raw material for surface-active agents/decomposition product
6	37	Bisphenol A	Raw material for resins
7	38	Di-(2-ethylhexyl)phthalate	Plasticizer for plastics
8	39	Butyl benzyl phthalate	Plasticizer for plastics
9	40	Di-n-butyl phthalate	Plasticizer for plastics
10	41	Dicyclohexyl phthalate	Plasticizer for plastics
11	42	Diethyl phthalate	Plasticizer for plastics
12	43	Benzo(a)pyrene	(Unintended product)
13	44	Dichlorophenol	Dye intermediate
14	45	Diethylhexyl adipate	Plasticizer for plastics
15	46	Benzophenone	Synthetic raw materials for medical products, perfume
16	47	4-Nitrotoluene	2,4-dinitrotoluene intermediate
17	48	Octachlorostyrene	By-product of organic chlorine compound
18	63	Dipentyl phthalate	(Not produced in Japan)
19	64	Dihexyl phthalate	(Not produced in Japan)
20	65	Dipropyl phthalate	(Not produced in Japan)
21	66	Styren dimer and trimer	Non-reacting substance of styrene-rubber plastic
22	67	n-Butylbenzene	Synthesis intermediate, for liquid crystal manufacture
23	—	Styrene monomer	Raw materials for plastics
24	—	17-beta-estradiol	Female hormone of human or animal origin

Note

SPEED' 98: "On countermeasures of Environment Agency for the problems of exogenous endocrine disrupting chemicals - Strategic Programs on Environmental Endocrine Disruptors '98 -" Japan Environment Agency, May 1998

Table 3 Sampling bottle washing method

Substances investigated	Washing method
Organic tin compounds, 17-beta-estradiol	Wash with detergent, water, 1M hydrochloric acid - methanol, water and acetone, and heat at minimum 200 ° C for minimum two hours. Seal the bottle when cooled.
n-Butylbenzene, styrene monomer	Wash with detergent, water, acetone and hexane, in that order, and heat at minimum 200 ° C for minimum two hours. Purge nitrogen (or denitrify the bottle) and leave the bottle to cool, and then seal it.
Substances other than those listed above	Wash with detergent, water, acetone and hexane, in that order, and heat at minimum 200 ° C for minimum two hours. Leave the bottle and seal it when cooled.

Table 4 Volume of sample water, etc.

Substances	Water volume	Treatment after sampling
Polychlorinated biphenyl (PCB), polybromobiphenyl (PBB), aromatics and diethylhexyl adipate	Gallon (3.5liter) bottle x 1	Seal and shade from light.
Alkyl phenol, bisphenol A and chlorophenol	Gallon (3.5liter) bottle x 1	Fix with L-ascorbic acid (1g/liter). Seal and shade from light.
Phthalates	Glass bottle (250ml) for VOC x 1	Seal and shade from light.
n-butylbenzene, styrene monomer	Glass bottle (100ml) for VOC x 2	Seal and shade from light. Place the bottle in a polyethylene bag with faster.
Organic tin compounds, 17-beta-estradiol	Glass bottle (2 liter) x 2	Seal and shade from light.
Other substances, extra	Gallon (3.5liter) bottle x 1	Seal and shade from light.

Remarks

Gallon bottle : screwed-topped brown bottle with Teflon-coated inner lid.

Glass bottle for VOC : screw-topped glass bottle for screw cap, with 4-ethyl fluoride resin-coated silicone rubber stopper.

Glass bottle : brown jar with stopper attached.

Table 5 Sampling bottle washing method

Substances	Washing method
Containers for all substances	Wash with detergent, water, acetone and hexane, in that order, and heat at minimum 200 ° C for minimum of two hours. Leave the bottles to cool, then seal.

Table 6 Volume of sediment samples, etc.

Substances	No. of bottles	Treatment method
Polychlorinated biphenyls (PCB)	Large-mouth 500mL	Seal and shade from light
Polybromobiphenyls (PBB)	glass bottle x 1	
17-b-estradiol		
Alkylphenols	Large-mouth 500mL	Seal and shade from light
Bisphenol A	glass bottle x 1	
Chlorophenol		
Phthalates	Large-mouth 250mL	Seal and shade from light
Diethylhexyl adipate	glass bottle x 1	
Aromatics	Large-mouth 250mL	Seal and shade from light
Organic tin compounds	glass bottle x 1	
Styrene monomer	100mL duran bottle	Seal and shade from light
n-Butylbenzene	x 1	Place bottle in a polyethylene bag with fastener

Table 7　Outline of water quality analysis method

Substances		Outline of analysis method	Minimum detectable values (unit：μg/L)	
Analysis group	Details		(Autumn)	(Summer)
Polychlorinated biphenyls(PCB)	1 chloride, 3 chloride - 7 chloride, 2 chloride 8 chloride -10 chloride	Measured by HRGC/HRMS after extracting with hexane, dehydrating and condensing. Processed with a silica-gel column as needed.	0.00001 0.00001 0.00001	0.0005 0.002 0.001
Polybromobiphenyls (PBB)	1 bromide - 5 bromide 6 bromide 10 bromide	Measured by HRGC/HRMS after extracting with hexane, dehydrating and condensing.	0.001 0.01 0.05	0.001 0.01 0.05
Organic tin compounds	Tributyltin, Triphenyltin	Measured by GC/MS after extracting with hexane under the acidic condition of hydrochloric acid, dehydrating, condensing and propylating.	0.002 0.001	0.01 0.01
Alkylphenols (from C4 to C9)	1. 4-t-Butylphenol 4-n-Butylphenol 4-n-Pentylphenol 4-n-Hexylphenol 4-n-Heptylphenol Nonyl phenol 4-t-Octylphenol 4-n-Octylphenol	Measured by GC/MS after extracting with dichloromethane, after adjusting the acidity of the sample solution to pH3 and adding sodium chloride. Processed with a silica-gel column as needed.	0.01 0.01 0.01 0.01 0.01 0.05～0.1 0.01 0.01	0.01 0.01 0.01 0.01 0.01 0.05 0.01 0.01
Aromatic hydrocarbons 1	Benzo(a)pyrene Benzophenone 4-Nitrotoluene Octachlorostyrene Styrene dimer Styrene trimer	Measured by GC/MS after extracting with hexane by adding sodium chloride, dehydrating and condensing. Processed with a silica-gel column as needed.	0.01 0.01 0.01 0.01 0.01 0.01	0.01 0.01 0.01 0.01 0.01 0.01～0.05
Bisphenol A Chlorophenols	Bisphenol A 2,4-Dichlorophenol	Measured by GC/MS after extracting with dichloromethane, dehydrating, condensing and conducting trimetyl sililation.	0.01 0.01	0.01 0.01
Phthalates	Diethyl phthalate Dipropyl phthalate Di-n-butyl phthalate Dipentyl phthalate Dihexyl phthalate Butylbenzene phthalate Di-(2-ethylhexyl) phthalate Dicyclohexyl phthalate Diethylhexyl phthalate	Measured by GC/MS after agitation-extracting with hexane using an SPC volumetric flask, after adding sodium chloride.	0.1 0.1 0.3 0.1 0.1 0.1 0.3～0.5 0.1 0.01	0.1 0.1 0.3 0.1 0.1 0.1 0.3 0.1 0.05
Aromatic hydrocarbons 2 (VOC)	Styrene monomer n-Butylbenzene	Measured by purge-trap method.	0.01 0.01	0.01 0.01
Female hormone of human and animal origin	17-β-estradiol	Solid layer was extracted, heated to decompose, dissolved in methanol and measured by the ELISA method.	0.001	0.001

Table 8　Outline of sediment quality analysis methods

Substances		Outline of analysis method	Minimum detectable values (μg/kg)
Analysis group	Details		
Polychlorinated biphenyls	1 chloride -10 chloride	After alkali ??decomposition??, extracting by hexane and processing by sulfuric acid, sample was dehydrated, condensed, refined, then measured by GC/MS.	0.02
Polybromobiphenyls	1 bromide - 6 bromide 10 bromide Octachlorostyrene	After acetone extraction, sample was dissolved in an aqueous solution of sodium chloride, extracted by hexane, dehydrated, condensed, refined, then measured by GC/MS	2 10 2
Organic tin compounds	Tributyltin, Triphenyltin	After extraction by ??hydrochloric acid, methanol and ethyl acetate??, sample was further extracted by ethyl acetate and hexane, refined with an ion exchange resin and propylized, then measured by GC/MS.	0.1 0.1
Alkylphenols (from C4 to C9)	4-t-Butylphenol 4-n-Butylphenol 4-n-Pentylphenol 4-n-Hexylphenol 4-n-Heptylphenol Nonyl phenol 4-t-Octylphenol 4-n-Octylphenol	Based on acidic conditions, after acetone extraction, the sample was added to an aqueous solution of sodium chloride, extracted using dichloromethane, dehydrated, condensed, refined, then measured by GC/MS.	5 5 5 5 5 50 5 5
Aromatic hydrocarbons 1	Benzo(a)pyrene Styrene dimer and styrene trimer Diethylhexyl adipate	After alkali ??decomposition??, extracting by hexane and processing by sulfuric acid, sample was dehydrated, condensed, refined, then measured by GC/MS.	1 1 10
Aromatic hydrocarbons 2	Benzophenone 4-Nitrotoluene	After acetone extraction, the sample was steam-distilled and extracted by hexane, then dehydrated, condensed, refined and measured by GC/MS.	1 1
Bisphenol A, Chlorophenols	Bisphenol A 2,4-Dichlorophenol	Based on acidic conditions, after acetone extraction, the sample was added to an aqueous solution of sodium chloride, extracted using dichloromethane, dehydrated, condensed, refined, ??converted to trimethyl ciryl??, then measured by GC/MS.	5 5
Phthalates	Diethyl phthalate Dipropyl phthalate Di-n-butyl phthalate Dipentyl phthalate Dihexyl phthalate Butylbenzene phthalate Di-(2-ethylhexyl) phthalate Dicyclohexyl phthalate	After acetonitrile extraction, the sample was dehydrated, condensed, then measured by GC/MS.	10 10 25 10 10 10 25 10
Aromatic hydrocarbons 3 (VOC)	n-Butylbenzene Styrene monomer	After methanol extraction, a portion of the extracted liquid was added to water and measured using the purge-trap method.	1 1
Female hormone of human and animal origin	17-β-estradiol	After methanol extraction, the sample was added to water, after which a solid layer was extracted, heated to decompose, dissolved in methanol and measured by the ELISA method.	0.0048

Table 9 Outline of aquatic life analysis methods

Substances		Outline of analysis method	Minimum detectable values
Analysis group	Details		(μ g/kg)
Polychlorinated biphenyls (PCB)	1 chloride -10 chloride	After saponification, sample was extracted using hexane, dehydrated, condensed, refined with a silica-gel cartridge, then measured by GC/MS. Samples which were shown to have a high level of obstruction in the final chromatogram were further refined using a sulfuric wash.	0.4
Polybromobiphenyls (PBB)	1 bromide - 6 bromide 10 bromide	After extraction in an aqueous mixture of acetone and hexane and washing in water, one portion of the sample was separated, refined by a sulfuric wash and ??phlorigyl?? column chromatography, the measured by GC/MS.	2 10
Organic tin compounds	Tributyltin Triphenyltin	Based on the hydrochloric acidity, the sample was extracted in an aqueous mixture of methanol and ethyl acetate, extracted in an aqueous mixture of ethyl acetate and hexane, refined with an ion exchange column cartridge, dehydrated, condensed and propylized, then measured by GC/MS.	1 1
Alkylphenols (from C4 to C9)	4-t-Butylphenol 4-n-Butylphenol 4-n-Pentylphenol 4-n-Hexylphenol 4-n-Heptylphenol Nonyl phenol 4-t-Octylphenol 4-n-Octylphenol	After acetone extraction, the sample was added to an aqueous solution of sodium chloride, extracted using hexane, ??distributed by hexane and acetonitrile??, refined with silica gel and then alumina column chromatography, then measured by GC/MS.	1.5 1.5 1.5 1.5 1.5 15 1.5 1.5
Aromatic hydrocarbons	Benzo(a)pyrene Octachlorostyrene	After extraction in an aqueous mixture of acetone and hexane and washing in water, one portion of the sample was separated, ??distributed by hexane and acetonitrile?? using diatomaceous earth column chromatography, refined by silica gel column chromatography, the measured by GC/MS.	2 2
	Benzophenone 4-Nitrotoluene	Extracted by hexane in an essential oil measuring device, then measured by GC/MS.	1 1
	Styrene dimer Styrene trimer	After saponification, sample was extracted using hexane, refined with a silica-gel cartridge, then measured by GC/MS.	1 1

Substances		Outline of analysis method	Minimum detectable values
Analysis group	Details		(μ g/kg)
Bisphenol A Chlorophenols	Bisphenol A 2,4-Dichlorophenol	After extraction by acetonitrile and washing in hexane, the sample was added to an aqueous solution of sodium chloride, shaken with hexane, and then divided into a hexane layer (chlorophenols) and a water layer (bisphenol A). The hexane layer (chlorophenols) was refined using silica-gel column chromatography, condensed, ??converted to trimethyl ciryl??, then measured by GC/MS. From the water layer (bisphenol A), a sample was extracted using dichloromethane, ethylized, saponified, extracted with hexane, then measured by GC/MS.	5 1.5
Phthalates Diethylhexyl adipate-2-	Diethyl phthalate Dipropyl phthalate Di-n-butyl phthalate Dipentyl phthalate Dihexyl phthalate Butylbenzene phthalate Di-(2-ethylhexyl) phthalate Dicyclohexyl phthalate Diethylhexyl adipate	Extracted by acetonitrile, refined by GPC and ??phlorigyl?? column chromatography, then measured by GC/MS.	10 10 25 10 10 10 25 10 10
Aromatic hydrocarbons 2 (VOC)	n-Butylbenzene Styrene monomer	Measured by purge-trap method.	1 1

6 Result of Surveillance

(1) Points for special attention

Because this was the first nation-wide surveillance to investigate the chemicals in water environment suspected of endocrine disrupting effects, and the sample must be analyzed to find even the extremely low concentrations in water and bottom sediments as well as in aquatic animals and plant life, special attention should be paid to the following points:

-1- On the surveys carried out

In this first ever investigation of the chemicals in water environment suspected of endocrine disrupting effects, water quality was surveyed in July to September 1998, and water quality, bottom sediments and aquatic animals and plant life were surveyed in November 1998 to January 1999. In order to determine the existence or non-existence of such chemicals in total water environment, further surveys will be necessary.

-2- Hormone (17-β-estradiol)

The ELISA (Enzyme-Linked Immunosorbent Assay) method used for the analysis of hormone (17-β-estradiol) uses the immuno-reaction to the substance to be analyzed. The reaction is shown by the depth of color (of the solution), which is measured by an absorptiometer to determine the concentration of the substance.

This method is advantageous as it facilitates a quick and very accurate analysis of the substance. However, there may be a small difference between the measurement and the substance's actual concentration, as an enzyme may also react to other similar substances and the measurement line is shown on logarithmic scale.

-3- On control of precision

The chemical substances analyzed in this surveillance are microscopic, many of which are commonly found in products used or consumed in daily life. Due partly to this fact, some of the substances were detected even in the disguised blank tests (analysis of the materials not containing the samples collected for this surveillance) at the institutions which conducted the analysis. Possibilities of their being mixed in the process of collecting, transporting or analyzing samples, thereby influencing the results, cannot be ruled out, despite due cares taken by the analytical institutions in handling them to maintain high analytical accuracy. Stricter control of precision should be required in future surveillance.

-4- The chemical substances inspected and analyzed in this surveillance are those suspected of having endocrine disrupting properties. However, since their hormone disrupting mechanism and magnitude have yet to be elucidated fully, the result of this surveillance alone shall not be taken as the basis for such evaluation.

Especially in respect of the survey of aquatic animals and plant life, it should be noted that the measured results do not necessarily reflect the actual state of existence or non-existence of endocrine disruptors at the sampling sites, considering that the samples were limited to those species which could be collected at each sampling site at the time of sampling, and that fish age and habitat area are not known.

(2) Measured results

-1- Water quality

(Surveys in general water areas)

Table 10 shows the results of the water quality measured in the summer survey (at 130 samplin g sites) and in the autumn survey (at 174 sampling sites). The Separate Volume 1 shows the m easured results at each sampling site.

The following substances were not detected at any sampling site: polybromobiphenyl, 4-n-butylph enol, 4-n-pentylphenol, 4-n-hexylphenol, 4-n-octylphenol, octachlorostyrene, styrene dimer, butyl b enzyl phthalate, dipropyl phthalate, dipentyl phthalate, dihexyl phthalate, and dicyclohexyl phthala te.

The following substances were detected at 10% or more of the sampling sites in both summer and winter surveys: polychlorinated biphenyl, 4-t-butylphenol, nonylphenol, 4-t-octylphenol, bisphe nol A, di-(2-ethylhexyl) phthalate, styrene monomer, and female hormone of human or animal or igin 17-β-estradiol.

(Surveys in priority water areas)

Table 11 shows the results of the water quality measured in the autumn survey at the total 101 sampling sites in the rivers Tonegawa, Arakawa, Tamagawa, Yodogawa and Chikugogawa, and Tokyo and Osaka Bays. The Separate Volume 2 shows the results at each sampling site.

The following substances were not detected at any sampling site: polybromobiphenyl, triphenyltin, 4-n-butylphenol, 4-n-pentylphenol, 4-n-hexylphenol, 4-n-octylphenol, 4-nitrotoluene, octachlorostyr ene, dipropyl phthalate, dipentyl phthalate, dihexyl phthalate, dicyclohexyl phthalate and n-butylbe nzene.

The following substances were detected at 10% or more of the 101 sampling sites: polychlorina ted biphenyl, tributyltin, 4-t-butylphenol, nonylphenol, 4-t-octylphenol, benzophenon, bisphenol A, 2,4-dichlorophenol, di-n-butyl phthalate, di-(2-ethylhexyl) phthalate, diethylhexyl adipate, and hor mone of human or animal origin 17-β-estradiol.

-2- Bottom sediments

Table 12 shows the measured results of the bottom sediments sampled at the 152 sites in the w hole country. The Separate Volume 3 shows the results at each sampling site.

The following substances were not detected at any sampling site: polybromobiphenyl, 4-t-butylph enol, 4-n-butylphenol, 4-n-pentylphenol, 4-n-hexylphenol, 4-n-heptylphenol, 4-n-octylphenol, 4-nitro toluene, octachlorostyrene, dipropyl phthalate, and n-butylbenzene.

The following substances were detected at 10% or more of the 152 sampling sit es: polychlori nated biphenyl, tributyltin, triphenyltin, nonylphenol, benzo(a)pyrene, styrene trimer, bisphenol A, di-n-butyl phthalate, di-(2-ethylhexyl) phthalate, and female hormone of human or animal origin 17-β-estradiol.

-3- Aquatic animals and plant life

Table 13 shows the measured results of the aquatic animals and plant life sampled at the 141 s ites in the whole country. The Separate Volune 4 shows the results at each sampling site.

The following substances were not detected at any sampling site: polybromobiphenyl, 4-t-butylph enol, 4-n-butylphenol, 4-n-pentylphenol, 4-n-hexylphenol, 4-n-heptylphenol, 4-n-octylphenol, benzo (a)pyrene, diethyl phthalate, dipropyl phthalate, di-n-butyl phthalate, dicyclohexyl phthalate, dipent yl phthalate, dihexyl phthalate, diethylhexyl adipate.

The following substances were detected at 10% or more of the 141 sampling sit es: polychlori

nated biphenyl, tributyltin, triphenyltin, nonylphenol, 4-t-octylphenol, styrene trimer, di-(2-ethylhex yl) phthalate, and styrene monomer.

Table 10 Measured results of water quality (surveyed in general water areas)

(Polychlorinated biphenyl)

調査対象物質 Substance inspected		検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites					範囲 Range (ng/L)
		河川 Rivers	湖沼 Lakes	地下水 Ground water	海域 Sea areas	全体 Total	
塩化ビフェニール Chlorinated biphenyl	秋季 Autumn	7/139 (5%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	7/174 (4%)	N.D.～4.5
	夏季 Summer	1/100 (1%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	1/130 (1%)	N.D.～5.6
二塩化ビフェニール Dichloro biphenyl	秋季 Autumn	74/139 (53%)	3/5 (60%)	7/12 (58%)	12/18 (67%)	96/174 (55%)	N.D.～49
	夏季 Summer	2/100 (2%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	2/130 (2%)	N.D.～12
三塩化ビフェニール Trichloro biphenyl	秋季 Autumn	102/139 (73%)	3/5 (60%)	4/12 (33%)	17/18 (94%)	126/174 (72%)	N.D.～100
	夏季 Summer	13/100 (13%)	4/5 (80%)	0/8 (0%)	0/17 (0%)	17/130 (13%)	N.D.～23
四塩化ビフェニール Tetrachloro biphenyl	秋季 Autumn	87/139 (63%)	3/5 (60%)	3/12 (25%)	14/18 (78%)	107/174 (61%)	N.D.～46
	夏季 Summer	5/100 (5%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	5/130 (4%)	N.D.～12
五塩化ビフェニール Pentachloro biphenyl	秋季 Autumn	101/139 (73%)	3/5 (60%)	5/12 (42%)	14/18 (78%)	123/174 (71%)	N.D.～55
	夏季 Summer	3/100 (3%)	1/5 (20%)	0/8 (0%)	0/17 (0%)	4/130 (3%)	N.D.～2.9
六塩化ビフェニール Hexachloro biphenyl	秋季 Autumn	67/139 (48%)	3/5 (60%)	2/12 (17%)	4/18 (22%)	76/174 (44%)	N.D.～27
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
七塩化ビフェニール Heptachloro biphenyl	秋季 Autumn	7/139 (5%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	7/174 (4%)	N.D.～2.3
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
八塩化ビフェニール Octachloro biphenyl	秋季 Autumn	4/139 (3%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	4/174 (2%)	N.D.～0.07
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
九塩化ビフェニール Nonachloro biphenyl	秋季 Autumn	1/139 (1%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	1/174 (1%)	N.D.～0.04
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
十塩化ビフェニール Decichloro biphenyl	秋季 Autumn	1/139 (1%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	1/174 (1%)	N.D.～0.02
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
ポリ塩化ビフェニール類合計 Polychlorinated biphenyl Total	秋季 Autumn	131/139 (94%)	5/5 (100%)	9/12 (75%)	18/18 (100%)	163/174 (94%)	N.D.～220
	夏季 Summer	14/100 (14%)	4/5 (80%)	0/8 (0%)	0/17 (0%)	18/130 (14%)	N.D.～53

Table 10 Measured results of water quality (surveyed in general water areas)

(Polybromobiphenyl)

調査対象物質 Substance inspected		検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites					範囲 Range (ng/L)
		河川 Rivers	湖沼 Lakes	地下水 Ground water	海域 Sea areas	全体 Total	
臭化ビフェニール Bromo biphenyl	秋季 Autumn	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
二臭化ビフェニール Dibromo biphenyl	秋季 Autumn	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
三臭化ビフェニール Tribromo biphenyl	秋季 Autumn	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
四臭化ビフェニール Tetrabromo biphenyl	秋季 Autumn	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
五臭化ビフェニール Pentabromo biphenyl	秋季 Autumn	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
六臭化ビフェニール Hexabromo biphenyl	秋季 Autumn	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
十臭化ビフェニール Decibromo biphenyl	秋季 Autumn	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
ポリ臭化ビフェニール類合計 Polybromobiphenyl Total	秋季 Autumn	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.

(Organic tin compounds)

調査対象物質 Substance inspected		検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites					範囲 Range (μg/L)
		河川 Rivers	湖沼 Lakes	地下水 Ground water	海域 Sea areas	全体 Total	
トリブチルスズ Tributyltin	秋季 Autumn	2/139 (1%)	0/5 (0%)	0/12 (0%)	3/18 (17%)	5/174 (3%)	N.D.～0.008
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	1/17 (6%)	1/130 (1%)	N.D.～0.09
トリフェニルスズ Triphenyltin	秋季 Autumn	1/139 (1%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	1/174 (1%)	N.D.～0.004
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.

Table 10 Measured results of water quality (surveyed in general water areas)

(Alkylphenol from C4 to C9)

調査対象物質 Substance inspected		検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites					範囲 Range (μg/L)
		河川 Rivers	湖沼 Lakes	地下水 Ground water	海域 Sea areas	全体 Total	
4-t-ブチルフェノール 4-t-Butylphenol	秋季 Autumn	40/139 (29%)	2/5 (40%)	0/12 (0%)	1/18 (6%)	43/174 (25%)	N.D.～ 0.87
	夏季 Summer	30/100 (30%)	4/5 (80%)	2/8 (25%)	9/17 (53%)	45/130 (35%)	N.D.～ 0.72
4-n-ブチルフェノール 4-n-Butylphenol	秋季 Autumn	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
4-n-ペンチルフェノール 4-n-Pentylphenol	秋季 Autumn	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
4-n-ヘキシルフェノール 4-n-Hexylphenol	秋季 Autumn	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
4-n-ヘプチルフェノール 4-n-Heptylphenol	秋季 Autumn	1/139 (1%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	1/174 (1%)	N.D.～ 0.01
	夏季 Summer	3/100 (3%)	2/5 (40%)	0/8 (0%)	0/17 (0%)	5/130 (4%)	N.D.～ 0.06
ノニルフェノール Nonylphenol	秋季 Autumn	90/139 (65%)	4/5 (80%)	0/12 (0%)	4/18 (22%)	98/174 (56%)	N.D.～ 21
	夏季 Summer	73/100 (73%)	4/5 (80%)	7/8 (88%)	15/17 (88%)	99/130 (76%)	N.D.～ 7.1
4-t-オクチルフェノール 4-t-Octylphenol	秋季 Autumn	91/139 (65%)	3/5 (60%)	1/12 (8%)	8/18 (44%)	103/174 (59%)	N.D.～ 13
	夏季 Summer	58/100 (58%)	4/5 (80%)	6/8 (75%)	13/17 (76%)	81/130 (62%)	N.D.～ 1.4
4-n-オクチルフェノール 4-n-Octylphenol	秋季 Autumn	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.

Table 10 Measured results of water quality (surveyed in general water areas)

(Aromatic compounds (other than VOC))

調査対象物質 Substance inspected		検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites					範囲 Range (μg/L)
		河川 Rivers	湖沼 Lakes	地下水 Ground water	海域 Sea areas	全体 Total	
ベンゾ(a)ピレン Benzo(a)pyrene	秋季 Autumn	0/139 (0%)	0/5 (0%)	1/12 (8%)	0/18 (0%)	1/174 (1%)	N.D.～0.01
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
ベンゾフェノン Benzophenone	秋季 Autumn	32/139 (23%)	2/5 (40%)	0/12 (0%)	0/18 (0%)	34/174 (20%)	N.D.～0.16
	夏季 Summer	12/100 (12%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	12/130 (9%)	N.D.～0.09
4-ニトロトルエン 4-Nitrotoluene	秋季 Autumn	2/139 (1%)	0/5 (0%)	0/12 (0%)	1/18 (6%)	3/174 (2%)	N.D.～0.21
	夏季 Summer	1/100 (1%)	0/5 (0%)	0/8 (0%)	1/17 (6%)	2/130 (2%)	N.D.～0.09
オクタクロロスチレン Octachlorostyrene	秋季 Autumn	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
スチレン2量体の合計 Total of styrene dimer	秋季 Autumn	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
スチレン3量体の合計 Total of styrene trimer	秋季 Autumn	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	6/100 (6%)	0/5 (0%)	0/8 (0%)	1/17 (6%)	7/130 (5%)	N.D.～0.30

(Bisphenol A and chlorinated phenols)

調査対象物質 Substance inspected		検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites					範囲 Range (μg/L)
		河川 Rivers	湖沼 Lakes	地下水 Ground water	海域 Sea areas	全体 Total	
ビスフェノールA Bisphenol A	秋季 Autumn	75/139 (54%)	3/5 (60%)	2/12 (17%)	9/18 (50%)	89/174 (51%)	N.D.～0.71
	夏季 Summer	68/100 (68%)	4/5 (80%)	2/8 (25%)	14/17 (82%)	88/130 (68%)	N.D.～0.94
2,4-ジクロロフェノール 2,4-Dichlorophenol	秋季 Autumn	12/139 (9%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	12/174 (7%)	N.D.～0.05
	夏季 Summer	14/100 (14%)	1/5 (20%)	0/8 (0%)	0/17 (0%)	15/130 (12%)	N.D.～0.20

Table 10 Measured results of water quality (surveyed in general water areas)

(Styrene dimers and trimers)

調査対象物質 Substance inspected			検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites					範囲 Range (μg/L)
			河川 Rivers	湖沼 Lakes	地下水 Ground water	海域 Sea areas	全体 Total	
スチレン2量体の合計 Total of styrene dimers	秋季 Autumn		0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer		0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
1,3-ｼﾞﾌｪﾆﾙﾌﾟﾛﾊﾟﾝ 1,3-diphenyl propane	秋季 Autumn		0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer		0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
Cis-1,2-ｼﾞﾌｪﾆﾙ ｼｸﾛﾌﾞﾀﾝ Cis-1,2-diphenyl cyclobutane	秋季 Autumn		0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer		0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
Trans-1,2-ｼﾞﾌｪﾆﾙ ｼｸﾛﾌﾞﾀﾝ Trans-1,2-diphenyl cyclobutane	秋季 Autumn		0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer		0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
2,4-ｼﾞﾌｪﾆﾙ-1-ﾌﾞﾃﾝ 2,4-diphenyl-1-butene	秋季 Autumn		0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer		0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
スチレン3量体の合計 Total of styrene trimers	秋季 Autumn		0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer		6/100 (6%)	0/5 (0%)	0/8 (0%)	1/17 (6%)	7/130 (5%)	N.D.～0.30
2,4,6-ﾄﾘﾌｪﾆﾙ-1-ﾍｷｾﾝ 2,4,6-triphenyl-1-hexene	秋季 Autumn		0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer		6/100 (6%)	0/5 (0%)	0/8 (0%)	1/17 (6%)	7/130 (5%)	N.D. ～0.05
1,3,5-ﾄﾘﾌｪﾆﾙ ｼｸﾛﾍｷｻﾝ 1,3,5-triphenyl cyclohexane	秋季 Autumn		0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer		0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
ﾌｪﾆﾙ(1-ﾌｪﾆﾙｴﾁﾙ)ﾃﾄﾗﾘﾝ＊ Phenyl (1-phenylethyl) tetralin *	秋季 Autumn	1a,4a-体 1a,4a	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
		1a,4e-体 1a,4a	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
		1e,4a-体 1e,4a-	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
		1e,4e-体 1e,4e -	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	1a,4a-体 1a,4a-	6/100 (6%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	6/130 (5%)	N.D.～0.04
		1a,4e-体 1a,4e-						
		1e,4a-体 1e,4a-	6/100 (6%)	0/5 (0%)	0/8 (0%)	1/17 (6%)	7/130 (5%)	N.D.～0.22
		1e,4e-体						

＊ （注）ﾌｪﾆﾙ(1-ﾌｪﾆﾙｴﾁﾙ)ﾃﾄﾗﾘﾝについて：夏季調査においてはﾌｪﾆﾙ(1-ﾌｪﾆﾙｴﾁﾙ)ﾃﾄﾗﾘﾝの1a,4e-体、1e,4a-体及び1e,4e-体の３異性体を合わせて定量した。

＊ * (N.B.) On phenyl(1-phenylethyl)tetralin: in the summer survey, three isomers (1a,4e-, 1e,4a- and 1e,4e-) of phenyl(1-phenylethyl)tetralin were determined collectively.

Table 10 Measured results of water quality (surveyed in general water areas)

(Phthalates and diethylhexyl adipate)

調査対象物質 Substance inspected		検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites					範囲 Range (μg/L)
		河川 Rivers	湖沼 Lakes	地下水 Ground water	海域 Sea areas	全体 Total	
フタル酸ジエチル Diethyl phthalate	秋季 Autumn	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	3/100 (3%)	0/5 (0%)	0/8 (0%)	2/17 (12%)	5/130 (4%)	N.D.～ 1.1
フタル酸ジプロピル Dipropyl phthalate	秋季 Autumn	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
フタル酸ジ-n-ブチル Di-n-butyl phthalate	秋季 Autumn	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	9/100 (9%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	9/130 (7%)	N.D.～ 2.3
フタル酸ジペンチル Dipentyl phthalate	秋季 Autumn	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
フタル酸ジヘキシル Dihexyl phthalate	秋季 Autumn	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
フタル酸ブチルベンジル Butyl benzyl phthalate	秋季 Autumn	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
フタル酸ジ-2-エチルヘキシル Di-(2-ethylhexyl)phthalate	秋季 Autumn	25/139 (18%)	0/5 (0%)	0/12 (0%)	3/18 (17%)	28/174 (16%)	N.D.～ 4.0
	夏季 Summer	57/100 (57%)	1/5 (20%)	3/8 (38%)	10/17 (59%)	71/130 (55%)	N.D.～ 9.9
フタル酸ジシクロヘキシル Dicyclohexyl phthalate	秋季 Autumn	0/139 (0%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	0/174 (0%)	N.D.
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
アジピン酸ジ-2-エチルヘキシル Diethylhexyl adipate	秋季 Autumn	11/139 (8%)	0/5 (0%)	2/12 (17%)	0/18 (0%)	13/174 (7%)	N.D.～ 0.02
	夏季 Summer	1/100 (1%)	0/5 (0%)	2/8 (25%)	0/17 (0%)	3/130 (2%)	N.D.～ 0.07

Table 10 Measured results of water quality (surveyed in general water areas)

(VOC)

調査対象物質 Substance inspected		検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites					範囲 Range (μg/L)
		河川 Rivers	湖沼 Lakes	地下水 Ground water	海域 Sea areas	全体 Total	
n-ブチルベンゼン n-Butylbenzene	秋季 Autumn	1/139 (1%)	0/5 (0%)	0/12 (0%)	0/18 (0%)	1/174 (1%)	N.D.～ 0.01
	夏季 Summer	0/100 (0%)	0/5 (0%)	0/8 (0%)	0/17 (0%)	0/130 (0%)	N.D.
スチレンモノマー Styrene monomer	秋季 Autumn	34/139 (24%)	2/5 (40%)	4/12 (33%)	2/18 (11%)	42/174 (24%)	N.D.～ 1.0
	夏季 Summer	11/100 (11%)	0/5 (0%)	6/8 (75%)	3/17 (18%)	20/130 (15%)	N.D.～ 1.0

(The female hormone of human or animal origin)

調査対象物質 Substance inspected		検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites					範囲 Range (μg/L)
		河川 Rivers	湖沼 Lakes	地下水 Ground water	海域 Sea areas	全体 Total	
17-β-エストラジオール 17-β-estradiol	秋季 Autumn	88/139 (63%)	4/5 (80%)	1/12 (8%)	4/18 (22%)	97/174 (56%)	N.D.～ 0.024
	夏季 Summer	62/100 (62%)	4/5 (80%)	3/8 (38%)	10/17 (59%)	79/130 (61%)	N.D.～ 0.035

Table－11　Measured results of water quality (in priority water areas)
(Polychlorinated biphenyl)

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites			範　囲 Range
	河　川 Rivers	海　域 Sea areas	全　体 Total	(ng / L)
塩化ビフェニール Chlorinated biphenyl	24/71 (34%)	5/30 (17%)	29/101 (29%)	N.D.～ 0.16
二塩化ビフェニール Dichloro biphenyl	53/71 (75%)	26/30 (87%)	79/101 (78%)	N.D.～ 2.9
三塩化ビフェニール Trichloro biphenyl	63/71 (89%)	30/30 (100%)	93/101 (92%)	N.D.～ 10
四塩化ビフェニール Tetrachloro biphenyl	64/71 (90%)	27/30 (90%)	91/101 (90%)	N.D.～ 17
五塩化ビフェニール Pentachloro biphenyl	46/71 (65%)	22/30 (73%)	68/101 (67%)	N.D.～ 3.2
六塩化ビフェニール Hexachloro biphenyl	49/71 (69%)	19/30 (63%)	68/101 (67%)	N.D.～ 0.82
七塩化ビフェニール Heptachloro biphenyl	17/71 (24%)	4/30 (13%)	21/101 (21%)	N.D.～ 0.22
八塩化ビフェニール Octachloro biphenyl	4/71 (6%)	0/30 (0%)	4/101 (4%)	N.D.～ 0.04
九塩化ビフェニール Nonachloro biphenyl	0/71 (0%)	0/30 (0%)	0/101 (0%)	N.D.
十塩化ビフェニール Decichloro biphenyl	0/71 (0%)	0/30 (0%)	0/101 (0%)	N.D.
塩化ビフェニール合計 Total of polychlorinated biphenyl	70/71 (99%)	30/30 (100%)	100/101 (99%)	N.D.～ 32

(Polybromobiphenyl)

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites			範　囲 Range
	河　川 Rivers	海　域 Sea areas	全　体 Total	(ng / L)
臭化ビフェニール Bromo biphenyl	0/71 (0%)	0/30 (0%)	0/101 (0%)	N.D.
二臭化ビフェニール Dibromo biphenyl	0/71 (0%)	0/30 (0%)	0/101 (0%)	N.D.
三臭化ビフェニール Tribromo biphenyl	0/71 (0%)	0/30 (0%)	0/101 (0%)	N.D.
四臭化ビフェニール	0/71	0/30	0/101	N.D.

Table－11　Measured results of water quality (in priority water areas)

Tetrabromo biphenyl	(0%)	(0%)	(0%)	
五臭化ビフェニール Pentabromo biphenyl	0/71 (0%)	0/30 (0%)	0/101 (0%)	N.D.
六臭化ビフェニール Hexabromo biphenyl	0/71 (0%)	0/30 (0%)	0/101 (0%)	N.D.
十臭化ビフェニール Decibromo biphenyl	0/71 (0%)	0/30 (0%)	0/101 (0%)	N.D.
臭化ビフェニール合計 Total of polybromobiphenyl	0/71 (0%)	0/30 (0%)	0/101 (0%)	N.D.

(Organic tin compounds)

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites			範　囲 Range
	河　川 Rivers	海　域 Sea areas	全　体 Total	(μg/L)
Tributyltin	6/71 (8%)	17/30 (57%)	23/101 (23%)	N.D. ～ 0.006
Triphenyltin	0/71 (0%)	0/30 (0%)	0/101 (0%)	N.D.

(Alkylphenol from C4 to C9)

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites			範　囲 Range
	河　川 Rivers	海　域 Sea areas	全　体 Total	(μg/L)
4-t-ﾌﾞﾁﾙﾌｪﾉｰﾙ 4-t-Butylphenol	20/71 (28%)	2/30 (7%)	22/101 (22%)	N.D. ～ 0.38
4-n-ﾌﾞﾁﾙﾌｪﾉｰﾙ 4-n-Butylphenol	0/71 (0%)	0/30 (0%)	0/101 (0%)	N.D.
4-n-ﾍﾟﾝﾁﾙﾌｪﾉｰﾙ 4-n-Pentylphenol	0/71 (0%)	0/30 (0%)	0/101 (0%)	N.D.
4-n-ﾍｷｼﾙﾌｪﾉｰﾙ 4-n-Hexylphenol	0/71 (0%)	0/30 (0%)	0/101 (0%)	N.D.
4-n-ﾍﾌﾟﾁﾙﾌｪﾉｰﾙ 4-n-Heptylphenol	0/71 (0%)	2/30 (7%)	2/101 (2%)	N.D.～ 0.04
ノニルフェノール Nonylphenol	42/71 (59%)	6/30 (20%)	48/101 (48%)	N.D.～ 12
4-t-ｵｸﾁﾙﾌｪﾉｰﾙ	37/71	7/30	44/101	N.D.～ 0.33

Table－11　Measured results of water quality (in priority water areas)

4-t-Octylphenol	(52%)	(23%)	(44%)	
4-n-ｵｸﾁﾙﾌｪﾉｰﾙ 4-n-Octylphenol	0/71 (0%)	0/30 (0%)	0/101 (0%)	N.D.

Table－11　Measured results of water quality (in priority water areas)

(Aromatic compounds (other than VOC))

調査対象物質	検出限界値以上を検出した			範　囲
Substance inspected	地点数／調査地点数			Range
	Number of sites where concentration			
	exceeded minimum detection value/			
	total number of sites			
	河　川	海　域	全　体	(μg/L)
	Rivers	Sea areas	Total	
ベンゾ(a)ピレン	5/71	2/30	7/101	N.D.～　0.02
Benzo(a)pyrene	(7%)	(7%)	(7%)	
ベンゾフェノン	23/71	2/30	25/101	N.D.～　0.08
Benzophenone	(32%)	(7%)	(25%)	
4－ニトロトルエン	0/71	0/30	0/101	N.D.
4-Nitrotoluene	(0%)	(0%)	(0%)	
オクタクロロスチレン	0/71	0/30	0/101	N.D.
Octachlorostyrene	(0%)	(0%)	(0%)	
1,3-ジフェニルプロパン	1/71	0/30	1/101	N.D.～　0.01
1,3-diphenyl propane	(1%)	(0%)	(1%)	
cis-1,2-ジフェニルシクロブタン	0/71	0/30	0/101	N.D.
cis-1,2-diphenyl	(0%)	(0%)	(0%)	
cyclobutane				
trans-1,2-ジフェニルシクロブタン	1/71	0/30	1/101	N.D.～　0.01
trans-1,2-diphenyl	(1%)	(0%)	(1%)	
cyclobutane				
2,4-ジフェニル-1-ブテン	0/71	0/30	0/101	N.D.
2,4-diphenyl-1-butene	(0%)	(0%)	(0%)	
スチレンの2 量体合計	2/71	0/30	2/101	N.D.～　0.01
Total of styrene dimers	(3%)	(0%)	(2%)	
2,4,6-トリフェニル-1-ヘキセン	1/71	0/30	1/101	N.D.～　0.02
2,4,6-triphenyl-1-hexene	(1%)	(0%)	(1%)	
1e,3e,5a-トリフェニルシクロヘキサン	0/71	0/30	0/101	N.D.
1e,3e,5a-triphenyl	(0%)	(0%)	(0%)	
cyclohexane				
1e,3e,5e-トリフェニルシクロヘキサン	0/71	0/30	0/101	N.D.
1e,3e,5e-triphenyl	(0%)	(0%)	(0%)	
cyclohexane				
1a-フェニル-4a-(1'フェニルエチル)テトラリン	1/71	0/30	1/101	N.D.～　0.02
	(1%)	(0%)	(1%)	
1a-phenyl-4a-(1				
-phenylethyl)tetralin				
1a-フェニル-4e-(1'フェニルエチル)テトラリン	0/71	0/30	0/101	N.D.
	(0%)	(0%)	(0%)	
1a-phenyl-4e-(1				

Table－11　Measured results of water quality (in priority water areas)

-phenylethyl)tetralin				
1e-ﾌｪﾆﾙ-4a-(1'ﾌｪﾆﾙｴﾁﾙ)ﾃﾄﾗﾘﾝ	0/71 (0%)	0/30 (0%)	0/101 (0%)	N.D.
1e-phenyl-4a-(1-phenylethyl)tetralin				
1e-ﾌｪﾆﾙ-4e-(1'ﾌｪﾆﾙｴﾁﾙ)ﾃﾄﾗﾘﾝ	1/71 (1%)	0/30 (0%)	1/101 (1%)	N.D.～ 0.01
1e-phenyl-4e-(1-phenylethyl)tetralin				
ｽﾁﾚﾝの3量体合計 Total of styrene trimers	1/71 (1%)	0/30 (0%)	1/101 (1%)	N.D.～ 0.05

(Bisphenol A and chlorinated phenols)

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites			範　囲 Range
	河　川 Rivers	海　域 Sea areas	全　体 Total	(μg/L)
ビスフェノールA Bisphenol A	59/71 (83%)	19/30 (63%)	78/101 (77%)	N.D.～ 1.7
2,4-ｼﾞｸﾛﾛﾌｪﾉｰﾙ 2,4-Dichlorophenol	11/71 (15%)	0/30 (0%)	11/101 (11%)	N.D.～ 0.02

(Phthalates and diethylhexyl adipate)

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites			範　囲 Range
	河　川 Rivers	海　域 Sea areas	全　体 Total	(μg/L)
ﾌﾀﾙ酸ｼﾞｴﾁﾙ Diethyl phthalate	4/71 (6%)	0/30 (0%)	4/101 (4%)	N.D.～ 0.3
ﾌﾀﾙ酸ｼﾞﾌﾟﾛﾋﾟﾙ Dipropyl phthalate	0/71 (0%)	0/30 (0%)	0/101 (0%)	N.D.
ﾌﾀﾙ酸ｼﾞ-n-ﾌﾞﾁﾙ Di-n-butyl phthalate	7/71 (10%)	7/30 (23%)	14/101 (14%)	N.D.～ 1.9
ﾌﾀﾙ酸ｼﾞﾍﾟﾝﾁﾙ Dipentyl phthalate	0/71 (0%)	0/30 (0%)	0/101 (0%)	N.D.
ﾌﾀﾙ酸ｼﾞﾍｷｼﾙ	0/71	0/30	0/101	N.D.

Table－11　Measured results of water quality (in priority water areas)

Dihexyl phthalate	(0%)	(0%)	(0%)	
ﾌﾀﾙ酸ﾌﾞﾁﾙﾍﾞﾝｼﾞﾙ Butyl benzyl phthalate	0/71 (0%)	1/30 (3%)	1/101 (1%)	N.D.～ 0.1
ﾌﾀﾙ酸ｼﾞ-2-ｴﾁﾙﾍｷｼﾙ Di-(2-ethylhexyl) phthalate	26/71 (37%)	11/30 (37%)	37/101 (37%)	N.D.～ 4.9
ﾌﾀﾙ酸ｼﾞｼｸﾛﾍｷｼﾙ Dicyclohexyl phthalate	0/71 (0%)	0/30 (0%)	0/101 (0%)	N.D.
ｱｼﾞﾋﾟﾝ酸 ｼﾞ-2-ｴﾁﾙﾍｷｼﾙ Diethylhexyl adipate	21/71 (30%)	5/30 (17%)	26/101 (26%)	N.D.～ 1.8

Table－11　Measured results of water quality (in priority water areas)
(VOC)

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites			範　囲 Range
	河　川 Rivers	海　域 Sea areas	全　体 Total	(μg/L)
n-ブチルベンゼン n-Butylbenzene	0/71 (0%)	0/30 (0%)	0/101 (0%)	N.D.
スチレンモノマー Styrene monomer	1/71 (1%)	0/30 (0%)	1/101 (1%)	N.D.～　0.01

(The female hormone of human or animal origin)

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites			範　囲 Range
	河　川 Rivers	海　域 Sea areas	全　体 Total	(μg/L)
17-β-ｴｽﾄﾗｼﾞｵｰﾙ 17-β-estradiol	69/71 (97%)	15/30 (50%)	84/101 (83%)	N.D.～　0.041

Table 12　Measured results of bottom sediments

（Polychlorinated biphenyl）

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites				範囲 Range (μg/kg)
	河川 Rivers	海域 Sea areas	湖沼 Lakes	全体 Total	
塩化ビフェニール Chlorinated biphenyl	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.
二塩化ビフェニール Dichloro biphenyl	35 /128 (27%)	14 /19 (74%)	3 /5 (60%)	52 /152 (34%)	N.D.～ 130
三塩化ビフェニール Trichloro biphenyl	84 /128 (66%)	18 /19 (95%)	5 /5 (100%)	107 /152 (70%)	N.D.～ 260
四塩化ビフェニール Tetrachloro biphenyl	73 /128 (57%)	18 /19 (95%)	5 /5 (100%)	96 /152 (63%)	N.D.～ 450
五塩化ビフェニール Pentachloro biphenyl	85 /128 (66%)	18 /19 (95%)	5 /5 (100%)	108 /152 (71%)	N.D.～ 540
六塩化ビフェニール Hexachloro biphenyl	72 /128 (56%)	18 /19 (95%)	5 /5 (100%)	95 /152 (63%)	N.D.～ 420
七塩化ビフェニール Heptachloro biphenyl	36 /128 (28%)	18 /19 (95%)	3 /5 (60%)	57 /152 (38%)	N.D.～ 80
八塩化ビフェニール Octachloro biphenyl	21 /128 (16%)	17 /19 (89%)	2 /5 (40%)	40 /152 (26%)	N.D.～ 11
九塩化ビフェニール Nonachloro biphenyl	5 /128 (4%)	9 /19 (47%)	1 /5 (20%)	15 /152 (10%)	N.D.～ 0.47
十塩化ビフェニール Decichloro biphenyl	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.
合計 Total	103 /128 (80%)	18 /19 (95%)	5 /5 (100%)	126 /152 (83%)	N.D.～ 1500

（Polybromobiphenyl）

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites				範囲 Range (μg/kg)
	河川 Rivers	海域 Sea areas	湖沼 Lakes	全体 Total	
臭化ビフェニール Bromo biphenyl	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.
二臭化ビフェニール Dibromo biphenyl	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.
三臭化ビフェニール Tribromo biphenyl	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.
四臭化ビフェニール Tetrabromo biphenyl	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.
五臭化ビフェニール Pentabromo biphenyl	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.
六臭化ビフェニール Hexabromo biphenyl	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.
十臭化ビフェニール Decibromo biphenyl	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.
合計 Total	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.

Table 12　Measured results of bottom sediments

（Organic tin compounds）

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites				範囲 Range (μg/kg)
	河川 Rivers	海域 Sea areas	湖沼 Lakes	全体 Total	
Tributyltin	58 /128 (45%)	19 /19 (100%)	4 /5 (80%)	81 /152 (53%)	N.D.～ 200
Triphenyltin	9 /128 (7%)	18 /19 (95%)	2 /5 (40%)	29 /152 (19%)	N.D.～ 16

（Alkylphenol from C4 to C9）

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites				範囲 Range (μg/kg)
	河川 Rivers	海域 Sea areas	湖沼 Lakes	全体 Total	
4-t-ﾌﾞﾁﾙﾌｪﾉｰﾙ 4-t-Butylphenol	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.
4-n-ﾌﾞﾁﾙﾌｪﾉｰﾙ 4-n-Butylphenol	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.
4-n-ﾍﾟﾝﾁﾙﾌｪﾉｰﾙ 4-n-Pentylphenol	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.
4-n-ﾍｷｼﾙﾌｪﾉｰﾙ 4-n-Hexylphenol	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.
4-n-ﾍﾌﾟﾁﾙﾌｪﾉｰﾙ 4-n-Heptylphenol	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.
ノニルフェノール Nonylphenol	30 /128 (23%)	4 /19 (21%)	2 /5 (40%)	36 /152 (24%)	N.D.～ 4900
4-t-ｵｸﾁﾙﾌｪﾉｰﾙ 4-t-Octylphenol	9 /128 (7%)	2 /19 (11%)	0 /5 (0%)	11 /152 (7%)	N.D.～ 45
4-n-ｵｸﾁﾙﾌｪﾉｰﾙ 4-n-Octylphenol	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.

Table 12　Measured results of bottom sediments

（Aromatic compounds (other than VOC)）

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites				範囲 Range (μg/kg)
	河川 Rivers	海域 Sea areas	湖沼 Lakes	全体 Total	
ベンゾ(a)ピレン Benzo(a)pyrene	98 /128 (77%)	19 /19 (100%)	5 /5 (100%)	122 /152 (80%)	N.D.～ 3800
ベンゾフェノン Benzophenone	3 /128 (2%)	1 /19 (5%)	0 /5 (0%)	4 /152 (3%)	N.D.～ 4
4-ニトロトルエン 4-Nitrotoluene	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.
オクタクロロスチレン Octachlorostyrene	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.
(Styrene dimerss)					
1,3-ｼﾞﾌｪﾆﾙﾌﾟﾛﾊﾟﾝ 1,3-diphenyl propane	1 /128 (1%)	0 /19 (0%)	0 /5 (0%)	1 /152 (1%)	N.D.～ 1
cis-1,2-ｼﾞﾌｪﾆﾙｼｸﾛﾌﾞﾀﾝ cis-1,2-diphenyl cyclobutane	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.
trans-1,2-ｼﾞﾌｪﾆﾙｼｸﾛﾌﾞﾀﾝ trans-1,2-diphenyl cyclobutane	2 /128 (2%)	0 /19 (0%)	0 /5 (0%)	2 /152 (1%)	N.D.～ 2
2,4-ｼﾞﾌｪﾆﾙ-1-ﾌﾞﾃﾝ 2,4-diphenyl-1-butene	1 /128 (1%)	0 /19 (0%)	0 /5 (0%)	1 /152 (1%)	N.D.～ 3
合計 Total of styrene dimers	4 /128 (3%)	0 /19 (0%)	0 /5 (0%)	4 /152 (3%)	N.D.～ 3
（Styrene trimers）					
2,4,6-ﾄﾘﾌｪﾆﾙ-1-ﾍｷｾﾝ 2,4,6-triphenyl-1-hexene	25 /128 (20%)	7 /19 (37%)	1 /5 (20%)	33 /152 (22%)	N.D.～ 42
1e,3e,5a-ﾄﾘﾌｪﾆﾙｼｸﾛﾍｷｻﾝ 1e,3e,5a-triphenyl cyclohexane	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.
1e,3e,5e-ﾄﾘﾌｪﾆﾙｼｸﾛﾍｷｻﾝ 1e,3e,5e-triphenyl cyclohexane	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.
1a-ﾌｪﾆﾙ-4a-(1'-ﾌｪﾆﾙｴﾁﾙ)ﾃﾄﾗﾘﾝ 1a-phenyl-4a-(1-phenylethyl)tetralin	2 /128 (2%)	0 /19 (0%)	0 /5 (0%)	2 /152 (1%)	N.D.～ 4
1a-ﾌｪﾆﾙ-4e-(1'-ﾌｪﾆﾙｴﾁﾙ)ﾃﾄﾗﾘﾝ 1a-phenyl-4e-(1-phenylethyl)tetralin	6 /128 (5%)	4 /19 (21%)	0 /5 (0%)	10 /152 (7%)	N.D.～ 12
1e-ﾌｪﾆﾙ-4a-(1'-ﾌｪﾆﾙｴﾁﾙ)ﾃﾄﾗﾘﾝ 1e-phenyl-4a-(1-phenylethyl)tetralin	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.
1e-ﾌｪﾆﾙ-4e-(1'-ﾌｪﾆﾙｴﾁﾙ)ﾃﾄﾗﾘﾝ 1e-phenyl-4e-(1-phenylethyl)tetralin	6 /128 (5%)	6 /19 (32%)	1 /5 (20%)	13 /152 (9%)	N.D.～ 6
合計 Total of styrene trimers	27 /128 (21%)	8 /19 (42%)	2 /5 (40%)	37 /152 (24%)	N.D.～ 42

（Bisphenol A and chlorinated phenols）

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites				範囲 Range (μg/kg)
	河川 Rivers	海域 Sea areas	湖沼 Lakes	全体 Total	
ビスフェノールA Bisphenol A	40 /128 (31%)	11 /19 (58%)	4 /5 (80%)	55 /152 (36%)	N.D.～ 67
2,4-ｼﾞｸﾛﾛﾌｪﾉｰﾙ 2,4-Dichlorophenol	2 /128 (2%)	2 /19 (11%)	0 /5 (0%)	4 /152 (3%)	N.D.～ 230

Table 12　Measured results of bottom sediments

（Phthalates and diethylhexyl adipate）

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites				範囲 Range (μg/kg)
	河川 Rivers	海域 Sea areas	湖沼 Lakes	全体 Total	
ﾌﾀﾙ酸ｼﾞｴﾁﾙ Diethyl phthalate	1 /128 (1%)	0 /19 (0%)	0 /5 (0%)	1 /152 (1%)	N.D.～ 22
ﾌﾀﾙ酸ｼﾞﾌﾟﾛﾋﾟﾙ Dipropyl phthalate	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.
ﾌﾀﾙ酸ｼﾞ-n-ﾌﾞﾁﾙ Di-n-butyl phthalate	48 /128 (38%)	15 /19 (79%)	4 /5 (80%)	67 /152 (44%)	N.D.～ 2000
ﾌﾀﾙ酸ｼﾞﾍﾟﾝﾁﾙ Dipentyl phthalate	1 /128 (1%)	0 /19 (0%)	0 /5 (0%)	1 /152 (1%)	N.D.～ 16
ﾌﾀﾙ酸ｼﾞﾍｷｼﾙ Dihexyl phthalate	1 /128 (1%)	0 /19 (0%)	0 /5 (0%)	1 /152 (1%)	N.D.～ 17
ﾌﾀﾙ酸ﾌﾞﾁﾙﾍﾞﾝｼﾞﾙ Butyl benzyl phthalate	10 /128 (8%)	0 /19 (0%)	0 /5 (0%)	10 /152 (7%)	N.D.～ 1400
ﾌﾀﾙ酸ｼﾞ-2-ｴﾁﾙﾍｷｼﾙ Di-(2-ethylhexyl)phthalate	101 /128 (79%)	19 /19 (100%)	5 /5 (100%)	125 /152 (82%)	N.D.～ 210000
ﾌﾀﾙ酸ｼﾞｼｸﾛﾍｷｼﾙ Dicyclohexyl phthalate	3 /128 (2%)	1 /19 (5%)	0 /5 (0%)	4 /152 (3%)	N.D.～ 170
ｱｼﾞﾋﾟﾝ酸ｼﾞ-2-ｴﾁﾙﾍｷｼﾙ Diethylhexyl adipate	6 /128 (5%)	4 /19 (21%)	2 /5 (40%)	12 /152 (8%)	N.D.～ 66

（VOC）

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites				範囲 Range (μg/kg)
	河川 Rivers	海域 Sea areas	湖沼 Lakes	全体 Total	
n-ブチルベンゼン n-Butylbenzene	0 /128 (0%)	0 /19 (0%)	0 /5 (0%)	0 /152 (0%)	N.D.
スチレンモノマー Styrene monomer	5 /128 (4%)	0 /19 (0%)	0 /5 (0%)	5 /152 (3%)	N.D.～ 3

（The female hormone of human or animal origin）

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites				範囲 Range (μg/kg)
	河川 Rivers	海域 Sea areas	湖沼 Lakes	全体 Total	
17-β-ｴｽﾄﾗｼﾞｵｰﾙ 17-β-estradiol	110 /128 (86%)	19 /19 (100%)	5 /5 (100%)	134 /152 (88%)	N.D.～ 16

Table 13 Measured results of aquatic animals and plant life

(Polychlorinated biphenyl)

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites				範 囲 Range (μg/kg)
	河 川 Rivers	海 域 Sea areas	湖 沼 Lakes	全 体 Total	
塩化ビフェニール Chlorinated biphenyl	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
二塩化ビフェニール Dichloro biphenyl	4/119 (4%)	1/17 (6%)	0/5 (0%)	5/141 (4%)	N.D.～ 74
三塩化ビフェニール Trichloro biphenyl	73/119 (61%)	17/17 (100%)	3/5 (60%)	93/141 (66%)	N.D.～ 710
四塩化ビフェニール Tetrachloro biphenyl	71/119 (60%)	17/17 (100%)	4/5 (80%)	92/141 (65%)	N.D.～ 310
五塩化ビフェニール Pentachloro biphenyl	95/119 (80%)	17/17 (100%)	4/5 (80%)	116/141 (82%)	N.D.～ 260
六塩化ビフェニール Hexachloro biphenyl	107/119 (90%)	17/17 (100%)	5/5 (100%)	129/141 (91%)	N.D.～ 140
七塩化ビフェニール Heptachloro biphenyl	30/119 (25%)	14/17 (82%)	1/5 (20%)	45/141 (32%)	N.D.～ 38
八塩化ビフェニール Octachloro biphenyl	5/119 (4%)	5/17 (29%)	0/5 (0%)	10/141 (7%)	N.D.～ 7.2
九塩化ビフェニール Nonachloro biphenyl	1/119 (1%)	0/17 (0%)	0/5 (0%)	1/141 (1%)	N.D.～ 0.6
十塩化ビフェニール Decichloro biphenyl	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
塩化ビフェニール類合計 Total of polychlorinated biphenyl	111/119 (93%)	17/17 (100%)	5/5 (100%)	133/141 (94%)	N.D.～ 1300

(Polybromobiphenyl)

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites				範 囲 Range (μg/kg)
	河 川 Rivers	海 域 Sea areas	湖 沼 Lakes	全 体 Total	
臭化ビフェニール Bromo biphenyl	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
二臭化ビフェニール Dibromo biphenyl	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
三臭化ビフェニール Tribromo biphenyl	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
四臭化ビフェニール Tetrabromo biphenyl	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
五臭化ビフェニール Pentabromo biphenyl	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
六臭化ビフェニール Hexabromo biphenyl	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
十臭化ビフェニール Decibromo biphenyl	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
臭化ビフェニール 合計 Total of polybromobiphenyl	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.

Table 13 Measured results of aquatic animals and plant life

(Organic tin compounds)

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites				範囲 Range (μg/kg)
	河川 Rivers	海域 Sea areas	湖沼 Lakes	全体 Total	
トリブチルスズ Tributyltin	92/119 (77%)	17/17 (100%)	4/5 (80%)	113/141 (80%)	N.D.～ 120
トリフェニルスズ Triphenyltin	49/119 (41%)	17/17 (100%)	4/5 (80%)	70/141 (50%)	N.D.～ 210

(Alkylphenol from C4 to C9)

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites				範囲 Range (μg/kg)
	河川 Rivers	海域 Sea areas	湖沼 Lakes	全体 Total	
4-t-ﾌﾞﾁﾙﾌｪﾉｰﾙ 4-t-Butylphenol	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
4-n-ﾌﾞﾁﾙﾌｪﾉｰﾙ 4-n-Butylphenol	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
4-n-ﾍﾟﾝﾁﾙﾌｪﾉｰﾙ 4-n-Pentylphenol	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
4-n-ﾍｷｼﾙﾌｪﾉｰﾙ 4-n-Hexylphenol	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
4-n-ﾍﾌﾟﾁﾙﾌｪﾉｰﾙ 4-n-Heptylphenol	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
ノニルフェノール Nonylphenol	41/119 (34%)	1/17 (6%)	0/5 (0%)	42/141 (30%)	N.D.～ 780
4-t-ｵｸﾁﾙﾌｪﾉｰﾙ 4-t-Octylphenol	16/119 (13%)	0/17 (0%)	0/5 (0%)	16/141 (11%)	N.D.～ 30
4-n-ｵｸﾁﾙﾌｪﾉｰﾙ 4-n-Octylphenol	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.

(Aromatic compounds (other than VOC))

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites				範囲 Range (μg/kg)
	河川 Rivers	海域 Sea areas	湖沼 Lakes	全体 Total	
ベンゾ(a)ピレン Benzo(a)pyrene	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
ベンゾフェノン Benzophenone	3/119 (3%)	0/17 (0%)	0/5 (0%)	3/141 (2%)	N.D.～ 4
４－ニトロトルエン 4-Nitrotoluene	0/119 (0%)	1/17 (6%)	0/5 (0%)	1/141 (1%)	N.D.～ 5
オクタクロロスチレン Octachlorostyrene	1/119 (1%)	1/17 (6%)	0/5 (0%)	2/141 (1%)	N.D.～ 12

Table 13 Measured results of aquatic animals and plant life

(Styrene dimers and trimers)

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites				範 囲 Range (μg/kg)
	河 川 Rivers	海 域 Sea areas	湖 沼 Lakes	全 体 Total	
1,3-ｼﾞﾌｪﾆﾙﾌﾟﾛﾊﾟﾝ 1,3-diphenyl propane	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
Cis-1,2-ｼﾞﾌｪﾆﾙｼｸﾛﾌﾞﾀﾝ cis-1,2-diphenyl cyclobutane	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
Trans-1,2-ｼﾞﾌｪﾆﾙｼｸﾛﾌﾞﾀﾝ trans-1,2-diphenyl cyclobutane	11/119 (9%)	0/17 (0%)	0/5 (0%)	11/141 (8%)	N.D.～ 9
2,4-ｼﾞﾌｪﾆﾙ-1-ﾌﾞﾃﾝ 2,4-diphenyl-1-butene	1/119 (1%)	0/17 (0%)	0/5 (0%)	1/141 (1%)	N.D.～ 3
スチレン２量体合計 Total of styrene dimers	11/119 (9%)	0/17 (0%)	0/5 (0%)	11/141 (8%)	N.D.～ 12
2,4,6-ﾄﾘﾌｪﾆﾙ-1-ﾍｷｾﾝ 2,4,6-triphenyl-1-hexene	15/119 (13%)	0/17 (0%)	0/5 (0%)	15/141 (11%)	N.D.～ 11
1e,3e,5a-ﾄﾘﾌｪﾆﾙｼｸﾛﾍｷｻﾝ 1e,3e,5a-triphenyl cyclohexane	7/119 (6%)	1/17 (6%)	0/5 (0%)	8/141 (6%)	N.D.～ 2
1e,3e,5e-ﾄﾘﾌｪﾆﾙｼｸﾛﾍｷｻﾝ 1e,3e,5e-triphenyl cyclohexane	18/119 (15%)	3/17 (18%)	1/5 (20%)	22/141 (16%)	N.D.～ 11
1a-ﾌｪﾆﾙ-4a-(1-ﾌｪﾆﾙｴﾁﾙ)ﾃﾄﾗﾘﾝ 1a-phenyl-4a-(1-phenylethyl)tetralin	2/119 (2%)	0/17 (0%)	0/5 (0%)	2/141 (1%)	N.D.～ 2
1a-ﾌｪﾆﾙ-4e-(1-ﾌｪﾆﾙｴﾁﾙ)ﾃﾄﾗﾘﾝ 1a-phenyl-4e-(1-phenylethyl)tetralin	5/119 (4%)	0/17 (0%)	0/5 (0%)	5/141 (4%)	N.D.～ 4
1e-ﾌｪﾆﾙ-4a-(1-ﾌｪﾆﾙｴﾁﾙ)ﾃﾄﾗﾘﾝ 1e-phenyl-4a-(1-phenylethyl)tetralin	1/119 (1%)	0/17 (0%)	0/5 (0%)	1/141 (1%)	N.D.～ 1
1e-ﾌｪﾆﾙ-4e-(1-ﾌｪﾆﾙｴﾁﾙ)ﾃﾄﾗﾘﾝ 1e-phenyl-4e-(1-phenylethyl)tetralin	17/119 (14%)	1/17 (6%)	0/5 (0%)	18/141 (13%)	N.D.～ 49
スチレン３量体合計 Total of styrene trimers	34/119 (29%)	4/17 (24%)	1/5 (20%)	39/141 (28%)	N.D.～ 56

(Bisphenol A and chlorinated phenols)

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites				範 囲 Range (μg/kg)
	河 川 Rivers	海 域 Sea areas	湖 沼 Lakes	全 体 Total	
ビスフェノールA Bisphenol A	8/119 (7%)	0/17 (0%)	0/5 (0%)	8/141 (6%)	N.D.～ 15
2,4-ｼﾞｸﾛﾛﾌｪﾉｰﾙ 2,4-Dichlorophenol	1/119 (1%)	0/17 (0%)	0/5 (0%)	1/141 (1%)	N.D.～ 1.6

Table 13 Measured results of aquatic animals and plant life

(Phthalates and diethylhexyl adipate)

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites				範　囲 Range (μg/kg)
	河　川 Rivers	海　域 Sea areas	湖　沼 Lakes	全　体 Total	
ﾌﾀﾙ酸ｼﾞｴﾁﾙ Diethyl phthalate	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
ﾌﾀﾙ酸ｼﾞﾌﾟﾛﾋﾟﾙ Dipropyl phthalate	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
ﾌﾀﾙ酸ｼﾞ-n-ﾌﾞﾁﾙ Di-n-butyl phthalate	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
ﾌﾀﾙ酸ｼﾞ-n-ﾍﾟﾝﾁﾙ Di-n-pentyl phthalate	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
ﾌﾀﾙ酸ｼﾞ-n-ﾍｷｼﾙ Di-n-hexyl phthalate	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
ﾌﾀﾙ酸ﾌﾞﾁﾙﾍﾞﾝｼﾞﾙ Butylbenzyl phthalate	3/119 (3%)	0/17 (0%)	0/5 (0%)	3/141 (2%)	N.D.～ 35
ﾌﾀﾙ酸ｼﾞ-2-ｴﾁﾙ ﾍｷｼﾙ Di-(2-ethylhexyl) phthalate	29/119 (24%)	1/17 (6%)	0/5 (0%)	30/141 (21%)	N.D.～ 190
ﾌﾀﾙ酸ｼﾞｼｸﾛﾍｷｼﾙ Dicyclohexyl phthalate	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.
ｱｼﾞﾋﾟﾝ酸 ｼﾞ-2-ｴﾁﾙﾍｷｼﾙ Diethylhexyl adipate	0/119 (0%)	0/17 (0%)	0/5 (0%)	0/141 (0%)	N.D.

(VOC)

調査対象物質 Substance inspected	検出限界値以上を検出した地点数／調査地点数 Number of sites where concentration exceeded minimum detection value/ total number of sites				範　囲 Range (μg/kg)
	河　川 Rivers	海　域 Sea areas	湖　沼 Lakes	全　体 Total	
n-ブチルベンゼン n-Butylbenzene	11/119 (9%)	1/17 (6%)	0/5 (0%)	12/141 (9%)	N.D.～ 11
スチレンモノマー Styrene monomer	11/119 (9%)	5/17 (29%)	0/5 (0%)	16/141 (11%)	N.D.～ 4