Chapter 1 Results of the Initial Environmental Survey in FY2022

1. Purpose of the survey

Initial Environmental Surveys are implemented in compliance with the Law Concerning Reporting, etc. of Releases of Specific Chemical Substances to the Environment and Promoting Improvement in Their Management (Law No. 86, 1999) (hereafter, the PRTR Law); these surveys provide the basic resources to properly evaluate chemical substances which may present environmental risk by compiling and tracking data notably from areas susceptible to high concentrations in their general environments, as well as for evaluating environmental and exposure risks to chemical substances that are other than as designated by law.

2. Target chemicals

In the FY2022 Initial Environmental Survey, 13 chemicals that were selected and designated as target chemicals. The combinations of target chemicals and the surveyed media are given below.

No.	Name	The Chemical Substances Control Law *1, 2		The PRTR Law *3			Surveyed media	
		Before the revision	After the revision	2000-	2008-	2021-	Surface water	Air
[1]	Atorvastatin						○	
[2]	2-(Diethylamino)ethanol	II Monitored		I 109	I 145			○
[3]	Diethylamine						○	
[4]	4,4'-Dihydroxydiphenylmethane (synonym: Bisphenol F)						○	
[5]	1,3-Diphenylguanidine	II Monitored			I 205	II 56	○	
[6]	4,4'-Sulfonyldiphenol (synonym: Bisphenol S)	II Monitored					○	
[7]	2,5,8,11-Tetraoxadodecane (synonym: Triethylene glycol dimethyl ether)						○	
[8]	1,3,5-Tris(2,3-epoxypropyl)-1,3,5-triazine-2,4,6(1*H*,3*H*,5*H*)-trione (synonym: 1,3,5-Triglycidyl isocyanurate)	II Monitored		I 218	I 291	II 71	○	
[9]	4,4'-[2,2,2-Trifluoro-1-(trifluoromethyl)ethylidene]bis phenol (synonym: Bisphenol AF)						○	
[10]	3,5,5-Trimethyl-1-hexanol			I 223	I 295	II 76	○	
[11]	1,2-Bis(2-chlorophenyl)hydrazine	III Monitored			I 327		○	
[12]	Furan	II Monitored			I 377	II 110	○	
[13]	2-Mercaptobenzothiazole (synonym: 1,3-Benzothiazole-2-thiol)	II Monitored III Monitored			I 452	II 132	○	

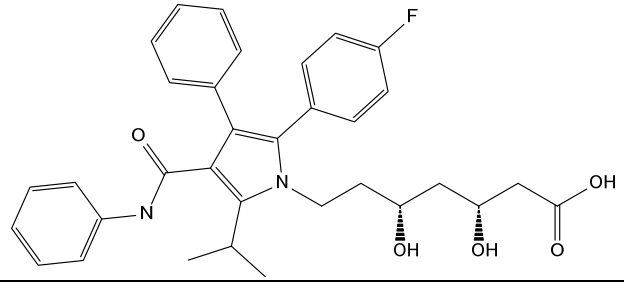
(Note 1) “The Chemical Substances Control Law” hereafter means “Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances (Law No. 117 of 1973).”

(Note 2) “Before the revision” in “The Chemical Substances Control Law” means designation before the May 20, 2009 revison of tha low (enforced April 1, 2011), and “After the revision” means designation after the law revison.

(Note 3) “2000-” in the “The PRTR Law” means designation at the time of enactment of government ordinance of tha low on June 7, 2000, "2008-" means the designation after the revision of the government ordinance on November 21, 2008, and "2021-" means the designation after the revision of the government ordinance on October 20, 2021.

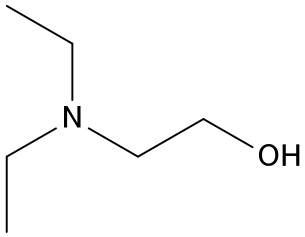
Chemical and physical properties of target chemicals of the Initial Environmental Survey are as follows.

[1] Atorvastatin



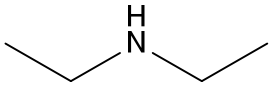
Molecular formula:	$C_{33}H_{35}FN_2O_5$
CAS:	134523-00-5
ENCS:	No pertinence
MW:	558.64
mp:	176 °C [1)]
bp:	722 °C (760 mmHg) [1)]
sw:	<1 g/L [2)]
Specific gravities:	Uncertain
logPow:	Uncertain

[2] 2-(Diethylamino)ethanol



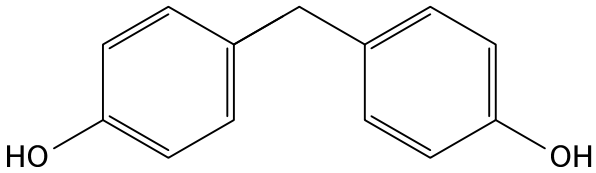
Molecular formula:	$C_6H_{15}NO$
CAS:	100-37-8
ENCS:	2-297 [*1], 2-353 [*2]
MW:	117.19
mp:	-70 °C [3)]
bp:	163 °C [3)]
sw:	Miscible [3)]
Specific gravities:	0.88 [3)]
logPow:	0.46 [3)]

[3] Diethylamine



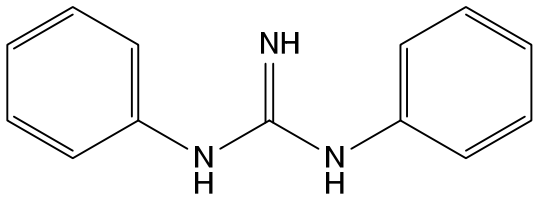
Molecular formula:	$C_4H_{11}N$
CAS:	109-89-7
ENCS:	2-135
MW:	73.40
mp:	-50 °C [4)]
bp:	55.5 °C [4)]
sw:	Miscible [4)]
Specific gravities:	0.7 [4)]
logPow:	0.58 [4)]

[4] 4,4'-Dihydroxydiphenylmethane (synonym: Bisphenol F)



Molecular formula:	$C_{13}H_{12}O_2$
CAS:	620-92-8
ENCS:	4-90
MW:	200.24
mp:	162.5 °C [1)]
bp:	Sublimes [1)]
sw:	Uncertain
Specific gravities:	Uncertain
logPow:	2.91 °C [1)]

[5] 1,3-Diphenylguanidine

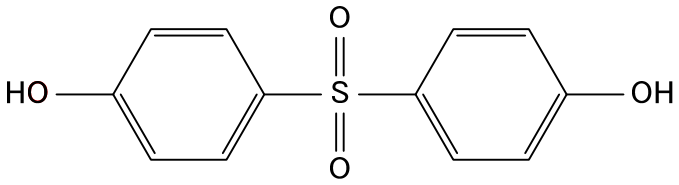


Molecular formula:	$C_{13}H_{13}N_3$
CAS:	102-06-7
ENCS:	3-480 (Diphenylguanidine), 3-2189
MW:	211.27
mp:	150 °C [5)]
bp:	170 °C (Decomposition) [5)]
sw:	29.5 mg/L (The mean of the results at pH 7.4) [1)]
Specific gravities:	1.19 g/cm^3 [5)]
logPow:	1.69 [5)]

(Note 1) *N*,*N*-Dialkyl-N-ethanolamine (The alkyl groups have 1 ~ 3 carbon atoms.)
(Note 2) *N*,*N*-Dialkyl (or hydroxyethyl)-*N*-(2-hydroxyalkyl) amine

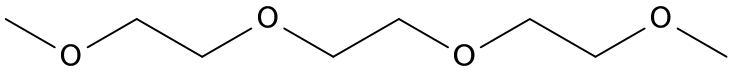
(Abbreviations) CAS CAS registry number, ENCS registry number in the Existing and New Chemical Substances List, MW molecular weight, mp melting point, bp boiling point, SW solubility in water, Specific gravities Specific gravity(no unit) or density, logPow *n*-octanol-water partition coefficient, kPa kilopascal (1 atom approximately equal to 101.3kPa).

[6] 4,4'-Sulfonyldiphenol (synonym: Bisphenol S)



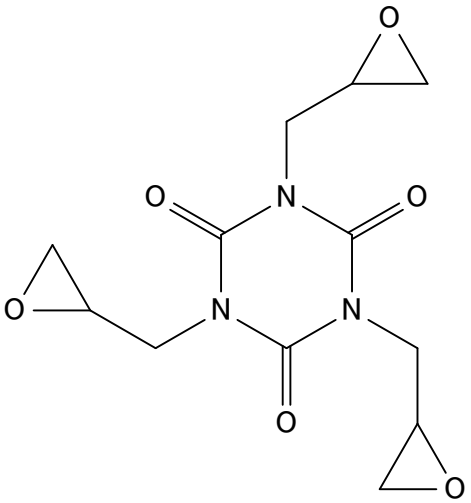
Molecular formula: $C_{12}H_{10}O_4S$
CAS: 80-09-1
ENCS: 3-2169 *3
MW: 250.27
mp: 240.5 °C [6)]
bp: 330 °C (Decomposition) [6)]
sw: 770 mg/L (20 °C) [6)]
Specific gravities: 1.366 g/cm^3 (15 °C) [6)]
logPow: 2.36 (24.5 °C) [6)]

[7] 2,5,8,11-Tetraoxadodecane (synonym: Triethylene glycol dimethyl ether)



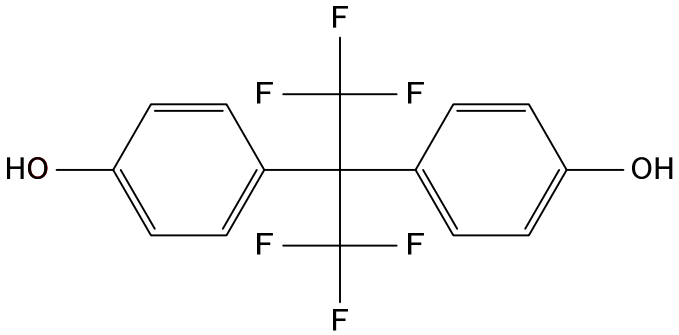
Molecular formula: $C_8H_{18}O_4$
CAS: 112-49-2
ENCS: 7-1321 *2
MW: 178.23
mp: -45 °C [7)]
bp: 216 °C [7)]
sw: Miscible [7)]
Specific gravities: 0.99 [7)]
logPow: -0.48 [7)]

[8] 1,3,5-Tris(2,3-epoxypropyl)-1,3,5-triazine-2,4,6(1*H*,3*H*,5*H*)-trione (synonym: 1,3,5-Triglycidyl isocyanurate)



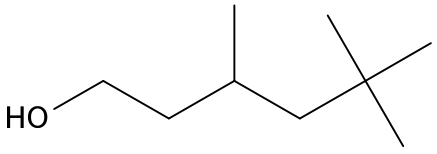
Molecular formula: $C_{12}H_{15}N_3O_6$
CAS: 2451-62-9
ENCS: 5-1052
MW: 297.26
mp: 105 °C (α-anomer), 156 °C (β-anomer) [8)]
bp: >240 °C (Decomposition) [1)]
sw: 10.1 mg/L (α-anomer) 、0.53 mg/L (β-anomer) [8)]
Specific gravities: 1.5 g/cm^3 (Mixture of about 90% α-anomer and 10% β-anomer) [8)]
logPow: -1.07 [8)]

[9] 4,4'-[2,2,2-Trifluoro-1-(trifluoromethyl)ethylidene]bisphenol (synonym: Bisphenol AF)



Molecular formula: $C_{15}H_{10}F_6O_2$
CAS: 1478-61-1
ENCS: 4-1335
MW: 336.23
mp: 159 ~ 162 °C [1)]
bp: 400 °C [1)]
sw: Negligible
Specific gravities: 1.447 g/cm^3 [1)]
logPow: Uncertain

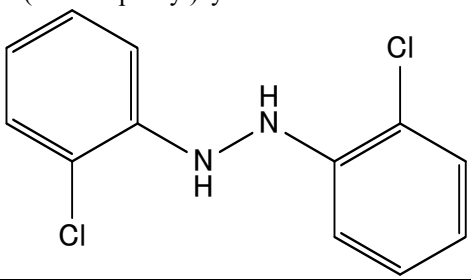
[10] 3,5,5-Trimethyl-1-hexanol



Molecular formula: $C_9H_{20}O$
CAS: 3452-97-9
ENCS: 2-217 *5
MW: 144.26
mp: -70 °C [9)]
bp: 190 °C (1,013 hPa) [10)]
sw: 490 mg/L (20 °C) [10)]
Specific gravities: 0.828 g/cm^3 [10)]
logPow: 3.42 (23°C) [10)]

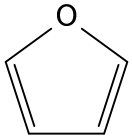
(Note 3) Dihydroxydiphenylsulfone(include nuclear methyl derivatives)
(Note 4) Polyoxyalkylene dialkyl (or alkenyl) ether (The oxyalkylene has 2 or 3 carbon atoms, the alkyl groups (or alkenyl groups) have 1 ~ 5 carbon atoms, and the polymerization of oxyalkylene is 1 ~ 150.)
(Note 5) Alkanol (The alkyl group has 5 ~ 38 carbon atoms)

[11] 1,2-Bis(2-chlorophenyl)hydrazine



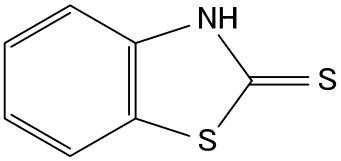
Molecular formula: $C_{12}H_{10}Cl_2N_2$
CAS: 782-74-1
ENCS: 3-2756
MW: 253.13
mp: 87 °C [1)]
bp: Uncertain
sw: <10 mg/L [1)]
Specific gravities: Uncertain
logPow: Uncertain

[12] Furan



Molecular formula: C_4H_4O
CAS: 110-00-9
ENCS: 5-3334
MW: 68.08
mp: -85.6 °C [11)]
bp: 31.3 [11)]
sw: 10 g/L (25 °C) [11)]
Specific gravities: 0.94 [11)]
logPow: 1.34 [11)]

[13] 2-Mercaptobenzothiazole (synonym: 1,3-Benzothiazole-2-thiol)



Molecular formula: $C_7H_5NS_2$
CAS: 149-30-4
ENCS: 5-242
MW: 167.24
mp: 180～182 °C [12)]
bp: Decomposes [1)]
sw: 0.1 g/L (20 °C) [12)]
Specific gravities: 1.42 g/cm^3 [12)]
logPow: 2.41 [12)]

References

1) U.S. National Library of Medicine, PubChem (https://pubchem.ncbi.nlm.nih.gov/, Retrieved on November, 2023)
2) Royal Society of Chemistry, ChemSpider (http://www.chemspider.com/, Retrieved on November, 2023)
3) International Labour Organization (ILO), 2-Diethylaminoethanol, International Chemical Safety Cards (ICSCs), 0257 (2002)
4) International Labour Organization (ILO), Diethylamine, International Chemical Safety Cards (ICSCs), 0444 (2008)
5) International Labour Organization (ILO), 1,3-Diphenylguanidine, International Chemical Safety Cards (ICSCs), 0467 (2000)
6) OECD, 4,4'-Sulfonyldiphenol, SIDS Initial Assessment Report, CoCAM 4, 16-18 April 2013 (2013)
7) International Labour Organization (ILO), Triethylene glycol dimethyl ether, International Chemical Safety Cards (ICSCs), 1570 (2004)
8) National Institute of Technology and Evaluation (NITE), 1,3,5-Tris(2,3-epoxypropyl)-1,3,5-triazine-2,4,6(1*H*,3*H*,5*H*)-trione, Chemicals Initial Risk Assessment Report, Ver. 1.0, No. 146 (2008) (in Japanese)
9) National Institute of Technology and Evaluation (NITE), 3,5,5-Trimethyl-1-hexanol, Chemicals Initial Risk Assessment Report Ver. 1.0 No. 27 (2008) (in Japanese)
10) OECD, 3,5,5-Trimethyl-1-hexano, SIDS Initial Assessment Report, SIAM 14, 26-28th March 2002 (2002)
11) International Labour Organization (ILO), Furan, International Chemical Safety Cards (ICSCs), 1257 (2014)
12) International Labour Organization (ILO), 2-Mercaptobenzothiazole, International Chemical Safety Cards (ICSCs), 1183 (2017)

3. Surveyed site and procedure

In the Initial Environmental Survey, the sampling and analysis of specimens was entrusted to prefectural governments and government-designated cities across Japan, and some specimens were sampled and analysed by private analytical laboratories.

(1) Organisations responsible for sampling

Local communities	Organisations responsible for sampling *1	Surveyed media	
		Surface water	Air
Hokkaido	Recycling-based Society Promotion Division, Environment and Lifestyle Department, Environmental Conservation Bureau, Hokkaido Prefectural Government and Research Institute of Energy, Environment and Geology, Hokkaido Research Organization	○	
Sapporo City	Sapporo City Institute of Public Health	○	
Iwate Pref.	Research Institute for Environmental Sciences and Public Health of Iwate Prefecture	○	
Miyagi Pref.	Miyagi Prefectural Institute of Public Health and Environment	○	
Sendai City	Sendai City Institute of Public Health	○	○
Akita Pref.	Akita Research Center for Public Health and Environment	○	
Yamagata Pref.	Yamagata Environmental Science Research Center	○	
Ibaraki Pref.	Ibaraki Kasumigaura Environmental Science Center	○	○
Tochigi Pref.	Tochigi Prefectural Institute of Public Health and Environmental Science	○	
Gunma Pref.	Gunma Prefectural Institute of Public Health and Environmental Sciences	○	
Saitama Pref.	Center for Environmental Science in Saitama		○
Saitama City	Saitama City Institute of Health Science and Research	○	○
Chiba Pref.	Chiba Prefectural Environmental Research Center	○	
Tokyo Met.	Environmental Improvement Division, Bureau of Environment, Tokyo Metropolitan Government and Tokyo Metropolitan Research Institute for Environmental Protection	○	○
Kanagawa Pref.	Kanagawa Environmental Research Center		○
Yokohama City	Yokohama Environmental Science Research Institute	○	
Kawasaki City	Kawasaki Environment Research Institute	○	○
Niigata Pref.	Niigata Prefectural Institute of Public Health and Environmental Sciences	○	
Ishikawa Pref.	Ishikawa Prefectural Institute of Public Health and Environmental Science	○	○
Nagano Pref.	Nagano Environmental Conservation Research Institute	○	○
Shizuoka Pref.	Shizuoka Institute of Environment and Hygiene	○	
Aichi Pref.	Aichi Environmental Research Center	○	
Nagoya City	Nagoya City Environmental Science Research Center, Regional Environmental measures Division, Environmental Bureau, Nagoya city	○	○
Mie Pref.	Mie Prefecture Health and Environment Research Institute	○	○
Shiga Pref.	Lake Biwa Environmental Research Institute	○	○
Kyoto Pref.	Kyoto Prefectural Institute of Public Health and Environment	○	○
Kyoto City	Kyoto City Institute of Health and Environmental Sciences	○	○
Osaka Pref.	Environment Preservation Division, Environment Management Office, Department of Environment, Agriculture, Forestry and Fisheries, Osaka Prefectural Government	○	○ *2
Osaka City	Osaka City Institute of Public Health and Environmental Sciences	○	
Hyogo Pref.	Water and Air Division, Environment Department, Hyogo Prefectural Government and Hyogo Prefectural Institute of Environmental Sciences, Hyogo Environmental Advancement Association	○	
Kobe City	Environmental Conservation Division, Environment Bureau, Kobe City and Kobe City Institute of Health and Environmental Science	○	
Nara Pref.	Nara Prefecture Landscape and Environment Center	○	
Wakayama Pref.	Wakayama Prefectural Research Center of Environment and Public Health	○	○
Okayama Pref.	Okayama Prefectural Institute for Environmental Science and Public Health	○	
Yamaguchi Pref.	Yamaguchi Prefectural Institute of Public Health and Environment	○	○
Tokushima Pref.	Tokushima Prefectural Public Health, Pharmaceutical and Environmental Sciences Center		○
Kagawa Pref.	Kagawa Prefectural Research Institute for Environmental Sciences and Public Health	○	○
Ehime Pref.	Ehime Prefectural Institute of Public Health and Environmental Science	○	
Fukuoka Pref.	Fukuoka Institute of Health and Environmental Sciences	○	
Kitakyushu City	Kitakyushu City Institute of Health and Environmental Sciences	○	
Fukuoka City	Fukuoka City Institute for Hygiene and the Environment	○	
Saga Pref.	Saga Prefectural Environmental Research Center	○	○
Oita Pref.	Environment Preservation Division, Department of Environment, Oita Prefectural Government and Oita Prefectural Institute of Health and Environment	○	○

Local communities	Organisations responsible for sampling *1	Surveyed media	
		Surface water	Air
Okinawa Pref.	Okinawa Prefectural Institute of Health and Environment	○	

(Note 1) *1: Organisations responsible for sampling are described by their official names in FY 2022.
(Note 2) *2: Those organizations cooperated with a private analytical laboratory in sampling specimens

(2) Surveyed sites and target chemicals

The numbers of target chemicals and the numbers of surveyed sites, etc. by surveyed medium in the initial environmental survey were as shown in the following table.

The target chemicals and the national distribution map of the survey sites for each medium are shown in Table 1-1-1 and Fig.1-1-1 for surface water, Table 1-1-2 and Fig.1-1-2 for air.

In addition, about 20 sites were selected as survey sites per target chemical. To obtain data for areas to be expected to high concentrations in the general environment survey sites are selected based on information regarding releases and emissions. Among the sites considering to rank in the top of PRTR emissions, it was included the surrounding sites where samples can be taken in the survey sites.

Surveyed media	Numbers of local communities	Numbers of target chemicals	Numbers of surveyed sites	Numbers of samples at a surveyed site
Surface water	41	12	70	1
Air	21*	1	22	3
All media	44	13	92	

(Note) *: For 1 of the 21 organizations, they were cooperated with a private analytical laboratory in sampling specimens.

(3) Sampling method of specimens

The sampling of specimens and the preparation of samples were carried out following the “Guidelines on Conducting of Environmental Surveys and Monitoring of Chemicals” (published on March 2021) by the Environment Health and Safety Division, Environmental Health Department, Ministry of the Environment of Japan (MOE).

(4) Detection limit

The detection limits of analysed values reported by the analytical laboratory are not necessarily the same because of differences in the properties of specimens and in the available measurement equipment. To enable summarisation, therefore, a unified detection limit is predetermined and the analytical values reported by the analytical laboratory are summarised by the following procedure.

Treatment of measured value as an undetected value in high-sensitivity analysis

In the case of high-sensitivity analysis, in which the detection limit of the analytical laboratory is lower than the unified detection limit, any measured value lower than the unified detection limit is treated as an undetected value in the nationwide summary (see schematic (A)).

Elimination of undetected values in low-sensitivity analysis from summary subject

When the detection limit of the analytical laboratory is higher than the unified detection limit, any target chemical not detected is eliminated from the subject of the summary (see schematic (B)).

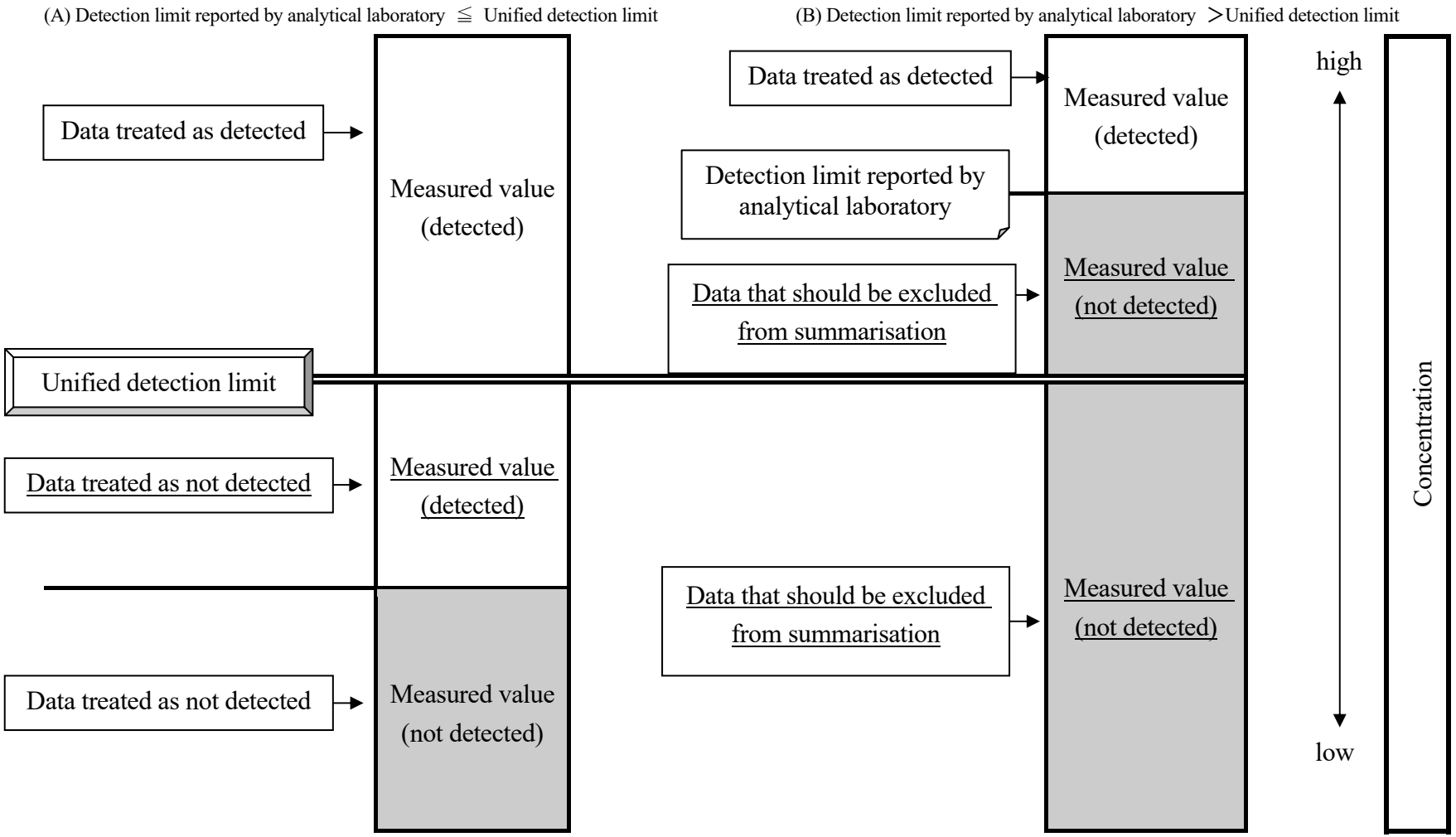
When the instrument detection limit (IDL) and the method detection limit (MDL) are given in the analytical method, which is described in reports on the investigation of the development of analytical methods for chemicals and adopted in the Initial Environmental Survey (hereafter, the Initial Environmental Survey Analytical Method), if the IDL measured by the analytical laboratory is lower than the given IDL, the MDL of the Initial Environmental Survey Analytical Method is used as the detection limit by the analytical laboratory.

When IDL and MDL are not given in the Initial Environmental Survey Analytical Method, the detection limit is predetermined by the following procedure.

When the analytical laboratory calculates the appropriate IDL and MDL following the calculation method stated in the analytical method development instruction manuals, this calculated MDL is used as the detection limit by the analytical laboratory.

When the appropriate IDL and MDL are not calculated by the analytical laboratory, one of the following procedures was employed to establish the detection limit by the analytical laboratory.

- deduction from the IDL and MDL calculated for the corresponding chemical by Initial Environmental Survey Analytical Method or other analytical laboratories
- deduction from the lowest calibration curve concentration and the results of recovery tests
- deduction from the results of addition and collection tests, the results of operation blank tests, and the signal/noise ratio (S/N ratio) obtained from the chromatogram of environmental specimens



Schematic of procedure for data summarisation

Table 1-1-1 List of surveyed sites (surface water) and target chemicals in the Initial Environmental Survey in FY2022

Local communities	Surveyed sites	Target chemicals											
		[1]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
Hokkaido	Suzuran-ohashi Bridge, Riv. Tokachi (Obihiro City)	○											
	Inou-ohashi Bridge, Riv. Ishikari (Asahikawa City)	○											
	Osamunai-bashi Bridge, Riv. Ishikari (Fukagawa City)	○											
	Ishikarikakokyo Bridge, Mouth of Riv. Ishikari (Ishikari City)	○		○	○	○	○		○	○	○	○	○
Sapporo City	Nakanuma of Riv.Toyohira (Sapporo City)	○									○		
	Daiichishinkawa-bashi Bridge, Riv. Shin (Sapporo City)	○									○		
Iwate Pref.	Toyosawa-bashi Bridge, Riv. Toyosawa (Hanamaki City)	○			○			○			○		○
Miyagi Pref.	Futatsuya-bashi Bridge, Riv. Hasama (Tome City)		○					○					
	Sakura-hodoukyou Bridge, Riv.Shiroishi (Shibata Town)		○					○					
Sendai City	Hirose-ohashi Bridge, Riv. Hirose (Sendai City)		○				○	○				○	
Akita Pref.	Akita Canal (Akita City)	○	○	○	○	○	○		○	○	○	○	○
Yamagata Pref.	Goten-bashi Bridge, Riv. Mogami (Murayama City)	○		○	○	○		○	○		○		
Ibaraki Pref.	Tonekamome-ohasi Bridge, Mouth of Riv. Tone (Kamisu City)				○		○					○	
Tochigi Pref.	Tagawa Kyubun Area Head Works, Riv. Tagawa (Utsunomiya City)	○	○				○	○					
Gunma Pref.	Furutone-bashi Bridge, Riv. Ishida (Ota City)	○											
Saitama City	Nakadote-hashi Bridge, Riv. Kamo (Saitama City)		○	○		○		○	○		○		
Chiba Pref.	Asai-bashi Bridge, Riv. Yourou (Ichihara City)	○	○	○	○	○	○	○	○	○		○	
	Coast of Ichihara and Anegasaki		○	○		○	○		○	○	○	○	
Tokyo Met.	Mouth of Riv. Arakawa (Koto Ward)	○	○	○	○	○	○		○	○	○	○	○
	Mouth of Riv. Sumida (Minato Ward)	○	○	○	○	○	○		○	○	○	○	○
Yokohama City	Kamenoko-bashi Bridge, Riv.Tsurumi (Yokohama City)	○	○	○	○	○	○	○	○	○	○	○	○
	Yokohama Port	○		○		○			○			○	○
	Yoshikura-bashi Bridge, Riv.Kashio (Yokohama City)	○	○	○	○	○	○	○	○	○	○	○	○
Kawasaki City	Mouth of Riv. Tama (Kawasaki City)	○	○	○	○	○	○		○	○	○	○	○
	Front of Chidori Town, Keihin Canal, Port of Kawasaki	○								○			
	Front of Ougi Town, Keihin Canal, Port of Kawasaki *		○	○	○	○	○		○	○	○	○	○
Niigata Pref.	Lower Riv. Shinano (Niigata City)	○	○	○		○	○		○	○	○	○	
Ishikawa Pref.	Mouth of Riv. Sai (Kanazawa City)	○	○	○	○	○	○		○	○	○		
Nagano Pref.	Lake Suwa (center)						○	○					
	Chuo-bashi Bridge, Riv. Tenryu (Ina City)						○	○					
Shizuoka Pref.	Shimizu Port				○		○				○	○	○
	Kuroishi-bashi Bridge, Riv. Kuroishi (Yaizu City)						○	○					
	Kashima-hashi Bridge, Riv. Ushibuchi (Kakegawa City)	○					○	○					
	Kaketsuka-bashi Bridge, Riv. Tenryu (Iwata City)							○			○		
Aichi Pref.	Kira Head Works, Riv. Hirota (Nishio City)				○		○	○					
	Kinuura Port									○			○
	Inaharu-hashi Bridge, Riv. Gojo (Inazawa City, Kiyosu City)	○	○	○	○	○		○	○	○			
	West of Shiomi Wharf, Nagoya Port		○	○		○	○		○	○		○	○
Nagoya City	Hinode-bashi Bridge, Riv.Shin-hori (Nagoya City)	○											
	Minatoshinbashi Bridge, Riv. Hori (Nagoya City)	○		○		○			○				
	South of Shiomi Wharf, Nagoya Port			○		○			○				
Mie Pref.	Yokkaichi Port	○	○	○	○	○			○	○	○	○	
	Toba Port				○								
Shiga Pref.	Lake Biwa (center, offshore of Minamihira)		○	○		○		○	○			○	○
	Lake Biwa (center, offshore of Karasaki)		○	○		○		○	○			○	○
Kyoto Pref.	Miyazu Port						○			○		○	
	Gokou-bashi Bridge, Riv. Kizu (Yawata City)		○	○	○	○	○	○	○			○	
Kyoto City	Miyamae-bashi Bridge, Riv. Katsura (Kyoto City)			○		○		○	○			○	
Osaka Pref.	Mouth of Riv. Yamato (Sakai City)	○	○	○	○	○	○		○	○	○	○	○
Osaka City	Kema-bashi Bridge, Riv. Oh-kawa (Osaka City)	○			○								○
	Osaka Port	○			○								○
Hyogo Pref.	Befu port									○			
	Offshore of Aboshi Port									○			
Kobe City	Kobe Port (center)		○	○		○			○				○
Nara Pref.	Taisho-bashi Bridge, Riv. Yamato (Oji Town)	○	○	○	○	○	○	○	○	○	○	○	○

Local communities	Surveyed sites	Target chemicals											
		[1]	[2]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
Wakayama Pref.	Kinokawa-ohashi Bridge, Mouth of Riv. Kinokawa (Wakayama City)				○								
	Wakayamashimotsu Port, North Port Area									○			
Okayama Pref.	Sasagase-bashi Bridge, Riv. Sasagase (Okayama City)						○	○		○			
	Offshore of Mizushima			○	○	○	○		○	○		○	○
Yamaguchi Pref.	Tokuyama Bay		○	○	○	○	○		○			○	○
	Offshore of Hagi				○							○	
Kagawa Pref.	Takamatsu Port						○			○	○		
Ehime Pref.	Niihama Port			○	○	○			○				○
Fukuoka Pref.	Kabura-bashi Bridge, Riv. Raizan (Itoshima City)	○					○					○	
	Offshore of Omuta	○					○					○	
Kitakyushu City	Dokai Bay		○	○	○	○	○		○	○	○	○	○
Fukuoka City	Hakata Bay	○											
Saga Pref.	Imari Bay						○				○	○	
Oita Pref.	Mouth of Riv. Oita (Oita City)	○	○	○	○	○	○		○		○		○
Okinawa Pref.	Ryutou-bashi Bridge, Riv. Nagadou (Tomigusuku City, Haebaru Town)									○			

[1] Atorvastatin, [3] Diethylamine, [4] 4,4'-Dihydroxydiphenylmethane (synonym: Bisphenol F), [5] 1,3-Diphenylguanidine, [6] 4,4'-Sulfonyldiphenol (synonym: Bisphenol S), [7] 2,5,8,11-Tetraoxadodecane (synonym: Triethylene glycol dimethyl ether), [8] 1,3,5-Tris(2,3-epoxypropyl)-1,3,5-triazine-2,4,6(1*H*,3*H*,5*H*)-trione (synonym: 1,3,5-Triglycidyl isocyanurate), [9] 4,4'-[2,2,2-Trifluoro-1-(trifluoromethyl)ethylidene]bisphenol (synonym: Bisphenol AF), [10] 3,5,5-Trimethyl-1-hexanol, [11] 1,2-Bis(2-chlorophenyl)hydrazine, [12] Furan, [13] 2-Mercaptobenzothiazole (synonym: 1,3-Benzothiazole-2-thiol)

(Note) *: "Front of Ogimachi, Keihin Canal, Port of Kawasaki" of Detailed Environmental Survey and "Keihin Canal, Port of Kawasaki" of Environmental Monitoring are the same point each.

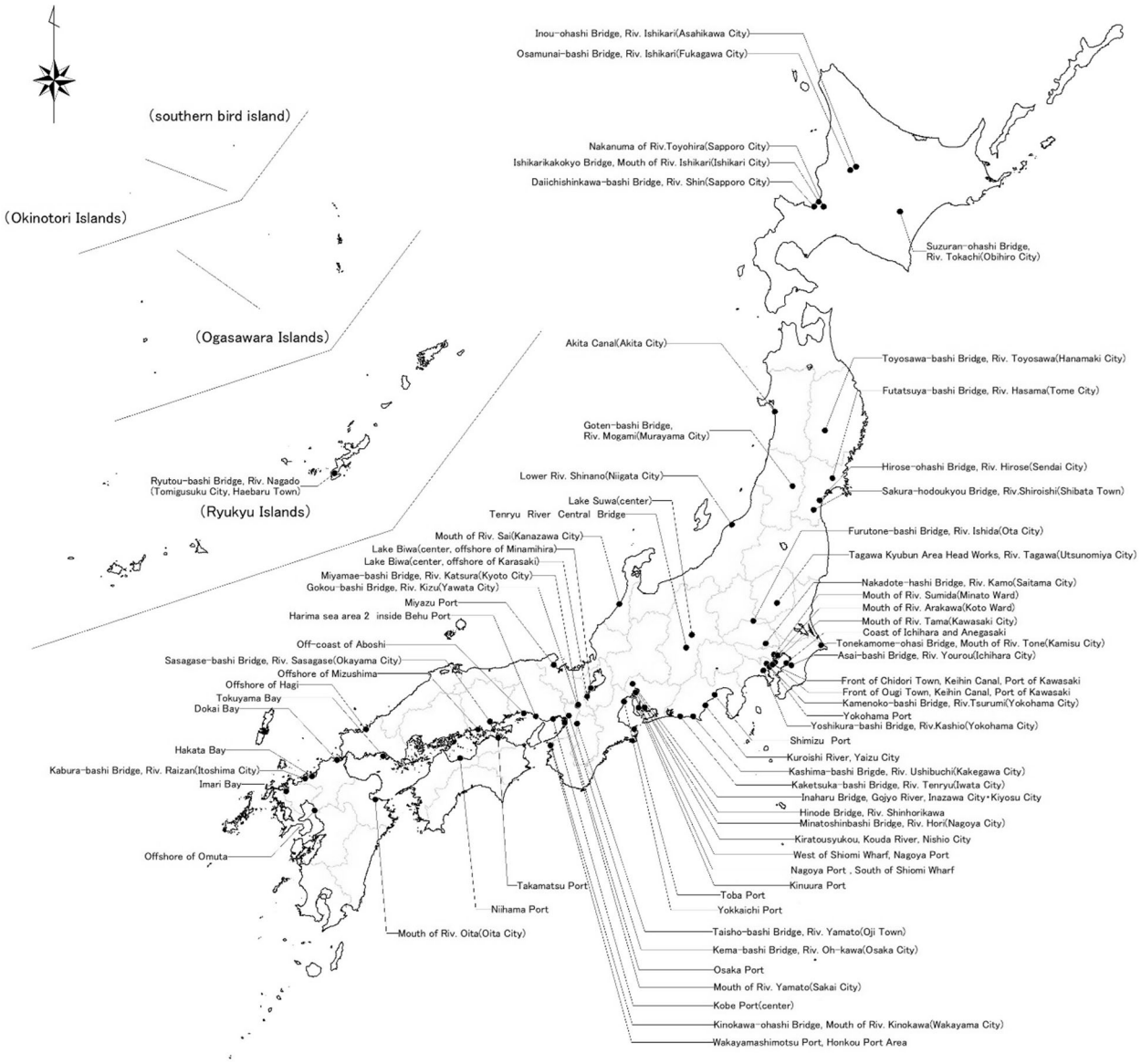


Figure 1-1-1 Surveyed sites (surface water) in the Initial Environmental Survey in FY 2022

Table 1-1-2 List of surveyed sites (air) and target chemicals in the Initial Environmental Survey in FY 2022

Local Communities	Surveyed sites	Target chemicals
		[4] 2-(Diethylamino)ethanol
Sendai City	Tsutsujigaoka Park (Sendai City)	○
Ibaraki Pref.	Ibaraki Kasumigaura Environmental Science Center (Tsuchiura City)	○
Saitama Pref.	Center for Environmental Science in Saitama (Kazo City)	○
Saitama City	Saitama City Public Health Center (Saitama City)	○
Tokyo Met.	Tokyo Metropolitan Research Institute for Environmental Protection (Koto Ward)	○
	Chichijima Island (Ogasawara Village)	○
Kanagawa Pref.	Kanagawa Environmental Research Center (Hiratsuka City)	○
Kawasaki City	Daishi Air Quality Monitoring Station (Kawasaki City)	○
Ishikawa Pref.	Ishikawa Prefectural Institute of Public Health and Environmental Science (Kanazawa City)	○
Nagano Pref.	Nagano Environmental Conservation Research Institute (Nagano City)	○
Nagoya City	Chikusa Ward Heiwa Park (Nagoya City)	○
Mie Pref.	Mie Prefecture Health and Environment Research Institute (Yokkaichi City)	○
Shiga Pref.	Nagahama Air Quality Monitoring Station (Nagahama City)	○
Kyoto Pref.	Uji Prefectural Government Building(Uji City)	○
Kyoto City	Kyoto City Institute of Health and Environmental Sciences(Kyoto City)	○
Osaka Pref.	Osaka Joint Prefectural Government Building, Building 2 Annex (Osaka City)	○
Wakayama Pref.	Wakayama Prefectural Research Center of Environment and Public Health (Wakayama City)	○
Yamaguchi Pref.	Yamaguchi Prefectural Institute of Public Health and Environment (Yamaguchi City)	○
Tokushima Pref.	Tokushima Prefectural Public Health, Pharmaceutical and Environmental Sciences Center (Tokushima City)	○
Kagawa Pref.	Kagawa Prefectural Research Institute for Environmental Sciences and Public Health (Takamatsu City)	○
Saga Pref.	Saga Prefectural Environmental Research Center (Saga City)	○
Oita Pref.	Oita City Misa Elementary School (Oita City)	○

Figure 1-1-2 Surveyed sites (air) in the Initial Environmental Survey in FY 2022

4. Summary of survey results

The detection ranges and the detection limits are shown in Table 1-2. The survey results are summarized as follows.

In surface water, 6 out of the 12 target chemicals were detected.

[1] Atorvastatin: 15 of the 35 valid sites

[3] Diethylamine: 6 of the 28 valid sites

[5] 1,3-Diphenylguanidine: 19 of the 29 valid sites

[6] 4,4'-Sulfonyldiphenol (synonym: Bisphenol S): 25 of the 32 valid sites

[8] 1,3,5-Tris(2,3-epoxypropyl)-1,3,5-triazine-2,4,6(1*H*,3*H*,5*H*)-trione (synonym: 1,3,5-Triglycidyl isocyanurate): 2 of the 23 valid sites

[9] 4,4'-[2,2,2-Trifluoro-1-(trifluoromethyl)ethylidene]bisphenol (synonym: Bisphenol AF): 5 of the 32 valid sites

In air, the target chemical was not detected.

Table 1-2 Summary of the detection ranges and the detection limits in the Initial Environmental Survey in FY 2022

No.	Target chemicals	Surface water [ng/L]		Air [ng/m^3]	
		Detection range and frequency	Detection limit	Detection range and frequency	Detection limit
[1]	Atorvastatin*	nd ~ 18 14/34	1.4		
[2]	2-(Diethylamino)ethanol*			nd 0/22	40
[3]	Diethylamine	nd ~ 19,000 6/28	50		
[4]	4,4'-Dihydroxydiphenylmethane (synonym: Bisphenol F)	nd 0/32	8.8		
[5]	1,3-Diphenylguanidine	nd ~ 220 19/29	5.0		
[6]	4,4'-Sulfonyldiphenol (synonym: Bisphenol S)	nd ~ 420 25/32	1.4		
[7]	2,5,8,11-Tetraoxadodecane (synonym: Triethylene glycol dimethyl ether)	nd 0/35	620		
[8]	1,3,5-Tris(2,3-epoxypropyl)-1,3,5-triazine-2,4,6(1*H*,3*H*,5*H*)-trione (synonym: 1,3,5-Triglycidyl isocyanurate)*	nd ~ 27 2/23	14		
[9]	4,4'-[2,2,2-Trifluoro-1-(trifluoromethyl)ethylidene]bisphenol (synonym: Bisphenol AF)	nd ~ 10 5/32	0.38		
[10]	3,5,5-Trimethyl-1-hexanol	nd 0/28	420		
[11]	1,2-Bis(2-chlorophenyl)hydrazine	nd 0/25	1.8		
[12]	Furan	nd 0/31	38		
[13]	2-Mercaptobenzothiazole (synonym: 1,3-Benzothiazole-2-thiol)	nd 0/24	4.1		

(Note 1) Detection frequency is based on the number of sites, thus means (the number of detected sites/the number of surveyed sites). A site where data was not available was excluded from the number of surveyed sites. A site where the data became invalid under a unified detection limit was also excluded. In sediment, wildlife and air, 3 samples were measured for a site, and the detection in more than one out of samples from a site can be defined as one detected site.

(Note 2) Detection range is based on the number of samples and therefore can be shown as "nd ~ " even if a target chemical is detected in all sites.

(Note 3) ☐ means the medium was not surveyed.

(Note 4) *: The substances were surveyed including the points selected for survey in light of documentation or submittals regarding emissions.