Chapter 1 Results of the Initial Environmental Survey in FY2017

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); 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 FY2017 Initial Environmental Survey, 15 chemicals (groups) 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		The PRTR Law		Surveyed media		
		Before the revision	Before the revision	Before the revision	After the revision	Surface water	Sedi-ment	Air
[1]	2,3-Epoxy-1-propanol	II Monitored		I 55	I 32	○		
[2]	Glutaraldehyde	II Monitored		I 66	I 85	○		
[3]	2-Methoxyethyl acetate (synonym: Ethylene glycol monomethyl ether acetate)	II Monitored		I 103	I 135	○		
[4]	2,4-Dichloro-1-nitrobenzene	II Monitored III Monitored			II 29	○		
[5]	*N,N*-Dicyclohexylamine	II Monitored III Monitored			I 188	○		
[6]	2,4-Dinitroaniline	III Monitored			II 41	○		
[7]	Dimethyl disulfide (synonym: Dimethyl disulfane)	II Monitored III Monitored			I 219	○		
[8]	Naphthols							
	[8-1]1-Naphthol (synonym: α-naphthol)					○		
	[8-2]2-Naphthol (synonym: β-naphthol)				I 393	○		
[9]	1-Nitropyrene					○		○
[10]	2-Vinylpyridine	II Monitored III Monitored		I 256	I 338	○		
[11]	4-Vinyl-1-cyclohexene	II Monitored III Monitored		I 255	I 337	○		
[12]	Pyridine	II Monitored		I 259	I 342	○		
[13]	Fluoranthene						○	
[14]	3-Methylpyridine			I 336	I 439	○		
[15]	Phosphorus compound							
	[15-1] (2-Ethylhexyl) diphenyl phosphate	II Monitored III Monitored			II 99	○		
	[15-2] Di-*n*-butyl phenyl phosphate				II 100	○		
	[15-3] Triphenyl phosphate				I 461	○		

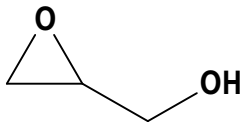
(Note 1) "The Chemical Substances Control Law" hereafter means "Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances (Law No. 117 of 1973)."

(Note 2) Pre-Revision "Areas as designated under the Chemical Substances Control Law" refer to those areas designated prior to the 20 May 2009 revision of the law (which went into effect on 1 April 2011), while "Post Revision Areas" refer to the areas defined as designated post-20 May 2009.

(Note 3) "Before the revision" in "The PRTR Law" means "appointments before the revision of government ordinance on November 21, 2008" and "After the revision" in "The PRTR Law" means "appointments after that revision".

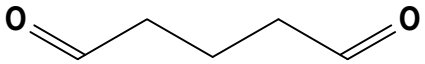
Chemical and physical properties of target chemicals of the Initial Environmental Survey are as follows.

[1] 2,3-Epoxy-1-propanol



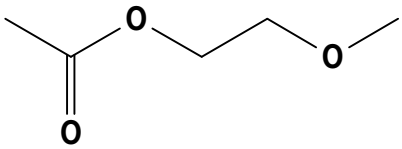
Molecular formula:	$C_3H_6O_2$
CAS:	556-52-5
ENCS:	2-2389
MW:	74.08
mp:	Uncertain
bp:	167℃ [1)]
sw:	1,000g/L(20°C)[2)]
Specific gravities:	1.1143(25°C /4°C)[1)]
logPow:	-0.95 [2)]

[2] Glutaraldehyde



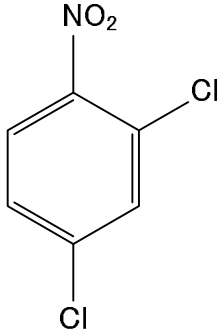
Molecular formula:	$C_5H_8O_2$
CAS:	111-30-8
ENCS:	2-509
MW:	100.12
mp:	-14 [3)]
bp:	187~189°C [1)]
sw:	soluble [1)]
Specific gravities:	0.72g/cm^3 [4)]
logPow:	-0.01 [4)]

[3] 2-Methoxyethyl acetate (synonym: Ethylene glycol monomethyl ether acetate)



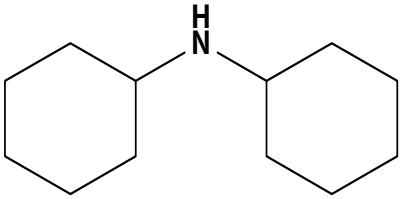
Molecular formula:	$C_5H_{10}O_3$
CAS:	110-49-6
ENCS:	2-740
MW:	118.13
mp:	-65.1°C [1)]
bp:	145°C [1)]
sw:	1,000g/L(20°C)[2)]
Specific gravities:	1.0067(20°C /20°C)[1)]
logPow:	Uncertain

[4] 2,4-Dichloro-1-nitrobenzene



Molecular formula:	$C_6H_3Cl_2NO_2$
CAS:	611-06-3
ENCS:	3-455
MW:	192
mp:	33°C [3)]
bp:	258.5°C [3)]
sw:	200mg/L(25°C)[4)]
Specific gravities:	1.4790 g/cm^3(80°C)[3)]
logPow:	2.9

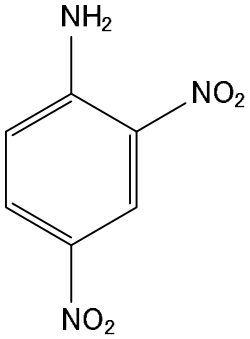
[5] *N,N*-Dicyclohexylamine



Molecular formula:	$C_{12}H_{23}N$
CAS:	101-83-7
ENCS:	3-2259
MW:	181.32
mp:	Uncertain
bp:	255.8°C [2)]
sw:	Insoluble [5)]
Specific gravities:	0.9104(25°C /25°C)[5)]
logPow:	Uncertain

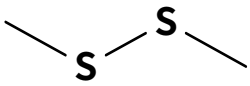
(Abbreviations) CAS CAS registry number, ENCS registry number in the Existing and New Chemical Substances List, MW molecular weight, mp melting point, bp boiling point, SW solubility in water, Specific gravities Specific gravity(no unit) or density, logPow *n*-octanol-water partition coefficient, kPa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

[6] 2,4-Dinitroaniline



Molecular formula: $C_6H_5N_3O_4$
CAS: 97-02-9
ENCS: 3-403
MW: 183.12
mp: 187.5~188°C [1)]
bp: 255.8°C [2)]
sw: 0.078g/kg(25°C)[3)]
Specific gravities: 1.615g/cm^3(14°C)[3)]
logPow: Uncertain

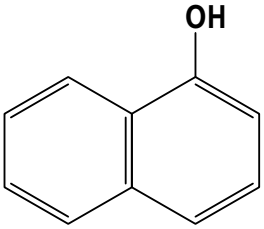
[7] Dimethyl disulfide (synonym: Dimethyl disulfane)



Molecular formula: $C_2H_6S_2$
CAS: 624-92-0
ENCS: 2-477
MW: 94.19
mp: -84.67°C [3)]
bp: 109.72°C [3)]
sw: 0.3g/L(25°C)[2)]
Specific gravities: 1.0625 g/cm^3(20°C)[3)]
logPow: 1.77 [2)]

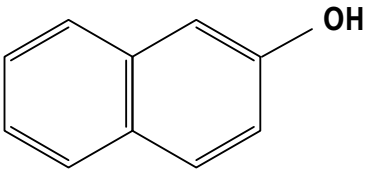
[8] Naphthols

[8-1] 1-Naphthol (synonym: α-naphthol)



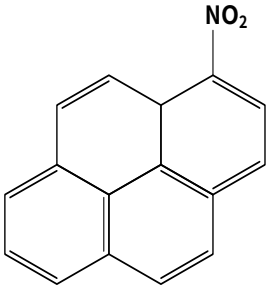
Molecular formula: $C_{10}H_8O$
CAS: 90-15-3
ENCS: 4-354
MW: 144.17
mp: 96°C [1)]
bp: 288°C [1)]
sw: 1.11 g/kg(20°C)[3)]
Specific gravities: 1.0954(98.7°C /4°C)[1)]
logPow: 2.84 [6)]

[8-2] 2-Naphthol (synonym: β-naphthol)



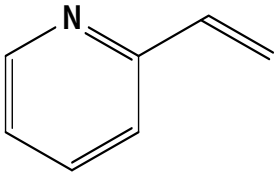
Molecular formula: $C_{10}H_8O$
CAS: 135-19-3
ENCS: 4-355
MW: 144.17
mp: 121~123°C [1)]
bp: 285~286°C [1)]
sw: 0.64g/kg(20°C)[1)]
Specific gravities: 1.22 [1)]
logPow: 2.70 [6)]

[9] 1-Nitropyrene



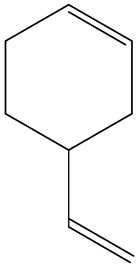
Molecular formula: $C_{16}H_9NO_2$
CAS: 5522-43-0
ENCS: 4-391
MW: 247.25
mp: 152°C [3)]
bp: Uncertain
sw: 0.0000118g/L(25°C)[2)]
Specific gravities: Uncertain
logPow: 5.06 [2)]

[10] 2-Vinylpyridine



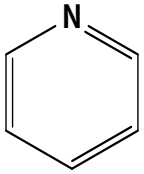
Molecular formula: C_7H_7N
CAS: 100-69-6
ENCS: 5-716
MW: 105.14
mp: Uncertain
bp: 159.5°C [3)]
sw: 27.5g/L(20°C)[2)]
Specific gravities: 0.9983 g/cm^3(20°C)[)]
logPow: 1.54 [2)]

[11] 4-Vinyl-1-cyclohexene



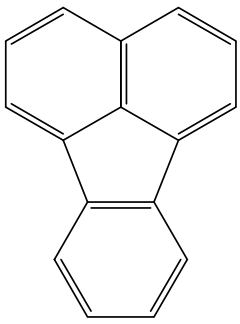
Molecular formula: C_8H_{12}
CAS: 100-40-3
ENCS: 3-2229
MW: 108.18
mp: -108.9°C [3)]
bp: 130°C [3)]
sw: 0.05g/L(25°C)[2)]
Specific gravities: 0.8299 g/cm^3(20°C)[3)]
logPow: 3.93 [2)]

[12] Pyridine



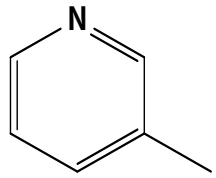
Molecular formula: C_5H_5N
CAS: 110-86-1
ENCS: 5-710
MW: 79.1
mp: -41.6°C [1)]
bp: 115.2~115.3°C [1)]
sw: 1,000g/L(25°C)[2)]
Specific gravities: 0.98272(20°C /4°C)[1)]
logPow: 0.65 [6)]

[13] Fluoranthene



Molecular formula: $C_{16}H_{10}$
CAS: 206-44-0
ENCS: 4-2
MW: 202.25
mp: 110.2°C [3)]
bp: 380°C [3)]
sw: 0.00021g/kg(25°C)[3)]
Specific gravities: 1.252 g/cm^3(0°C)[3)]
logPow: 5.07 [6)]

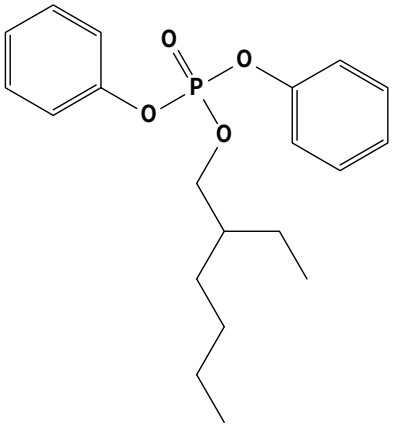
[14] 3-Methylpyridine



Molecular formula: C_6H_7N
CAS: 108-99-6
ENCS: 5-711
MW: 93.13
mp: -18.1°C [3)]
bp: 144.1°C [3)]
sw: 1,000g/L(25°C)[2)]
Specific gravities: 0.9566 g/cm^3(20°C)[3)]
logPow: 1.20 [6)]

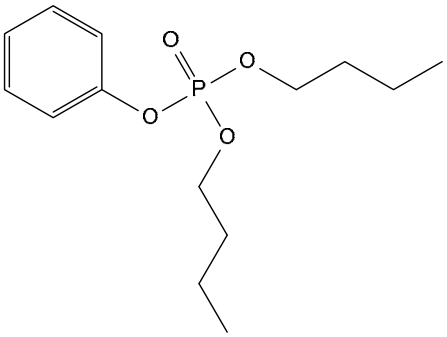
[15] Phosphorus compound

[15-1] (2-Ethylhexyl) diphenyl phosphate



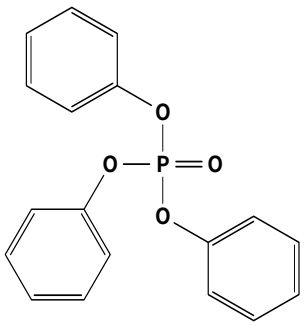
Molecular formula: $C_{20}H_{27}O_4P$
CAS: 1241-94-7
ENCS: 3-2520
MW: 362.4
mp: -54°C [2)]
bp: 375°C [2)]
sw: 0.0019g/L(25°C)[2)]
Specific gravities: 1.090g/cm^3(25°C)[5)]
logPow: 5.73 [2)]

[15-2] Di-*n*-butyl phenyl phosphate



Molecular formula: $C_{14}H_{23}O_4P$
CAS: 2528-36-1
ENCS: Uncertain
MW: 286.31
mp: Uncertain
bp: 155°C(1mmHg)[2)]
sw: 0.096g/L(25°C)[2)]
Specific gravities: 1.0691(25°C /25°C)[5)]
logPow: 4.27 [2)]

[15-3] Triphenyl phosphate



Molecular formula: $C_{18}H_{15}O_4P$
CAS: 115-86-6
ENCS: 3-2522、3-3363
MW: 326.29
mp: 49~50°C [1)]
bp: 245°C(11mmHg)[1)]
sw: 0.00073g/kg(24°C)[3)]
Specific gravities: 1.2055 g/cm^3(50°C)[3)]
logPow: 4.59 [2)]

References

1) O'Neil, M.J. (ed), The Merck Index 15th Edition (2013), CRC Press.
2) U.S. EPA, Estimation Programs Interface (EPI) Suite v4.1 (http://www.epa.gov/oppt/exposure/pubs/episuitedl.htm)
3) Rumble, J.R. (ed), CRC Handbook of Chemistry and Physics 98th Edition (2017), The Royal society of Chemistry.
4) OECD, Screening Information Dataset (SIDS) for High Product inVolume Chemicals (Processed by UNEP Chemicals) (http://www.inchem.org/pages/sids.html)
5) U.S. National Library of Medicine, Hazardous Substances Data Bank (HSDB) (https://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB)
6) Rumble, J.R. (ed), CRC Handbook of Chemistry and Physics 99th Edition (2018), The Royal society of Chemistry.

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	Sediment	Air
Hokkaido	Environmental Promotion Section, Environment Division, Department of Environment and Lifestyle, Hokkaido Prefectural Government and Hokkaido Research Organization Environmental and Geological Research Department Institute of Environmental Sciences	○	○	○
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 Institute of Environmental Sciences	○		
Fukushima Pref.	Fukushima Prefectural Environmental Center	○		
Ibaraki Pref.	Ibaraki Kasumigaura Environmental Science Center	○		
Tochigi Pref.	Tochigi Prefectural Institute of Public Health and Environmental Science	○		
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	○	○	
Toyama Pref.	Toyama Prefectural Environmental Science Research Center	○		
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	○		○
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	○	○	
Osaka City	Osaka City Institute of Public Health and Environmental Sciences	○		
Hyogo Pref.	Water and Air Quality Control Division, Environmental Management Bureau, Agricultural and Environmental Affairs Department, Hyogo Prefectural Government and Hyogo Prefectural Institute of Environmental Sciences, Hyogo Environmental Advancement Association	○		
Kobe City	Natural Environmental Symbiotic Division, Environmental Presevation Branch, Environment Bureau, Kobe City and Kobe Institute of Health, Welfare Bureau, Health Division, Health	○	○	
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 Pablic 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 Environmental Sciences	○	○	
Fukuoka City	Fukuoka City Institute for Hygiene and the Environment	○		
Saga Pref.	Saga Prefectural Environmental Research Center	○		
Kumamoto Pref.	Kumamoto Prefectural Institute of Public-Health and Environmental Science	○		
Oita Pref.	Environment Preservation Division, Department of Environment, Oita Prefectural Government and Oita Prefectural Institute of Health and Environment	○		○

(Note 1) *1: Organisations responsible for sampling are described by their official names in FY 2017.

(2) Surveyed sites and target chemicals

The numbers of target chemicals (groups) 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 1-1-1and Fig.1-1-1 for surface water, Table 1-1-2 and Fig.1-1-1 for sediment, Table 1-1-3 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 (groups)	Numbers of surveyed sites	Numbers of samples at a surveyed site
Surface water	42	14	67	1
Sediment	18	1	21	3
Air	12	1	13	3
All media	44	15	80	

(3) 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.

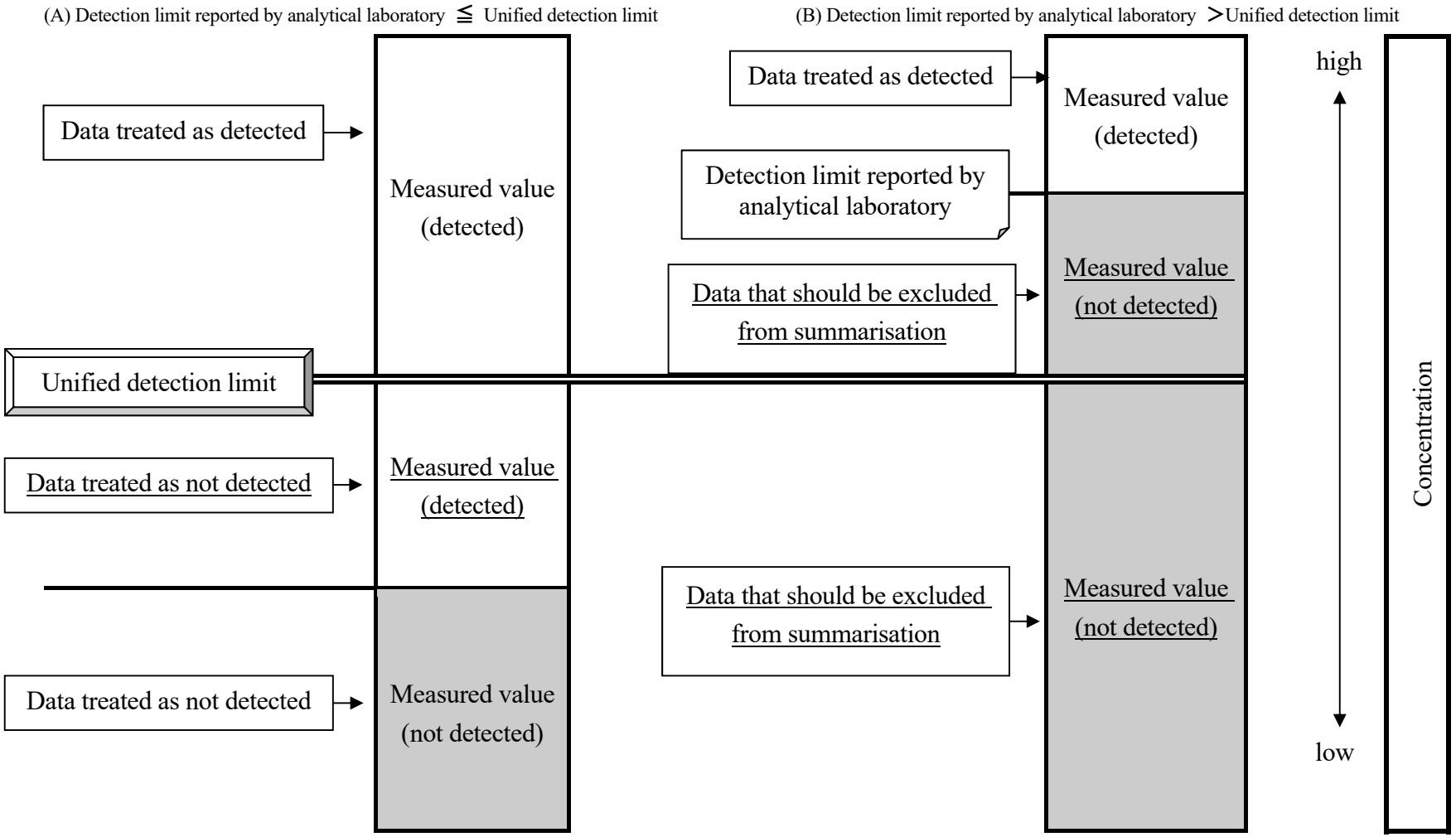
When IDL and MDL are not given in the Initial Environmental Survey Analytical Method, the detection limit is predetermined by the following procedure.

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 FY2017

Local Communities	Surveyed sites	Target chemicals													
		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[14]	[15]
Hokkaido	Onnenai-ohashi Bridge, Riv. Teshio (Bifuka Town)			○	○		○		○	○			○		○
	Suzuran-ohashi Bridge, Riv. Tokachi (Obihiro City)			○	○		○		○	○		○	○		○
	Ishikarikakokyo Bridge, Mouth of Riv. Ishikari (Ishikari City)		○	○	○	○	○	○	○	○			○	○	○
	Tomakomai Port	○					○		○	○	○				
	Muroran Port						○			○					
Sapporo city	Nakanuma of Riv.Toyohira(Sapporo City)														○
	Daiichishinkawa-bashi Bridge, Riv. Shin (Sapporo City)														○
Iwate Pref.	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.	Mouth of Riv. Mogami (Sakata City)		○					○		○					
	Murayamanogawa (Before Mogami Riv. joining)												○		
Fukushima Pref.	Shima-bashi Bridge, Riv. Fujiwara (Iwaki City)												○		
Ibaragi Pref.	Tonekamome-ohasi Bridge, Mouth of Riv. Tone (Kamisu City)	○									○	○			○
Tochigi Pref.	Tagawa Kyubun Area Head Works (Utsunomiya City)					○									
Saitama Pref.	Akigaseshusuizeki of Riv. Arakawa (Shiki 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	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Kawasaki City	Mouth of Riv. Tama (Kawasaki City)										○	○	○		○
	Keihin Canal, Port of Kawasaki, The Coast of Chidori Town		○			○							○		
	Keihin Canal, Port of Kawasaki, The Coast of Ougi Town												○		
Niigata Pref.	Lower Riv. Shinano (Niigata City)	○						○							
	Nakagawashindo-bashi Bridge, Riv. Shibue (Myoko City)			○											
Toyama Pref.	Ishida-bashi Bridge, Riv. Kurose (Kurobe City)					○									
Ishikawa Pref.	Mouth of Riv. Sai (Kanazawa City)		○	○	○		○				○		○	○	
Nagano Pref.	Tategahana-bashi Bridge, Riv. Shinano (Nakano City)		○												
	Lake Suwa(center)		○												
Shizuoka Pref.	Shimizu Port											○			
	Riv. Tenryu (Iwata City)										○				○
	Nagano-bashi Bridge, Riv. Boso (Iwata City)								○						

Local Communities	Surveyed sites	Target chemicals													
		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[14]	[15]
Aichi Pref.	Nagoya Port, West of Shiomi Wharf	○			○	○	○	○		○	○			○	
	Sakai-ohashi Bridge, Riv. Aizuma (Kariya City)												○		
Nagoya city	Minatoshinbashi Bridge, Riv. Hori (Nagoya City)	○	○					○		○			○	○	○
	Tenpaku-bashi Bridge, Riv. Tenpaku (Nagoya City)														○
Mie Pref.	Yokkaichi Port			○		○				○		○			
Shiga Pref.	Lake Biwa (center, offshore of Minamihira)				○										○
	Lake Biwa (center, offshore of Karasaki)				○							○			○
Kyoto Pref.	Miyazu Port		○						○			○			
Osaka Pref.	Mouth of Riv. Yamato (Sakai City)	○		○		○	○	○	○	○	○	○	○		
Osaka City	Kema-bashi Bridge, Riv. Oh-kawa (Osaka City)		○											○	○
	Osaka Port		○		○				○				○	○	○
Hyogo Pref.	Offshore of Himeji	○		○						○					○
Kobe City	Kobe Port(center)					○	○	○			○	○			
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				○		○								
Tokushima Pref.	Shinmachi-bashi Bridge, Riv. Shinmachi (Tokushima City)					○									○
Kagawa Pref.	Takamatsu Port				○						○		○	○	
Ehime Pref.	Sawadu Fishing 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													○	
Kumamoto Pref.	Hiraki-bashi Bridge, Riv. Midori (Uto City)				○										
	Ichibu-bashi Bridge, Riv. Ura (Arao City)														○
Oita Pref.	Mouth of Riv. Oita (Oita City)					○		○							

[1] 2,3-Epoxy-1-propanol, [2] Glutaraldehyde, [3] 2-Methoxyethyl acetate (synonym: Ethylene glycol monomethyl ether acetate), [4] 2,4-Dichloro-1-nitrobenzene, [5] *N,N*-Dicyclohexylamine, [6] 2,4-Dinitroaniline, [7] Dimethyl disulfide (synonym: Dimethyl disulfane), [8-1] 1-Naphthol (synonym: α-naphthol), [8-2] 2-Naphthol (synonym:β-naphthol), [9] 1-Nitropyrene, [10] 2-Vinylpyridine, [11] 4-Vinyl-1-cyclohexene, [12] Pyridine, [14] 3-Methylpyridine, [15-1] (2-Ethylhexyl)diphenyl phosphate , [15-2] Di-*n*-butyl phenyl phosphate, [15-3] Triphenyl phosphate

Table 1-1-2 List of surveyed sites (sediment) and target chemicals in the Initial Environmental Survey in FY2017

Local communities	Surveyed sites	Target chemical
		[13]
Hokkaido	Ishikarikakokyo Bridge, Mouth of Riv. Ishikari (Ishikari City)	○
	Tomakomai Port	○
	Muroran Port	○
Iwate Pref.	Riv. Toyosawa (Hanamaki City)	○
Akita Pref.	Akita Canal (Akita City)	○
Chiba Pref.	Coast of Ichihara and Anegasaki	○
Tokyo Met.	Mouth of Riv. Arakawa (Koto Ward)	○
	Mouth of Riv. Sumida (Minato Ward)	○
Yokohama City	Yokohama Port	○
Niigata Pref.	Lower Riv. Shinano (Niigata City)	○
Ishikawa Pref.	Mouth of Riv. Sai (Kanazawa City)	○
Nagano Pref.	Lake Suwa(center)	○
Aichi Pref.	Nagoya Port, West of Shiomi Wharf	○
Mie Pref.	Yokkaichi Port	○
Kyoto Pref.	Miyazu Port	○
Osaka Pref.	Mouth of Riv. Yamato (Sakai City)	○
Kobe City	Kobe Port(center)	○
Wakayama Pref.	Kinokawa-ohashi Bridge, Mouth of Riv. Kinokawa (Wakayama City)	○
Yamaguchi Pref.	Tokuyama Bay	○
Kagawa Pref.	Takamatsu Port	○
Kitakyushu City	Dokai Bay	○

[13] Fluoranthene

Figure 1-1-1 Surveyed sites (surface water and sediment) in the Initial Environmental Survey in FY 2017

Table 1-1-3 List of surveyed sites (air) and target chemicals in the Initial Environmental Survey in FY 2017

Local communities	Surveyed sites	Target chemical
		[9] 1-Nitropyrene
Hokkaido	Hokkaido Research Organization Environmental and Geological Research Department Institute of Environmental Sciences (Sapporo City)	○
Sendai city	Tsutsujigaoka Park (Sendai City)	○
Chiba Pref.	Ichihara-Iwasakinishi Air Quality Monitoring Station (Ichihara City)	○
Tokyo Met.	Tokyo Metropolitan Research Institute for Environmental Protection (Koto Ward)	○
	Chichijima Island (Ogasawara Village)	○
Kanagawa Pref.	Kanagawa Environmental Research Center (Hiratsuka 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)	○
Kyoto City	Kyoto City Institute of Health and Environmental Sciences (Kyoto City)	○
Yamaguchi Pref.	Yamaguchi Prefectural Institute of Public Health and Environment (Yamaguchi City)	○
Kagawa Pref.	Kagawa Prefectural Public Swimming Pool (Takamatsu City)	○
Oita Pref.	Oita City Misa Elementary School (Oita City)	○

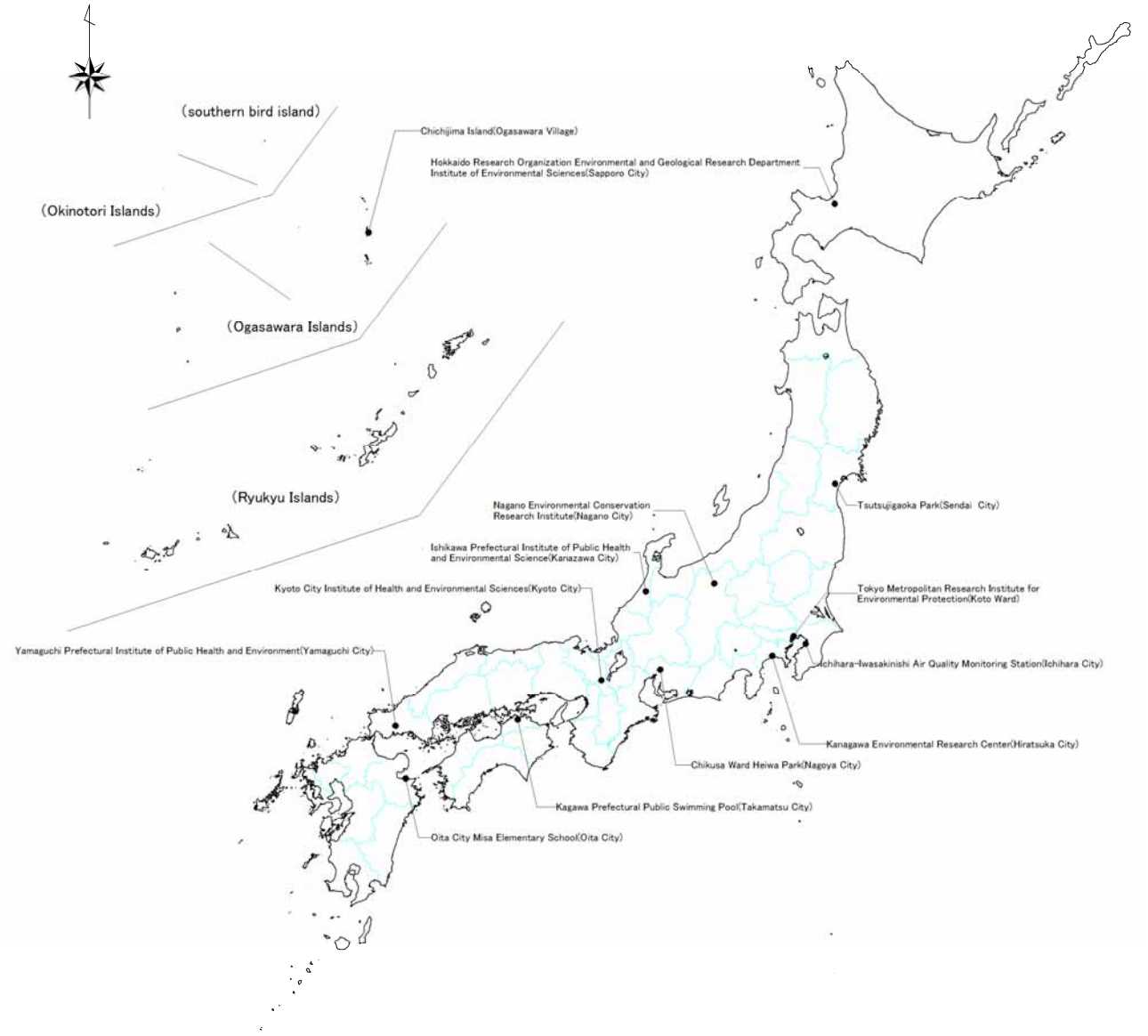


Figure 1-1-2 Surveyed sites (air) in the Initial Environmental Survey in FY 2017

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 14 target chemicals (groups) were detected. Target chemicals were categorized by analytical methods such as structurally similar chemicals capable of simultaneous analyses.

・[5] *N*,*N*-Dicyclohexylamine: 3 of the 19 valid sites
・[7] Dimethyl disulfide (synonym: Dimethyl disulfane) :12 of the 17 valid sites
・[8] Naphthols
  [8-1] 1-Naphthol (synonym: α-naphthol): 3 of the 20 valid sites
  [8-2] 2-Naphthol (synonym: β-naphthol): 2 of the 20 valid sites
・[12] Pyridine: 12 of the 21 valid sites
・[14] 3-Methylpyridine: 6 of the 18 valid sites
・[15] Phosphorus compound
  [15-1] (2-Ethylhexyl)diphenyl phosphate: 1 of the 21 valid site
  [15-2] Di-*n*-butyl phenyl phosphate: 2 of the 21 valid sites
  [15-3] Triphenyl phosphate: 3 of the 18 valid sites

In sediment, 1 target chemical was detected.

・[13] Fluoranthene: All 21 valid sites

In air, 1 target chemical was not detected.

Table 1-2 Summary of the detection ranges and the detection limits in the Initial Environmental Survey in FY 2017

No.	Target chemicals	Surface water [ng/L]		Sediment [ng/g-dry]		Air [ng/m^3]	
		Detection range and frequency	Detection limit	Detection range and frequency	Detection limit	Detection range and frequency	Detection limit
[1]	2,3-Epoxy-1-propanol*	nd 0/16	31				
[2]	Glutaraldehyde*	nd 0/19	60				
[3]	2-Methoxyethyl acetate (synonym: Ethylene glycol monomethyl ether acetate) *	nd 0/18	1,400				
[4]	2,4-Dichloro-1-nitrobenzene	nd 0/21	22				
[5]	*N,N*-Dicyclohexylamine *	nd~37 3/19	17				
[6]	2,4-Dinitroaniline	nd 0/21	150				
[7]	Dimethyl disulfide (synonym: Dimethyl disulfane) *	nd~16 12/17	3.4				
[8]	Naphthols						
	[8-1]1-Naphthol (synonym: α-naphthol)	nd~2.7 3/20	2.6				
	[8-2]2-Naphthol (synonym: β-naphthol) *	nd~210 2/20	2.3				
[9]	1-Nitropyrene	nd 0/22	0.18			nd 0/13	0.11
[10]	2-Vinylpyridine *	nd 0/20	6.1				
[11]	4-Vinyl-1-cyclohexene *	nd 0/18	47				
[12]	Pyridine *	nd~2,300 12/21	19				
[13]	Fluoranthene*			2.2~2,300 21/21	0.86		
[14]	3-Methylpyridine *	nd~31 6/18	12				
[15]	Phosphorus compound						
	[15-1] (2-Ethylhexyl)diphenyl phosphate	nd~1.4 1/21	0.66				
	[15-2] Di-*n*-butyl phenyl phosphate	nd~2.1 2/21	0.60				
	[15-3] Triphenyl phosphate*	nd~24 3/18	11				

(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)* connote target substances or points selected for survey in light of documentation or submittals regarding emissions.