Chapter 1 Results of the Initial Environmental Survey in FY 2011

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 FY 2011 Initial Environmental Survey, 14 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		The PRTR Law		Surveyed media	
		Before the revision	After the revision	Before the revision	After the revision	Surface water	Air
[1]	Acrylamide	II Monitored	Priority Assessment Chemical Substances	I 2	I 2		○
[2]	Allyl alcohol			I 22	I 28		○
[3]	Isobutyl alcohol					○	
[4]	11-Ketotestosterone					○	
[5]	Cobalt and its compounds (as Cobalt)			I 100	I 132	○	
[6]	1,3-Dichloro-2-propanol	II Monitored		I 134	II 36		○
[7]	1,2,4,5-Tetrachlorobenzene					○	
[8]	3,5,5-Trimethyl-1-hexanol			I 223	I 295		○
[9]	4-Vinyl-1-cyclohexene	II Monitored III Monitored		I 255	I 337		○
[10]	Fluoranthene					○	
[11]	4,4'-Propane-2,2-diyldiphenol (synonym: 4,4'-Isopropylidenediphenol or Bisphenol A)	II Monitored III Monitored	Priority Assessment Chemical Substances	I 29	I 37		○
[12]	2,3-Epoxypropyl methacrylate	II Monitored		I 316	I 417		○
[13]	*n*-Butyl methacrylate			I 319	I 419	○	○
[14]	Methyl benzoimidazol-2-ylcarbamate (synonym: Carbendazim)	II Monitored III Monitored			II 95	○	

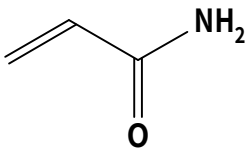
(Note 1)"The Chemical Substances Control Law" hereafter means "Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances (Law No. 117 of 1973)."

(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".

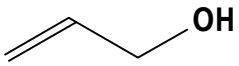
Chemical and physical properties of target chemicals of the Initial Environmental Survey are as follows.

[1] Acrylamide



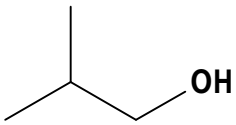
Molecular formula:	C_3H_5NO
CAS:	79-06-1
ENCS:	2-1014
MW:	71.08
mp:	84.5°C [1]
bp:	125°C (25mmHg) [1]
sw:	2,155g/L(30°C) [1]
Specific gravity:	1.122(30/4°C) [1]
logPow:	-0.67 [2]

[2] Allyl alcohol



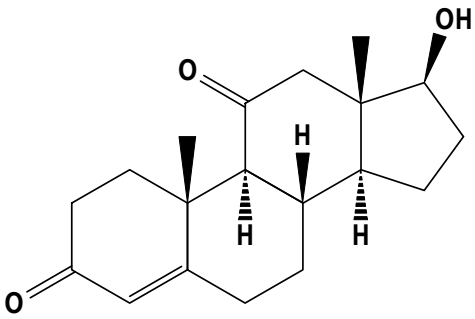
Molecular formula:	C_3H_6O
CAS:	107-18-6
ENCS:	2-260
MW:	58.08
mp:	-50°C [1]
bp:	96～97°C [1]
sw:	Dissolve in water [3]
Specific gravity:	0.8540(20/4°C)[1]
logPow:	0.17 [2]

[3] Isobutyl alcohol



Molecular formula:	$C_4H_{10}O$
CAS:	78-83-1
ENCS:	2-3049
MW:	74.12
mp:	-108°C [1]
bp:	108°C [1]
sw:	88g/kg(25°C)[3]
Specific gravity:	0.806(15°C)[1]
logPow:	0.76 [2]

[4] 11-Ketotestosterone



Molecular formula:	$C_{19}H_{26}O_3$
CAS:	564-35-2
ENCS:	No pertinence
MW:	Uncertain
mp:	Uncertain
bp:	Uncertain
sw:	Uncertain
Specific gravity:	Uncertain
logPow:	Uncertain

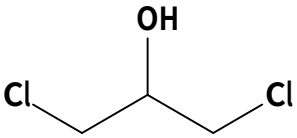
[5] Cobalt and its compounds (as Cobalt)

Co

Molecular formula:	Not specified
CAS:	7440-48-4 etc.
ENCS:	Not specified
MW:	Not specified
mp:	Not specified
bp:	Not specified
sw:	Not specified
Specific gravity:	Not specified
logPow:	Not specified

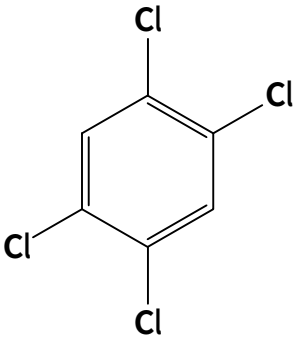
(Abbreviations) CAS CAS registry number, ENCS registry number in the Existing and New Chemical Substances List, MW molecular weight, mp melting point, bp boiling point, SW solubility in water, logPow *n*-octanol-water partition coefficient, kPa kilopascal (1 atom 101.3kPa).

[6] 1,3-Dichloro-2-propanol



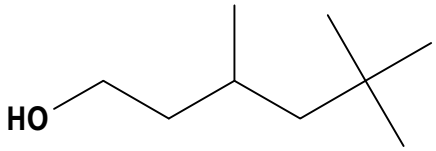
Molecular formula: $C_3H_6Cl_2O$
CAS: 96-23-1
ENCS: 2-2002
MW: 128.99
mp: -4°C [1)]
bp: 174.3°C(760mmHg)[1)]
sw: 110g/L(20°C)[4)]
Specific gravity: 1.3506(17/4°C)[1)]
logPow: Uncertain

[7] 1,2,4,5-Tetrachlorobenzene



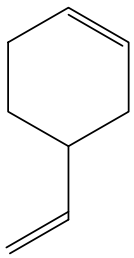
Molecular formula: $C_6H_2Cl_4$
CAS: 95-94-3
ENCS: 3-76
MW: 215.89
mp: 139.2°C [3)]
bp: 247°C [3)]
sw: 0.007g/kg(25°C)[3)]
Specific gravity: 1.858g/cm^3(22°C)[3)]
logPow: 4.64 [2)]

[8] 3,5,5-Trimethyl-1-hexanol



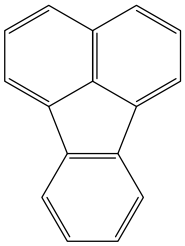
Molecular formula: $C_9H_{20}O$
CAS: 3452-97-9
ENCS: 2-217
MW: 144.25
mp: -70°C [5)]
bp: 193°C [3)]
sw: Uncertain [5)]
Specific gravity: 0.8236 g/cm^3(25°C)[3)]
logPow: Uncertain

[9] 4-Vinyl-1-cyclohexene



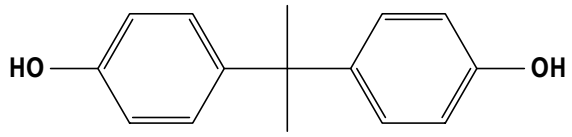
Molecular formula: C_8H_{12}
CAS: 100-40-3
ENCS: 3-2229
MW: 108.18
mp: -108.9°C [3)]
bp: 130°C [3)]
sw: 0.05g/kg(25°C)[3)]
Specific gravity: 0.8299(20°C)[3)]
logPow: 3.93 [6)]

[10] Fluoranthene



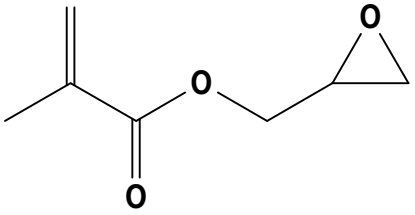
Molecular formula: $C_{16}H_{10}$
CAS: 206-44-0
ENCS: 4-2
MW: 202.25
mp: 110.2°C [3)]
bp: 380°C [3)]
sw: 0.00021g/kg(25°C)[3)]
Specific gravity: 1.252(0°C)[3)]
logPow: 5.16 [2)]

[11] 4,4'-Propane-2,2-diyldiphenol (synonym: 4,4'-Isopropylidenediphenol or Bisphenol A)



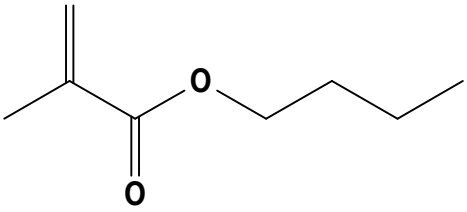
Molecular formula:	$C_{15}H_{16}O_2$
CAS:	80-05-7
ENCS:	4-123
MW:	228.29
mp:	150～155°C [1]
bp:	220°C(4mmHg)[1]
sw:	0.30g/kg(25°C)[3]
Specific gravity:	1.195(25/25°C)[7]
logPow:	3.32 [2]

[12] 2,3-Epoxypropyl methacrylate



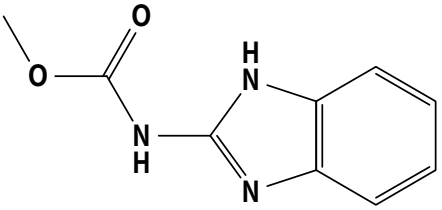
Molecular formula:	$C_7H_{10}O_3$
CAS:	106-91-2
ENCS:	2-1041
MW:	142.15
mp:	<-10°C [8]
bp:	189°C [3]
sw:	50g/L(25°C)[8]
Specific gravity:	1.042(20°C)[3]
logPow:	0.96 [8]

[13] *n*-Butyl methacrylate



Molecular formula:	$C_8H_{14}O_2$
CAS:	97-88-1
ENCS:	2-1039
MW:	142.20
mp:	-50°C [9]
bp:	163.7°C [3]
sw:	0.8g/L(25°C) [9]
Specific gravity:	0.8936(20°C)[3]
logPow:	2.88 [2]

[14] Methyl benzoimidazol-2-ylcarbamate (synonym: Carbendazim)



Molecular formula:	$C_9H_9N_3O_2$
CAS:	10605-21-7
ENCS:	5-465
MW:	191.19
mp:	300°C(degradation) [3]
bp:	Uncertain
sw:	0.008g/L(24°C) [10]
Specific gravity:	1.417(25°C) [3]
logPow:	1.49 [10]

References

1) O'Neil, The Merck Index - An Encyclopedia of Chemicals, Drugs, and Biologicals 14th Edition, Merck Co. Inc. (2006)
2) Hansch et al., Exploring QSAR - Hydrophobic, Electronic and Steric Constants, American Chemical Society (1995)
3) Haynes, CRC Handbook of Chemistry and Physics, 92nd Edition, CRC Press LLC (2011)
4) IPCS, International Chemical Safety Cards, 1,3-Dichloro-2-propanol, ICSC1711 (2008)
5) IPCS, International Chemical Safety Cards, 3,5,5-Trimethylhexanol, ICSC0608 (1997)
6) IPCS, International Chemical Safety Cards, 4-Vinylcyclohexene, ICSC1177 (1995)
7) Lewis, Hawley's Condensed Chemical Dictionary 15th Edition, John Wiley & Sons (2007)
8) OECD, Glucidyl methacrylate, SIDS Initial Assessment Report for 10th SIAM (2000)
9) IPCS, International Chemical Safety Cards, n-Butyl methacrylate, ICSC1018 (2009)
10) IPCS, International Chemical Safety Cards, Carbendazim, ICSC1177 (1277)

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	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	○	○*2
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		
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	○	○*3
Chiba Pref.	Chiba Prefectural Environmental Research Center	○	○*3
Tokyo Met.	Tokyo Metropolitan Research Institute for Environmental Protection	○	○
Kanagawa Pref.	Kanagawa Environmental Research Center		○
Yokohama City	Yokohama Environmental Science Research Institute	○	○
Kawasaki City	Kawasaki Municipal Research Institute for Environmental Protection	○	○*3
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	○	○*3
Nagoya City	Nagoya City Environmental Science Research Institute	○	○
Mie Pref.	Mie Prefecture Health and Environment Research Institute	○	○
Shiga Pref.	Lake Biwa Environmental Research Institute	○	○
Kyoto Pref.	Kyoto City Prefectural Institute of Public Health and Environment	○	○*2
Kyoto City	Kyoto Prefectural Institute of Public Health and Environment	○	○
Osaka Pref.	Research Institute of Environment, Agriculture and Fisheries, Osaka Prefectural Government	○	○*2
Osaka City	Osaka City Institute of Public Health and Environmental Sciences	○	
Hyogo Pref.	Hyogo Prefectural Agricultural Administration and Environment Division, Environment Bureau	○	○
Kobe City	Environmental Conservation and Guidance Division, Environment Bureau	○	
Nara Pref.	Nara Prefectural Institute for Hygiene and Environment	○	
Wakayama Pref.	Wakayama Prefectural Research Center of Environment and Public Health	○	○
Okayama Pref.	Okayama Prefectural Institute for Environmental Science and Public Health	○	○
Hiroshima Pref.	Hiroshima Prefectural Technology Research Institute Health and Environment Center	○	○
Yamaguchi Pref.	Yamaguchi Prefectural Public Health and Environment	○	○
Tokushima Pref.	Tokushima Prefectural Pablic Health, Pharmaceutical and Environmental Science 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 Science	○	○
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.	Oita Prefectural Environmental Preservation Division, Life and Environment Department	○	○
Miyazaki Pref.	Miyazaki Prefectural Institute for Public Health and Environment		○

(Note 1) *1: Organisations responsible for sampling are described by their official names in FY 2011.
(Note 2) *2: Those organizations cooperated with a private analytical laboratory in sampling specimens.
(Note 3) *3: Those organizations sampled some specimens, and cooperated with a private analytical laboratory in sampling other specimens.

(2) Surveyed sites and target chemicals

Surveyed sites and target chemicals for surface water are shown in Table 1-1-1 and Figure 1-1-1. Surveyed sites and target chemicals for air are shown in Table 1-1-2 and Figure 1-1-2. The breakdown is summarized as follows.

To ensure more accurate data for areas susceptible to high concentrations in the general environment, Survey Points are selected and determined based on information regarding releases and emissions. New survey points utilized for the FY 2011 surveys were finalized considering the emissions and releases reports submitted in accord with the PRTR, correlated with identification of geographical points with high particulate release volumes.

Surveyed media	Numbers of local communities	Numbers of target chemicals	Numbers of surveyed sites	Numbers of samples at a surveyed site
Surface water	41	7	56	1
Air	33*	8	46	3
All media	45	14	102	

(Note) For 4 of the 33 organizations, sampling was restricted to a portion of substances subject to survey, and the remaining substances subject to survey were given over, along with support, to a private analysis service. For 3 specific organizations, a private analysis service, with support, handled all sampling of substances subject to survey.

Table 1-1-1 List of surveyed sites (surface water) and target chemicals in the Initial Environmental Survey in FY 2011

Local communities	Surveyed sites	Target chemicals						
		[3]	[4]	[5]	[7]	[10]	[13]	[14]
Hokkaido	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.	Riv. Toyosawa(Hanamaki City)			○				○
Sendai City	Hirose-ohashi Bridge, Riv. Hirose(Sendai City)	○						
Ibaraki Pref.	Tonekamome-ohasi Bridge, Mouth of Riv. Tone(Kamisu City)	○	○	○	○	○	○	○
Tochigi Pref.	Riv. Tagawa(Utsunomiya City)			○			○	
Gunma Pref.	Tako Bridge of Riv. Kabura(Takasaki City)				○			○
Saitama Pref.	Shiki-ohasi Bridge, Riv. Yanase(Shiki City)							○
	Kachi-hashi Bridge, Riv. Ichino(Yoshimi Town)		○					
Chiba Pref.	Coast of Ichihara and Anegasaki	○		○				
	Asai-bashi Bridge, Riv.Yourou(Ichihara City)		○		○	○		
Tokyo Met.	Mouth of Riv. Arakawa(Koto Ward)		○	○	○	○		
	Mouth of Riv. Sumida(Minato Ward)		○	○	○	○		
Yokohama City	Kamenoko Bridge over Riv.Tsurumi(Yokohama City)	○	○	○	○	○	○	
	Yokohama Port	○	○	○	○	○	○	
Kawasaki City	Mouth of Riv. Tama(Kawasaki City)	○						○
	Keihin Canal, Port of Kawasaki	○						○
Niigata Pref.	Lower Riv. Shinano(Niigata City)	○	○		○			○
	Nakagawashindo-bashi Bridge, Lower Riv. Shibue(Myoko City)						○	
Toyama Pref.	Yoshida-bashi Bridge, Riv. Yoshida(Kurobe City)			○				
Ishikawa Pref.	Mouth of Riv. Sai(Kanazawa City)		○			○		○
Nagano Pref.	Lake Suwa(center)	○			○	○		○
Shizuoka Pref.	Shimizu Port	○						
	Riv. Tenryu(Iwata City)		○					○
Aichi Pref.	Nagoya Port	○	○	○	○	○	○	○
Nagoya City	Minatoshinbashi Bridge, Riv. Hori (Nagoya City)				○		○	○
Mie Pref.	Yokkaichi Port	○		○	○	○	○	○
Shiga Pref.	Lake Biwa(center, offshore of Minamihira)		○			○		○
	Lake Biwa(center, offshore of Karasaki)		○			○		○
Kyoto Pref.	Miyazu Port	○						○
Kyoto City	Miyamae-bashi Bridge, Miyamae Bridge, Riv. Katsura(Kyoto City)	○				○		
Osaka Pref.	Mouth of Riv. Yamato(Sakai City)	○	○	○	○	○	○	○
Osaka City	Kema Bridge, Riv. Oh-kawa (Osaka City)	○			○	○		
	Osaka Port	○			○	○		
Hyogo Pref.	Offshore of Himeji				○	○	○	
Kobe City	Kobe Port(center)		○					
Nara Pref.	Riv. Yamato(Ooji Town)	○						
Wakayama Pref.	Kinokawa-ohashi Bridge, Mouth of Riv. Kinokawa(Wakayama City)	○				○		○
Okayama Pref.	Otoidezeki of Riv. Asahi(Okayama City)		○			○		○
	Offshore of Mizushima	○	○	○		○		○
Hiroshima Pref.	Ootake Port						○	
Yamaguchi Pref.	Tokuyama Bay			○	○	○	○	
	Offshore of Hagi			○	○	○	○	
Tokushima Pref.	Tomioka Port			○				
	Kuwanodani-bashi Bridge, Riv. Kuwano(Anan City)			○				
Kagawa Pref.	Takamatsu Port	○				○		
	Offshore of Marugame			○				
Ehime Pref.	Mishima area, Riv. Iwamatsu(Uwajima City)	○				○		○
Fukuoka Pref.	Kabura-bashi Bridge, River Raizan(Maebaru City)				○	○		○
	Offshore of Omuta				○			○
Kitakyushu City	Dokai Bay				○			
Fukuoka City	Hakata Bay	○				○		
Saga Pref.	Imari Bay			○				○
Kumamoto Pref.	Yatsushiro Sea	○						
Oita Pref.	Mouth of Riv. Oita(Oita City)	○	○	○	○	○	○	○

[3] Isobutyl alcohol, [4] 11-Ketotestosterone, [5] Cobalt and its compounds (as Cobalt), [7] 1,2,4,5-Tetrachlorobenzene, [10] Fluoranthene, [13] *n*-Butyl methacrylate, [14] Methyl benzoimidazol-2-ylcarbamate (synonym: Carbendazim)

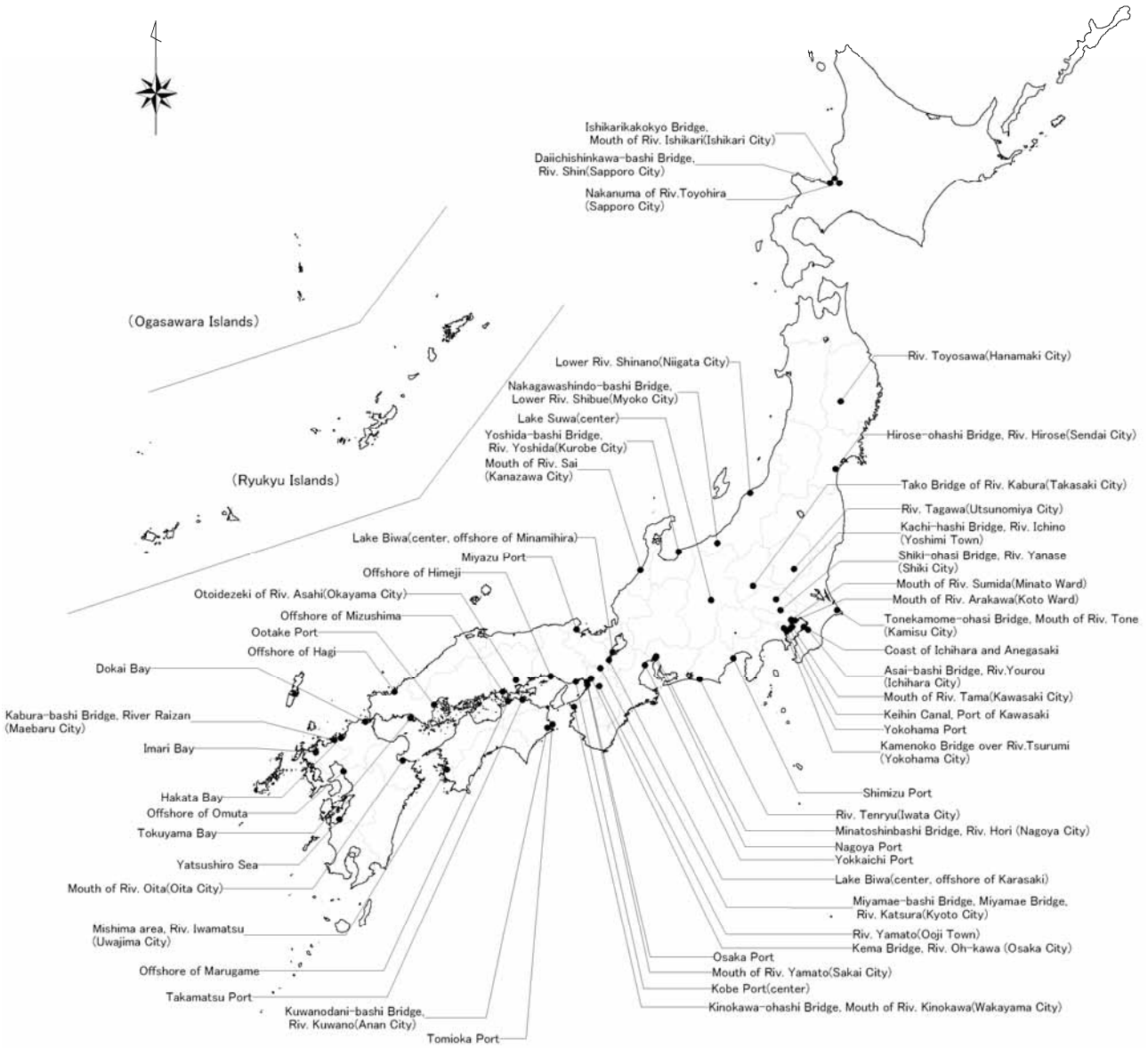


Figure 1-1-1 Surveyed sites (surface water) in the Initial Environmental Survey in FY 2011

Table 1-1-2 List of surveyed sites (air) and target chemicals in the Initial Environmental Survey in FY 2011

Local communities	Surveyed sites	Target chemicals							
		[1]	[2]	[6]	[8]	[9]	[11]	[12]	[13]
Hokkaido	Hokkaido Institute of Environmental Sciences	○		○			○		
Sapporo City	Sapporo City Institute of Public Health(Sapporo City)					○		○	○
Iwate Pref.	Yoshityo Air Quality Monitoring Station(Kitakami City)			○					
Akita Pref.	Akita City West gymnasium(Akita City)	○							
Ibaraki Pref.	Josou Public Health Center(Joso City)					○			
	Hasaki-Oota Air Quality Monitoring Station(Kamisu City)					○			
Saitama Pref.	Center for Environmental Science in Saitama(Kazo City)		○	○		○	○		○
Chiba Pref.	Ichihara-Iwasakinishi Air Quality Monitoring Station (Ichihara City)				○				○
	Sodegaura-Daijyuku Air Quality Monitoring Station (Sodegaura City)							○	
	Ichikawa-Hutamata Air Quality Monitoring Station (Ichikawa City)								○
	Kashiwa-Oomuro Air Quality Monitoring Station (Kashiwa City)								○
Tokyo Met.	Tokyo Metropolitan Research Institute for Environmental Protection(Koto Ward)			○			○		
	Chichijima Island			○					
Kanagawa Pref.	Kanagawa Environmental Research Center(Hiratsuka City)		○		○				
Yokohama City	Yokohama Environmental Science Research Institute(Yokohama City)						○		
Kawasaki City	Daishi Branch Office, Kawasaki Ward Office(Kawasaki City)	○	○					○	
Toyama Pref.	Takaoka-Hushiki Air Quality Monitoring Station(Takaoka City)								○
Ishikawa Pref.	Ishikawa Prefectural Institute of Public Health and Environmental Science(Kanazawa City)		○	○					○
	Seinanbu Air Quality Monitoring Station(Kanazawa City)			○					
	Mikawa Air Quality Monitoring Station(Hakusan City)		○						
Nagano Pref.	Nagano Environmental Conservation Research Institute(Nagano City)				○			○	
Aichi Pref.	Toyokawa City Government Building(Toyokawa City)				○				○
Nagoya City	Chikusa Ward Heiwa Park(Nagoya City)			○					○
	Nagoya City Hakusui Elementary School(Nagoya City)						○	○	
Mie Pref.	Mie Prefecture Health and Environment Research Institute(Yokkaichi City)		○	○	○	○		○	○
Shiga Pref.	Moriyama Air Quality Monitoring Station(Moriyama City)			○			○		
Kyoto Pref.	Kyoto Prefecture Joyo Senior High School(Joyo City)	○						○	
Kyoto City	Kyoto City Government Building(Kyoto City)								○
Osaka Pref.	Research Institute of Environment, Agriculture and Fisheries, Osaka Prefectural Government(Osaka City)	○	○	○	○	○	○	○	○
Hyogo Pref.	Amagasaki City Tachibana Elementary School(Amagasaki City)						○		
	Nishinomiya City Government Building, Naruo Branch(Nishinomiya City)							○	
	Shikama Air Quality Monitoring Station(Himeji City)		○						
Wakayama Pref.	Wakayama Prefectural Research Center of Environment and Public Health(Wakayama City)			○					
Okayama Pref.	Shoo Town Office(Shoo Town)							○	
Hiroshima Pref.	Hukuyama City Ekiyahigashi Elementary School(Hukuyama City)						○		
	Otake-Yumi Park(Otake City)		○			○			○
Yamaguchi Pref.	Yamaguchi Prefectural Public Health and Environment(Yamaguchi City)			○		○			
Tokushima Pref.	Anan Air Quality Monitoring Station(Anan City)	○							
Kagawa Pref.	Takamatsu Joint Prefectural Government Building(Takamatsu City)				○			○	
	Sakaide City Government Building(Sakaide City)	○							
Fukuoka Pref.	Munakata Prefectural Government Building(Munakata City)						○		○
	Omuta City Government Building(Omuta City)						○		○
Kitakyushu City	Kitakyushu Monitoring Station (Kitakyushu City)			○		○			
Saga Pref.	Saga Prefectural Environmental Research Center(Saga City)				○				
Oita Pref.	Oita City Misa Elementary School(Oita City)	○	○						
Miyazaki Pref.	Nobeoka Public Health Center(Nobeoka City)	○	○						

[1] Acrylamide, [2] Allyl alcohol, [6] 1,3-Dichloro-2-propanol, [8] 3,5,5-Trimethyl-1-hexanol, [9] 4-Vinyl-1-cyclohexene, [11] 4,4'-Propane-2,2-diyldiphenol (synonym: 4,4'-Isopropylidenediphenol or Bisphenol A), [12] 2,3-Epoxypropyl methacrylate, [13] *n*-Butyl methacrylate

Figure 1-1-2 Surveyed sites (air) in the Initial Environmental Survey in FY 2011

(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)).

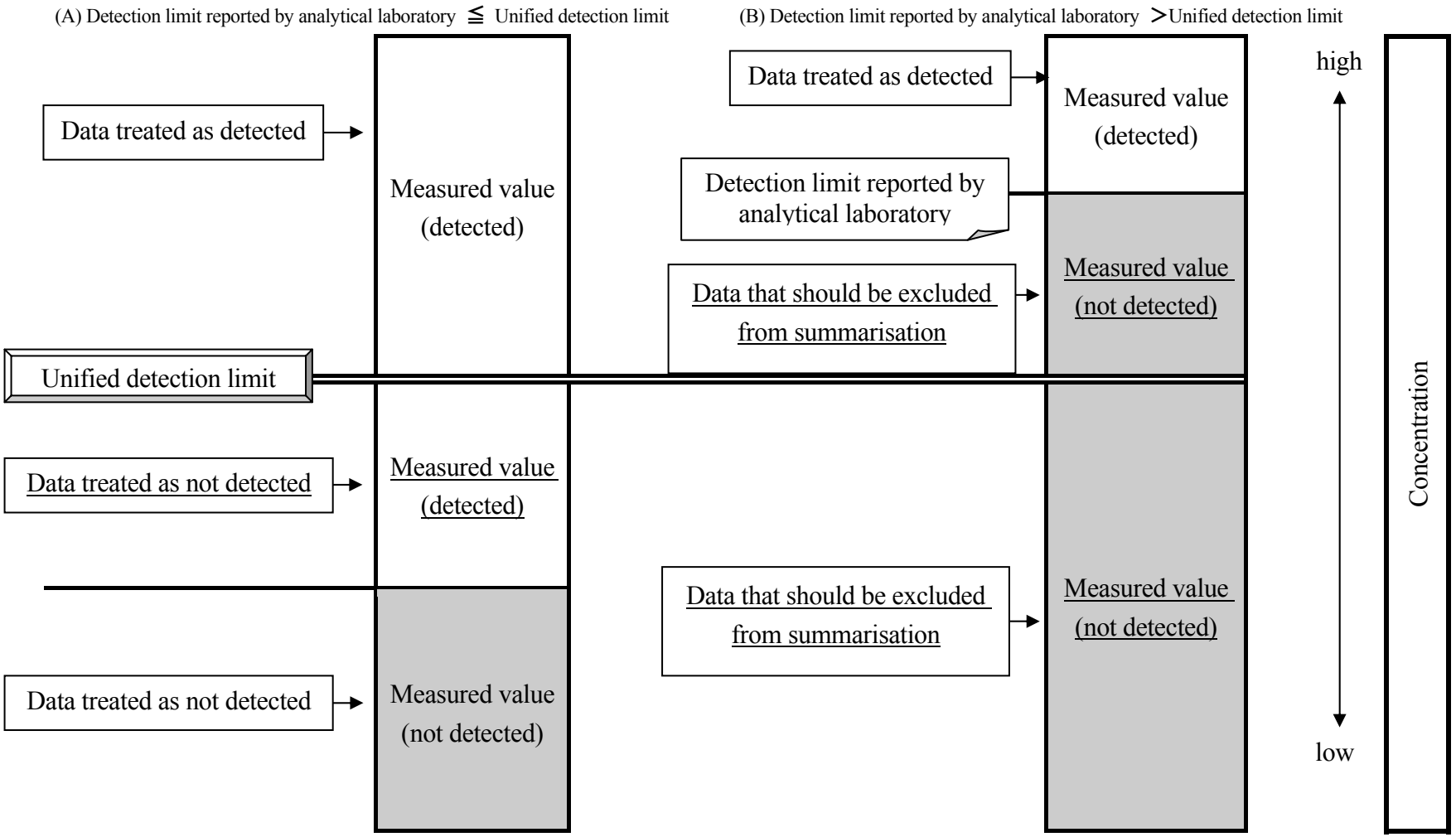
When the instrument detection limit (IDL) and the method detection limit (MDL) are given in the analytical method, which is described in reports on the investigation of the development of analytical methods for chemicals and adopted in the Initial Environmental Survey (hereafter, the Initial Environmental 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

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, 4 out of the 7 target chemicals were detected.

- [3] Isobutyl alcohol: 15 of the 25 valid sites
- [5] Cobalt and its compounds (as Cobalt): 20 of the 20 valid sites
- [10] Fluoranthene: 28 of the 28 valid sites
- [14] Methyl benzoimidazol-2-ylcarbamate (synonym: Carbendazim): 25 of the 26 valid sites

In air, 4 out of the 8 target chemicals were detected.

- [2] Allyl alcohol: 6 of the 11 valid sites
- [6] 1,3-Dichloro-2-propanol: 9 of the 13 valid sites
- [11] 4,4'-Propane-2,2-diyldiphenol (synonym: 4,4'-Isopropylidenediphenol or Bisphenol A): 3 of the 11 valid sites
- [13] *n*-Butyl methacrylate: 2 of the 14 valid sites

Table 1-2 Summary of the detection ranges and the detection limits in the Initial Environmental Survey in FY 2011

No.	Target chemicals	Surface water [ng/L]		Air [ng/m^3]	
		Detection range and frequency	Detection limit	Detection range and frequency	Detection limit
[1]	Acrylamide			nd 0/9	6.9
[2]	Allyl alcohol			nd～86 6/11	16
[3]	Isobutyl alcohol	nd～290 15/25	63		
[4]	11-Ketotestosterone	nd 0/19	0.088		
[5]	Cobalt and its compounds (as Cobalt)*	5.3～9,100 20/20	4.8		
[6]	1,3-Dichloro-2-propanol*			nd～7.9 9/13	0.80
[7]	1,2,4,5-Tetrachlorobenzene	nd 0/23	12		
[8]	3,5,5-Trimethyl-1-hexano*l			nd 0/8	730
[9]	4-Vinyl-1-cyclohexene*			nd 0/9	29
[10]	Fluoranthene	0.17～3.2 28/28	0.15		
[11]	4,4'-Propane-2,2-diyldiphenol (synonym: 4,4'-Isopropylidenediphenol or Bisphenol A)*			nd～5.6 3/11	0.96
[12]	2,3-Epoxypropyl methacrylate*			nd 0/11	59
[13]	*n*-Butyl methacrylate*	nd 0/14	12	nd～37 2/14	8.7
[14]	Methyl benzoimidazol-2-ylcarbamate (synonym: Carbendazim)	nd～120 25/26	0.39		

(Note 1) Detection frequency is based on the number of sites or areas, 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. 3 samples were measured for a site or area, and the detection in more than one out of samples from a site or area can be defined as one detected site or area.

(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 (or areas).

(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.