

Chapter 3 Results of the Environmental Survey for Exposure Study in FY 2005

1. Purpose of the survey

The Environmental Survey for Exposure Study is aimed at understanding the environmental persistence of the Specified Chemical Substances and Monitored Chemical Substances under the Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances (Law No. 117 of 1973) (hereafter, the Chemical Substances Control Law) and chemicals requiring the Initial Environmental Risk Assessment.

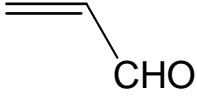
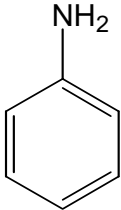
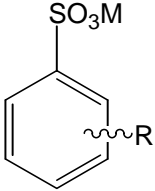
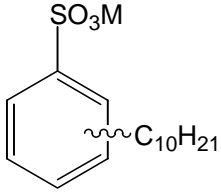
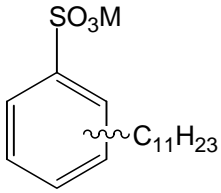
2. Target chemicals

In the FY 2005 Environmental Survey for Exposure Study, 21 chemicals (groups) that were selected by the FY 2005 Expert Group for Promotion of the Environmental Survey and Monitoring of Chemicals were designated as target chemicals. The combinations of target chemicals and surveyed media are given below.

No	Target chemicals Name	Designated Class in		Surveyed media				
		The Chemical Substances Control Law	The PRTR Law	Surface water	Sediment	Wildlife	Food	Indoor air
1	Acrolein	II Monitored	I					
2	Aniline		I					
3	Linear alkylbenzene sulfonates (LAS-C ₁₀ ~ C ₁₄)		I					
	[3-1] Linear decylbenzene sulfonate (LAS-C ₁₀)							
	[3-2] Linear undecylbenzene sulfonate (LAS-C ₁₁)							
	[3-3] Linear dodecylbenzene sulfonate (LAS-C ₁₂)							
	[3-4] Linear tridecylbenzene sulfonate (LAS-C ₁₃)							
	[3-5] Linear tetradecylbenzene sulfonate (LAS-C ₁₄)							
4	1,2-Dibromo-3-chloropropane							
5	2-(2 <i>H</i> -1,2,3-Benzotriazol-2-yl)-4,6-di- <i>tert</i> -butylphenol	I Monitored						
6	2,4-Di- <i>tert</i> -butyl-6-(5-chloro-2 <i>H</i> -1,2,3-benzotriazol-2-yl)phenol	I Monitored						
7	2,4,5-Trichlorophenoxyacetic acid (2,4,5-T)							
8	Nitrofen (NIP or (2,4-Dichloro-1-(4-nitrophenoxy)benzene)							
9	3-Methyl-4-nitrophenol							
10	Vinclozolin (<i>N</i> -3,5-Dichlorophenyl-5-methyl-5-vinyl-1,3-oxazolidine-2,4-dione)							
11	Methoxychlor							
12	2-Chloro-2',6'-diethyl- <i>N</i> -(2-propoxyethyl)acetanilide (Pretilachlor)		I					
13	Diisopropyl 1,3-dithiolan-2-ylidenemalonate (Isoprothiolan)		I					
14	<i>O,O</i> -Diethyl <i>S</i> -(2-ethylthioethyl) dithiophosphate (Ethylthiometon or Disulfoton)		I					
15	<i>S</i> -(2,3-Dihydro-5-methoxy-2-oxo-1,3,4-thiadiazol-3-yl) methyl <i>O,O</i> -dimethyl dithiophosphate (Methidathion or DMTP)		I					
16	<i>O,O</i> -Diethyl <i>O</i> -5-phenylisoxazol-3-yl phosphorothioate (Isoxathion)		I					
17	<i>O,O</i> -Dimethyl <i>O</i> -3-methyl-4-(methylthio)phenyl phosphorothioate (Fenthion OR MPP)		I					
18	<i>S</i> -Benzyl- <i>O,O</i> -diisopropyl phosphorothioate (Iprobenfos or IBP)		I					
19	Trichloronitromethane (Chloropicrine)	II Monitored	I					
20	α,α,α -Trifluoro-2,6-dinitro- <i>N,N</i> -dipropyl- <i>p</i> -toluidine (Tifluralin)	II Monitored III Monitored	I					
21	1-Naphthyl <i>N</i> -methylcarbamate (Carbaryl or NAC)		I					

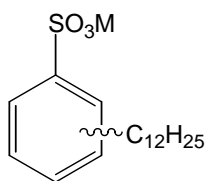
(Note) "The PRTR Law" hereafter means "Substance in the Law Concerning Reporting, etc. of Releases of Specific Chemical Substances to the Environment and Promoting Improvement in Their Management (Law No. 86 of 1999)."

Chemical and physical properties of target chemicals of the Environmental Survey for Exposure Study are as follows.

<p>[1] Acrolein</p> 	<p>Molecular formula: C₃H₄O CAS: 107-02-8 ENCS: 2-521 MW: 56.06 mp: -88¹⁾ bp: 52.5¹⁾ SW: 208g/L (20²⁾) Specific gravity: 0.84 (20¹⁾) logPow: -0.01³⁾</p>
<p>[2] Aniline</p> 	<p>Molecular formula: C₆H₇N CAS: 62-53-3 ENCS: 3-105 MW: 93.13 mp: -6.0⁴⁾ bp: 184.1⁴⁾ SW: 36g/L (25⁵⁾) Specific gravity: 1.02 (20⁴⁾) logPow: 0.90³⁾</p>
<p>[3] Linear alkylbenzene sulfonates (LAS-C₁₀ ~ C₁₄)</p>  <p>M = H or Na and other metals</p>	<p>Molecular formula: See [3-1] ~ [3-5] CAS: See [3-1] ~ [3-5] ENCS: See [3-1] ~ [3-5] MW: See [3-1] ~ [3-5] mp: See [3-1] ~ [3-5] bp: See [3-1] ~ [3-5] SW: See [3-1] ~ [3-5] Specific gravity: See [3-1] ~ [3-5] logPow: See [3-1] ~ [3-5]</p>
<p>[3-1] Linear decylbenzene sulfonate (LAS-C₁₀)</p>  <p>M = H or Na and other metals</p>	<p>Molecular formula: C₁₆H₂₆O₃S (C₁₆H₂₅O₃SNa as a sodium salt) CAS: 1322-98-1 ENCS: 3-1949 MW: 298.46 (320.44 as a sodium salt) mp: Uncertain bp: Uncertain SW: Uncertain Specific gravity: Uncertain logPow: Uncertain</p>
<p>[3-2] Linear undecylbenzene sulfonate (LAS-C₁₁)</p>  <p>M = H or Na and other metals</p>	<p>Molecular formula: C₁₇H₂₈O₃S (C₁₇H₂₇O₃SNa as a sodium salt) CAS: 27636-75-5 ENCS: 3-1906 MW: 312.48 (334.46 as a sodium salt) mp: Uncertain bp: Uncertain SW: Uncertain Specific gravity: Uncertain logPow: Uncertain</p>

(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.

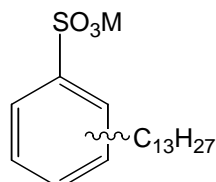
[3-3] Linear dodecylbenzene sulfonate (LAS-C₁₂)



Molecular formula: C₁₈H₃₀O₃S (C₁₈H₂₉O₃SNa as a sodium salt)
 CAS: 25155-30-0
 ENCS: 3-1884
 MW: 326.51 (348.49 as a sodium salt)
 mp: Uncertain (300 以上 as a sodium salt¹⁷⁾)
 bp: Uncertain
 SW: 0.8g/L⁵⁾ (200g/L as a sodium salt¹⁷⁾)
 Specific gravity: Uncertain (1.0 as a 60% slurry of sodium salt¹⁷⁾)
 logPow: 0.45³⁾ (1.96 as a sodium salt¹⁷⁾)

M = H or Na and other metals

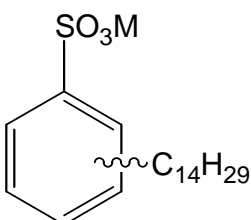
[3-4] Linear tridecylbenzene sulfonate (LAS-C₁₃)



Molecular formula: C₁₉H₃₂O₃S (C₁₉H₃₁O₃SNa as a sodium salt)
 CAS: 26248-24-8
 ENCS: Uncertain
 MW: 340.47 (362.45 as a sodium salt)
 mp: Uncertain
 bp: Uncertain
 SW: Uncertain
 Specific gravity: Uncertain
 logPow: 2.52³⁾

M = H or Na and other metals

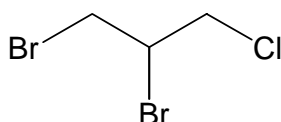
[3-5] Linear tetradecylbenzene sulfonate (LAS-C₁₄)



Molecular formula: C₂₀H₃₄O₃S (C₂₀H₃₃O₃SNa as a sodium salt)
 CAS: 28348-61-0
 ENCS: 3-1906
 MW: 354.50 (376.48 as a sodium salt)
 mp: Uncertain
 bp: Uncertain
 SW: Uncertain
 Specific gravity: Uncertain
 logPow: Uncertain

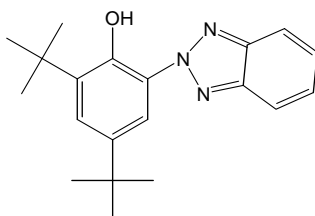
M = H or Na and other metals

[4] 1,2-Dibromo-3-chloropropane



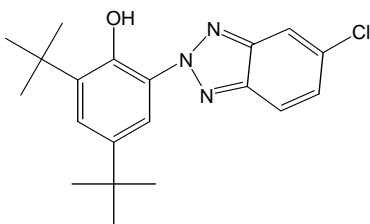
Molecular formula: C₃H₅Br₂Cl
 CAS: 96-12-8
 ENCS: 2-82
 MW: 236.36
 mp: 5⁶⁾
 bp: 164.5 (300mmHg)⁷⁾
 SW: Uncertain
 Specific gravity: 2.08⁸⁾
 logPow: 2.96³⁾

[5] 2-(2*H*-1,2,3-Benzotriazol-2-yl)-4,6-di-*tert*-butylphenol



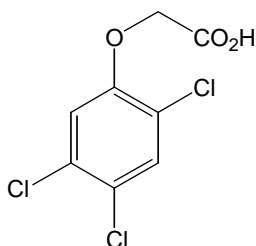
Molecular formula: C₂₀H₂₅N₃O
 CAS: 3846-71-7
 ENCS: 5-3580, 5-3604
 MW: 323.44
 mp: Uncertain
 bp: Uncertain
 SW: Uncertain
 Specific gravity: Uncertain
 logPow: 6.27³⁾

[6] 2,4-Di-*tert*-butyl-6-(5-chloro-2*H*-1,2,3-benzotriazol-2-yl)phenol



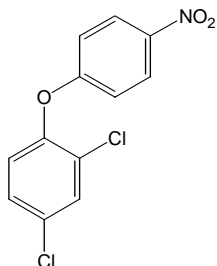
Molecular formula: C₂₀H₂₄ClN₃O
 CAS: 3864-99-1
 ENCS: 5-3581, 5-3605
 MW: 357.5
 mp: Uncertain
 bp: Uncertain
 SW: Uncertain
 Specific gravity: Uncertain
 logPow: Uncertain

[7] 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T)



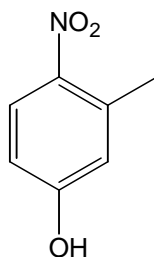
Molecular formula: C₈H₅O₃Cl₃
 CAS: 93-76-5
 ENCS: Uncertain
 MW: 255.49
 mp: 153¹⁾
 bp: Uncertain
 SW: Uncertain
 Specific gravity: 1.8 (20¹⁾)¹⁾
 logPow: 4⁴⁾

[8] Nitrofen (NIP or (2,4-Dichloro-1-(4-nitrophenoxy)benzene)



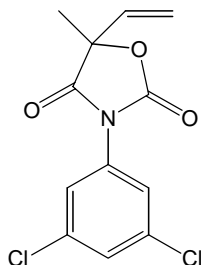
Molecular formula: C₁₂H₇Cl₂NO₃
 CAS: 1836-75-5
 ENCS: Uncertain
 MW: 284.1
 mp: 70 ~ 71⁹⁾
 bp: Uncertain
 SW: 0.7 ~ 1.2mg/L⁹⁾
 Specific gravity: 1.3¹⁰⁾
 logPow: Uncertain

[9] 3-Methyl-4-nitrophenol

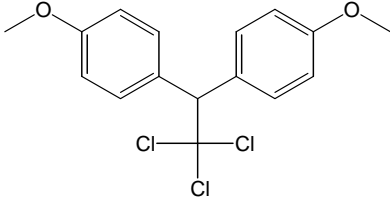
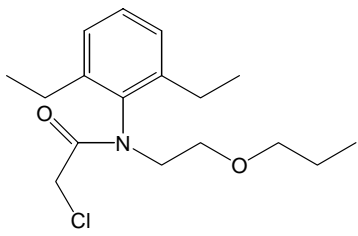
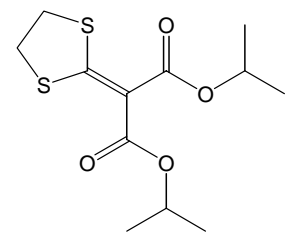
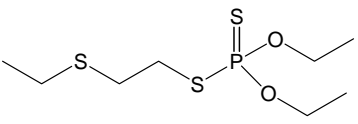
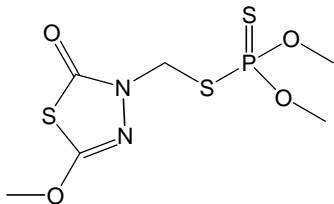


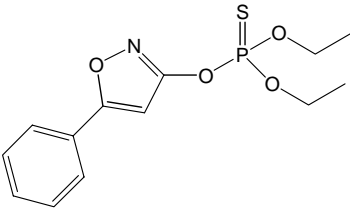
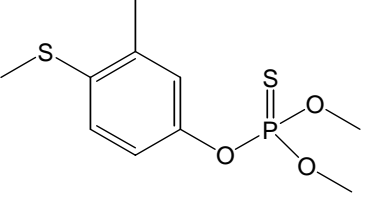
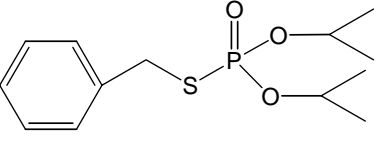
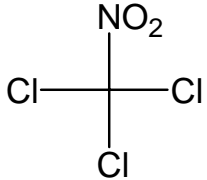
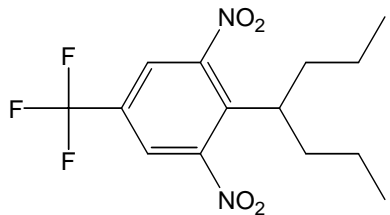
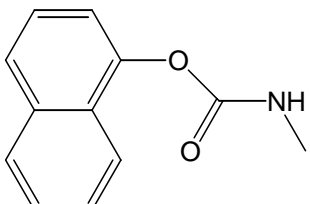
Molecular formula: C₇H₇NO₃
 CAS: 2581-34-2
 ENCS: 3-790
 MW: 153.15
 mp: 129⁴⁾
 bp: Uncertain
 SW: 1.19g/L (20⁵⁾)⁵⁾
 Specific gravity: Uncertain
 logPow: 2.48³⁾

[10] Vinclozolin (*N*-3,5-Dichlorophenyl-5-methyl-5-vinyl-1,3-oxazolidine-2,4-dione)



Molecular formula: C₁₂H₉Cl₂NO₃
 CAS: 50471-44-8
 ENCS: Uncertain
 MW: 286.11
 mp: 108⁴⁾
 bp: 131⁴⁾
 SW: 1g/L (20⁵⁾)⁵⁾
 Specific gravity: 1.51⁴⁾
 logPow: 3.10³⁾

<p>[11] Methoxychlor</p> 	<p>Molecular formula: C₁₆H₁₅Cl₃O₂ CAS: 72-43-5 ENCS: Uncertain MW: 345.65 mp: 87⁴⁾ bp: Uncertain SW: 0.1mg/L (25³⁾) Specific gravity: 1.41 (25⁴⁾) logPow: 5.08³⁾</p>
<p>[12] 2-Chloro-2',6'-diethyl-N-(2-propoxyethyl)acetanilide (Pretilachlor)</p> 	<p>Molecular formula: C₁₇H₂₆ClNO₂ CAS: 51218-49-6 ENCS: Uncertain MW: 311.85 mp: Uncertain bp: 135 (0.001mmHg)¹⁾ SW: 50mg/L (20¹⁾) Specific gravity: 0.93³⁾, 1.076 (20¹⁾) logPow: 4.08²⁾</p>
<p>[13] Diisopropyl 1,3-dithiolan-2-ylidenemalonate (Isoprothiolan)</p> 	<p>Molecular formula: C₁₂H₁₈O₄S₂ CAS: 50512-35-1 ENCS: Uncertain MW: 290.39 mp: 54.0 ~ 54.5¹⁸⁾ bp: Uncertain SW: 54mg/L (25¹⁸⁾) Specific gravity: Uncertain logPow: 3.3¹⁸⁾</p>
<p>[14] O,O-Diethyl S-(2-ethylthioethyl) dithiophosphate (Ethylthiometon or Disulfoton)</p> 	<p>Molecular formula: C₈H₁₉O₂PS₃ CAS: 298-04-4 ENCS: Uncertain MW: 274.4 mp: -25⁴⁾ bp: 132 ~ 133 (1.5mmHg)¹⁾ SW: 16.3mg/L (20¹²⁾) Specific gravity: Uncertain logPow: 4.02³⁾</p>
<p>[15] S-(2,3-Dihydro-5-methoxy-2-oxo-1,3,4-thiadiazol-3-yl) methyl O,O-dimethyl dithiophosphate (Methidathion or DMTP)</p> 	<p>Molecular formula: C₆H₁₁N₂O₄PS₃ CAS: 950-37-8 ENCS: Uncertain MW: 302.33 mp: Uncertain bp: Uncertain SW: 187mg/L (20¹²⁾) Specific gravity: 1.51 (20²⁾) logPow: 2.20²⁾</p>

<p>[16] <i>O,O</i>-Diethyl <i>O</i>-5-phenylisoxazol-3-yl phosphorothioate (Isoxathion)</p> 	<p>Molecular formula: C₁₃H₁₆NO₄PS CAS: 18854-01-8 ENCS: Uncertain MW: 313.3 mp: Uncertain bp: 160 (decomposition)²⁾ SW: 1.9mg/L (25 °C)¹³⁾ Specific gravity: Uncertain logPow: 3.73¹⁴⁾</p>
<p>[17] <i>O,O</i>-Dimethyl <i>O</i>-3-methyl-4-(methylthio)phenyl phosphorothioate (Fenthion OR MPP)</p> 	<p>Molecular formula: C₁₀H₁₅O₃PS₂ CAS: 55-38-9 ENCS: Uncertain MW: 278.34 mp: 7 °C¹⁵⁾ bp: Uncertain SW: Uncertain Specific gravity: 1.25 (20 °C)¹⁾ logPow: 4.091¹²⁾</p>
<p>[18] <i>S</i>-Benzyl-<i>O,O</i>-diisopropyl phosphorothioate (Iprobenfos or IBP)</p> 	<p>Molecular formula: C₁₃H₂₁O₃PS CAS: 26087-47-8 ENCS: Uncertain MW: 269.30 mp: Uncertain bp: Uncertain SW: Uncertain Specific gravity: Uncertain logPow: 3.34¹⁴⁾</p>
<p>[19] Trichloronitromethane (Chloropicrine)</p> 	<p>Molecular formula: CCl₃NO₂ CAS: 76-06-2 ENCS: Uncertain MW: 164.39 mp: -64 °C¹⁾ bp: 112 (757mmHg)¹⁾ SW: 1.621g/L (25 °C)¹⁾ Specific gravity: 1.66 (20 °C)¹⁾ logPow: 2.09³⁾</p>
<p>[20] α,α,α-Trifluoro-2,6-dinitro-<i>N,N</i>-dipropyl-<i>p</i>-toluidine (Tifluralin)</p> 	<p>Molecular formula: C₁₃H₁₆F₃N₃O₄ CAS: 1582-09-8 ENCS: 3-426 MW: 335.28 mp: 46 ~ 47 °C¹⁾ bp: 139 ~ 140 (4.2mmHg, decomposition)¹⁾ SW: 24mg/L¹⁾, 18.4mg/L (25 °C)²⁾ Specific gravity: 1.36 (22 °C)²⁾ logPow: 5.34³⁾</p>
<p>[21] 1-Naphthyl <i>N</i>-methylcarbamate (Carbaryl or NAC)</p> 	<p>Molecular formula: C₁₂H₁₁NO₂ CAS: 63-25-2 ENCS: 4-387 MW: 201.22 mp: 145 °C¹⁾ bp: Uncertain SW: 120mg/L (20 °C)²⁾ Specific gravity: 1.232 (20 °C)¹⁶⁾ logPow: 2.36³⁾</p>

References

- 1) O'Neil, The Merck Index - An Encyclopedia of Chemicals, Drugs, and Biologicals 13th Edition, Merck Inc. (2001)
- 2) Tomlin, The Pesticide Manual 10th Edition. British Crop Protection Council (1994)
- 3) Hansch et al., Exploring QSAR - Hydrophobic, Electronic, and Steric Constants, American Chemical Society (1995)
- 4) Lide, CRC Handbook of Chemistry and Physics 81st Edition, CRC Press LLC (2004-2005)
- 5) Yalkowsky et al., Aquasol Database of Aqueous Solubility Version 5, College of Pharmacy, University of Arizona (1992)
- 6) Clayton et al., Patty's Industrial Hygiene and Toxicology Volumes 2A, 2B and 2C (Toxicology) 3rd Edition, John Wiley Sons (1982)
- 7) International Labour Office, Encyclopedia of Occupational Health and Safety (1983)
- 8) Verschuere, Handbook of Environmental Data of Organic Chemicals 2nd Edition, Van Nostrand Reinhold Co. (1983)
- 9) Kearney et al., Herbicides Chemistry, Degradation and Mode of Action Volumes 1 and 2 2nd Edition, Marcel Dekker Inc. (1975)
- 10) Spencer, Guide to the Chemicals Used in Crop Protection 7th Edition, Research Institute, Agriculture Canada (1982)
- 11) Meylan et al., Improved method for estimating water solubility from octanol/water partition coefficient, Environmental Toxicological Chemistry, 15, 100-106 (1996)
- 12) Bowman et al., Determination of octanol-water partitioning co-efficients (Kow) of 61 organophosphorus and carbamate insecticides and their relationship to respective water solubility (S) values, Journal of Environmental Science and Health - Part B: Pesticides, Food Contaminants, and Agricultural Wastes, 18 (6), 667-684 (1983)
- 13) Shiu et al., Solubilities of Pesticides in Water, Reviews of Environmental Contamination and Toxicology, 116, 15-187 (1990)
- 14) Saito et al., Cytotoxicity of 109 chemicals to goldfish GFS cells and relationships with 1-octanol/water partition coefficients, Chemosphere, 26, 1015-1028 (1993)
- 15) Hartley et al., The Agrochemical Handbook 2nd Edition, The Royal Society of Chemistry (1987)
- 16) Willoughby, Farm Chemicals Handbook, Meister Publishing Co. (1999)
- 17) New Energy and Industrial Technology Development Organisation, Initial Risk Assessment Report, Linear alkylbenzene sulfonic acid and its salt, No.5 (2005) (in Japanese)
- 18) Nihon Noyaku Co., Isoprothiolan no dokusei shiken no gaiyo, Noyaku-jihou, special issue, 14 -18 (1990) (in Japanese)

3. Surveyed site and procedure

In the Environmental Survey for Exposure Study (of surface water, sediment, and wildlife), the sampling of specimens was entrusted to prefectural governments and government-designated cities across Japan (some were performed by private analytical laboratories) and the specimens sampled were analysed by private analytical laboratories. In the surface water survey of target chemicals [12] ~ [21] (mainly used as pesticides), the water was sampled taking into consideration the time of pesticide spraying.

(1) Organisations responsible for sampling

Local communities	Organisations responsible for sampling	Surveyed media		
		Surface water	Sediment	Wildlife
Hokkaido	Hokkaido Institute of Environmental Sciences			
Sapporo City	Sapporo City Institute of Public Health			
Aomori Pref.	Aomori Prefectural Institute of Public Health and Environment			
Iwate Pref.	Research Institute for Environmental Sciences and Public Health of Iwate Prefecture			
Miyagi Pref.	Miyagi Prefectural Institute of Public Health and Environment			
Akita Pref.	Akita Research Center for Public Health and Environment			
Yamagata Pref.	Environmental Science Research Center of Yamagata Prefecture			
Fukushima Pref.	Fukushima Prefectural Institute of Environmental Research			
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			
Chiba Pref.	Chiba Prefectural Environmental Research Center			
Tokyo	Tokyo Metropolitan Research Institute for Environmental Protection			
Yokohama City	Yokohama Environmental Science Research Institute			
Kawasaki City	Kawasaki Municipal Research Institute for Environmental Protection			
Toyama Pref.	Toyama Prefectural Environmental Science Research Center			
Ishikawa Pref.	Ishikawa Prefectural Institute of Public Health and Environmental Science			
Fukui Pref.	Fukui 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			
Mie Pref.	Mie Prefectural Science and Technology Promotion Center			
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.	Osaka Prefecture Environmental Pollution Control Center			
Hyogo Pref.	Hyogo Prefectural Institute of Public Health and Environmental Sciences			
Wakayama Pref.	Wakayama Prefectural Research Center of Environment and Public Health			
Kobe City	Environmental Conservation and Guidance Division, Environment Bureau			
Okayama Pref.	Okayama Prefectural Institute for Environmental Science and Public Health			
Hiroshima Pref.	Hiroshima Prefectural Institute of Public Health and Environment			
Yamaguchi Pref.	Yamaguchi Prefectural Institute of Public Health and Environment			
Tokushima Pref.	Tokushima Prefectural Institute of Public Health and Environmental Sciences			
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			
Kagoshima Pref.	Kagoshima Prefectural Institute for Environmental Research and Public Health			
Okinawa Pref.	Okinawa Prefectural Institute of Health and Environment			

(Note) Organisations responsible for sampling are described by their official names in FY 2005.

(2) Surveyed sites (or areas) and target chemicals

Surveyed sites and target chemicals for surface water are shown in Table 3-1-1 and Figure 3-1-1. Surveyed sites and target chemicals for sediment are shown in Table 3-1-2 and Figure 3-1-2. Surveyed areas and target chemicals for wildlife were shown in Table 3-1-3 and Figure 3-1-3. Surveyed areas and target chemicals for food and room are shown in Table 3-1-4 and Table 3-1-5, respectively. The breakdown is summarized as follows.

Surveyed media	Numbers of local communities	Numbers of target chemicals (groups)	Numbers of surveyed sites (or areas)	Numbers of samples at a surveyed site (or area)
Surface water	40	17	56	3 ²
Sediment	31	3	35	3
Wildlife	12	8	12	3
Food	-	2	-	150 ¹
Indoor air	-	2	-	78 ¹

(Note 1) indicates the sample number.

(Note 2) For target chemicals [5] and [6], 17 and 9 specimens were sampled at Riv. Ookita (Kitaibaraki City) in Ibaraki Pref., and Riv. Kuzuryu (Mikuni Town) in Fukui Pref., respectively. For target chemicals [12] ~ [21], 9 specimens were sampled during 3 days taking into consideration the time of pesticide spraying.

Table 3-1-1 List of surveyed sites (surface water) and target chemicals in the Environmental Survey for Exposure Study in FY 2005

Local communities	Surveyed sites	Target chemicals																			
		[2]	[4]	[5]	[6]	[7]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]			
Hokkaido	Riv Tokachi (Obihiro City)																				
	Mouth of Riv. Ishikari (Ishikari City)																				
Sapporo City	Riv. Toyohira (Sapporo City)																				
Aomori Pref.	Lake Jusan																				
Iwate Pref.	Riv. Toyosawa (Hanamaki City)																				
Miyagi Pref.	Sendai Bay (Matsushima Bay)																				
	Riv. Masuda (Natori City)																				
Akita Pref.	Lake Hachiro																				
Yamagata Pref.	Mouth of Riv. Mogami (Sakata City)																				
Fukushima Pref.	Onahama Port																				
Ibaraki Pref.	Mouth of Riv. Tone (Kamisu City)																				
	Riv. Ookita (Kitaibaraki City)																				
	Riv. Tone (Tone Town)																				
Tochigi Pref.	Riv. Tagawa (Utsunomiya City)																				
Gunma Pref.	Riv. Ino (Takasaki City)																				
Saitama Pref.	Riv. Motoarakawa (Kounosu City)																				
Chiba Pref.	Coast of Ichihara and Anegaaski																				
Tokyo Met.	Mouth of Riv. Arakawa (Koto Ward)																				
	Mouth of Riv. Sumida (Minato Ward)																				
Yokohama City	Riv. Tsurumi (Yokohama City)																				
	Yokohama Port																				
Kawasaki City	Kawasaki Port																				
Toyama Pref.	Mouth of Riv. Jintsu (Toyama City)																				
Ishikawa Pref.	Mouth of Riv. Sai (Kanazawa City)																				
Fukui Pref.	Riv. Kuzuryu (Mikuni Town)																				
Nagano Pref.	Lake Suwa (center)																				
Shizuoka Pref.	Shimizu Port																				
	Riv. Tenryu (Iwata City)																				
Aichi Pref.	Nagoya Port																				
Mie Pref.	Riv. Inabe (Kuwana City)																				
	Yokkaichi Port																				
	Riv. Kanazawa (Suzuka City)																				
	Toba Port																				
Shiga Pref.	Lake Biwa (center, offshore of Karasaki)																				
Kyoto Pref.	Miyazu Port																				
Kyoto City	Riv. Katsura (Kyoto City)																				
Osaka Pref.	Mouth of Riv. Yamato (Sakai City)																				
	Mouth of Riv. Yamato (Osaka City • Sakai City)																				
Hyogo Pref.	Offshore of Himeji																				
	Riv. Kako (Miki City • Ono City • Kakogawa City)																				
	Riv. Minoh (Miki City)																				
Kobe City	Kobe Port (center)																				
Wakayama Pref.	Mouth of Riv. Kinokawa (Wakayama City)																				
Okayama Pref.	Offshore of Mizushima																				
Hiroshima Pref.	Kure Port																				
	Hiroshima Bay																				
Yamaguchi Pref.	Tokuyama Bay																				
Tokushima Pref.	Mouth of Riv. Yoshino (Tokushima City)																				
Kagawa Pref.	Takamatsu Port																				
	Riv. Zaida (Kannonji City)																				
Ehime Pref.	Riv. Iwamatsu (Uwajima City)																				
Fukuoka Pref.	Offshore of Omuta																				
Saga Pref.	Imari Bay																				
Kagoshima Pref.	Riv. Gotanda (Ichikikushikino City)																				
	Riv. Amori (Hayato Town)																				
Okinawa Pref.	Naha Port																				

[2] Aniline, [4] 1,2-Dibromo-3-chloropropane, [5] 2-(2*H*-1,2,3-Benzotriazol-2-yl)-4,6-di-*tert*-butylphenol, [6] 2,4-Di-*tert*-butyl-6-(5-chloro-2*H*-1,2,3-benzotriazol-2-yl)phenol, [7] 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T), [10] Vinclozolin (*N*-3,5-Dichlorophenyl-5-methyl-5-vinyl-1,3-oxazolidine-2,4-dione), [11] Methoxychlor, [12] 2-Chloro-2',6'-diethyl-*N*-(2-propoxyethyl)acetanilide (Pretilachlor), [13] Diisopropyl 1,3-dithiolan-2-ylidenemalonate (Isoprothiolan), [14] *O,O*-Diethyl S-(2-ethylthioethyl) dithiophosphate (Ethylthiometon or Disulfoton), [15] *S*-(2,3-Dihydro-5-methoxy-2-oxo-1,3,4-thiadiazol-3-yl) methyl *O,O*-dimethyl dithiophosphate (Methidathion or DMTP), [16] *O,O*-Diethyl *O*-5-phenylisoxazol-3-yl phosphorothioate (Isoxathion), [17] *O,O*-Dimethyl *O*-3-methyl-4-(methylthio)phenyl phosphorothioate (Fenthion OR MPP), [18] *S*-Benzyl-*O,O*-diisopropyl phosphorothioate (Iprobenfos or IBP), [19] Trichloronitromethane (Chloropicrine), [20] α,α,α -Trifluoro-2,6-dinitro-*N,N*-dipropyl-*p*-toluidine (Tifluralin), [21] 1-Naphthyl *N*-methylcarbamate (Carbaryl or NAC)

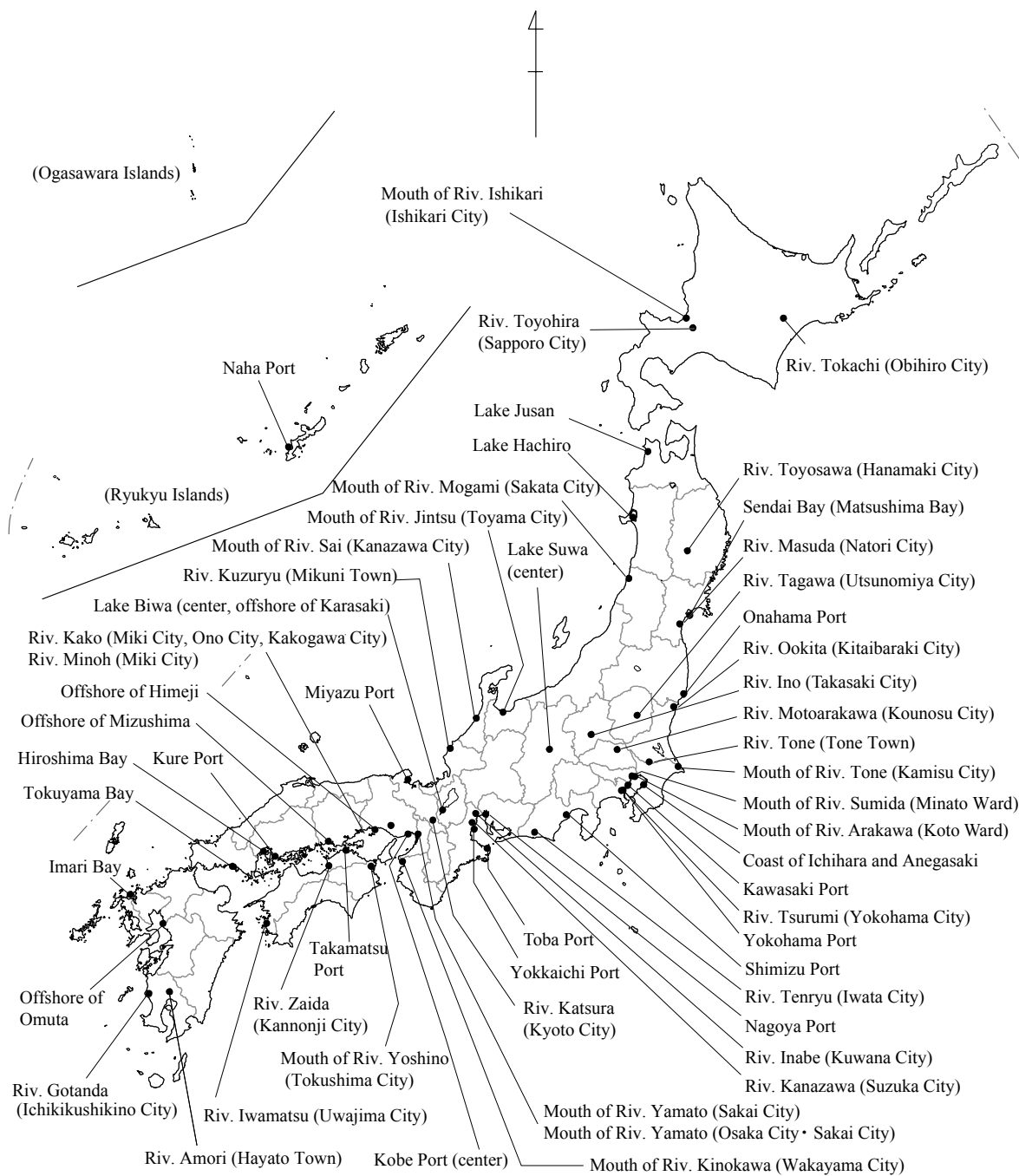


Figure 3-1-1 Surveyed sites (surface water) in the Environmental Survey for Exposure Study in FY 2005

Table 3-1-2 List of surveyed sites (sediment) and target chemicals in the Environmental Survey for Exposure Study in FY 2005

Local communities	Surveyed sites	Target chemicals		
		[8] Nitrofen (NIP or (2,4-Dichloro-1-(4-nitro phenoxy)benzene)	[10] Vinclozolin (N-3,5-Dichlorophenyl-5-methyl-5-vinyl-1,3-oxazolidine-2,4-dione)	[11] Methoxychlor
Hokkaido	Riv Tokachi (Obihiro City)			
	Mouth of Riv. Ishikari (Ishikari City)			
Iwate Pref.	Riv. Toyosawa (Hanamaki City)			
Miyagi Pref.	Sendai Bay (Matsushima Bay)			
Akita Pref.	Lake Hachiro			
Yamagata Pref.	Mouth of Riv. Mogami (Sakata City)			
Fukushima Pref.	Onahama Port			
Ibaraki Pref.	Mouth of Riv. Tone (Kamisu City)			
Tochigi Pref.	Riv. Tagawa (Utsunomiya City)			
Tokyo Met.	Mouth of Riv. Arakawa (Koto Ward)			
	Mouth of Riv. Sumida (Minato Ward)			
Yokohama City	Yokohama Port			
Kawasaki City	Kawasaki Port			
Toyama Pref.	Mouth of Riv. Jintsu (Toyama City)			
Nagano Pref.	Lake Suwa (center)			
Aichi Pref.	Nagoya Port			
Mie Pref.	Yokkaichi Port			
	Toba Port			
Shiga Pref.	Lake Biwa (center, offshore of Karasaki)			
Kyoto Pref.	Miyazu Port			
Kyoto City	Riv. Katsura (Kyoto City)			
Osaka Pref.	Mouth of Riv. Yamato (Sakai City)			
Hyogo Pref.	Offshore of Himeji			
Kobe City	Kobe Port (center)			
Wakayama Pref.	Mouth of Riv. Kinokawa (Wakayama City)			
Okayama Pref.	Offshore of Mizushima			
Hiroshima Pref.	Kure Port			
	Hiroshima Bay			
Yamaguchi Pref.	Tokuyama Bay			
Tokushima Pref.	Mouth of Riv. Yoshino (Tokushima City)			
Kagawa Pref.	Takamatsu Port			
Fukuoka Pref.	Offshore of Omuta			
Fukuoka City	Hakata Bay			
Saga Pref.	Imari Bay			
Okinawa Pref.	Naha Port			

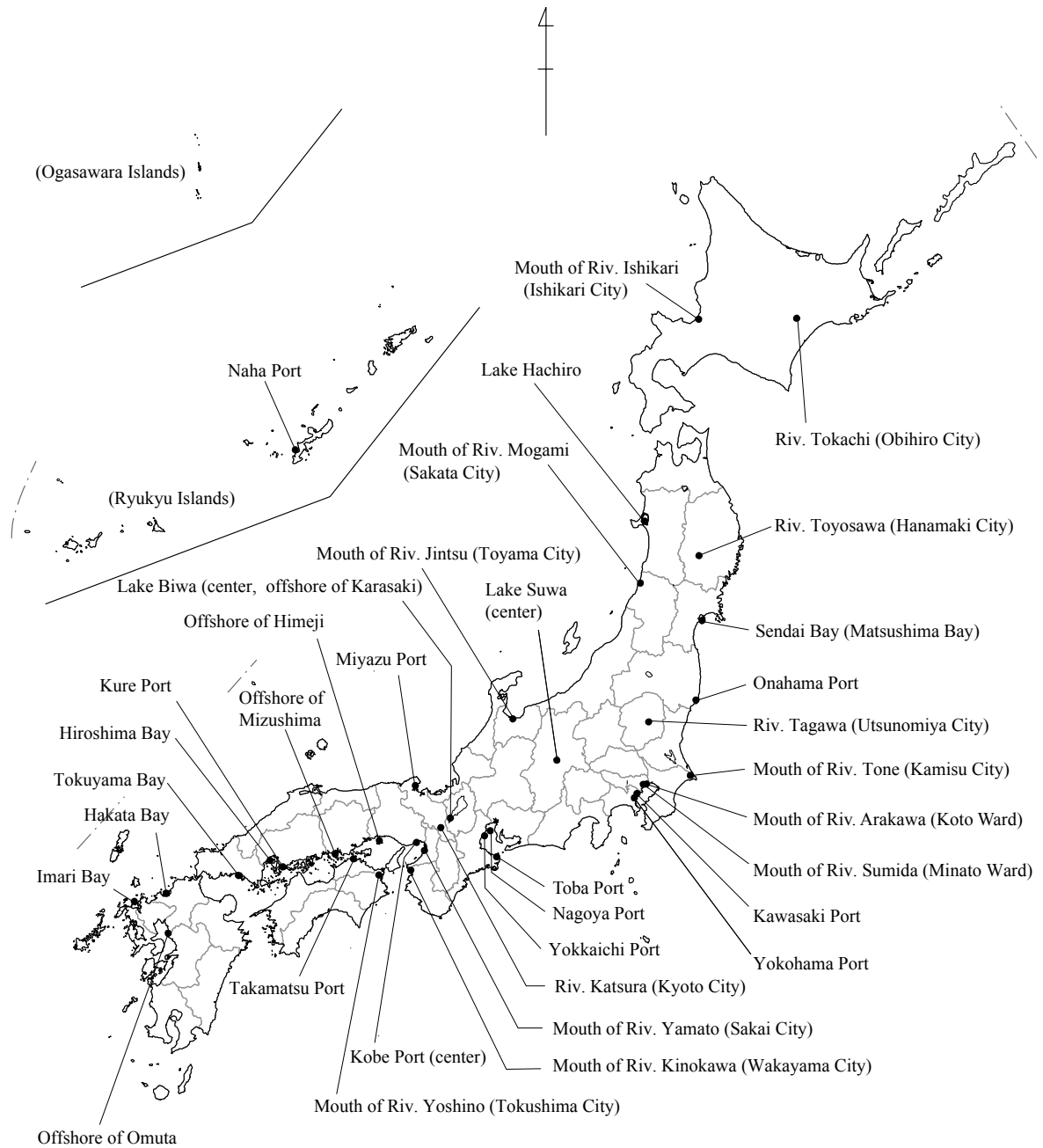


Figure 3-1-2 Surveyed sites (sediment) in the Environmental Survey for Exposure Study in FY 2005

Table 3-1-3 List of surveyed areas (wildlife) and target chemicals in the Environmental Survey for Exposure Study in FY 2005

Local communities	Surveyed areas	Wildlife species	Target chemicals							
			[10]	[11]	[12]	[13]	[14]	[15]	[20]	[21]
Hokkaido	Mouth of Riv. Ishikari (Ishikari City)	Dace (<i>Tribolodon hakonensis</i>)								
Miyagi Pref.	Sendai Bay (Matsushima Bay)	Sea bass (<i>Lateolabrax japonicus</i>)								
Ibaraki Pref.	Offshore of Joban	Pacific saury (<i>Cololabis saira</i>)								
Tokyo Met.	Tokyo Bay	Sea bass (<i>Lateolabrax japonicus</i>)								
Yokohama City	Riv. Tsurumi (Yokohama City)	Carp (<i>Cyprinus carpio</i>)								
Kawasaki City	Offshore of Ogi Island in Kawasaki Port	Sea bass (<i>Lateolabrax japonicus</i>)								
Shiga Pref.	Lake Biwa, Riv. Azumi (Takashima City)	Dace (<i>Tribolodon hakonensis</i>)								
Osaka Pref.	Osaka Bay	Sea bass (<i>Lateolabrax japonicus</i>)								
Hyogo Pref.	Offshore of Himeji	Sea bass (<i>Lateolabrax japonicus</i>)								
Okayama Pref.	Offshore of Mizushima	Sea bass (<i>Lateolabrax japonicus</i>)								
Kagawa Pref.	Takamatsu Port	Sea bass (<i>Lateolabrax japonicus</i>)								
Kitakyushu City	Dokai Bay	Thread-sail filefish (<i>Stephanolepis cirrhifer</i>)								

[10] Vinclozolin (*N*-3,5-Dichlorophenyl-5-methyl-5-vinyl-1,3-oxazolidine-2,4-dione), [11] Methoxychlor,
 [12] 2-Chloro-2',6'-diethyl-*N*-(2-propoxyethyl)acetanilide (Pretilachlor), [13] Diisopropyl 1,3-dithiolan-2-ylidenemalonate
 (Isoprothiolan), [14] *O,O*-Diethyl *S*-(2-ethylthioethyl) dithiophosphate (Ethylthiometon or Disulfoton),
 [15] *S*-(2,3-Dihydro-5-methoxy-2-oxo-1,3,4-thiadiazol-3-yl) methyl *O,O*-dimethyl dithiophosphate (Methidathion or DMTP), [20]
 α,α,α -Trifluoro-2,6-dinitro-*N,N*-dipropyl-*p*-toluidine (Tifluralin), [21] 1-Naphthyl *N*-methylcarbamate (Carbaryl or NAC)

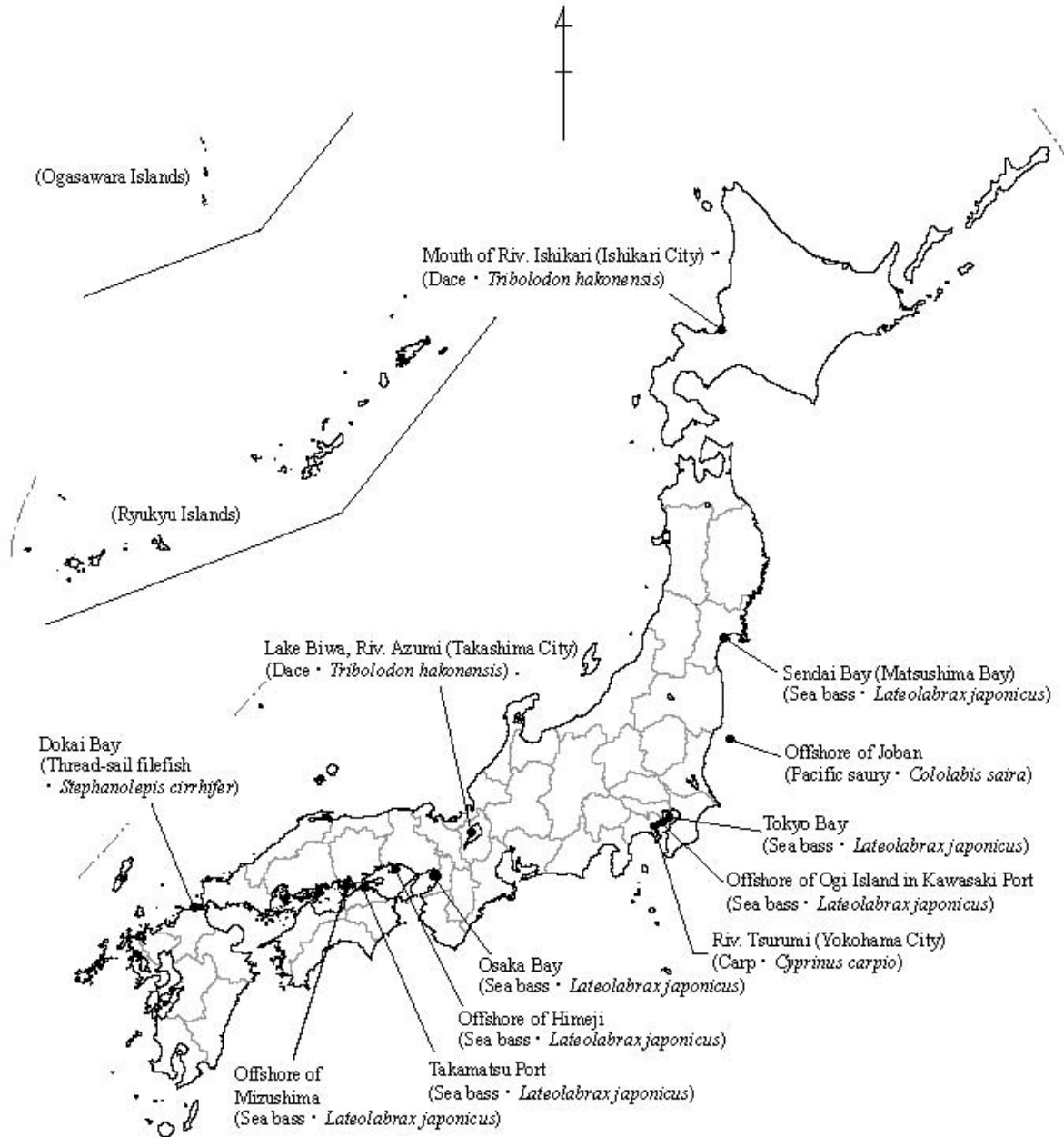


Figure 3-1-3 Surveyed areas (wildlife) in the Environmental Survey for Exposure Study in FY 2005

Table 3-1-4 List of surveyed areas (food) and target chemicals in the Environmental Survey for Exposure Study in FY 2005

Domestic Food

Surveyed areas	Surveyed sites	Numbers of samples	Target chemicals	
			[1] Acrolein	[3] Linear alkylbenzene sulfonates (LAS-C ₁₀ ~ C ₁₄)
Hokkaido	Sapporo City	1		
	Sapporo City	1		
	Hiroshima City	1		
	Sapporo City	1		
	Sapporo City	1		
Miyagi Pref.	Sendai City	1		
	Shiogama City	1		
	Tome City	1		
	Ishinomaki City	1		
	Sendai City	1		
Tokyo Met.	Adachi Ward	1		
	Shinjuku Ward	1		
	Koto Ward	1		
	Suginami Ward	1		
	Edogawa Ward	1		
Nagano Pref.	Nakano City	1		
	Nagano City	1		
	Chikuma City	1		
	Matsumoto City	1		
	Ueda City	1		
Aichi Pref.	Nagoya City	1		
	Kasugai City	1		
	Kasugai City	1		
	Nagoya City	1		
	Kiyosu City	1		
Ishikawa Pref.	Kanazawa City	1		
	Kanazawa City	1		
	Nanao City	1		
	Nanao City	1		
	Nakanoto Town	1		
Osaka Pref.	Kashiwabara City	1		
	Higashiosaka City	1		
	Sakai City	1		
	Ibaraki City	1		
	Osaka City	1		
Ehime Pref.	Matsuyama City	1		
	Matsuyama City	1		
	Matsuyama City	1		
	Iyo District	1		
	Iyo District	1		
Fukuoka Pref.	Fukuoka City	1		
	Fukuoka City	1		
	Fukuoka City	1		
	Kasuga City	1		
	Fukuoka City	1		
Okinawa Pref.	Naha City	1		
	Nakagami District	1		
	Okinawa City	1		
	Ishigaki City	1		
	Naha City	1		

Instant foods

Types	Contents	Numbers of samples	Target chemicals	
			[1] Acrolein	[3] Linear alkylbenzene sulfonates (LAS-C ₁₀ ~ C ₁₄)
Frozen food	Frozen pilaf	1		
	Frozen <i>udon</i> (wheat noodle)	1		
	Frozen spaghetti	1		
	Chinese dumplings	1		
	Frozen hamburger	1		
	Frozen rice balls	1		
	Frozen prepared food	1		
	Frozen vegetables	1		
	Frozen fried food	1		
Frozen pizza	1			
Retort-packed food	Retort curry	1		
	Retort spaghetti	1		
	Sauces	1		
	Baby food	1		
	Western soup	1		
	Chinese soup	1		
	Rice	1		
	Porridge	1		
	Prepared food	1		
	Box lunch	1		
Instant food	Cup noodles	1		
	Instant cup <i>udon</i> (wheat noodle)	1		
	Instant cup fried noodles	1		
	Instant <i>ramen</i> (packed)	1		
	Instant soup	1		
	Freeze-dried baby food	1		
	<i>Miso</i> soup with pork and vegetables	1		
	Powdered milk	1		
	Rice	1		
Pasta	1			
Canned food	Canned soup	1		
	Canned cooking ingredients	1		
	Canned water-boiled food	1		
	Canned fruits in syrup	1		
	Canned cooked food	1		
	Canned meat sauce	1		
Bottled food	Pickles	1		
	Jam	1		
	Baby food	1		
	<i>Tsukudani</i> (food boiled down in sweetened soy sauce)	1		
Prepared food	Preparedfood-1	1		
	Preparedfood-2	1		
	Preparedfood-3	1		
	Preparedfood-4	1		
	Preparedfood-5	1		
	Preparedfood-6	1		
	Preparedfood-7	1		
	Preparedfood-8	1		
	Preparedfood-9	1		
	Preparedfood-10	1		

Restaurant food

Types	Contents	Numbers of samples	Target chemicals	
			[1] Acrolein	[3] Linear alkylbenzene sulfonates (LAS-C ₁₀ ~ C ₁₄)
Fast food	Hamburg steak set, etc.	5		
Japanese rice bowl dishes	Rice bowl dishes, etc.	5		
Family restaurant	Set menus	5		
Steak, grilled meat	Set menus	5		
<i>Sushi</i>	<i>Sushi</i>	5		
<i>Ramen, soba</i> (buckwheat noodle), <i>udon</i> (wheat noodle), pasta	Noodles	5		
Chinese food	Set menus	5		
Box lunch	Set menus	5		
Box lunch shop	Box lunch	5		
Bakery	Bread	5		

Table 3-1-5 List of surveyed areas (indoor air) and target chemicals in the Environmental Survey for Exposure Study in FY 2005

Houses

Surveyed areas	House types	Ages	Numbers of samples	Target chemicals	
				[1] Acrolein	
Suburbs of Sapporo City	Detached house	less than 1 year	2		
		1 to 10 years	2		
		10 years or more	2		
	Flats	less than 1 year	2		
		1 to 10 years	2		
		10 years or more	2		
Suburbs of Sendai City	Detached house	less than 1 year	2		
		1 to 10 years	2		
		10 years or more	2		
	Flats	less than 1 year	2		
		1 to 10 years	2		
		10 years or more	2		
Suburbs of Tokyo Metropolitan Area	Detached house	less than 1 year	2		
		1 to 10 years	2		
		10 years or more	2		
	Flats	less than 1 year	2		
		1 to 10 years	2		
		10 years or more	2		
	Office building	less than 1 year	2		
		1 to 10 years	2		
		10 years or more	2		
Suburbs of Osaka City	Detached house	less than 1 year	2		
		1 to 10 years	2		
		10 years or more	2		
	Flats	less than 1 year	2		
		1 to 10 years	2		
		10 years or more	2		
	Office building	less than 1 year	2		
		1 to 10 years	2		
		10 years or more	2		
Suburbs of Fukuoka City	Detached house	less than 1 year	2		
		1 to 10 years	2		
		10 years or more	2		
	Flats	less than 1 year	2		
		1 to 10 years	2		
		10 years or more	2		
	Office building	less than 1 year	2		
		1 to 10 years	2		
		10 years or more	2		

Automobiles

Automobile types	Years of use	Numbers of samples	Target chemicals	
			[1] Acrolein	[9] 3-Methyl-4-nitrophenol
Gas-powered automobile	brand new (less than 1 year)	2		
	3 years or more to less than 5 years	2		
	7 years or more	2		
Diesel-powered automobile	brand new (less than 1 year)	2		
	3 years or more to less than 5 years	2		
	7 years or more	2		

(3) Sampling method of specimens

a. Surface water

- Sampling time: A day preceded by continuous relatively sunny weather whereby the surface water is stable is selected. For some chemicals that are mainly used as pesticides, if necessary, the water was sampled for three days considering the time of pesticide spraying.
- Sampling depth: As a rule, surface water (0-5 cm below the water surface) is sampled at the centre of the flow in the surveyed site. However, the surface layer (1-2 cm from the top) is avoided as necessary in order that floating garbage and oil are not mixed in the sample.
- Pretreatment: Supernatant water from which garbage was removed is used (surface water), taking care not to include the surface layer. Filtration and centrifugation are avoided.

b. Sediment

- Sampling method: The sediment, sampled using an Ekman-Birge bottom sampler or other appropriate bottom samplers considering the properties of the sediment in the surveyed site, is put into a clean tray. After removing foreign substances, including pebbles, shellfish, and bits of organic matter, the sample is passed through a 16-mesh sieve (pore diameter: 1 mm) and then analysed. At that time, the sludge content (weight of portion passing through the sieve/weight of original specimen) (%) is measured. Moreover, dry weight (dried at 105-110°C for approximately 2 hours) and ignition loss (heated at $600 \pm 25^\circ\text{C}$ for approximately 2 hours) are calculated for some specimens.
- Others: Samples for analysis are, as a rule, not air- or heat-dried, and the measured value per dry weight is obtained by calculation.

c. Wildlife

- Specimens sampled: The specimens are fish bred in each surveyed area. For marine areas, sea bass (if not available, striped mullet, pacific saury, and threadsail filefish are acceptable) is used, and for marshes and rivers, dace (if not available, carp is acceptable) is used as the reference specimen. Although a single individual should be used as a sample, the use of several individuals is also allowed. Small individuals are sufficiently cleaned before use.
- Pretreatment: Edible parts (muscles tissue) are used as samples. Any part of the specimen may be sampled. At least approximately 200 g of sample is collected and homogenised. In the case of small fish with less than 200 g, a total of 200 g of muscle tissue is collected from several fish, and then homogenised for use as the sample. In the case of tiny fish, a total of 200 g is collected from any species of fish, and then homogenized for use as the sample.
- Calculation of lipid weight: A sample of 5 g is put in a homogenizer cup to which 20 mL of chloroform and 40 mL of methanol is then added, and the sample is homogenised for 2 min. More chloroform (20 mL) is added and the sample is further homogenised for another 2 min. The sample is filtered using a Buchner funnel, and the precipitate is again homogenised with 80 mL of a 1:1 mixture of chloroform and methanol. The entire chloroform and methanol fraction is put into a separatory funnel, 60 mL of distilled water is added, and the mixture is gently shaken. After the lower chloroform fraction is collected and dried with anhydrous sodium sulfate, the solvent is evaporated using a rotary evaporator, and the residue is dried in a desiccator with phosphorus pentoxide and its weight is measured.

d. Food

- Sampling method: For domestic food, Japan is divided into 10 regions with 5 selected households per region. The specimens are sampled from meals in one day for each household in a *kagezen* method (the subject household is asked to prepare an extra serving for survey). The specimens from meals in one day (three meals + between-meal snack + beverages) are transferred to a sampling container (acetone-cleaned lidded stainless-steel 3L container), and the closed container is stored in a refrigerator. The meals sampled for 3 consecutive days are treated together, partially thawed, and then rapidly mixed and homogenised using a stainless-steel mixer, taking the greatest care against contamination. The mixture is stored in a sealed container, and then used as the sample.
- Others: Instant food and restaurant food are also prepared by the same method as that for domestic food.

e. Indoor air

- Sampling time: The time of the highest risk of indoor air to humans, winter, when indoor ventilation is poor and heating appliances are used, is targeted.
- Sampling position: The positions for sampling indoor air are determined by considering the ventilation flow: near the exhaust outlet and far from the suction inlet.
- The height of the sampling position is approximately 1.0-1.5 m.
- Sampling method: Indoor air is collected by vacuum for 24 hours at the flow rate of 0.1-1 L/min.
- As a control, outdoor air is sampled in a similar fashion. In the case of houses, the air is sampled at the height of 1.0-1.5 m outdoors on the same floor as where the indoor air is sampled. The sampling site is within the same premise and within 5 m from the ground surface of the house. In the case of automobiles, outdoor air is sampled at the height of 1.0 m within 1 m from the side of the stationary automobile.

4. Summary of survey results

The detection ranges and the detection limits are shown in Table 3-2. The survey results are summarized as follows.

In surface water, 9 out of 17 target chemicals (groups) were detected.

- [2] Aniline: 11 of the 42 valid sites
- [5] 2-(2*H*-1,2,3-Benzotriazol-2-yl)-4,6-di-*tert*-butylphenol: 4 of the 44 valid sites
- [6] 2,4-Di-*tert*-butyl-6-(5-chloro-2*H*-1,2,3-benzotriazol-2-yl)phenol: 25 of the 44 valid sites
- [12] 2-Chloro-2',6'-diethyl-*N*-(2-propoxyethyl)acetanilide (Pretilachlor): 4 of the 4 valid sites
- [13] Diisopropyl 1,3-dithiolan-2-ylidenemalonate (Isoprothiolan): 9 of the 9 valid sites
- [15] *S*-(2,3-Dihydro-5-methoxy-2-oxo-1,3,4-thiadiazol-3-yl) methyl *O,O*-dimethyl dithiophosphate (Methidathion or DMTP): 1 of the 6 valid sites
- [17] *O,O*-Dimethyl *O*-3-methyl-4-(methylthio)phenyl phosphorothioate (Fenthion OR MPP): 2 of the 6 valid sites
- [18] *S*-Benzyl-*O,O*-diisopropyl phosphorothioate (Iprobenfos or IBP): 8 of the 8 valid sites
- [20] α,α,α -Trifluoro-2,6-dinitro-*N,N*-dipropyl-*p*-toluidine (Tifluralin): 2 of the 6 valid sites

In sediment, 2 out of 3 target chemicals (groups) were detected.

- [10] Vinclozolin (*N*-3,5-Dichlorophenyl-5-methyl-5-vinyl-1,3-oxazolidine-2,4-dione): 1 of the 35 valid sites
- [11] Methoxychlor: 1 of the 35 valid sites

In wildlife, 2 out of the 8 target chemicals (groups) were detected.

- [14] *O,O*-Diethyl *S*-(2-ethylthioethyl) dithiophosphate (Ethylthiometon or Disulfoton): 1 of the 3 valid areas
- [20] α,α,α -Trifluoro-2,6-dinitro-*N,N*-dipropyl-*p*-toluidine (Tifluralin): 1 of the 3 valid areas

In food, 2 out of the 2 target chemicals (groups) were detected.

- [1] Acrolein: 146 of the 150 valid samples
- [3-1] Linear decylbenzene sulfonate (LAS-C₁₀): 150 of the 150 valid samples
- [3-2] Linear undecylbenzene sulfonate (LAS-C₁₁): 150 of the 150 valid samples
- [3-3] Linear dodecylbenzene sulfonate (LAS-C₁₂): 150 of the 150 valid samples
- [3-4] Linear tridecylbenzene sulfonate (LAS-C₁₃): 148 of the 150 valid samples
- [3-5] Linear tetradecylbenzene sulfonate (LAS-C₁₄): 137 of the 150 valid samples

In indoor air, 2 out of the 2 target chemicals (groups) were detected.

- [1] Acrolein: 89 of the 90 valid samples
- [9] 3-Methyl-4-nitrophenol: 6 of the 6 valid samples

Table 3-2 Summary of the detection ranges and the detection limits in the Environmental Survey for Exposure Study in FY 2005

Target chemicals		Surface water [ng/L]		Sediment [ng/g-dry]		Wildlife [ng/g-wet]		Food [ng/g-wet]		Indoor air [ng/m ³]	
No.	Name	Range Median Frequency	Detection limit	Range Median Frequency	Detection limit	Range Median Frequency	Detection limit	Range Median Frequency	Detection limit	Range Median Frequency	Detection limit
1	Acrolein							nd ~ 200 8.3 146/150	0.090	Houses nd ~ 6,000 730 77/78 Automobiles 170 ~ 1,000 380 12/12	0.73
2	Aniline	nd ~ 490 nd 11/42	40								
3	Linear alkylbenzene sulfonates (LAS-C ₁₀ ~ C ₁₄)							2.2 ~ 1,600 76 150/150	0.22		
3-1	Linear decylbenzene sulfonate (LAS-C ₁₀)							0.47 ~ 92 4.2 150/150	0.031		
3-2	Linear undecylbenzene sulfonate (LAS-C ₁₁)							0.39 ~ 340 19 150/150	0.047		
3-3	Linear dodecylbenzene sulfonate (LAS-C ₁₂)							0.41 ~ 620 32 150/150	0.066		
3-4	Linear tridecylbenzene sulfonate (LAS-C ₁₃)							nd ~ 670 20 148/150	0.065		
3-5	Linear tetradecylbenzene sulfonate (LAS-C ₁₄)							nd ~ 11 0.29 137/150	0.014		
4	1,2-Dibromo-3-chloropropane	nd nd 0/42	3.0								
5	2-(2 <i>H</i> -1,2,3-Benzotriazol-2-yl)-4,6-di- <i>tert</i> -butylphenol	nd ~ 30 nd 4/44	0.080								
6	2,4-Di- <i>tert</i> -butyl-6-(5-chloro-2 <i>H</i> -1,2,3-benzotriazol-2-yl)phenol	nd ~ 28 nd 25/44	0.093								
7	2,4,5-Trichlorophenoxyacetic acid (2,4,5-T)	nd nd 0/42	0.38								
8	Nitrofen (NIP or (2,4-Dichloro-1-(4-nitrophenoxy)benzene)			nd nd 0/35	4.1						
9	3-Methyl-4-nitrophenol									Automobiles 110 ~ 1,100 250 6/6	0.06
10	Vinclozolin (<i>N</i> -3,5-Dichlorophenyl-5-methyl-5-vinyl-1,3-oxazolindine-2,4-dione)	nd nd 0/42	5.0	nd ~ 2.2 nd 1/35	0.43	nd nd 0/9	3.3				
11	Methoxychlor	nd nd 0/42	2.0	nd ~ 7.3 nd 1/35	2.6	nd nd 0/9	1.8				
12	2-Chloro-2',6'-diethyl- <i>N</i> -(2-propoxyethyl)acetanilide (Pretilachlor)	nd ~ 1,700 30 4/4	3.5			nd nd 0/5	1.1				
13	Diisopropyl 1,3-dithiolan-2-ylidenemalonate (Isoprothiolan)	nd ~ 1,800 64 9/9	6.2			nd nd 0/5	1.0				
14	<i>O,O</i> -Diethyl S-(2-ethylthioethyl) dithiophosphate (Ethylthiometon or Disulfoton)	nd nd 0/6	30			nd ~ tr(1.2) nd 1/3	1.0				
15	<i>S</i> -(2,3-Dihydro-5-methoxy-2-oxo-1,3,4-thiadiazol-3-yl) methyl <i>O,O</i> -dimethyl dithiophosphate	nd ~ tr(40) nd 1/6	15			nd nd 0/3	1.2				

Target chemicals		Surface water [ng/L]		Sediment [ng/g-dry]		Wildlife [ng/g-wet]		Food [ng/g-wet]		Indoor air [ng/m ³]	
No.	Name	Range Median Frequency	Detection limit	Range Median Frequency	Detection limit	Range Median Frequency	Detection limit	Range Median Frequency	Detection limit	Range Median Frequency	Detection limit
	(Methidathion or DMTP)										
16	<i>O,O</i> -Diethyl <i>O</i> -5-phenylisoxazol-3-yl phosphorothioate (Isoxathion)	nd nd 0/7	22								
17	<i>O,O</i> -Dimethyl <i>O</i> -3-methyl-4-(methylthio)phenyl phosphorothioate (Fenthion OR MPP)	nd ~ 76 nd 2/6	10								
18	<i>S</i> -Benzyl- <i>O,O</i> -diisopropyl phosphorothioate (Iprobenfos or IBP)	nd ~ 1,900 69 8/8	12								
19	Trichloronitromethane (Chloropicrine)	nd nd 0/1	30								
20	α,α,α -Trifluoro-2,6-dinitro- <i>N,N</i> -dip ropyl- <i>p</i> -toluidine (Tifluralin)	nd ~ tr(4.2) nd 2/6	2.8			nd ~ 2.5 nd 1/3	0.58				
21	1-Naphthyl <i>N</i> -methylcarbamate (Carbaryl or NAC)	nd nd 0/1	14			nd nd 0/1	1.3				

(Note 1) Detection frequency is based on the number of sites or areas for all the surveyed media except food and indoor air where detection frequency is based of the number of samples. Detection range and median are 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 2) □ means the medium was not surveyed.

(Note 3) □ is the sum value of for detection limits of each congener, and therefore a detection range that does not exceed this value can be shown instead of “nd”.