

# Chapter 1 Results of the Initial Environmental Survey in FY2019

## 1. Purpose of the survey

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

## 2. Target chemicals

In the FY2019 Initial Environmental Survey, 22 chemicals (groups) that were selected and designated as target chemicals. The combinations of target chemicals and the surveyed media are given below.

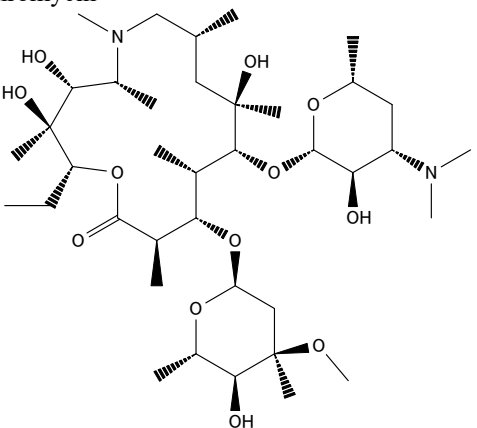
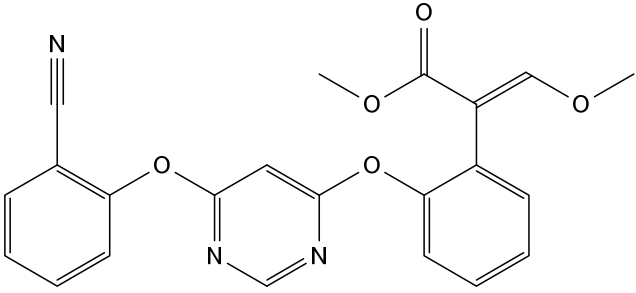
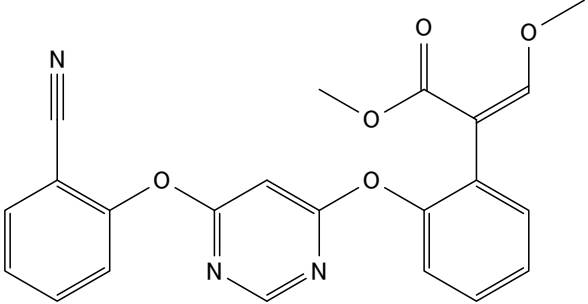
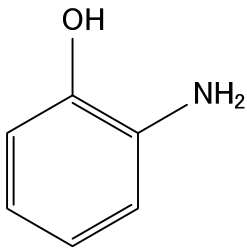
No.	Name	The Chemical Substances Control Law *1,2		The PRTR Law *3		Surveyed media	
		Before the revision	After the revision	2000-	2008-	Surface water	Air
[1]	Azithromycin					○	
[2]	Azoxystrobins						
	[2-1] Methyl ( <i>E</i> )-2-{2-[6-(2-cyanophenoxy)pyrimidin-4-yloxy]phenyl}-3-methoxyacrylate (synonym: ( <i>E</i> )-Azoxystrobin)				I 431	○	
	[2-2] Methyl ( <i>Z</i> )-2-{2-[6-(2-cyanophenoxy)pyrimidin-4-yloxy]phenyl}-3-methoxyacrylate (synonym: ( <i>Z</i> )-Azoxystrobin)					○	
[3]	<i>o</i> -Aminophenol					○	
[4]	Amoxicillin					○	
[5]	Cyanamide	II Monitored			I 137	○	
[6]	1,3-Dioxorane	II Monitored			I 151		○
[7]	3-[[[(Dimethylamino)carbonyl]oxy]-1-methylpyridinium (synonym: Pyridostigmine)					○	
[8]	(4-{{4-(Dimethylamino)phenyl}(phenyl)methylidene}cyclohexa-2,5-dien-1-ylidene)(dimethylammonium chloride (synonym: Malachite green)	II Monitored III Monitored			II 51	○	
[9]	<i>N,N</i> -Dimethylbiguanide hydrochloride (as <i>N,N</i> -Dimethylbiguanide) (synonym: Metformin hydrochloride (as Metformin))					○	
[10]	Cerium and its compounds (as Cerium)					○	
[11]	Thallium and its compounds (as Thallium)					○	○
[12]	2-(1,3-Thiazol-4-yl)-1 <i>H</i> -benzimidazole (synonym: Thiabendazole)				II 55	○	
[13]	Tiamulin					○	
[14]	<i>N</i> -Nitrosodiethylamine					○	○
[15]	<i>N</i> -Nitrosodimethylamine					○	○
[16]	Valproic Acid					○	
[17]	Pyridine	II Monitored		I 259	I 342		○
[18]	Pyrimethanil					○	
[19]	3-Benzylidene camphor					○	
[20]	Benzyl- <i>p</i> -hydroxybenzoate (synonym: Benzylparaben)					○	
[21]	Polyfluoroacetic acids						
	[21-1] Monofluoroacetic acid					○	
	[21-2] Difluoroacetic acid					○	
	[21-3] Trifluoroacetic acid					○	
[22]	Levofloxacin					○	

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

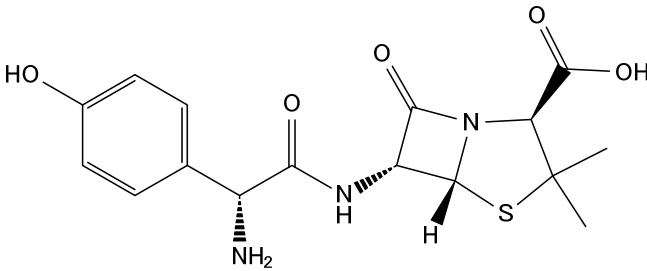
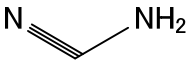
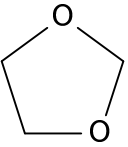
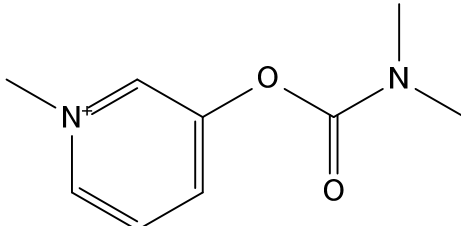
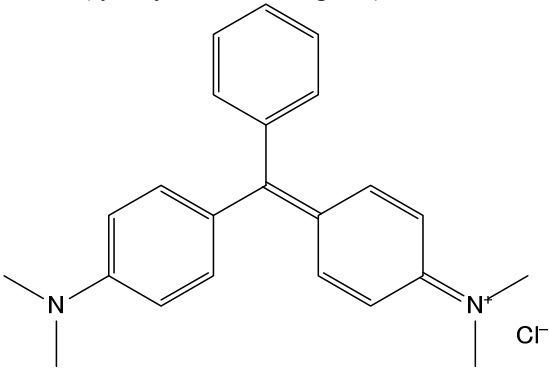
(Note 2) "Before the revision" in "The Chemical Substances Control Law" means designation before the May 20, 2009 revision of the law (enforced April 1, 2011), and "After the revision" means designation after the law revision.

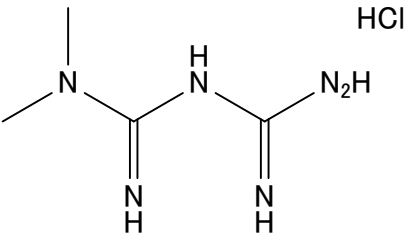


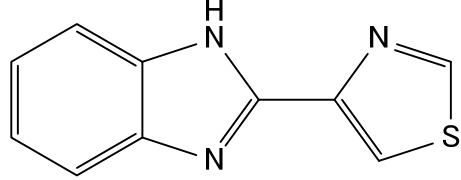
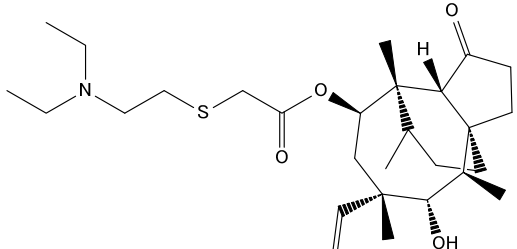
(Note 3) "2000-" in the "The PRTR Law" means designation at the time of enactment of government ordinance of the law on June 7, 2000, and "2008-" means the designation after the revision of the government ordinance on November 21, 2008.

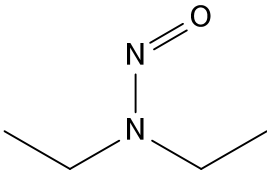
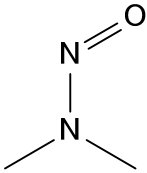
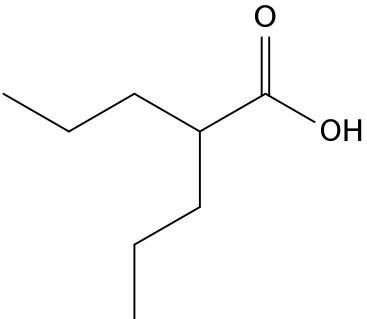
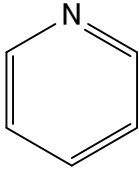
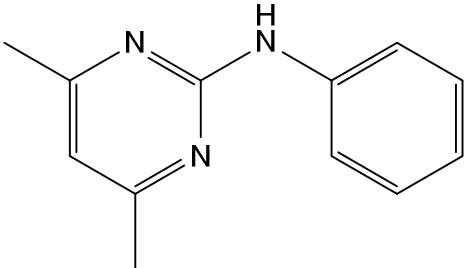
Chemical and physical properties of target chemicals of the Initial Environmental Survey are as follows.

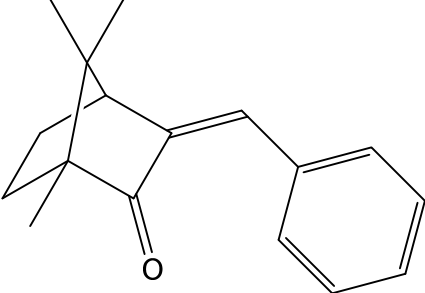
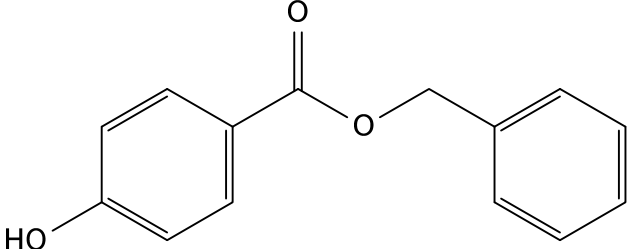
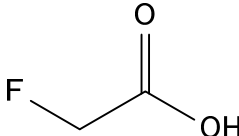
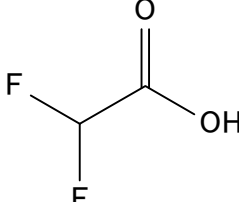
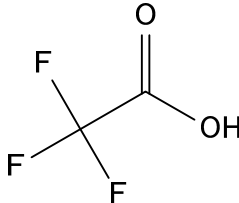
<p>[1] Azithromycin</p> 	<p>Molecular formula: C<sub>38</sub>H<sub>72</sub>N<sub>2</sub>O<sub>12</sub>            CAS: 83905-01-5            ENCS: No pertinence            MW: 748.98            mp: 113-115°C<sup>1)</sup>            bp: Uncertain            sw: 6.204 x 10<sup>-5</sup> g/L (25°C)<sup>2)</sup>            Specific gravities: Uncertain            logPow: 4.02<sup>2)3)</sup></p>
<p>[2] Azoxystrobins</p>	
<p>[2-1] Methyl (<i>E</i>)-2-{2-[6-(2-cyanophenoxy)pyrimidin-4-yloxy]phenyl}-3-methoxyacrylate (synonym: (<i>E</i>)-Azoxystrobin)</p> 	<p>Molecular formula: C<sub>22</sub>H<sub>17</sub>N<sub>3</sub>O<sub>5</sub>            CAS: 131860-33-8            ENCS: No pertinence            MW: 403.4            mp: 118 - 119°C<sup>1)</sup>            bp: Uncertain            sw: 0.01g/L (25°C)<sup>1)</sup>            Specific gravities: 1.33<sup>3)</sup>            logPow: 2.5 (20°C)<sup>3)</sup></p>
<p>[2-2] Methyl (<i>Z</i>)-2-{2-[6-(2-cyanophenoxy)pyrimidin-4-yloxy]phenyl}-3-methoxyacrylate (synonym: (<i>Z</i>)-Azoxystrobin)</p> 	<p>Molecular formula: C<sub>22</sub>H<sub>17</sub>N<sub>3</sub>O<sub>5</sub>            CAS: 143130-94-3            ENCS: No pertinence            MW: 403.4            mp: Uncertain            bp: Uncertain            sw: Uncertain            Specific gravities: Uncertain            logPow: Uncertain</p>
<p>[3] <i>o</i>-Aminophenol</p> 	<p>Molecular formula: C<sub>6</sub>H<sub>7</sub>NO            CAS: 95-55-6            ENCS: 3-675            MW: 109.13            mp: 173.5°C<sup>4)</sup>            bp: 267°C<sup>4)</sup>            sw: 19.6 g/kg (20°C)<sup>4)</sup>            Specific gravities: 1.328 g/cm<sup>3</sup><sup>3), 4)</sup>            logPow: 0.62<sup>3), 5)</sup></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, Specific gravities Specific gravity(no unit) or density, logPow *n*-octanol-water partition coefficient, kPa kilopascal (1 atm approximately equal to 101.3kPa).

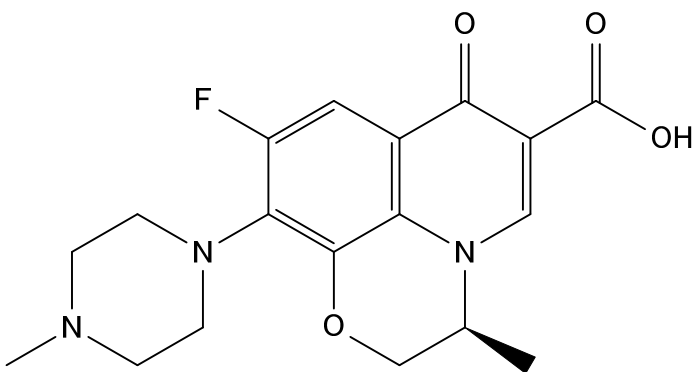
<p>[4] Amoxicillin</p> 	<p>Molecular formula: C<sub>16</sub>H<sub>19</sub>N<sub>3</sub>O<sub>5</sub>S  CAS: 26787-78-0  ENCs: No pertinence  MW: 365.40  mp: Uncertain  bp: Uncertain  sw: 3.433g/L (25°C)<sup>2)</sup>  Specific gravities: Uncertain  logPow: 0.87<sup>2),3)</sup></p>
<p>[5] Cyanamide</p> 	<p>Molecular formula: CH<sub>2</sub>N<sub>2</sub>  CAS: 420-04-2  ENCs: 1-139  MW: 42.04  mp: 45.55°C<sup>4)</sup>  bp: 140°C<sup>4)</sup>  sw: 651.5g/L (25°C)<sup>2)</sup>  Specific gravities: 1.282 g/cm<sup>3</sup> (20°C/4°C)<sup>1)3)4)</sup>  logPow: -0.82 (20°C)<sup>3)</sup></p>
<p>[6] 1,3-Dioxorane</p> 	<p>Molecular formula: C<sub>3</sub>H<sub>6</sub>O<sub>2</sub>  CAS: 646-06-0  ENCs: 5-500  MW: 74.08  mp: -97.21°C<sup>4)</sup>  bp: 75.3°C<sup>4)</sup>  sw: 276.9g/L (25°C)<sup>2)</sup>  Specific gravities: 1.060 g/cm<sup>3</sup><sup>3),4)</sup>  logPow: -0.37<sup>3)</sup></p>
<p>[7] 3-[[[(Dimethylamino)carbonyl]oxy]-1-methylpyridinium (synonym: Pyridostigmine)</p> 	<p>Molecular formula: C<sub>9</sub>H<sub>13</sub>N<sub>2</sub>O<sub>2</sub>  CAS: 155-97-5  ENCs: No pertinence  MW: 181.24  mp: Uncertain  bp: Uncertain  sw: Uncertain  Specific gravities: Uncertain  logPow: Uncertain</p>
<p>[8] (4-[[4-(Dimethylamino)phenyl](phenyl)methylidene]cyclohexa-2,5-dien-1-ylidene)(dimethyl)ammonium chloride (synonym: Malachite green)</p> 	<p>Molecular formula: C<sub>23</sub>H<sub>25</sub>ClN<sub>2</sub>  CAS: 569-64-2  ENCs: 5-2033  MW: 364.95  mp: Uncertain  bp: Uncertain  sw: 1.486g/L (25°C)<sup>2)</sup>  Specific gravities: Uncertain  logPow: 0.62<sup>3)</sup></p>

<p>[9] <i>N,N</i>-Dimethylbiguanide hydrochloride (as <i>N,N</i>-Dimethylbiguanide) (synonym: Metformin hydrochloride (as Metformin))</p> 	<p>Molecular formula: C<sub>4</sub>H<sub>11</sub>N<sub>5</sub>, HCl (<i>N,N</i>-Dimethyl biguanide hydrochloride), C<sub>4</sub>H<sub>11</sub>N<sub>5</sub> (<i>N,N</i>- Dimethyl biguanide)</p> <p>CAS: 1115-70-4 (<i>N,N</i>-Dimethyl biguanide hydrochloride), 657-24-9 (<i>N,N</i>- Dimethyl biguanide)</p> <p>ENCS: 2-2883 (<i>N,N</i>-Dimethyl biguanide hydrochloride),</p> <p>MW: 165.62 (<i>N,N</i>-Dimethyl biguanide hydrochloride), 129.16 (<i>N,N</i>- Dimethyl biguanide)</p> <p>mp: 232°C<sup>1)</sup> (<i>N,N</i>-Dimethyl biguanide hydrochloride)</p> <p>bp: Uncertain</p> <p>sw: 1,000g/L (25°C)<sup>2)</sup> (Both <i>N,N</i>-Dimethyl biguanide hydrochloride and <i>N,N</i>-Dimethyl biguanide)</p> <p>Specific gravities: Uncertain</p> <p>logPow: -2.64 ( 25°C )<sup>3)</sup> (Both <i>N,N</i>-Dimethyl biguanide hydrochloride and <i>N,N</i>-Dimethyl biguanide)</p>
<p>[10] Cerium and its compounds (as Cerium)</p> 	<p>Molecular formula: Not specified</p> <p>CAS: 7440-45-1 (Cerium) etc.</p> <p>ENCS: Not specified</p> <p>MW: Not specified</p> <p>mp: Not specified</p> <p>bp: Not specified</p> <p>sw: Not specified</p> <p>Specific gravities: Not specified</p> <p>logPow: Not specified</p>
<p>[11] Thallium and its compounds (as Thallium)</p> 	<p>Molecular formula: Not specified</p> <p>CAS: 7440-28-0 (Thallium) etc.</p> <p>ENCS: Not specified</p> <p>MW: Not specified</p> <p>mp: Not specified</p> <p>bp: Not specified</p> <p>sw: Not specified</p> <p>Specific gravities: Not specified</p> <p>logPow: Not specified</p>
<p>[12] 2-(1,3-Thiazol-4-yl)-1<i>H</i>-benzimidazole (synonym: Thiabendazole)</p> 	<p>Molecular formula: C<sub>10</sub>H<sub>7</sub>N<sub>3</sub>S</p> <p>CAS: 148-79-8</p> <p>ENCS: 9-820, 9-1851</p> <p>MW: 201.25</p> <p>mp: 304-305°C<sup>1)</sup></p> <p>bp: Uncertain</p> <p>sw: 0.3352g/L (25°C)<sup>2)</sup></p> <p>Specific gravities: Uncertain</p> <p>logPow: 2.47<sup>3)</sup></p>
<p>[13] Tiamulin</p> 	<p>Molecular formula: C<sub>28</sub>H<sub>47</sub>NO<sub>4</sub>S</p> <p>CAS: 55297-95-5</p> <p>ENCS: No pertinence</p> <p>MW: 493.74</p> <p>mp: Uncertain</p> <p>bp: Uncertain</p> <p>sw: 0.0006957g/L (25°C)<sup>2)</sup></p> <p>Specific gravities: Uncertain</p> <p>logPow: Uncertain</p>

<p>[14] <i>N</i>-Nitrosodiethylamine</p> 	<p>Molecular formula: C<sub>4</sub>H<sub>10</sub>N<sub>2</sub>O  CAS: 55-18-5  ENCs: No pertinence  MW: 102.14  mp: Uncertain  bp: 172°C<sup>4)</sup>  sw: 106g/kg (24°C)<sup>4)</sup>  Specific gravities: 0.9422 (20°C/4°C)<sup>1), 3), 4)</sup>  logPow: 0.48<sup>3)</sup></p>
<p>[15] <i>N</i>-Nitrosodimethylamine</p> 	<p>Molecular formula: C<sub>2</sub>H<sub>6</sub>N<sub>2</sub>O  CAS: 62-75-9  ENCs: No pertinence  MW: 74.08  mp: Uncertain  bp: 146°C<sup>4)</sup>  sw: 410.4g/L (25°C)<sup>4)</sup>  Specific gravities: 1.0048g/cm<sup>3</sup> (20°C/4°C)<sup>1), 3), 4)</sup>  logPow: -0.57<sup>3), 5)</sup></p>
<p>[16] Valproic Acid</p> 	<p>Molecular formula: C<sub>8</sub>H<sub>16</sub>O<sub>2</sub>  CAS: 99-66-1  ENCs: 2-608 Alkanoic acid (The number of carbon atoms is 4 – 30)  MW: 144.21  mp: Uncertain  bp: 219.5°C<sup>1), 3)</sup>  sw: 0.8946g/L (25°C)<sup>2)</sup>  Specific gravities: 0.9215 (0°C/4°C)<sup>1), 2)</sup>  logPow: 2.75<sup>3)</sup></p>
<p>[17] Pyridine</p> 	<p>Molecular formula: C<sub>5</sub>H<sub>5</sub>N  CAS: 110-86-1  ENCs: 5-710  MW: 79.10  mp: -41.63°C<sup>4)</sup>  bp: 115.2°C<sup>4)</sup>  sw: 729.8 g/L (25°C)<sup>2)</sup>  Specific gravities: 0.9819g/cm<sup>3</sup><sup>4)</sup>,  0.98272 (20°C/4°C)<sup>1), 3)</sup>  logPow: 0.65<sup>2), 3), 4), 5)</sup></p>
<p>[18] Pyrimethanil</p> 	<p>Molecular formula: C<sub>12</sub>H<sub>13</sub>N<sub>3</sub>  CAS: 53112-28-0  ENCs: No pertinence  MW: 199.25  mp: 96.3°C<sup>1), 3)</sup>  bp: Uncertain  sw: 0.121g/L (24°C)<sup>1)</sup>  Specific gravities: 1.15g/cm<sup>3</sup> (20°C)<sup>3)</sup>  logPow: 2.48<sup>1), 2), 3)</sup></p>

<p>[19] 3-Benzylidene camphor</p> 	<p>Molecular formula: C<sub>17</sub>H<sub>20</sub>O  CAS: 15087-24-8  ENCS: No pertinence  MW: 240.34  mp: Uncertain  bp: Uncertain  sw: 0.0006893g/L (25°C)<sup>2)</sup>  Specific gravities: Uncertain  logPow: Uncertain</p>
<p>[20] Benzyl-<i>p</i>-hydroxybenzoate (synonym: Benzylparaben)</p> 	<p>Molecular formula: C<sub>14</sub>H<sub>12</sub>O<sub>3</sub>  CAS: 94-18-8  ENCS: 9-1325  MW: 228.25  mp: Uncertain  bp: Uncertain  sw: 0.1078g/L (25°C)<sup>2)</sup>  Specific gravities: Uncertain  logPow: 3.56<sup>2)</sup></p>
<p>[21] Polyfluoroacetic acids</p>	
<p>[21-1] Monofluoroacetic acid</p> 	<p>Molecular formula: C<sub>2</sub>H<sub>3</sub>FO<sub>2</sub>  CAS: 144-49-0  ENCS: No pertinence  MW: 78.04  mp: 35.2°C<sup>3), 4)</sup>  bp: 168°C<sup>3), 4)</sup>  sw: 310.2 g/L (25°C)<sup>2)</sup>  Specific gravities: 1.3693g/cm<sup>3 3), 4)</sup>  logPow: Uncertain</p>
<p>[21-2] Difluoroacetic acid</p> 	<p>Molecular formula: C<sub>2</sub>H<sub>2</sub>F<sub>2</sub>O<sub>2</sub>  CAS: 381-73-7  ENCS: No pertinence  MW: 96.03  mp: -1°C<sup>4)</sup>  bp: 133°C<sup>4)</sup>  sw: 366.6g/L (25°C)<sup>2)</sup>  Specific gravities: 1.526 g/cm<sup>3 4)</sup>  logPow: Uncertain</p>
<p>[21-3] Trifluoroacetic acid</p> 	<p>Molecular formula: C<sub>2</sub>HF<sub>3</sub>O<sub>2</sub>  CAS: 76-05-1  ENCS: 2-1185  MW: 114.02  mp: -15.2°C<sup>4)</sup>  bp: 72°C<sup>4)</sup>  sw: 97.45 g/L (25°C)<sup>2)</sup>  Specific gravities: 1.5351g/cm<sup>3 4)</sup>  logPow: -2.1<sup>5)</sup></p>

[22] Levofloxacin



Molecular formula: C<sub>18</sub>H<sub>20</sub>FN<sub>3</sub>O<sub>4</sub>  
CAS: 100986-85-4  
ENCS: No pertinence  
MW: 361.37  
mp: 225 - 227°C <sup>1), 3)</sup>  
bp: Uncertain  
sw: Uncertain  
Specific gravities: Uncertain  
logPow: -0.39 <sup>3)</sup>

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/episuite.html>)
- 3) U.S. National Library of Medicine, Hazardous Substances Data Bank (HSDB) (<https://pubchem.ncbi.nlm.nih.gov/>, Browse the site in October 2020.)
- 4) Rumble, J.R. (ed), CRC Handbook of Chemistry and Physics 98th Edition (2017), The Royal society of Chemistry.
- 5) International Programme on Chemical Safety, International Chemical Safety Cards (ICSC) ([http://www.ilo.org/safework/info/publications/WCMS\\_113134/lang--en/index.htm](http://www.ilo.org/safework/info/publications/WCMS_113134/lang--en/index.htm), Browse the site in October 2020.)

### 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	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 Environmental Science Research Center	○	○
Ibaraki Pref.	Ibaraki Kasumigaura Environmental Science Center	○	○
Tochigi Pref.	Tochigi Prefectural Institute of Public Health and Environmental Science	○	
Gunma Pref.	Gunma Prefectural Institute of Public Health and Environmental Sciences	○	
Saitama Pref.	Center for Environmental Science in Saitama	○	○
Saitama City	Saitama City Institute of Health Science and Research	○	○
Chiba Pref.	Chiba Prefectural Environmental Research Center	○	○
Tokyo Met.	Environmental Improvement Division, Bureau of Environment, Tokyo Metropolitan Government and Tokyo Metropolitan Research Institute for Environmental Protection	○	○
Kanagawa Pref.	Kanagawa Environmental Research Center		○
Yokohama City	Yokohama Environmental Science Research Institute	○	○
Kawasaki City	Kawasaki Environment Research Institute	○	
Niigata Pref.	Niigata Prefectural Institute of Public Health and Environmental Sciences	○	
Toyama Pref.	Environment Preservation Division, Living Environmental and Cultural Affairs Department, Toyama Prefectural Government and 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, Regional Environmental measures Division, Environmental Bureau, Nagoya city	○	○
Mie Pref.	Mie Prefecture Health and Environment Research Institute	○	○
Shiga Pref.	Lake Biwa Environmental Research Institute	○	○
Kyoto Pref.	Kyoto Prefectural Institute of Public Health and Environment	○	
Kyoto City	Kyoto City Institute of Health and Environmental Sciences	○	○
Osaka Pref.	Environment Preservation Division, Environment Management Office, Department of Environment, Agriculture, Forestry and Fisheries, Osaka Prefectural Government	○	○*2
Osaka City	Osaka City Institute of Public Health and Environmental Sciences	○	
Hyogo Pref.	Water and Air 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 Preservation Branch, Environment Bureau, Kobe City and Kobe Institute of Health, Welfare Bureau, Health Division, Health	○	
Nara Pref.	Nara Prefecture Landscape and Environment Center	○	
Wakayama Pref.	Wakayama Prefectural Research Center of Environment and Public Health	○	
Okayama Pref.	Okayama Prefectural Institute for Environmental Science and Public Health	○	
Yamaguchi Pref.	Yamaguchi Prefectural Institute of Public Health and Environment	○	○
Tokushima Pref.	Tokushima Prefectural Public Health, Pharmaceutical and Environmental Sciences Center	○	○
Kagawa Pref.	Kagawa Prefectural Research Institute for Environmental Sciences and Public Health	○	○
Ehime Pref.	Ehime Prefectural Institute of Public Health and Environmental Science	○	
Fukuoka Pref.	Fukuoka Institute of Health and Environmental Sciences	○	
Kitakyushu City	Kitakyushu City Institute of Health and Environmental Sciences	○	
Fukuoka City	Fukuoka City Institute for Hygiene and the Environment	○	
Saga Pref.	Saga Prefectural Environmental Research Center	○	○



Local communities	Organisations responsible for sampling *1	Surveyed media	
		Surface water	Air
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	○	○
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 2019.

(Note 2) \*2: That organization cooperated with a private analytical laboratory in sampling specimens

## (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 1-1-1 and Fig.1-1-1 for surface water, Table 1-1-2 and Fig.1-1-2 for air.

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

Surveyed media	Numbers of local communities	Numbers of target chemicals (groups)	Numbers of surveyed sites	Numbers of samples at a surveyed site
Surface water	45	20	70	1
Air	24*	5	26	3
All media	46	22	96	

(Note) \*: For 1 of the 24 organization, it was cooperated with a private analytical laboratory in sampling specimens.

## (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.

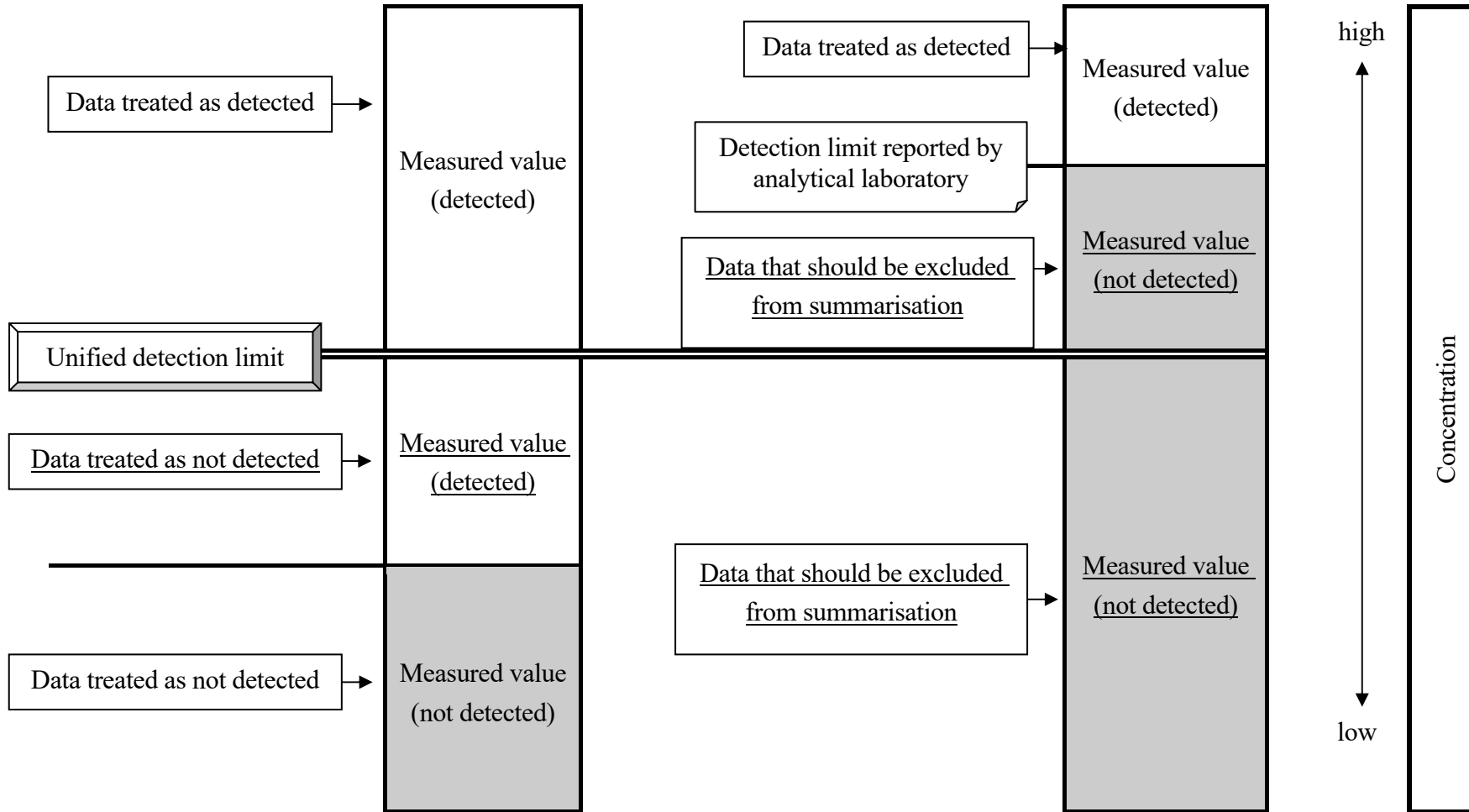
When the analytical laboratory calculates the appropriate IDL and MDL following the calculation method stated in the analytical method development instruction manuals, this calculated MDL is used as the detection limit by the analytical laboratory.

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

(A) Detection limit reported by analytical laboratory  $\leq$  Unified detection limit

(B) Detection limit reported by analytical laboratory  $>$  Unified detection limit



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 FY2019

Local communities	Surveyed sites	Target chemicals																					
		[1]	[2]	[3]	[4]	[5]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[18]	[19]	[20]	[21]	[22]		
Hokkaido	Suzuran-ohashi Bridge, Riv Tokachi (Obihiro City)	○	○		○		○		○	○	○			○	○	○				○			
	Inou-ohashi Bridge, Riv. Ishikari (Asahikawa City)	○	○		○		○		○	○	○			○	○	○	○		○				
	Ishikarikakokyo Bridge, Mouth of Riv. Ishikari (Ishikari City)	○	○		○	○	○	○	○	○	○	○			○		○		○	○	○		
	Tomakomai Port			○		○			○									○					
Sapporo City	Nakanuma of Riv. Toyohira (Sapporo City)							○													○		
	Daiichishinkawa-bashi Bridge, Riv. Shin (Sapporo City)	○						○		○											○		
Iwate Pref.	Toyosawa-bashi Bridge, Riv. Toyosawa (Hanamaki City)		○	○	○					○		○	○	○	○		○		○				
Miyagi Pref.	Futatsuya-bashi Bridge, Riv. Hasama (Tome City)		○			○						○						○					
	Sakura-hodoukyou Bridge, Riv. Shiroishi (Shibata Town)		○			○						○						○					
Sendai City	Hirose-ohashi Bridge, Riv. Hirose (Sendai City)									○	○					○							
Akita Pref.	Akita Canal (Akita City)													○	○	○		○	○	○	○		
Yamagata Pref.	Mouth of Riv. Mogami (Sakata City)		○	○		○		○				○		○	○		○			○	○		
	Goten-bashi Bridge, Riv. Mogami (Murayama City)																		○				
Ibaraki Pref.	Tonekamome-ohashi Bridge, Mouth of Riv. Tone (Kamisu City)	○	○	○	○	○		○	○	○	○	○	○	○	○		○		○				
Tochigi Pref.	Tagawa Kyubun Area Head Works, Riv. Tagawa (Utsunomiya City)		○		○			○		○	○		○						○				
Gunma Pref.	Okuhara-bashi Bridge, Riv. Arato (Maebashi City)													○	○								
Saitama Pref.	Akigaseshusuizeki of Riv. Arakawa (Shiki City)		○			○								○	○		○						
Saitama City	Nakadote-hashii 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)	○	○	○				○	○		○		○				○	○	○	○			
	Front of Chidori Town, Keihin Canal, Port of Kawasaki	○							○											○	○		
	Front of Ougi Town, Keihin Canal, Port of Kawasaki *				○		○	○								○		○			○		
Niigata Pref.	Lower Riv. Shinano (Niigata City)			○			○		○		○	○	○	○			○			○	○		
Toyama Pref.	Offshore of Uozu City, Toyama Bay					○																	
Ishikawa Pref.	Mouth of Riv. Sai (Kanazawa City)	○			○	○	○	○			○	○		○	○	○		○	○	○	○		
Nagano Pref.	Tategahana-bashi Bridge, Riv. Shinano (Nakano City)		○					○					○			○	○	○					
	Lake Suwa (center)			○								○	○		○	○				○	○		
Shizuoka Pref.	Shimizu Port			○								○	○				○						
	Kaketsuka-bashi Bridge, Riv. Tenryu (Iwata City)	○							○					○	○			○		○			
	Downstream of Riv. Yokosuka (Kosai City)													○	○					○			
Aichi Pref.	West of Shiomi Wharf, Nagoya Port			○	○	○	○	○	○	○	○	○	○			○	○		○	○			

Local communities	Surveyed sites	Target chemicals																					
		[1]	[2]	[3]	[4]	[5]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[18]	[19]	[20]	[21]	[22]		
Nagoya City	Minatoshinbashi Bridge, Riv. Hori (Nagoya City)	○	○		○	○	○		○		○			○	○		○	○		○			
	South of Shiomi Wharf, Nagoya Port			○						○													
Mie Pref.	Yokkaichi Port			○		○		○		○	○								○	○			
	Toba Port	○						○	○			○					○	○					
Shiga Pref.	Lake Biwa (center, offshore of Minamihira)			○									○						○	○			
	Lake Biwa (center, offshore of Karasaki)			○									○						○	○			
Kyoto Pref.	Miyazu Port			○			○					○	○								○		
	Gokou-bashi Bridge, Riv. Kizu (Yawata City)	○							○		○			○	○				○				
Kyoto City	Miyamae-bashi Bridge, Riv. Katsura (Kyoto City)						○						○					○					
Osaka Pref.	Mouth of Riv. Yamato (Sakai City)	○	○	○	○	○	○	○	○	○		○		○	○	○	○	○	○	○	○		
Osaka City	Kema-bashi Bridge, Riv. Oh-kawa (Osaka City)	○	○		○	○	○	○	○	○		○	○	○	○			○	○		○		
	Osaka Port	○	○		○	○	○	○	○	○		○	○	○	○			○	○		○		
Hyogo Pref.	Offshore of Himeji			○																	○		
Kobe City	Kobe Port (center)						○		○	○		○	○							○	○		
Nara Pref.	Taisho-bashi Bridge, Riv. Yamato (Oji Town)		○											○	○		○				○		
Wakayama Pref.	Kinokawa-ohashi Bridge, Mouth of Riv. Kinokawa (Wakayama City)	○			○	○	○	○	○			○	○	○	○			○	○	○	○		
Okayama Pref.	Sasagase-bashi Bridge, Riv. Sasagase (Okayama City)	○					○						○			○	○	○			○		
	Offshore of Mizushima			○						○	○					○	○			○			
Yamaguchi Pref.	Tokuyama Bay			○		○		○		○	○					○	○			○	○		
	Offshore of Hagi			○						○	○	○				○		○					
Tokushima Pref.	Kii-suido Channel		○																				
Kagawa Pref.	Takamatsu Port			○				○								○			○				
Ehime Pref.	Sawadu Fishing Port	○				○	○											○		○			
	Mishima area, Riv. Iwamatsu (Uwajima City)			○					○				○	○			○				○		
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.	Terada Sluice, Riv. Konoha (Tamana City)		○																				
Oita Pref.	Mouth of Riv. Oita (Oita City)	○			○		○		○			○		○	○	○		○	○	○	○		
Miyazaki Pref.	Matsubara-bashi Bridge, Riv. Heda (Kawaminami Town)				○									○									
	Takanabe-ohashi Bridge, Riv. Omaru (Takanabe Town)				○									○									
	Aioi-bashi Bridge, Riv. Ohyodo (Miyazaki City)				○									○									

[1] Azithromycin, [2] Azoxystrobins, [3] *o*-Aminophenol, [4] Amoxicillin, [5] Cyanamide, [7] 3-[[[(Dimethylamino)carbonyl]oxy]-1-methylpyridinium (synonym: Pyridostigmine), [8] (4-[[4-(Dimethylamino)phenyl](phenyl)methylidene]cyclohexa-2,5-dien-1-ylidene)(dimethyl)ammonium chloride (synonym: Malachite green), [9] *N,N*-Dimethylbiguanide hydrochloride (as *N,N*-Dimethylbiguanide) (synonym: Metformin hydrochloride (as Metformin)), [10] Cerium and its compounds (as Cerium), [11] Thallium and its compounds (as Thallium), [12] 2-(1,3-Thiazol-4-yl)-1*H*-benzoimidazole (synonym: Thiabendazole), [13] Tiamulin, [14] *N*-Nitrosodiethylamine, [15] *N*-Nitrosodimethylamine, [16] Valproic Acid, [18] Pyrimethanil, [19] 3-Benzylidene camphor, [20] Benzyl-*p*-hydroxybenzoate (synonym: Benzylparaben), [21] Polyfluoroacetic acids, [22] Levofloxacin

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

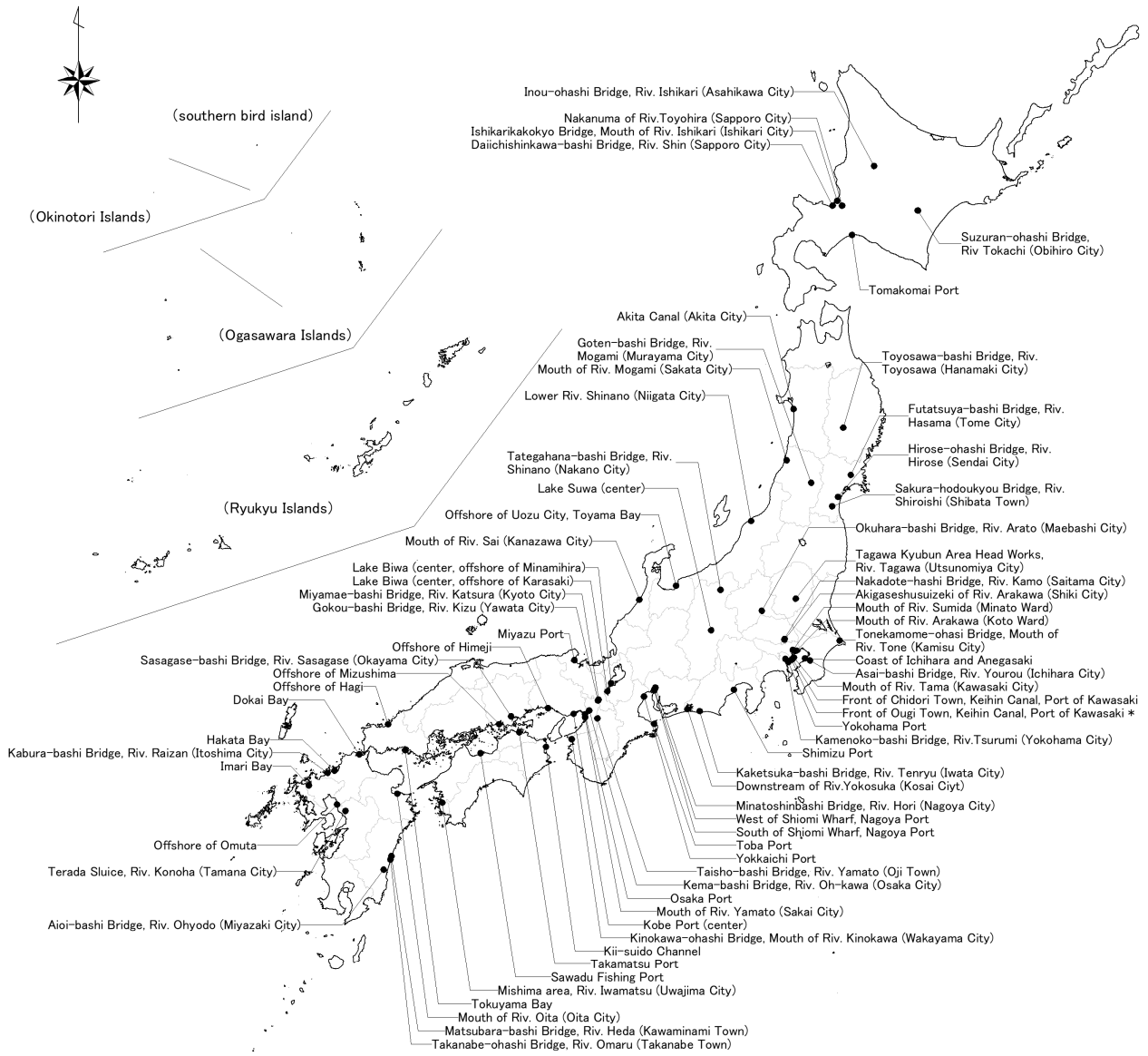


Figure 1-1-1 Surveyed sites (surface water) in the Initial Environmental Survey in FY 2019

Table 1-1-2 List of surveyed sites (air) and target chemicals in the Initial Environmental Survey in FY 2019

Local Communities	Surveyed sites	Target chemicals				
		[6]	[11]	[14]	[15]	[17]
Hokkaido	Hokkaido Research Organization Environmental and Geological Research Department Institute of Environmental Sciences (Sapporo City)			○	○	
Sendai City	Tsutsujigaoka Park (Sendai City)	○	○	○	○	○
Yamagata Pref.	Yamagata Environmental Science Research Center (Murayama City)					○
Ibaraki Pref.	Ibaraki Kasumigaura Environmental Science Center (Tsuchiura City)	○		○	○	
Saitama Pref.	Center for Environmental Science in Saitama (Kazo City)					○
Saitama City	Saitama City Public Health Center (Saitama City)					○
Chiba Pref.	Tougane-Horiage Air Quality Monitoring Station (Tougane City)					○
Tokyo Met.	Tokyo Metropolitan Research Institute for Environmental Protection (Koto Ward)			○	○	
	Chichijima Island (Ogasawara Village)			○	○	
Kanagawa Pref.	Kanagawa Environmental Research Center (Hiratsuka City)	○	○	○	○	○
Yokohama City	Yokohama Environmental Science Research Institute (Yokohama City)					○
Toyama Pref.	Namerikawa-Kamijima Air Quality Monitoring Station (Namerikawa City)					○
Ishikawa Pref.	Ishikawa Prefectural Institute of Public Health and Environmental Science (Kanazawa City)	○	○	○	○	○
Nagano Pref.	Nagano Environmental Conservation Research Institute (Nagano City)	○	○	○	○	○
Nagoya City	Chikusa Ward Heiwa Park (Nagoya City)	○	○	○	○	○
Mie Pref.	Mie Prefecture Health and Environment Research Institute (Yokkaichi City)	○	○	○	○	
Shiga Pref.	Higashiomi Air Quality Monitoring Station (Higashiomi City)	○				
Kyoto City	Fushimi Ward Office (Kyoto City)	○	○	○	○	
Osaka Pref.	Osaka Joint Prefectural Government Building, Building 2 Annex (Osaka City)	○	○	○	○	○
	Wangan Roadside Air Pollution Monitoring Station (Sakai City)	○	○	○	○	○
Hyogo Pref.	Ako City Government Building (Ako City)	○	○	○	○	○
Yamaguchi Pref.	Yamaguchi Prefectural Institute of Public Health and Environment (Yamaguchi City)	○		○	○	○
Tokushima Pref.	Tokushima Prefectural Public Health, Pharmaceutical and Environmental Sciences Center (Tokushima City)	○	○	○	○	○
Kagawa Pref.	Kagawa Prefectural Public Swimming Pool (Takamatsu City)	○	○	○	○	○
Saga Pref.	Saga Prefectural Environmental Research Center (Saga City)	○		○	○	○
Oita Pref.	Oita City Misa Elementary School (Oita City)	○	○	○	○	○

[6] 1,3-Dioxorane, [11] Thallium and its compounds (as Thallium), [14] *N*-Nitrosodiethylamine, [15] *N*-Nitrosodimethylamine, [17] Pyridine

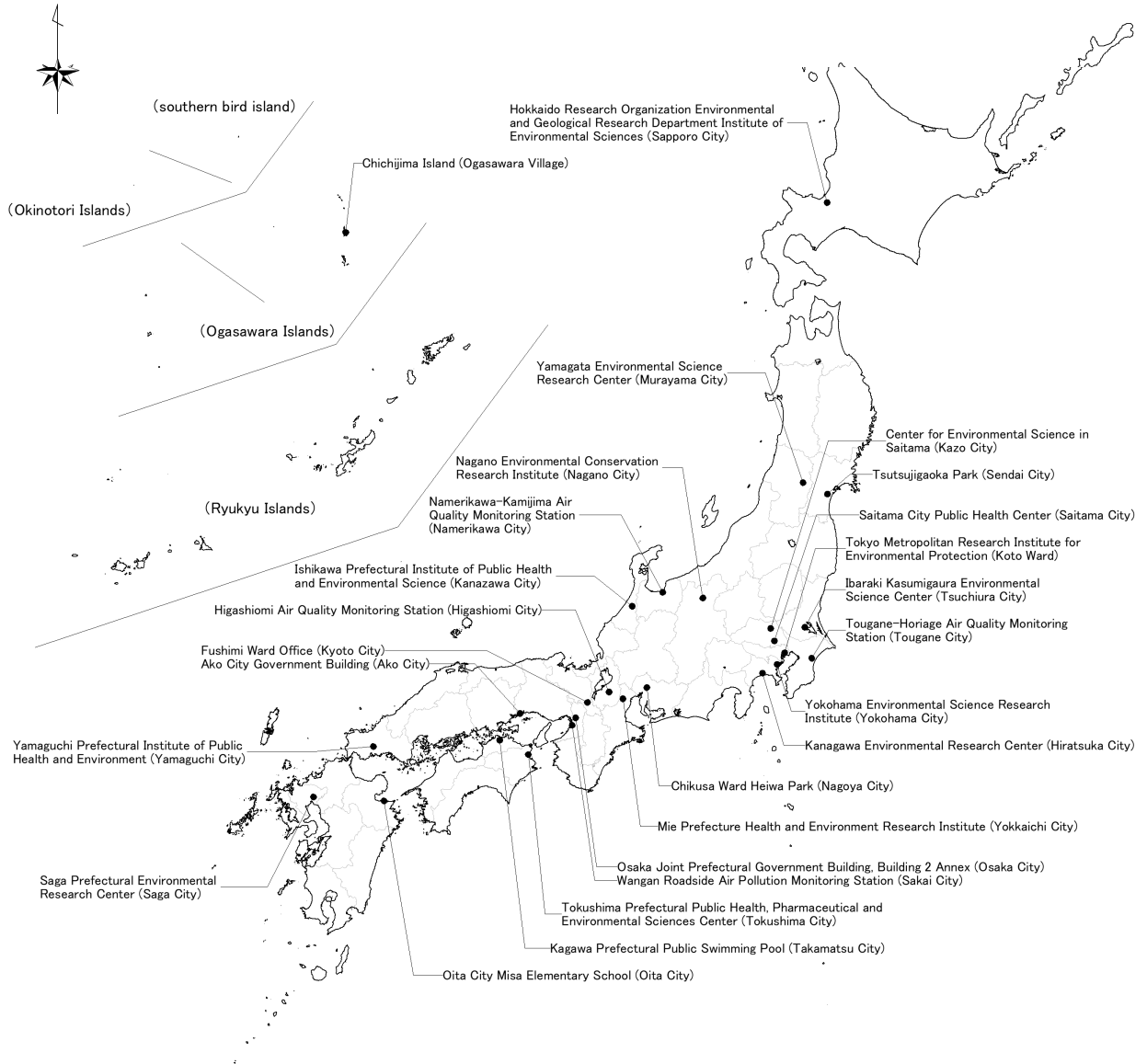


Figure 1-1-2 Surveied sites (air) in the Initial Environmental Survey in FY 2019



#### 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, 18 out of the 20 target chemicals (groups) were detected. Target chemicals were categorized by analytical methods such as structurally similar chemicals capable of simultaneous analyses.

- [1] Azithromycin: 9 of the 25 valid sites
- [2] Azoxystrobins
  - [2-1] Methyl (*E*)-2-{2-[6-(2-cyanophenoxy) pyrimidin-4-yloxy]phenyl}-3-methoxyacrylate (synonym: (*E*)-Azoxystrobin): 14 of the 28 valid sites
  - [2-2] Methyl (*Z*)-2-{2-[6-(2-cyanophenoxy) pyrimidin-4-yloxy]phenyl}-3-methoxyacrylate (synonym: (*Z*)-Azoxystrobin): 4 of the 28 valid sites
- [3] *o*-Aminophenol: 24 of the 25 valid sites
- [4] Amoxicillin: 15 of the 24 valid sites
- [5] Cyanamide: 14 of the 25 valid sites
- [7] 3-[[[(Dimethylamino)carbonyl]oxy]-1-methylpyridinium (synonym: Pyridostigmine) : 19 of the 26 valid sites
- [8] (4-{[4-(Dimethylamino)phenyl](phenyl)methylidene}cyclohexa-2,5-dien-1-ylidene)(dimethyl)ammonium chloride (synonym: Malachite green): 5 of the 23 valid sites
- [9] *N,N*-Dimethylbiguanide hydrochloride (as *N,N*-Dimethylbiguanide) (synonym: Metformin hydrochloride (as Metformin)): 26 of the 27 valid sites
- [10] Cerium and its compounds (as Cerium): all of the 25 valid sites
- [11] Thallium and its compounds (as Thallium): all of 24 valid sites
- [12] 2-(1,3-Thiazol-4-yl)-1*H*-benzoimidazole (synonym: Thiabendazole): 11 of the 26 valid sites
- [13] Tiamulin: 6 of the 27 valid sites
- [14] *N*-Nitrosodiethylamine: all of the 25 valid sites
- [15] *N*-Nitrosodimethylamine: all of the 26 valid sites
- [16] Valproic Acid: 9 of the 27 valid sites
- [20] Benzyl-*p*-hydroxybenzoate (synonym: Benzylparaben): 1 of the 27 valid sites
- [21] Polyfluoroacetic acids
  - [21-3] Trifluoroacetic acid: all of the 28 valid sites
- [22] Levofloxacin: 20 of the 26 valid sites

In air, 4 out of the 5 target chemicals were detected.

- [11] Thallium and its compounds (as Thallium): all of the 13 valid sites
- [14] *N*-Nitrosodiethylamine: all of the 19 valid sites
- [15] *N*-Nitrosodimethylamine: all of the 19 valid sites
- [17] Pyridine: all of the 19 valid sites

Table 1-2 Summary of the detection ranges and the detection limits in the Initial Environmental Survey in FY 2019

No.	Target chemicals	Surface water [ng/L]		Air [ng/m <sup>3</sup> ]	
		Detection range and frequency	Detection limit	Detection range and frequency	Detection limit
[1]	Azithromycin	nd - 130 9/25	1.7		
[2]	Azoxystrobins				
	[2-1] Methyl ( <i>E</i> )-2-{2-[6-(2-cyanophenoxy) pyrimidin-4-yloxy]phenyl}-3-methoxyacrylate (synonym: ( <i>E</i> )-Azoxystrobin)	nd - 100 14/28	1.1		
	[2-2] Methyl ( <i>Z</i> )-2-{2-[6-(2-cyanophenoxy) pyrimidin-4-yloxy]phenyl}-3-methoxyacrylate (synonym: ( <i>Z</i> )-Azoxystrobin)	nd - 0.52 4/28	0.39		
[3]	<i>o</i> -Aminophenol	nd - 77 24/25	2.3		
[4]	Amoxicillin *	nd - 2.3 15/24	0.013		
[5]	Cyanamide *	nd - 950 14/25	280		
[6]	1,3-Dioxorane *			nd 0/17	86
[7]	3-[[[(Dimethylamino)carbonyl]oxy]-1-methylpyridinium (synonym: Pyridostigmine)	nd - 18 19/26	0.043		
[8]	(4-{[4-(Dimethylamino)phenyl](phenyl)methylidene}cyclohexa-2,5-dien-1-ylidene)(dimethyl)ammonium chloride (synonym: Malachite green)	nd - 0.96 5/23	0.028		
[9]	<i>N,N</i> -Dimethylbiguanide hydrochloride (as <i>N,N</i> -Dimethylbiguanide) (synonym: Metformin hydrochloride (as Metformin))	nd - 3,600 26/27	0.17		
[10]	Cerium and its compounds (as Cerium)	4.3 - 1,200 25/25	0.15		
[11]	Thallium and its compounds (as Thallium)	3.4 - 100 24/24	0.14	0.0036 - 0.43 13/13	0.00020
[12]	2-(1,3-Thiazol-4-yl)-1 <i>H</i> -benzimidazole (synonym: Thiabendazole)	nd - 14 11/26	0.69		
[13]	Tiamulin *	nd - 3.1 6/27	0.013		
[14]	<i>N</i> -Nitrosodiethylamine	0.037 - 1.6 25/25	0.026	nd - 19 19/19	0.058
[15]	<i>N</i> -Nitrosodimethylamine	0.12 - 8.1 26/26	0.024	0.087 - 2.9 19/19	0.0075
[16]	Valproic Acid	nd - 24 9/27	3.1		
[17]	Pyridine *			nd - 54 19/19	2.4
[18]	Pyrimethanil	nd 0/26	2.1		
[19]	3-Benzylidene camphor	nd 0/28	23		
[20]	Benzyl- <i>p</i> -hydroxybenzoate (synonym: Benzylparaben)	nd - 0.31 1/27	0.29		
[21]	Polyfluoroacetic acids				
	[21-1] Monofluoroacetic acid	nd 0/28	0.76		
	[21-2] Difluoroacetic acid	nd 0/28	0.32		
	[21-3] Trifluoroacetic acid	47 - 420 28/28	8.2		
[22]	Levofloxacin	nd - 540 20/26	0.44		

(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.