Annex 1[33]
(Art. 9 and 10)

Concentration values for assessing the impact of polluted sites on ground and surface waters

1 In assessing the impact of polluted sites on waters, the concentration values in the following table apply. Where no concentration values are given in the table for potential water pollutants which are polluting a site, the authority shall specify a value on a case by case basis with the consent of the FOEN and according to the provisions of the legislation on waters protection.

2 Where the assessment is based on the eluate of the material of the site, the following requirements apply to sampling, preparation of the eluates and their analysis:

a. The number of samples and sampling points shall be chosen such that the samples are representative of the pollution of the site.

b. The eluate shall be prepared on the basis of a test column. The elution liquid used shall be oxygen-free deionised water. This must normally flow upwards through the column at a defined rate. Prior to analysis, the eluate may normally neither be centrifuged nor filtered in a microfilter.

c. The eluate need only be analysed in respect of those substances that are expected to occur at the site based on the historical investigation. In cases where lumped parameters only are analysed, the lowest concentration value of the individual substances shall be taken as the assessment criterion.

3 For sites with particularly heterogeneous pollution (e.g. waste disposal sites), if samples can be obtained from the seepage water, these may be regarded as equivalent to an eluate.

4 In assessing the impact of volatile substances[34], the seepage water shall be regarded as equivalent to an eluate. If it is not possible to take samples of the seepage water, pollutant concentrations shall be calculated based on measurements of interstitial air concentration.

5 An eluate test in accordance with paragraph 2 may be dispensed with if the pollutant concentration in the eluate of the material is assessable (i.e. to be above or below the concentration values) on the basis of other information, for example composition and origin of the material at the site, lumped parameters or ecotoxicological investigations, or can be calculated from total content.

6 The FOEN shall issue guidelines on sampling, preparation of eluates and their analysis, and on assessment of the impact of volatile substances.

33 Revised by Annex No II 2 of the O of 26 Sept. 2008 on the Charge for the Remediation of Contaminated Sites (AS **2008** 4771), No II of the O of 9 May 2012 (AS **2012** 2905) and of 22 March 2017, in force since 1 May 2017 (AS **2017** 2589).

34 Indicated in the table by *.

Substance	Concentration value
Inorganic substances	
Antimony	0.01 mg Sb/l
Arsenic	0.05 mg As/l
Lead	0.05 mg Pb/l
Cadmium	0.005 mg Cd/l
Chromium (VI)	0.02 mg CrVI/l
Cobalt	2 mg Co/l
Copper	1.5 mg Cu/l
Nickel	0.7 mg Ni/l
Mercury	0.001 mg Hg/l
Silver	0.1 mg Ag/l
Zinc	5 mg Zn/l
Tin	20 mg Sn/l
Ammonium**	0.5 mg NH_4^+/l
Cyanide (free)	0.05 mg CN-/l
Fluoride	1.5 mg F-/l
Nitrite**	0.1 mg NO_2^-/l
Organic substances	
Aliphatic hydrocarbons:	
– Total (C_5–C_{10})	2 mg/l
– Methyl tert-butyl ether (MTBE)	0.2 mg/l
Amines	
– Aniline	0.05 mg/l
– 4-aniline chloride	0.1 mg/l
Halogenated hydrocarbons	
– 1,2-Dibromoethane (EDB)	0.05 µg/l[a]
– 1,1-Dichloroethane*	3 mg/l
– 1,2-Dichloroethane (EDC)*	0.003 mg/l
– 1,1-Dichloroethene*	0.03 mg/l
– 1,2-Dichloroethene (cis and trans)*	0.05 mg/l
– Dichloromethane (methylene chloride, DCM)*	0.02 mg/l
– 1,2-Dichloropropane*	0.005 mg/l
– 1,1,2,2-Tetrachloroethane	0.001 mg/l
– Tetrachloroethene (PERC)	0.04 mg/l
– Tetrachloromethane (carbon tetrachloride)*	0.002 mg/l
– 1,1,1-Trichloroethane*	2 mg/l
– Trichloroethene (TCE)*	0.07 mg/l
– Trichloromethane (chloroform)*	0.04 mg/l
– Vinyl chloride*	0.5 µg/l
– Chlorobenzene	0.7 mg/l
– 1,2-Dichlorobenzene	3 mg/l
– 1,3-Dichlorobenzene	3 mg/l
– 1,4-Dichlorobenzene	0.01 mg/l

Substance	Concentration value
– 1,2,4-Trichlorobenzene	0.4 mg/l
– Polychlorinated biphenyls (PCBs)[b]	0.1 µg/l
Monocyclic aromatic hydrocarbons (BTEX)	
– Benzene*	0.01 mg/l
– Toluene	7 mg/l
– Ethylbenzene	3 mg/l
– Xylenes	10 mg/l
Nitro compounds	
– 2,4-Dinitrophenol	0.05 mg/l
– Dinitrotoluene	0.5 µg/l
– Nitrobenzene	0.01 mg/l
– 4-Nitrophenol	2 mg/l
Phenols	
– 2-Chlorophenol	0.2 mg/l
– 2,4-Dichlorophenol	0.1 mg/l
– 2-Methylphenol (o-cresol)	2 mg/l
– 3-Methylphenol (m-cresol)	2 mg/l
– 4-Methylphenol (p-cresol)	0.2 mg/l
– Pentachlorophenol (PCP)	0.001 mg/l
– Phenol (C_6H_6O)	10 mg/l
Polycyclic aromatic hydrocarbons (PAK)	
– Acenaphthene	2 mg/l
– Anthracene	10 mg/l[c]
– Benz[a]anthracene	0.5 µg/l
– Benzo[b]fluoranthene	0.5 µg/l
– Benzo[k]fluoranthene	0.005 mg/l
– Benzo[a]pyrene	0.05 µg/l
– Chrysene	0.05 mg/l
– Dibenz[a,h]anthracene	0.05 µg/l
– Fluoranthene	1 mg/l[3]
– Fluorene	1 mg/l
– Indeno[1,2,3-cd]pyrene	0.5 µg/l[3]
– Naphthalene	1 mg/l
– Pyrene	1 mg/l[3]

[a] Detection threshold
[b] PCB: the sum of the 6 congeners 28, 52, 101, 138, 153 and 180 multiplied by the factor 4.3 must not exceed the concentration value.
[c] Not normally detectable in the eluate at these concentrations.
* To be assessed according to Paragraph 4.
** Applies to surface waters only

Annex 2
(Art. 11)

Concentration values for the assessment of interstitial air at polluted sites

1 In assessing the interstitial air of polluted sites, the concentration values in the following table apply. Where no concentration values are given in the table for emissions occurring at the site, e.g. odours or particles, the site is deemed to be in need of remediation if the emissions may lead to excessive ambient concentrations in accordance with the Ordinance of 16 December 1985[35] on Air Pollution Control.

2 For sampling and the performance of interstitial air analyses, the following apply:

a. Samples must be taken using ground gas detectors at a number of points representative of the pollution of the site. It shall be ensured that no extraneous air is included in the samples.

b. The interstitial air need only be analysed in respect of those constituents that are expected to occur at the site based on the historical investigation. If the analysis is confined to lumped parameters, the lowest concentration value of the individual substances shall be taken as the assessment criterion.

3 Interstitial air samples may be dispensed with if it can be demonstrated by other means that the concentration values in the interstitial air cannot be exceeded, i.e. based on precise information concerning the composition and origin of the material at the site.

4 The FOEN shall issue guidelines on sampling and on procedures for interstitial air analyses.

Substance	Concentration value
Inorganic substances	
Mercury	0.005 ml/m³
Carbon dioxide	5000 ml/m³
Hydrogen sulphide	10 ml/m³
Organic substances	
Petrol (free of aromatics)	500 ml/m³
Light petrol (aromatic content 0–10 by vol.-%)	500 ml/m³
Methane	10 000 ml/m³
Halogenated hydrocarbons	
– Chlorobenzene	10 ml/m³
– 1,1-Dichloroethane	100 ml/m³
– 1,2-Dichloroethane (EDC)	5 ml/m³
– 1,1-Dichloroethene	2 ml/m³

35 SR **814.318.142.1**

Substance	Concentration value
– 1,2-Dichloroethene (cis and trans)	200 ml/m³
– Dichloromethane	100 ml/m³
– 1,2-Dichloropropane	75 ml/m³
– 1,1,2,2-Tetrachloroethane	1 ml/m³
– Tetrachloroethene (PERC)	50 ml/m³
– Tetrachloromethane (Carbon tetrachloride)	5 ml/m³
– 1,1,1-Trichloroethane	200 ml/m³
– Trichloroethene (TCE)	50 ml/m³
– Trichloromethane	10 ml/m³
– Vinyl chloride	2 ml/m³
Monocyclic aromatic hydrocarbons (BTEX)	
– Benzene	1 ml/m³
– Toluene	50 ml/m³
– Ethylbenzene	100 ml/m³
– Xylenes	100 ml/m³
Polycyclic aromatic hydrocarbons (PAK)	
– Benzo[a]pyrene	0.0002 ml/m³
– Naphthalene	10 ml/m³

Annex 3[36]
(Art. 12 para. 1)

Concentration values for the assessment of the need for remediation of soil

The concentration values in the table below apply in the assessment of the need for remediation of soil. Where no concentration values are given in the table for potential soil pollutants which are polluting a site, the authority shall specify a value on a case by case basis with the consent of the FOEN and according to the provisions of the legislation on the protection of the environment.

1 Sites used for agricultural or horticultural purposes

Substance	Concentration value
Inorganic substances	
Lead	2000 mg Pb/kg
Cadmium	30 mg Cd/kg
Copper	1000 mg Cu/kg
Zinc	2000 mg Zn/kg
Organic substances	
Polychlorinated biphenyls (PCBs)	3 mg/kg
Polycyclic aromatic hydrocarbons (PAHs)*	100 mg/kg
Benzo-a-pyrene	10 mg/kg

* ∑16 EPA PAHs: napthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benz[a]anthracene, chrysene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenz[a,h]anthracene, benzo[g,h,i]perylene, indeno[1,2,3-c,d]pyrene

36 Inserted by Annex No II 2 of the O of 26 Sept. 2008 on the Charge for the Remediation of Contaminated Sites, in force since 1 Jan. 2009 (AS **2008** 4771). Revised by No II of the O of 9 May 2012 (AS **2012** 2905) and No I of the O of 14 Jan. 2015, in force since 1 March 2015 (AS **2015** 317).

2 Sites in private gardens and allotments, children's playgrounds and other facilities where children play regularly

Substance	Concentration value
Inorganic substances	
Antimony	50 mg Sb/kg
Arsenic	50 mg As/kg
Lead	1000 mg Pb/kg
Cadmium	20 mg Cd/kg
Chromium (VI)	100 mg CrVI/kg
Copper	1000 mg Cu/kg
Nickel	1000 mg Ni/kg
Mercury	2 mg Hg/kg
Silver	500 mg Ag/kg
Zinc	2000 mg Zn/kg
Inorganic substances	
Volatile chlorinated hydrocarbons*	1 mg/kg
Polychlorinated biphenyls (PCBs)**	1 mg/kg
Aliphatic hydrocarbons C_5–C_{10}***	5 mg/kg
Aliphatic hydrocarbons C_{11}–C_{40}	500 mg/kg
Monocyclic aromatic hydrocarbons (BTEX)****	500 mg/kg
Benzene	1 mg/kg
Polycyclic aromatic hydrocarbons (PAHs)*****	100 mg/kg
Benzo[a]pyrene	10 mg/kg

* ∑7 volatile chlorinated hydrocarbons: dichloromethane, trichloromethane, tetrachloromethane, cis-1,2-dichloroethylene, 1,1,1-trichloroethane, trichloroethylene (TCE), tetrachlorethylene (PERC)

** ∑6 PCB congeners × 4.3: no. 28, 52, 101, 138, 153, 180

*** $\sum C_5$- to C_{10} hydrocarbons: area of the FID-chromatogram between n-pentane and n-decane, multiplied by the response factor of n-hexane, minus ∑BTEX

**** ∑6 BTEX: benzene, toluene, ethylbenzene, o-xylene, m-xylene, p-xylene

***** ∑16 EPA PAHs: napthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benz-a-anthracene, chrysene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenz[a,h]anthracene, benzo[g,h,i]perylene, indeno[1,2,3-c,d]pyrene