NB: Unofficial translation; legally binding texts are those in Finnish and Swedish

Ministry of the Environment, Finland

Government Decree

on the Assessment of Soil Contamination and Remediation Needs

214/2007

March 1, 2007

1 §

Scope of application

This Decree lays down the provisions for the assessment of soil contamination and remediation needs.

The Decree shall not be applied to the assessment of sediment contamination and remediation.

2 §

Assessment of contamination and remediation needs

The assessment of soil contamination and remediation needs shall be based on an assessment of the hazard or harm to health or the environment represented by the harmful substances in the soil. The following shall be taken into account in the assessment:

1) the concentration, overall amounts, properties, location and background concentration of the hazardous substances in the soil; *background concentration* refers to naturally occurring normal concentrations of hazardous substances in the soil or raised concentrations that are found in topsoil in a wide area in the environment of an area that is suspected to be contaminated;

2) the soil and groundwater conditions of an area suspected to be contaminated and factors that have an impact on the spreading of harmful substances inside and outside the area;

3) the current and planned purpose of use for the area suspected to be contaminated and its environment or groundwater;

4) the possibility of exposure to harmful substances in the short or long term;

5) the severity and likelihood of the health and environmental hazard from exposure and possible combined effects of the harmful substances,

6) the elements of uncertainty in the research data and other source information and assessment methods used.

As the conditions change, the soil contamination and remediation needs shall be reassessed, if necessary.

3 §

Application of threshold values

Soil contamination and remediation needs must be assessed if the concentration of one or several harmful substances in the soil exceeds the threshold value prescribed in the appendix to this Decree. The background concentration is regarded as the assessment threshold in areas with a background concentration higher than the threshold value.

4 §

Application of guideline values

The guideline values for harmful substances in soil, prescribed in the appendix

to this Decree, must be used as a tool in the assessment of soil contamination and remediation needs.

Soil is regarded as contaminated unless otherwise arisen in the assessment referred to in Section 2:

1) in an area used as an industrial, storage or transport area or as other corresponding area if the concentration of one substance or several substances exceeds the prescribed upper guideline value;

2) in other than an area referred to in paragraph 1 if the concentration of one substance or several substances exceeds the prescribed lower guideline value.

5 §

Assessing contamination and background concentration

In order to assess soil contamination and background concentration, it is necessary to take samples with a good representation of the area under examination and its soil and groundwater.

The assessment of harmful substances shall be based on standardised methods or methods corresponding to standardised ones with respect to their reliability.

6 §

Validity

This Decree will enter into force on 1 June 2007.

Provisions valid when the Decree became effective shall be applied in permit and registration matters that were brought up before the Decree became effective.

Appendix

THRESHOLD AND GUIDELINE VALUES FOR HARMFUL SUBSTANCES IN SOIL

The threshold and guideline values for the concentrations of some common harmful substances in soil as total concentration per dry matter are presented in this Appendix. The threshold and guideline values of inorganic substances are compared with the result measured from a particle size of less than 2 mm. If there is reason to suspect that the soil contains harmful substances other than those presented in this Appendix or inorganic substances with a particle size in excess of 2 mm or in a more harmful form than usual, these shall also be taken into account in the assessment of soil contamination and remediation needs.

The guideline values have been defined on the basis of either ecological risks (e) or health risks (t). If the risk of groundwater contamination is higher than normal in concentrations below the lower guideline value, the substances are marked with the letter p.

In addition to individual measured concentrations, a comparison of concentrations of harmful substances in soil with threshold and guideline values can also be carried out with statistical parameters describing various concentration distributions of the area if there is a sufficient amount of measurement results available for statistical processing and it is otherwise justified with respect to the assessment.

Substance (symbol)	Natural concentration[1] mg/kg	Threshold value mg/kg	Lower guideline value mg/kg	Higher guideline value mg/kg
Metals and semimetals[2]				
Antimony (Sb) (p)	0,02 (0,01-0,2)	2	10 (t)	50 (e)
Arsenic (As) (p)	1 (0,1-25)	5	50 (e)	100 (e)
Mercury (Hg)	0,005 (< 0,005-0,05)	0,5	2 (e)	5 (e)
Cadmium (Cd)	0,03 (0,01-0,15)	1	10 (e)	20 (e)
Cobalt (Co) (p)	8 (1-30)	20	100 (e)	250 (e)
Chrome (Cr)	31 (6-170)	100	200 (e)	300 (e)
Copper (Cu)	22 (5-110)	100	150 (e)	200 (e)
Lead (Pb)	5 (0,1-5)	60	200 (t)	750 (e)
Nickel (Ni)	17 (3-100)	50	100 (e)	150 (e)
Zinc (Zn)	31 (8-110)	200	250 (e)	400 (e)
Vanadium (V)	38 (10-115)	100	150 (e)	250 (e)
Other inorganic				
Cyanide (CN)		1	10	50
Aromatic hydrocarbons				
Benzene (p)		0,02	0.2 (t)	1 (t)
Toluene (p)			5 (t)	25 (t)
Ethylbenzene (p)			10 (t)	50 (t)
Xylenes[3] (p)			10 (t)	50 (t)
TEX[4]		1		
Polycyclic aromatic hydrocarbons				
Anthracene		1	5 (e)	15 (e)
Benzo(a)anthracene		1	5 (e)	15 (e)
Benzo(a)pyrene		0,2	2 (t)	15 (e)
Benzo(k)fluoranthene		1	5 (e)	15 (e)
Phenanthrene		1	5 (e)	15 (e)
Fluoranthene		1	5 (e)	15 (e)
Naphthalene		1	5 (e)	15 (e)
PAH[5]		15	30 (e)	100 (e)
Polychlorinated biphenyls (PCB) and polychlorinated dibenzo-p-dioxins and furans (PCDD/F)				
PCB[6]		0,1	0.5 (t)	5 (e)
PCDD-PCDF-PCB[7]		0,00001	0.0001 (t)	0.0015 (e)

Substance (symbol)	Threshold value mg/kg	Lower guideline value mg/kg	Higher guideline value mg/kg
Chlorinated aliphatic hydrocarbons			
Dichloromethane (p)	0,01	1 (t)	5 (t,e)
Vinyl chloride (p)	0,01	0.01 (t)	0.01 (t)
Dichloroethenes[3] (p)	0,01	0.05 (t)	0.2 (t)
Trichloroethene (p)	0,01	1 (t,e)	5 (e)
Tetrachloroethene (p)	0,01	0.5 (t)	2 (t)
Chlorobenzenes			
Trichlorobenzenes[3]	0,1	5 (t)	20 (e)
Tetrachlorobenzenes[3]	0,1	1 (t)	5 (e)
Pentachlorobenzene	0,1	1 (t)	5 (e)
Hexachlorobenzene	0,01	0.05 (t)	2 (e)
Chlorophenols			
Monochlorophenols[3] (p)	0,5	5 (e,t)	10 (e)
Dichlorophenols[3] (p)	0,5	5 (t)	40 (e)
Trichlorophenols[3] (p)	0,5	10 (e,t)	40 (e)
Tetrachlorophenols[4] (p)	0,5	10 (e,t)	40 (e)
Pentachlorophenol (p)	0,5	10 (e,t)	20 (e)
Pesticides and biocides			
Atrazine (p)	0,05	1 (e)	2 (e)
DDT-DDD-DDE[8]	0,1	1 (e)	2 (e)
Dieldrin	0,05	1 (e)	2 (e)
Endosulphan[9] (p)	0,1	1 (e)	2 (e)
Heptachlorine	0,01	0.2 (t)	1 (e)
Lindane (p)	0,01	0.2 (t)	2 (e)
TBT-TPT[10]	0,1	1 (e)	2 (e)
Petroleum hydrocarbon fractions and oxygenates			
MTBE-TAME[11]	0,1	5 (t)	50 (t)
Petrol fractions (C5-C10[12])		100	500
Middle distillates (>C10-C21[12])		300	1000
Heavy petroleum fractions (>C21-C40[12])		600	2000
Petroleum fractions (>C10-C40[12])	300		

[1] The median and range of the natural concentration of fines in moraine when defined by extraction with aqua regia, except pyrolytically defined mercury. It must be taken into account in site-specific analyses that especially in clay soils the natural concentrations may be clearly higher than those measured from moraine.

[2] The guideline values for metals and semimetals defined on ecological grounds are derived by adding the average natural concentration of the mineral soil to the calculatory concentration describing the acceptable ecological risk of the substance. Correspondingly, the natural concentration of the soil in the area can be taken into account in site-specific analyses if it has been analysed with a reliable method.

[3] Total concentration including the structural isomers of the substance.

[4] Total concentration including the following compounds: toluene, ethylbenzene and xylene.

[5] Total concentration of PAH compounds including the following compounds: anthracene, acenaphthene, acenaphthylene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, phenanthrene, fluoranthene, fluorene, indeno(1,2,3-c,d)pyrene, chrysene, naphthalene and pyrene.

[6] Total concentration including PCB congeners 28, 52, 101, 118, 138, 153, 180.

[7] Total concentration stated as WHO toxicity equivalent including PCDD/F compounds and dioxin-like PCB compounds.

[8] Total concentration including the following compounds: dichlorodiphenyltrichloroethane (DDT), dichlorodiphenyldichloroethane (DDD) and dichlorodiphenyldichloroethylene (DDE).

[9] Total concentration including the following compounds: alpha-endosulphane and beta-endosulphane.

[10] Total concentration including the following compounds: tributyl tin (TBT) and triphenyl tin (TPT).

[11] Total concentration including the following compounds: methyl *tert*-butyl ether (MTBE) and *tert*-amyl methyl ether (TAME).

[12] series of n paraffins in gas-chromatographic analysis.