

Appendix B: Monitoring methods

The monitoring regime for nitrogen compounds, metals and lindane are summarised in tables B.1 to B.5:

Table B.1. General information about sampling and analysis of nitrogen compounds in precipitation in 2005.

Country		Sampling period	Sampler		Analytical methods
			Wet only	Bulk	
Denmark	Nitrate ammonium	Biweekly	x		IC Spect. (CFA)
Estonia	Nitrate Ammonium	Weekly		X	IC Spect (indophenol)
Finland	Nitrate Ammonium	Weekly		X	IC IC
Germany	Nitrate Ammonium	Weekly	X		IC IC
Latvia	Nitrate Ammonium	Daily	X (LV10)	X (LV16)	IC Spect (indophenol)
Lithuania	Nitrate Ammonium	Daily	X		IC Spect (indophenol)
Poland	Nitrate Ammonium	Daily		x	IC Spect (chloramin T)
Russia	Nitrate Ammonium	Daily		x	IC
Sweden	Nitrate Ammonium	Weekly	X		IC Spect (FIA)

*IC: Ion chromatography

**Spect Spectrofotometric detection

Table B.2. General information about sampling and analysis of nitrogen compounds in air in 2005.

Country		Sampl period	Sampler	Analytical methods
Denmark	NO ₂	Daily	KI method 0.73m ³ /day	Spect
	NO ₂ (DK05)	Hourly	Chemiluminiscence	
	Sum of nitric acid and nitrate	Daily	Millipore RAWP, 1.2 µm + KOH-impregnated Whatman 41, 58 m ³ /day	IC
	Sum of ammonia and ammonium	Daily	Millipore RAWP, 1.2 µm + Oxalic acid impregnated Whatman 41, 58 m ³ /day	Spect (CFA)
Estonia	NO ₂	Hourly	Chemiluscence	
Finland	NO ₂	Hourly	Chemiluscence	
	Sum of nitric acid and nitrate	Daily	Whatman 40 + NaOH impregnated Whatman 40 filter, 24 m ³ /day	IC
	Sum of ammonia and ammonium	Daily	Oxalic acid impregnated Whatman 40 filter, 24 m ³ /day	IC
Germany	NO ₂	Daily	NaI imp. Glass filters, 0.7m ³ /day	FIA
	Sum of nitric acid and nitrate	Daily	Aerosol + KOH impr W40 filter, 22 m ³ /day	IC
	Sum of ammonia and ammonium		Aerosol + Oxalic acid impr W40 filter	FIA
Latvia	NO ₂	Daily	KI method 0.2-0.4 m ³ /day	Spect. Griess
	Sum of nitric acid and nitrate	Daily		IC
	Sum of ammonia and ammonium	Daily	KOH-impregnated Whatman 41 filter, 14-20 m ³ /day Oxalic acid impregnated Whatman 41 filter, 14-20 m ³ /day	Spect (indophenol)
Lithuania	NO ₂	Daily	KI method 0.4-0.7 m ³ /day	Spect. Griess
	Sum of nitric acid and nitrate	Daily	KOH impregnated Whatman 40 filter, 16-17 m ³ /day	IC
	Sum of ammonia and ammonium	Daily	Oxalic acid impregnated Whatman 40 filter, 16-17 m ³ /day	Spect (indophenol)
Poland	NO ₂	Daily	Abs.sol. TGS 0.73 ³ /day	Spect. Griess
	Sum of nitric acid and nitrate	Daily	NaF impregnated Whatman 40 filter, 3.5-4 m ³ /day	Spect. Griess
	Sum of ammonia and ammonium	Daily	Oxalic acid impregnated Whatman 40 filter, 3.5-4 m ³ /day	Spect. Chloramin T)
Russia	Ammonium, Nitrate	Daily	Whatman 40 filter, 10-15 m ³ /day	IC
Sweden	NO ₂	Daily	NaI imp. glass sinters 0.7 m ³ /day	Spect
	Sum of nitric acid and nitrate		Aerosol filter as for sulphate + KOH-impregnated Whatman 40 filter, 20 m ³ /day	IC
	Sum of ammonia and ammonium		Aerosol filter as for sulphate + Oxalic acid impregnated Whatman 40 filter, 20 m ³ /day	FIA

GF-AAS: Graphite furnace atomic absorption spectroscopy
 ICP-MS: Inductively coupled plasma - mass spectrometry
 CV-AFS: Cold vapour atomic fluorescence spectroscopy

Table B.3. General information about sampling and analysis of heavy metals in 2005.

Country	Precipitation		Air and aerosols		Laboratory method
	Field method	Frequency	Field method	Frequency	
Germany	wet only	Weekly	Low volume sampler	weekly	ICP-MS CV-AFS
	Hg wet only	Weekly	TGM:gold trap	daily	
Denmark	Bulk	Monthly	Filter-3pack	daily at DK3,8,31 weekly at DK11	Precip: GF-AAS Aerosols: PIXE
	Hg Bulk (Hg)	Monthly	Hg-monitor (Tekran)	hourly	
Estonia	Bulk	Monthly	Sampling High Volume Sampler	Weekly	GF-AAS, Zn: F-AAS
Finland	Bulk	Monthly	PTFE, Millipore, Fluoropore, 3 µm, 50 l/min, cut off 15 µm	weekly	ICP-MS CV-AFS CV-AFS
	Hg Bulk (Hg)	Monthly	Hg: gold traps (TGM)	2 X 24 h a week	
			Hg: mini traps (TPM)	weekly	
Lithuania	Bulk	Weekly	Low vol. 0.5-2 m ³ /h	weekly	GF-AAS
Latvia	Bulk	Weekly	Filter-1pack	Weekly	Cd, Cu, Pb, Ni, As: GF-AAS, Mn, Zn: F-AAS
Poland	Wet-only	Biveekly			GF-AAS (AVS from May); Zn: F-AAS GF-AAS, Zn: F-AAS
Sweden	Bulk	Monthly	Low volume sampler, PTFE filter	monthly	ICP-MS CV-AFS CV-AFS
	Hg Bulk (Hg)	Monthly	Hg: gold traps (TGM)	2 X 24 h a week	
			Hg: mini traps (TPM)	2 X 24 h a week	

AAS: Atomic Absorption Spectroscopy

GF-AAS: Graphic Furnace Atomic Absorption Spectroscopy

F-AAS: Furnace Atomic Absorption Spectroscopy

ICP-MS: Inductively Coupled Plasma - Mass Spectrometry

CV-AAS: Cold Vapour Atomic Fluorescence Spectroscopy

Table B.4. General information about sampling and analysis of γ HCH, 2005

Country	Precipitation		Air and aerosols		Laboratory method
	Sampling method	Frequency	Sampling method	Frequency	
Germany	wet only	Monthly			GC-MS
Sweden	Bulk (precip + dry dep)	monthly	High vol.	SE14 biweekly, SE12: 1 wa month	HPLC, GC-MS

HPLC: High Performance Liquid Chromatography

GC-MS: Gas chromatograph with Mass Spectrometry

