

Appendix B: Monitoring methods

The monitoring regime for nitrogen compounds and metals are summarised in tables B.1 to B.3:

Table B.1. General information about sampling and analysis of nitrogen compounds in precipitation in 2011.

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	Weekly	X		IC Spect (indophenol)
Lithuania	Nitrate Ammonium	Daily	X		IC Spect (indophenol)
Poland	Nitrate Ammonium	Daily		x	IC Spect (chloramin T)
Sweden	Nitrate Ammonium	Daily: SE05, 14 monthly: SE11, 12	X		IC Spect (FIA)

IC: Ion chromatography
Spect Spectrofotometric detection
FIA: Flow injection analysis

Table B.2. General information about sampling and analysis of nitrogen compounds in air in 2011.

Country		Sampl period	Sampler	Analytical methods
Denmark	NO ₂	Hourly	Chemiluminisence	
	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	Chemiluminisence	
Finland ¹ daily at FI09,FI17 Weekly at FI37	(NO ₂ Sum of nitric acid and nitrate	Hourly Daily ¹	Chemiluminisence Teflon filter + NaOH impregnated Whatman 40 filter, 24 m ³ /day	IC
	Sum of ammonia and ammonium	Daily ¹	Teflon filter +Oxalic acid impregnated Whatman 40 filter, 24 m ³ /day	IC
Germany	NO ₂	Daily	Nal imp. Glass filters, 0.7m ³ /day	FIA
	NH ₃	Weekly	Low cost denuder	FIA
	NH ₄	Daily	Filterpack, Teflon filter (jan-july)	IC
	NO ₃	Daily	Low vol sampl., PM _{2.5} quartz filter (july -dec) Filterpack, Teflon filter (jan-july) Low vol sampl., PM _{2.5} quartz filter (july -dec)	IC
Lithuania	NO ₂ ,	Daily	KI imp glass filters 0.4-0.7 m ³ /day	Spect. Griess
	Sum of nitric acid and nitrate	Daily	Aerosol filter (Whatman 40) + KOH impregnated filter, 20 m ³ /day	IC
	Sum of ammonia and ammonium	Daily	Aerosol filter (Whatman 40) + oxalic acid impregnated filter, 20 m ³ /day	Spect (indophenol)
Poland	NO ₂	Daily	Abs.sol. TGS 0.7 m ³ /day	Spect. Griess
	Sum of nitric acid and nitrate	Daily	Aerosol filter (Whatman 40) + NaF impregnated Whatman 40 filter, 3.5-4 m ³ /day	Spect. Griess
	Sum of ammonia and ammonium	Daily	Aerosol filter (Whatman 40) + Oxalic acid impregnated Whatman 40 filter, 3.5-4 m ³ /day	Spect. Chloramin T)
Sweden	NO ₂	Daily	Nal imp. glass sinters 0.7 m ³ /day	Spect, FIA
	Sum of nitric acid and nitrate		Teflon filter, Mitex membrane + KOH-impregnated Whatman 40 filter, 20 m ³ /day	IC
	Sum of ammonia and ammonium		Teflon filter, Mitex membrane + Oxalic acid impregnated Whatman 40 filter, 20 m ³ /day	FIA

IC: Ion chromatograpy

Spect Spectrofotometric detection

FIA: Flow injection analysis

Table B.3. General information about sampling and analysis of heavy metals in 2011.

Country	Precipitation		Air and aerosols		Laboratory method
	Field method	Frequency	Field method	Frequency	
Denmark	Bulk	Monthly	Low volume sampler, Millipore RAWP 1.2 mm, 58 m ³ /day TGM: monitor (Tekran)	daily continuously	Precip: GF-AAS Aerosols: ICP-MS
Estonia	Bulk	EE08 daily EE11 weekly		weekly	GF-AAS
Finland	Bulk	Monthly	PM ₁₀ , Teflon, Millipore Fluoropore 3 µm, 20 l/min	F117: 2+2+3 days, F136+F137: weekly	ICP-MS
Germany	wet only Hg wet only	Weekly Weekly	Low volume sampler TGM:Tekran Monitor	weekly hourly	ICP-MS
Latvia	Wet only	Weekly	PM ₁₀ , low volume sampler. 2.3 m ³ /h	Weekly	ICP-MS
Poland	Wet-only	biweekly			GF-AAS
Sweden	Bulk Hg Bulk (Hg)	Monthly Monthly	Low volume sampler, teflon filter Hg: gold traps (TGM) Hg: mini traps (TPM)	monthly 2 X 24 h a week 1 X 24 h a week	ICP-MS CV-AFS CV-AFS

GF-AAS: Graphic Furnace Atomic Absorption Spectroscopy

ICP-MS: Inductively Coupled Plasma - Mass Spectrometry

CV-AFS: Cold Vapour Atomic Fluorescence Spectroscopy

