

**Data Reporting Procedures and Formats
for
Acid Deposition Monitoring in East Asia**

March 2000

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of

Acid Deposition Monitoring Network in East Asia

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1. Introduction

The participating countries of EANET were expected to submit the following reports to the Network Center **within 6 months** after the start of formal phase, except the item (4) on “monitoring data of previous calendar year”, which will be submitted to either the Interim Network Center or the Network Center by the end of June every year:

- (1) information on the National Center and contact person(s);
- (2) national monitoring plan;
- (3) information on respective monitoring sites, including names, addresses and geographical descriptions;
- (4) monitoring data of the previous calendar year.

2. Monitoring components

The participating countries are expected to monitor the following items:

2.1. Wet deposition monitoring

Monitoring sites and interval

- every 24 hours or every precipitation event at more than one site that is clearly defined as either urban, rural or remote (at least more than one rural or remote sites are recommended in a country);

Monitoring parameters

- pH, electric conductivity (EC), concentrations of SO_4^{2-} , NO_3^- , Cl^- , NH_4^+ , Na^+ , K^+ , Ca^+ and Mg^+

Meteorological measurement

- wind direction/speed, temperature, humidity, precipitation amount and solar radiation (in accordance with the measurement frequency of the meteorological monitoring system of each country)

Other information

- monitoring site: land use, potential contamination sources, geographical

description, climate etc.

- sampling methods and sample handling
- analytical methods
- measurement laboratory
- QA/QC activities

2.2. Dry deposition monitoring

Monitoring sites and interval

- every week to two weeks (every hour when measured by automatic instruments) at the same site(s) as used for the wet deposition monitoring

Measurement parameters

- first priority: concentration of SO₂, NO₂(urban), NO, O₃ and particulate mass concentration
- second priority: concentrations of NO₂(rural and remote), HNO₃, NH₃, particles (SO₄²⁻, NO₃⁻, Cl⁻, NH₄⁺, and Ca²⁺)
(NO: only if the chemiluminescence method is available)

Meteorological measurement

- the same parameters as for wet deposition monitoring

Other information

- the same parameters as for wet deposition monitoring

2.3. Soil and vegetation monitoring

Monitoring sites and interval

- more than once every 3 to 5 years at more than one site which is classified as basic sites (when wet/dry deposition monitoring at the same site is not feasible, select a site within 50 km of a wet/dry deposition monitoring site);

Monitoring parameters

- soil: moisture content, pH (H₂O and KCl), concentrations of exchangeable cations (Na⁺, K⁺, Ca²⁺ and Mg⁺), exchangeable acidity, effective cation exchange capacity (ECEC), and carbonate content (for calcareous soil)[mandatory],

concentration of exchangeable Al and H, total carbon content, and total nitrogen content, and physical properties of soil (fine earth bulk density and penetration resistance(in the fieldwork))[optional], and available phosphate and sulfate [voluntary]

- vegetation: [general description of monitoring forest]: description of trees, and understory vegetation survey [mandatory],
[survey of tree decline]: observation of tree decline [mandatory], and photographic record of tree decline, and estimation of decline causes [optional]

Meteorological measurement

- the same parameters as wet deposition monitoring

Other information

- monitoring site: soil profile, vegetation, surface geology, geographical description, climate etc.
- sampling methods and sample handling
- analytical methods
- measurement laboratory
- QA/QC activities

2.4. Inland aquatic environment monitoring

Monitoring sites and interval

- more than four times a year to once in 3-5 years at ecological survey site;

Monitoring parameters

- inland water: [item measured more than 4times a year]: water temperature, pH, EC and alkalinity (at pH 4.8 baseline) and concentrations of SO_4^{2-} , NO_3^- , Cl^- , NH_4^+ , Na^+ , K^+ , Ca^{2+} and Mg^{2+} [mandatory], and phytoplankton (diatom species)[optional],
[items measured once a year]: transparency, water color, DOC or COD, NO_2^- , and PO_4^{3-} [mandatory], and total Al(ion) [optional],
[items measured once in 3-5 years]: sediment(SO_4^{2-} , NO_3^- , and NH_4^+ in pore water)[mandatory], and living organisms other than phytoplankton, and sediment(Pb, Pb-210 and stable isotope of S)[optional]

Meteorological measurement

- the same parameters as wet deposition monitoring

Other information

- monitoring site: lake characteristics (origin, area, depth, volume), watershed characteristics (area, land use, surface geology, geographical description), number of streams and their water volumes, retention time of water, climate, lake utilization etc.)
- sampling methods and sample handling
- analytical methods
- measurement laboratory
- QA/QC activities

2.5. Note

Monitoring data that only partly satisfy the above criteria, will also be included in the report to the Interim Network Center or the Network Center. In this case, the nature of the insufficiencies should be made clear.

3. Data reporting procedures and formats

Data reporting formats for EANET should be further elaborated, taking into account the progress of monitoring methodologies and so on. By using the format, the Network should be able to share regional data with known quality and in common formats, to best meet the objectives of the Network, i.e. a) to create a common basis for understanding the state of acid deposition problems in the region, and b) to provide useful inputs for decision-making at local, national and regional levels.

Based on the above principle, each participating country is invited to submit a report in the attached data reporting formats according to the following timetables, to the extent possible with available resources. To reduce the workload during the data compilation process, the submission of the reports via electronic media, in addition to the documents, is strongly encouraged.

Within **6 months** after the start of the formal phase

- Submission of
 - (i) information on the National Center and contact person(s) [Format: Annex I]
 - (ii) national monitoring plan [Format: Annex II]
 - (iii) information on respective monitoring sites [Format: Annex III]

By the end of June every year

- Submission of
 - (i) monitoring data for the previous calendar year [Format: Annex IV]

Note

If the information submitted to the Interim Network Center or the Network Center changes, the up-to-date information should be reported as soon as possible.

Format on information on the National Center and contact person(s)

Date(data reporting)	
Country name	
Organization name	
Department	
Name of contact person	
Name of national QA/QC manager (NAM)	
Postal address	
Contact address	Tel: _____ Fax: _____ E-mail: _____

Format on national monitoring plan

Date(that the plan was decided)	
Country name	
Organization name (Responsible agency)	
Department	
Name of the person in charge	
Postal address	
Contact address	Tel: _____ Fax: _____ E-mail: _____

1. Outline of the national monitoring plan

1) Number of monitoring sites and the arrangement (illustrations of monitoring sites arrangement should be attached in each cases.).

(number of sites)

Items	formal-phase network sites (a plan)	prospective future plan (year:)
Wet deposition		
Dry deposition		
Soil & vegetation		
Inland aquatic environment		

2) Measurement parameters and monitoring interval

Items	Measurement parameters	Monitoring interval
Wet deposition	1.pH, 2.EC, 3.NH ₄ ⁺ , 4.Na ⁺ , 5.K ⁺ , 6.Ca ²⁺ , 7.Mg ²⁺ , 8.SO ₄ ²⁻ , 9.NO ₃ ⁻ , 10.Cl, 11.others(, ,)	1.daily, 2.other()
Dry deposition	1.SO ₂ , 2.NO ₂ , 3.NO, 4.O ₃ , 5.other gases(HNO ₃ , NH ₃ , HCl), 6.Particulate Matter(PM), 7.Components in PM	1.hourly, 2.other()
Soil	1.pH(H ₂ O), 2.pH(KCl), exchangeable (3.Na ⁺ , 4.K ⁺ , 5.Ca ²⁺ , 6.Mg ²⁺ , 7.Al ³⁺ , 8.H ⁺), 9.exchangeable acidity, 10.ECEC, 11.Carbonate, 12.T-C, 13.T-N, 14.SO ₄ ²⁻ , 15.available phosphate, 16.others(, ,)	monitoring period (month: _____)
Vegetation	1.observation of tree decline, 2.description of trees, 3.others(,)	year: _____)
Inland aquatic environment	1.Water Temp.2.pH, 3.EC, 4.alkalinity, 5.NH ₄ ⁺ , 6.Na ⁺ , 7.K ⁺ , 8.Ca ²⁺ , 9.Mg ²⁺ , 10.SO ₄ ²⁻ , 11.NO ₃ ⁻ , 12.Cl, 13.others(, ,) 14.Transparency, 15.Water color, 16.DOC(COD), 17.NO ₂ ⁻ , 18.PO ₄ ³⁻ , 19.Sediment(SO ₄ ²⁻ , NO ₃ ⁻ , and NH ₄ ⁺ in pore water) 20.others(, ,)	1.regularly (_____times/year) 2.irregular (month: _____, year: _____)

3) Participating laboratories for each monitoring activities

<Wet deposition / Dry deposition (1)>

Organization name		Code	
Department/Section			
Name of a person in charge in the laboratory(PCL)			
Postal address			
Contact address	Tel: E-mail:	Fax:	
Note			

<Wet deposition / Dry deposition (2)>

Organization name		Code	
Department/Section			
Name of a person in charge in the laboratory(PCL)			
Postal address			
Contact address	Tel: E-mail:	Fax:	
Note			

<Soil & vegetation>

Organization name		Code	
Department/Section			
Name of a person in charge in the laboratory (PCL)			
Postal address			
Contact address	Tel: E-mail:	Fax:	
Note			

<Inland aquatic environment>

Organization name		Code	
Department/Section			
Name of a person in charge in the laboratory (PCL)			
Postal address			
Contact address	Tel: E-mail:	Fax:	
Note			

Format on information on respective monitoring sites

Date(data reporting)			
Country name			
Organization name			
Department			
Name of national QA/QC manager(NAM)			
Postal address			
Contact address	Tel:		Fax:
	E-mail:		

1. Wet deposition (prepare for each site)

1) Outline of monitoring site

Site name		Code	
Address			
Site classification	1.urban, 2.rural, 3.remote		
Latitude	(north, south) °	Longitude	(east) °
Altitude	M		
Height of sampling funnel	From the ground level: m	From the floor of collector installed: m	

2) Sample collection

Period of sample Collection	1.daily, 2.every precipitation event, 3.weekly, 4.biweekly, 5.monthly 6.daily collection and weekly composite analysis 7.other()
System of sample Collection	1.wet only, 2.other()
Collector	Manufacturer: , model: Funnel diameter: mm

3) Meteorological observation

Precipitation amount on site	Rain gauge: 1.use, 2.no use Manufacturer: , model: Height from the ground level: m Method: 1.tipping bucket, 2.gravimetric, 3.other()
Other parameters of observation on site	1.wind direction, 2.wind velocity, 3.temperature, 4.humidity, 5.solar radiation, 6.other()
In case of using nearest meteorological station data.	Name of the station: Distance from the site: km Direction from the site (bearings): 1.precipitation amount, 2.wind direction, 3.wind velocity, 4.temperature, 5.humidity, 6.solar radiation, 7.other()

4) Situation around the site

Describe the situation of the topography, land use, vegetation, sources of air pollutants, etc. at each divided directions in the following scale. And attach a sketch map for each scale. Attach color photos of 8 azimuth directions for on-site scale.

(1) On-site scale(within 150m from sampler)

Describe in "Outline of the monitoring site (Form A)"

(2) Local scale (150m - 10km)

Describe in "Outline of the monitoring site (Form B)"

(3) Regional scale(10km - 50km)

Describe in "Outline of the monitoring site (Form C)"

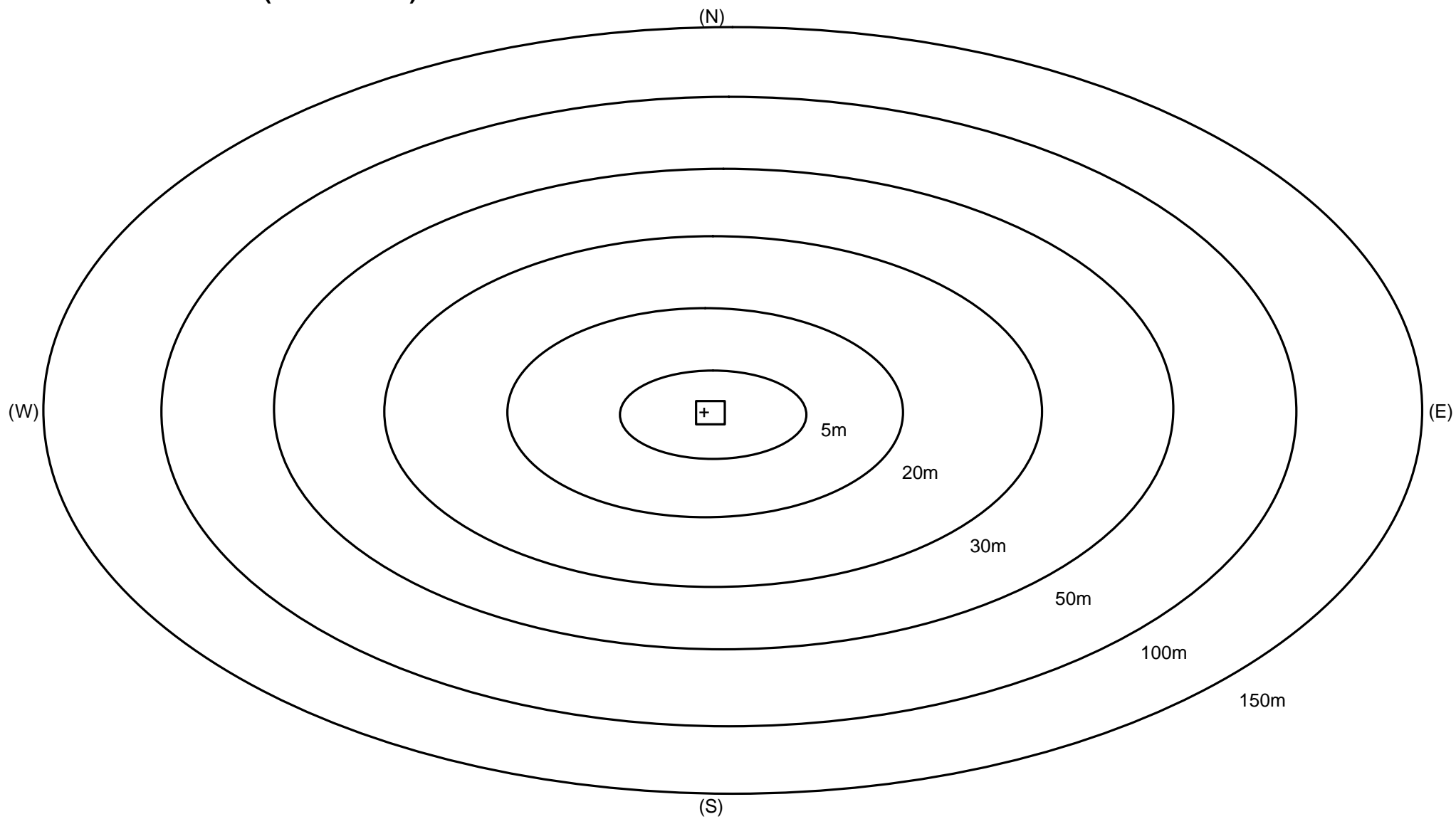
Outline of monitoring site A

On site scale(within 150m:a sketch map should be attached)

Items	north direction(NW-NE)	east direction(NE-SE)	south direction(SE-SW)	west direction(SW-NW)
Existence of trees, poles and buildings, and the heights of those.				
Existence of incinerators, domestic heating, parking lots, storage of fuel and agricultural products, dairy farm, and many livestock.				
Slope degree of the site.	° - °	° - °	° - °	° - °
Surface condition of the site.	(%)	(%)	(%)	(%)
Existence of a forest, river, lake, marsh, farm or fields.				
Existence of roads, and their traffic densities*.				

*:Describe roads with more than 100 vehicles/day for remote sites, and roads with more than 1,000 vehicles/day for urban and rural sites.

On-site Scale (within 150m)



Site Name: _____

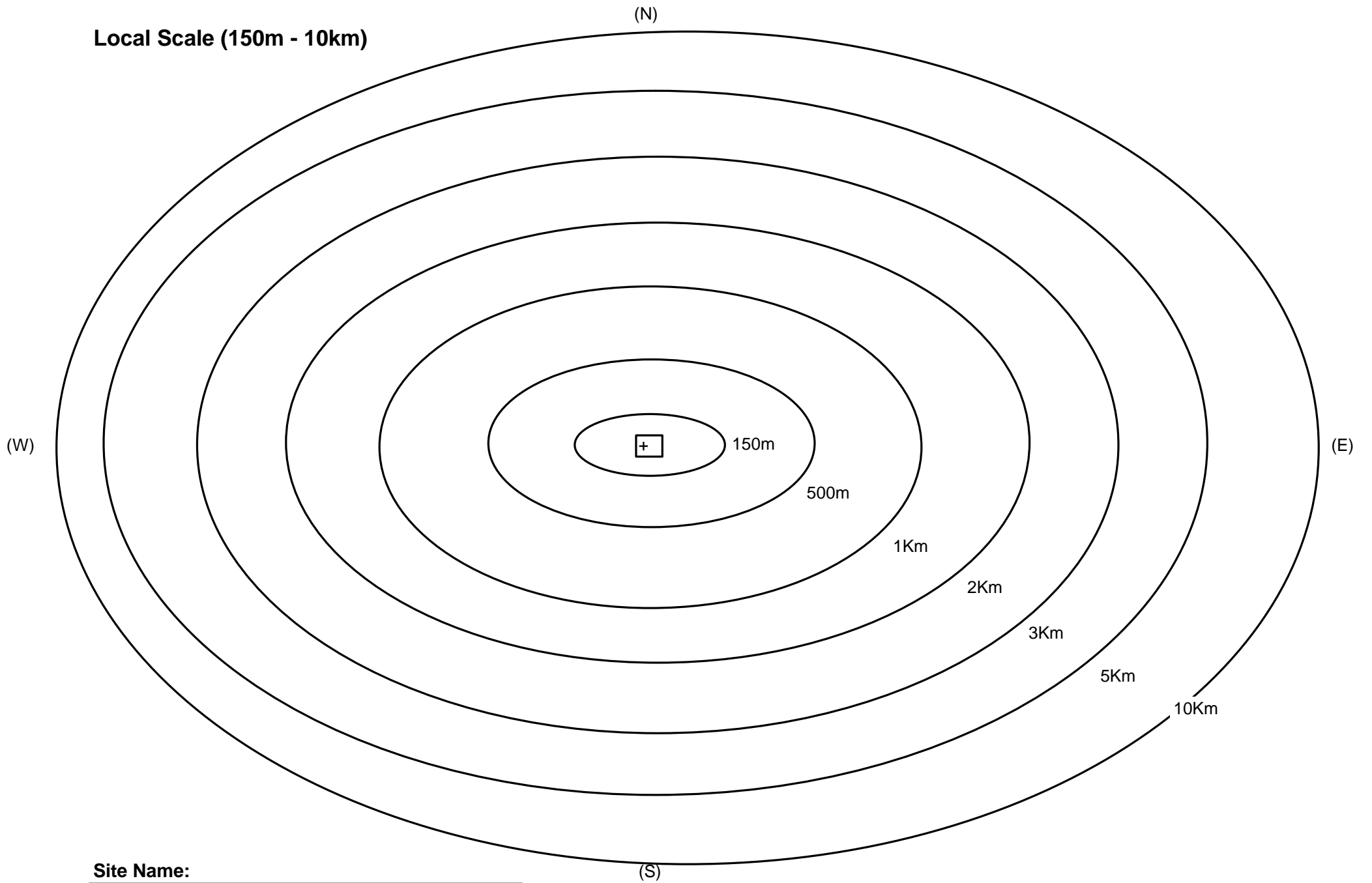
Outline of monitoring site B

Local scale(150m - 10km:a sketch map should be attached)

(For an urban site, at least information of area within 150m - 1km from the site is expected)

Items	north direction(NW-NE)	east direction(NE-SE)	south direction(SE-SW)	west direction(SW-NW)
Information on trunk roads, expressways, and their traffic densities (with more than <u>5,000 vehicles/day</u>).				
Information on airports and railways.				
Information on major emission sources such as large industries, and power plants and their fuel consumptions and so on.				
Information on houses/settlements with more than 5,000 persons, and their population.				
Descriptive information around the site such as topography and meteorological condition				

Local Scale (150m - 10km)



Site Name: _____

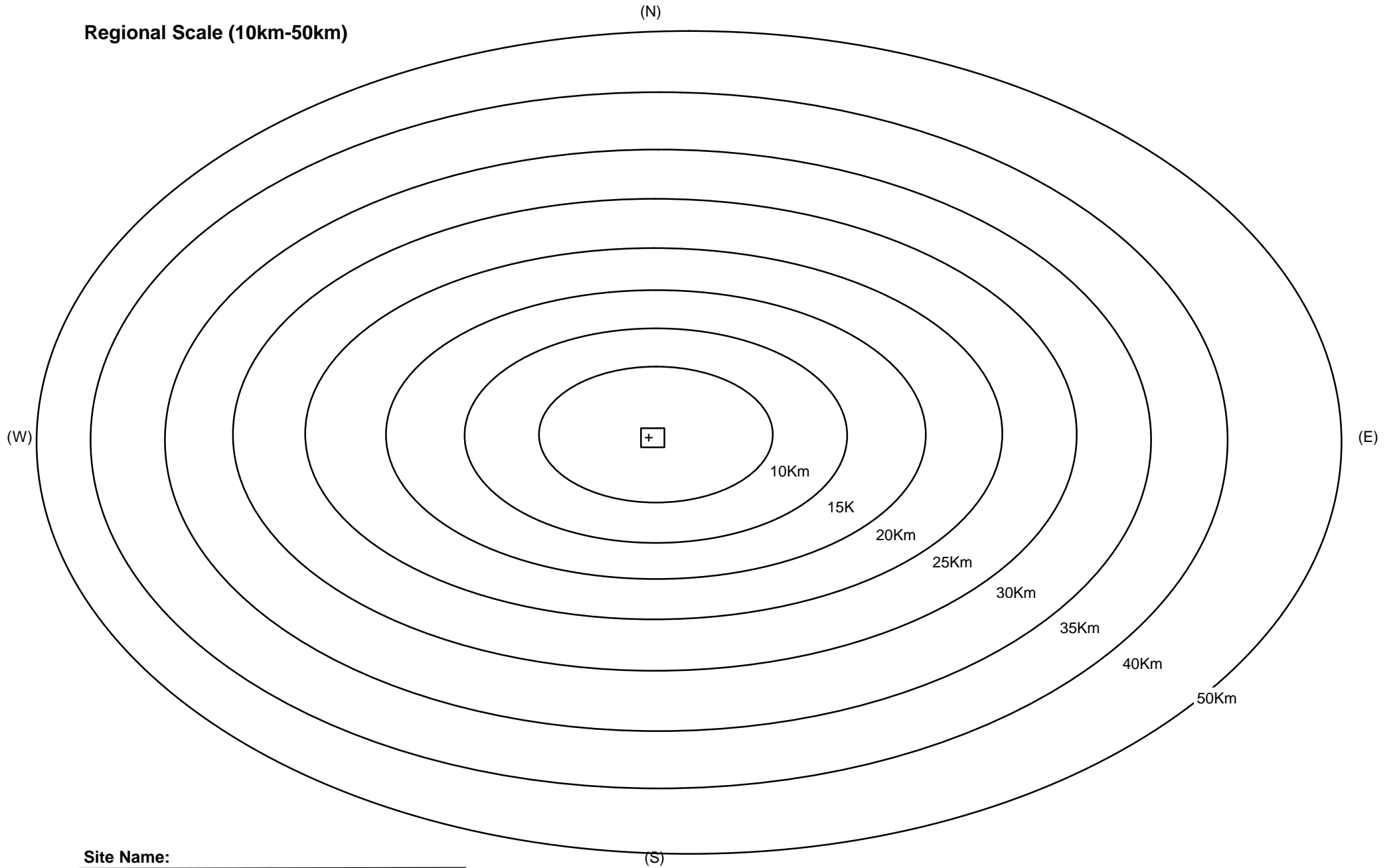
Outline of monitoring site C for remote sites*

Regional scale(10km - 50km:a sketch map should be attached)

Items	north direction(NW-NE)	east direction(NE-SE)	south direction(SE-SW)	west direction(SW-NW)
Existence of main stationary air pollution sources*				
Existence of trunk roads with more than <u>10,000 vehicles/day</u> , and their traffic densities.				
Existence of cities with the population more than <u>10,000 persons</u> .				

*: For rural site, description should be made on huge emission sources larger than 10,000tons/y and other major pollution sources.

Regional Scale (10km-50km)



Site Name: _____

2. Dry deposition (prepare for each site)

1) Outline of monitoring site

Site name		Code	
Address			
Site classification	1.urban, 2.rural, 3.remote, 4.ecological		
Latitude	(north, south) °	Longitude	(east) °
Altitude	M		
Height of sampling funnel	From the ground level: m From the floor of sampler installed: m		

2) A situation around the site

Describe the situation of the topography, land use, vegetation, sources of air pollutants, etc. at each divided direction in the following scale. A sketch map should be attached for each scale.

(1) On site scale(within 150m from sampler)

Describe in "Outline of the monitoring site (Form A)"

(2) Local scale (150m - 10km)

Describe in "Outline of the monitoring site (Form B)"

(3) Regional scale(10km - 50km)

Describe in "Outline of the monitoring site (Form C)"

3) Gases

(1) Outline of monitoring

Measured parameters	1.SO ₂ , 2.NO ₂ , 3.NO, 4.O ₃ , 5.others (HNO ₃ , NH ₃ , HCl)
Sampling period of each data	1.an hour, 2.12 hours, 3.a day, 4.a week, 5.two weeks, 6.a month 7.other()
Measurement interval	1.Continuous, 2.hourly, 3.daily, 4.weekly, 5.biweekly, 6.monthly, 7.other()

(2) Monitoring method

Measurement parameter(1)	
Measurement method	1.automatic(method:) manufacturer: , model:
	2.manual(method: 1.filtration(a.diffusion denuder, b.filter pack), 2.bubbling, 3.other()) sampling flow rate(liters/min)

Measurement parameter(2)	
Measurement method	1.automatic(method:) manufacturer: , model:
	2.manual(method: 1.filtration(a.diffusion denuder, b.filter pack), 2.bubbling, 3.other()) sampling flow rate(liters/min)

Measurement parameter(3)	
Measurement method	1.automatic(method:) manufacturer: , model:
	2.manual(method: 1.filtration(a.diffusion denuder, b.filter pack), 2.bubbling, 3.other()) sampling flow rate(liters/min)

Measurement parameter(4)	
Measurement method	1.automatic(method:) manufacturer: , model:
	2.manual(method: 1.filtration(a.diffusion denuder, b.filter pack), 2.bubbling, 3.other()) sampling flow rate(liters/min)

3. Soil and vegetation (prepare for each soil type)(For Basic survey site)

1) Permanent site

Site name (soil type)	()	Code	
Location			
Latitude	(north, south) ° '	Longitude	(east) ° '
Altitude	m		
Data of wet deposition	1. on site measuring data, 2. use the nearest wet deposition monitoring site data.		
In case of use the nearest wet deposition monitoring site data.	name of the site: distance from the site: km direction from the site(bearings):		
Site classification of the wet deposition monitoring site	1.urban 2.rural 3.remote		

2) A situation around the site

Describe the situation of the topography, land use, vegetation, sources of air pollutants, etc. at each divided directions in the following scale. A sketch map should be attached for each scale.

(1) On site scale(within 150m from sampler)

Describe in "Outline of the monitoring site (Form A)"

(2) Local scale (150m - 10km)

Describe in "Outline of the monitoring site (Form B)"

(3) Regional scale(10km - 50km)

Describe in "Outline of the monitoring site (Form C)"

3) Outline of monitoring

(1) Soil

Measurement parameters	1.pH(H ₂ O), 2.pH(KCl), exchangeable(3.Na ⁺ , 4.K ⁺ , 5.Ca ²⁺ , 6.Mg ²⁺ , 7.Al ³⁺ , 8.H ⁺), 9.exchangeable acidity, 10.ECEC, 11.Carbonate, 12.T-C, 13.T-N, 14.SO ₄ ²⁻ , 15.available phosphate, 16,others(,)
Monitoring interval	1. annual, 2.everyyears, 3.irregular(date of the last survey(m, d, y))

(2) Vegetation

Measurement parameters	1.observation of tree decline, 2.description of trees, 3.others(,)
Monitoring interval	1. annual, 2.everyyears, 3.irregular(date of the last survey(m, d, y))

4) Meteorological observation

Parameters of Observation	1.precipitation amount (a.tipping bucket, b.gravimetric, c.other()), 2.wind direction, 3.wind velocity, 4.temperature, 5.humidity, 6.solar radiation, 7.other()
In case of using the nearest meteorological station data	name of the station: distance from the site: km direction from the site (bearings):

4. Inland aquatic environment (prepare for each site)

1) Outline of monitoring site

Type of inland aquatic system	1.Lake or pond, 2.fountainhead and spring, 3.other()		
Site name		code	
Location	(attach a map)		
Latitude	(north, south) °	Longitude	(east) °
Altitude	M		
Origin of the inland aquatic system			
Data of wet deposition	1.on site monitoring data, 2.use the nearest wet deposition monitoring site data.		
In case of using the nearest wet deposition monitoring site data.	name of the site: distance from the site: km direction from the site(bearings):		
Site classification of the wet deposition monitoring site	1.urban 2.rural 3.remote		

2) Outline of monitoring

Analytical parameters	1.pH, 2.EC, 3.alkalinity, 4.NH ₄ ⁺ , 5.Na ⁺ , 6.K ⁺ , 7.Ca ²⁺ , 8.Mg ²⁺ , 9.SO ₄ ²⁻ , 10.NO ₃ ⁻ , 11.Cl 12.other ()
Monitoring interval	1. ___times a year, 2.every ___years, 3.irregular(date of the last survey(, ,))

3) Characteristics of the Lake (year:)

Area	m ²	Shape*	
Shore line length	M		
Hydrologic al type	1.extreme oligotrophic, 2.oligotrophic, 3.mesotrophic, 4.eutrophic, 5.hypereutrophic		
Water depth	mean:	m, maximum:	m
Water volume	m ³		
Annual deviation of water depth	m -	m(mean: m)	
Mean retention time of water	Days		
Utilization	1.irrigation, 2.domestic water, 3.electric power, 4.fish culture, 5.sightseeing, 6.others()		

*A map should be attached.

4) Outline of watershed (year:)

Area	. km ²
Altitude	m - m
Surface geology	
Soil Types	
Vegetation (dominant plants)	
Land uses (covered percentage %)	(%) (%) (%)
Population	
Number of inlet streams	:
Amount of inlet water	annual: m ³ /year daily: m ³ /day(month:) - m ³ /day(month:)
Number of outlet streams	:
Amount of outlet water	annual: m ³ /year daily: m ³ /day(month:) - m ³ /day(month:)
Number of springs	
Amount of the water	annual: m ³ /year daily: m ³ /day(month:) - m ³ /day(month:)

* A geological map should be attached.

5) Meteorological observation

Parameters of Observation	1.precipitation amount (a.tipping bucket, b.gravimetric, other()), 2.wind direction, 3.wind velocity, 4.temperature, 5.humidity, 6.solar radiation, 7.other()
In case of using the Nearest meteorological station data	name of the station: distance from the site: km direction from the site (bearings):

Format on monitoring data for each calendar year

Date(data reporting)	
Country name	
Organization name	
Department	
Name of national QA/QC manager(NAM)	
Postal address	
Contact address	Tel: _____ Fax: _____ E-mail: _____

1. Wet deposition (prepare for each site)

1) Site

Site name		Code	
Postal address			
Site classification	1.urban 2.rural 3.remote		

2) Sampling and shipping

Sampling	sample bottle: 1.polyethylene, 2.other()
	sample temperature: 1.uncontrolled, 2.cooling(°C)
	note*()
Shipping	sample temperature: 1.uncontrolled, 2.cooling(°C), 3.freezing
	note*()
	packing procedure: 1.cooler box, 2.other()
	shipping frequency: 1.weekly, 2.biweekly, 3.monthly, 4.other()
Mean time from Sampling to analysis	around.....(week,day,hour)(s)
Use of biocides, kind of biocide and added quantity	1,use(kind of biocide: , added quantity:), 2.no use
Name of sampling Organization and reporter	

*describe any treatments which don't meet the manual such as filtration of samples

3) Measurement/analytical condition

Parameter	Measurement/analytical method	Manufacturer/Type of equipment	Detection limit (µmol/l)	Determination limit (µmol/l)	Note
PH					
EC					
SO ₄ ²⁻					
NO ₃ ⁻					
Cl ⁻					
NH ₄ ⁺					
Na ⁺					
K ⁺					
Ca ²⁺					
Mg ²⁺					
()					
()					
()					

4) Results of analysis

Fill in the form of wet deposition analysis(Wet A).

5) Meteorological condition(reported year)

Month		1	2	3	4	5	6	7	8	9	10	11	12
Items													
Temperature(°C)	monthly mean												
	max.daily mean												
	min.daily mean												
Humidity (%)	monthly mean												
	max.daily mean												
	min.daily mean												
Mean wind speed (m/s)													
Most appearance wind Direction (bearings)													
Precipitation amount (mm/month)													
Sunshine duration (hours/month)													
Solar radiation (MJ/m ² /month)													

Hourly data of temperature, humidity, wind direction, wind speed, and daily precipitation amount and daily sunshine time, etc. prefer to be reported by the data files of computer (floppy disks: the data format will discuss extra) and its printout sheets. In case of reported by data files of computer and its printout sheets, the description in above column can be omitted.

5) Others

Note:

2. Dry deposition (prepare for each site)

1) Site

Site name		Code	
Postal address			
Site classification	1.urban 2.rural 3.remote		

2) Monitoring methods

(1) In case of automatic measurement

Measurement parameter				
Calculating method of each data				

(2) In case of manual measurement

a. Sampling

Sampling method	1.filtration(..... step(s) sampling, denuder: a.attached(coating: _____), b.not attached), 2.bubbling, 3.other(_____)
Mean time from sampling to analysis	around_.....(week,day,hour)(s)
Sample handling during shipping	temperature: 1.uncontrolled, 2.cooling(_____ ° C), 3.freezing sample vessel: 1.plastic bag, 2.glass vial, 3.plastic vial, 4.other(_____)

3) Measurement results

(1) Gases

a. Measurement results

When measured with automatic instrument, the data prefer to be reported by files of computer (floppy disks: the data format will discuss extra) and its printout sheets.

The form of printout should be followed the Form (Dry A).

In case of manual sampling and chemical analysis by filter packs, the data should be reported in the Form (Dry B and C).

2) Particulate matter

a. Measurement results

The concentration of particulate matter and its components should be described in data table of particulate matter(Form: Dry B)

If the particulate matter is measured by automatic equipment, the concentrations of particulate matter should be described in Form(Dry A) by change the unit ppb to $\mu\text{g}/\text{m}^3$.

4) Meteorological condition(reported year)

Month		1	2	3	4	5	6	7	8	9	10	11	12
Items													
Temperature(°C)	monthly mean												
	max.daily mean												
	min.daily mean												
Humidity (%)	monthly mean												
	max.daily mean												
	min.daily mean												
Mean wind speed (m/s)													
Most appearance wind Direction (bearings)													
Precipitation amount (mm/month)													
Sunshine duration (hours/month)													
Solar radiation (MJ/m ² /month)													

Hourly data of temperature, humidity, wind direction, wind speed, and daily precipitation amount and daily sunshine time, etc. prefer to be reported by the data files of computer (floppy disks: the data format will discuss extra) and its printout sheets. In case of reported by data files of computer and its printout sheets, the description in above column can be omitted.

5) Others

Note	
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3. Soil and vegetation (prepare for every survey)(For basic survey site)

1) Outline of the preliminary survey site

Site name		Code	
Postal address			
Site classification of (nearest) wet deposition monitoring site	1.urban 2.rural 3.remote		

2) Summary of sampling site(Reconnaissance survey) Form(Soil & vegetation A)

Date			
Vegetation type	1.natural forest, 2.secondary forest, 3.bush, 4.man-made forest, 5.plantation, 6.street trees, 7.grass, arable land		
Plants without injury			
Plants name:	, , , , , ,		
Plants with injury			
Plant name			
Symptom	1.chlorosis, 2.necrosis, 3.color change, 4.defoliation, 5.die back		
Damage	1.slight, 2.evident, 3.severe, 4.very severe or dead		
Comments:			
Plant name			
Symptom	1.chlorosis, 2.necrosis, 3.color change, 4.defoliation, 5.die back		
Damage	1.slight, 2.evident, 3.severe, 4.very severe or dead		
Comments:			
Plant name			
Symptom	1.chlorosis, 2.necrosis, 3.color change, 4.defoliation, 5.die back		
Damage	1.slight, 2.evident, 3.severe, 4.very severe or dead		
Comments:			

3) Establishment of permanent monitoring sites

(1) Description of permanent monitoring site *

Form(Soil & Vegetation B)

Site name			
Location			
Site classification of the (nearest) wet deposition monitoring site	1.urban 2.rural 3.remote		
Latitude	(North/South) °	Longitude	(east) °
Altitude	m		
Slope direction(bearings)		Slope degree	°
Surface geology:			
Geomorphology:			
Soil type:			

(2)Summary description of the monitoring forest*

Forest type	1.natural, 2.secondary, 3.man made
Major tree species	
Stand age	
Management review:	

Note*: Two different soil types should be selected in a basic survey. These formats should prepared for each soil type.

4) Soil survey

(For the following surveys, reporting formats should be prepared for each soil type.)

(1) Soil profile description

Fill in the form of the description of soil profile (soil & vegetation C) according to the method of FAO guideline (1990) before soil sampling, and attach photographs on the soil profile.

(2) Chemical analysis of soil

Site name		
Sampling date		
Soil type		
Collection subplot		
Collection method		
Mean time of sampling to analysis	day(s)	
Shipping and packing procedure of samples		
Name of analysis laboratory and reporter		
<p>Pretreatment methods of soil samples(If the method is different from the manual, it should be specified.):</p> <p>parameter: pretreatment:</p> <p>parameter: pretreatment:</p>		
<p>Analytical methods of soil samples(If the method is different from the manual, it should be specified.):</p> <p>parameter: analytical method:</p> <p>parameter: analytical method:</p>		

(3) Results of chemical analysis

Form (Soil&Vegetation C-1) Results of profile survey

PROFILE No.

DATE:

SURVEYER:

Profile sketch	211	212		221	222				231	232			
	Horizon	Boundary		Soil Color	Mottling				Text Class	Rock fragment			
		Depth	Distinctness		Topography	Abundance	Size	Contrast		Boundary	Color	Abundance	Shape
	A	A	S		N	V	F	S	C	N	F	F	F
	E	C	W		V	F	D	C	L	V	A	W	M
	B	G	I		F	M	P	D	CL	F	S	S	C
	C	D	B		C	C			Si	C	R		S
R					M				SiC	M			S
					A				SiCL	A			B
									SiL	D			L
									SC				
									SCL				
									SL				
									LS				
									S				
	(H,O)												
	L												
	F												
	H												

(AC GR GN GG QZ SC AN DI BA UB GA BT DO VO SE LI DM SA QS SH MA TR CO SI TU PY EV GY NK)

Form (Soil&Vegetation C-2)

PROFILE No.

DATE:

SURVEYER:

241		242				Hardness Yamanaka method	250				261				262				263				271		272		281		
Structure		Consistence					Voids				Cutanic features				Cementation & Compaction				Mineral nodule				Root		Biological feature		Carbonate		
Grade	Type	Size	Dry	Moist	Wet		Abundance	Size	Type	Porosity	Abundance	Contrast	Nat	Loc	Community	Degree	Structure	Nature	Abundance	Size	Shape	Hardness	Color	Nature	Kind	Abundance	Size	Abundance	Kind
VW	VF	SG	LO	LO	NST	NPL	N	V	I	1	N	F	C	P	B	N	N	K	N	V	R	H	K	T	N	VF	N	A	N
WE	FI	MA	SO	VFR	SST	SPL	V	F	B	2	V	D	CS	PV	D	Y	Q	V	V	F	E	S	C	V	F	V	B	SL	
MO	ME	GR	SHA	FR	ST	PL	F	M	V	3	F	P	CH	PH	C	W	F	F	F	M	I	B	CS	S	F	M	C	BO	
ST	CO	PR	HA	FI	VST	VPL	C	C	C	4	C		PF	CF	M	PI	QK	C	C	C	A		CS	S	C	C	M	BI	
VS	VC	CO	VHA	VFI			M	VC	P	5	M		S	LA	C	D	FM	M	A				GY	R	M		C	CE	
		AB	EHA	EFI							A		SP	VO			FO	D					SA					P	
		SB									D		SI	NS			GY						S					T	
		PL											SF				CS						Q					I	
		RS															CS						F						
																	MP						FM						
																	PNK						NK						

Form(Soil & vegetation D) Results of chemical analysis (Soil)

Sampling period: _____

Name of analysis laboratory: _____ Reporter: _____

Sample No.	Location	Plot No.	Sub-plot No	Layer analyzed (cm)	Moisture content (wt%)	pH		Exchangeable base cations				Ex-acidity	Ex-acid cations		ECEC	CaCO ₃ (%)	T-C (g kg ⁻¹)	T-N (g kg ⁻¹)
						HO	KCl	Ca	Mg	K	Na		Al	H				
						(cmol(+) kg ⁻¹)												
			1															
			2															
			3															
			4															
			5															
			1															
			2															
			3															
			4															
			5															
			1															
			2															
			3															
			4															
			5															
			1															
			2															
			3															
			4															
			5															

A large-scale map of the area showing each sampling plot should be attached. If the process from pretreatment through chemical analysis were repeated, two sets of sheet should be prepared. When voluntary items and optional items for physical properties are analyzed, the similar format should be prepared.

5) Vegetation survey

(For the following surveys, reporting formats should be prepared for each plot.)

(1) Measurement and decline value of trees

a. Outline of survey

Site name		Code	
Survey date			
Major tree species			
Survey methods (If the methods are different from the manual, they should be specified.):			
Name of survey laboratory and reporter			

b. Measurement of trees

Maximum height	m
Maximum diameter	cm
Mean height of dominant trees	m
Mean DBH of dominant trees	cm
Basal area	m ² /ha
Total volume	m ³ /ha
Density	/ha

c. Decline value of trees (Date of survey:)

(Summary of the Form (Soil & Vegetation E))

Category	A number of trees	Name of decline trees
Number of scale 0	(%)	
Number of scale 1	(%)	
Number of scale 2	(%)	
Number of scale 3	(%)	
Number of scale 4	(%)	

d. Record of foliage (tree crown) by photograph

Date	No.	Weather	Kind of film	Exposure level	Focal distance of lens	Hight of camera from ground (m)

Form(Soil & vegetation E) Decline of trees

Site Name: _____

Name of laboratory: _____, Name of reporter: _____

Individual No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
Plant Name																						
Relative height																						
Vitality of tree																						
Form of tree																						
Branch growth																						
Dieback of stem																						
Density of foliage																						
Deformation of leaves																						
Size of leaves																						
Color of leaves																						
Injury of leaves																						

Estimated cause of decline: _____

Form (Soil & Vegetation H): General Description of Monitoring Vegetation

Name of Monitoring Site: _____

Date: _____

Surveyor: _____

1. General Features

Location: _____

Forest type: Natural, Secondary, Man-made

Mean stand age: _____

Major tree species: _____

2. Trees (from Form(Soil & Vegetation F))

Maximum height: _____m (_____ m/year)

Maximum diameter: _____cm (_____ cm/year)

Mean height of dominant trees: _____m (_____ m/year)

Mean DBH of dominant trees: _____cm (_____ cm/year)

Basal area: _____m²/ha (_____ m²/ha/year)

Total volume: _____m³/ha (_____ m³/ha/year)

Density: _____stands/ha

In parenthesis, growth rate, which is calculated based on previous data, should be reported.

3. Understory Vegetation (from Form(Soil & Vegetation G))

Number of Species: _____

Name of dominant species: _____

New comer species: _____

Lost species: _____

(2) Chemical analysis of fresh leaf elements

a. Outline of survey

Site name	
Date	
Plant species	
Collection site	
Collection method	
Shipping and packing procedure of samples	
Name of laboratory and reporter on analysis	
<p>Pretreatment methods of leaf samples(If the methods are different from the manual, they should be specified.):</p> <p>parameter: pretreatment:</p> <p>parameter: pretreatment:</p>	
<p>Analytical method of leaf samples(If the methods are different from the manual, they should be specified.): should be specified.):</p> <p>parameter: analytical method:</p> <p>parameter: analytical method:</p>	

b.Results of chemical analysis(fresh leaves)

Sample name (Sample number)			
Site name			
Sampling date			
Tree height	m	m	m
No. of tree			
S	mg/kg	mg/kg	mg/kg
K	mg/kg	mg/kg	mg/kg
Ca	mg/kg	mg/kg	mg/kg
Mg	mg/kg	mg/kg	mg/kg

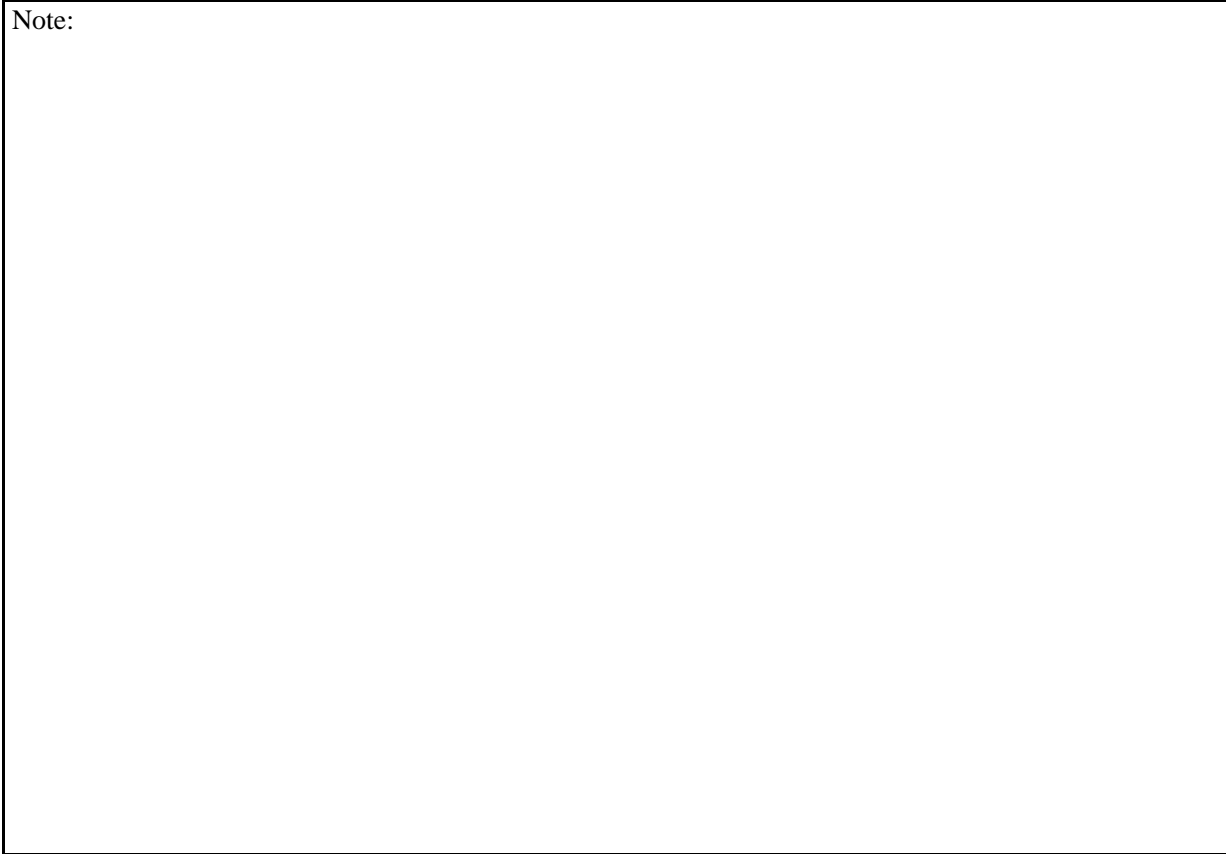
6) Meteorological condition(reported year)

Month		1	2	3	4	5	6	7	8	9	10	11	12
Items													
Temperature(°C)	monthly mean												
	max.daily mean												
	min.daily mean												
Humidity (%)	monthly mean												
	max.daily mean												
	min.daily mean												
Mean wind speed (m/s)													
Most appearance wind direction (bearings)													
Precipitation amount (mm/month)													
Sunshine duration (hours/month)													
Solar radiation (MJ/m ² /month)													

Hourly data of temperature, humidity, wind direction, wind speed, and daily precipitation amount and daily sunshine time, etc. prefer to be reported by the data files of computer (floppy disks: the data format will discuss extra) and its printout sheets. In case of reported by data files of computer and its printout sheets, the description in above column can be omitted.

7) Others

Note:

A large empty rectangular box with a black border, intended for providing additional information or notes related to the survey plot.

A soil map, geographical map, vegetation map and land use map of the area around the survey plot should be attached.

4. Inland Aquatic Environments (prepare for every survey)

1) Site

Site type	1.lake or marsh, 2.headwater or spring, 3.other()
Site name	
Location	

2) Sampling method

Water sampling method and sampling device	method: device/manufacture: model:
On site filtration	1.do(material of filter:), 2.don't
Temperature at the Shipping	1.uncontrolled, 2.cooling(°C)., 3.freezing
Mean time from sampling to analysis	day(s)
Name of sampling organization and reporter	

3) Results of analysis(surface water at the center of aquatic system)

Describe in analytical results(Inland aquatic environment) :Form(Inland A)

Form(Inland A-1) Analytical results of inland aquatic sample

Site name: _____ Date of sampling: _____

Date of analysis: _____ Sample No.: _____

Name of laboratory: _____ Name of reporter: _____

Items	Sample No.1						Sample No.2						Ratio of Mean (Sample No.1 / Sample No.2)
	1	2	3	Mean	RSD(%)	flg	1	2	3	Mean	RSD(%)	flg	
Water temperature (° C)													
pH	On-site at25° C												
EC mS/m	On-site at25° C												
Alkalinity meq/l													
SO ₄ ²⁻ mg/l													
NO ₃ ⁻ mg/l													
Cl ⁻ mg/l													
NH ₄ ⁺ mg/l													
Na ⁺ mg/l													
K ⁺ mg/l													
Ca ²⁺ mg/l													
Mg ²⁺ mg/l													
R1													
R2													

R1:cation and anion balance(100 x(cation-anion)/(cation+anion)), R2:specific conductance value(100 x(Λcalc-Λmeas)/(Λcalc+Λmeas))

Form(Inland A-2) Analytical results of inland aquatic sample

Site name: _____ Date of sampling: _____.

Date of analysis: _____ Sample No.: _____.

Name of laboratory: _____ Name of reporter: _____.

Items	Sample No.1						Sample No.2						Ratio of Mean (Sample No.1 / Sample No.2)
	1	2	3	Mean	RSD(%)	flg	1	2	3	Mean	RSD(%)	flg	
water color													
transparency													
DOC(COD) mg/l													
NO ₂ ⁻ mg/l													
PO ₄ ³⁻ mg/l													
T-Al mg/l													
SO ₄ ²⁻ * mg/l													
NO ₃ ⁻ * mg/l													
NH ₄ ⁺ * mg/l													

*Pore water of sediment sample

4) Meteorological condition(reported year)

Month		1	2	3	4	5	6	7	8	9	10	11	12
Items													
Temperature(°C)	Monthly mean												
	max.daily mean												
	min.daily mean												
Humidity (%)	Monthly mean												
	max.daily mean												
	min.daily mean												
Mean wind speed (m/s)													
Most appearance wind Direction (bearings)													
Precipitation amount (mm/month)													
Sunshine duration (hours/month)													
Solar radiation (MJ/m ² /month)													

Hourly data of temperature, humidity, wind direction, wind speed, and daily precipitation amount and daily sunshine time, etc. prefer to be reported by the data files of computer (floppy disks: the data format will discuss extra) and its printout sheets. In case of reported by data files of computer and its printout sheets, the description in above column can be omitted.

5) Others

Note: