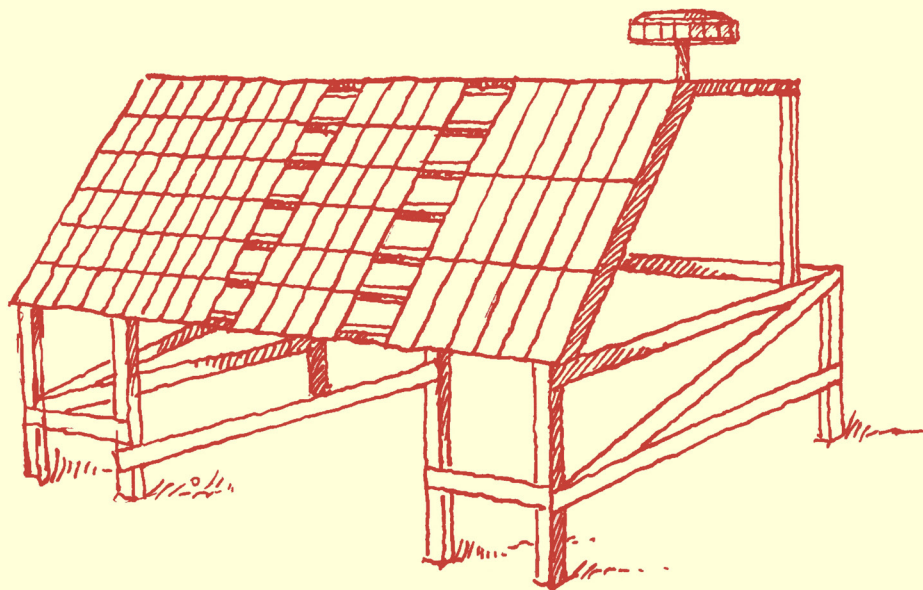


CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION

UN/ECE INTERNATIONAL CO-OPERATIVE PROGRAMME
ON EFFECTS ON MATERIALS, INCLUDING HISTORIC
AND CULTURAL MONUMENTS



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NILU - Norwegian Institute for Air Research
Kjeller / Norway

International Co-operative Programme on Materials, including Historic and Cultural Monuments

Trend exposure programme 2017 – 2018

Environmental data report October 2017 to November 2018

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Summary

This report presents the environmental measurements for the UN/ECE ICP Materials trend exposure programme, 2017-2018, and, in addition, data for temperature, relative humidity, and precipitation amount back to the end of the previous annual exposure programme in October/November 2015. All the data collected from the participating test sites are reported here. Interpretation of the data related to effects on the corrosion of materials including cultural heritage, is presented in other ICP-reports. The UN/ECE international co-operative programme on effects on materials is an international project that measures and assesses the corrosivity of the atmosphere. The corrosion of exposed sample materials and the air pollutants and climate are measured at stations mainly in Europe. Exposure studies have been ongoing in the programme since 1987, in different phases, with long time continuous exposures (1987-1995), exposures connected to EU framework projects (2002-2003), and, since 2005, with annual trend exposures and measurements of the environment every third year, and also with some longer duration exposures of materials.

The most recent annual, four- and eight-yearly exposure of corrosion material samples of: carbon steel, stainless steel, zinc, copper, limestone, coil coated steel, and soiling material samples of: modern glass limestone and marble, and environmental sampling, started at all the stations in October or November 2017. The annual samples were demounted in either October or November 2018. The four- and eight-yearly corrosion samples remain mounted on the racks. One set of eight-yearly weathering steel samples remaining from mounting in 2011, will be demounted in October 2019.

The exposures started at all the stations at dates between 19 October and 17 November. The annual average values for the environmental parameters were calculated from and including November 2017 for all the stations except one (no. 59) which did the mounting on the 17 November. For station no. 59, the annual average values for the environmental parameters were calculated from and including December 2017. Monthly values for the temperature, relative humidity and precipitation amount back to the end of the previous annual reporting period of October/November 2015 are also included.

Monthly (and tri- or a few cases four-monthly) values and annual average values for the period are reported in Appendix A and B.

Appendix A gives the monthly data reported directly from the ICP Materials test sites, for the exposure period 2017/18, and for temperature (T), relative humidity (RH) and precipitation amount (Prec) also for the exposure years 2015/16 and 2016/17. Appendix A also reports the tri-monthly, or four-monthly in the case of the two Czech stations no. 1 and 3, values for the same pollutant gases and for particle deposition, measured with IVL passive samplers and analysed at IVL, The Swedish Environmental Institute.

Appendix B gives the annual average values for the data reported directly from the ICP Materials test sites for the exposure year 2017/18, and for the same pollutant gases and for particle deposition measured with IVL passive samplers. Annex B also reports the annual average values for temperature (T), relative humidity (RH) and precipitation amount (Prec) for

the exposure years 2015/16 and 2016/17. Annex B reports the start and end dates for the material exposures and the months included in the calculation of the annual averages for the environmental parameters.

Appendix C and D give the original data from the IVL sampling, as reported by IVL. Appendix C gives the tri-monthly, or four-monthly in the case of the two Czech stations no. 1 and 3, mean values for particle deposition on IVL samplers in a position sheltered from rain and for passive sampling of pollutant gases. Appendix D gives the annual average values for the particle deposition and pollutant gases measured in a position sheltered from rain for the exposure period. Appendix E gives the data availability in % for the sampling performed.

Appendix F gives the daily rain amounts reported for the last month before demounting of samples in 2018. These data were collected especially to assist in the assessment of the observed changes in reflectivity of coil-coated surfaces after the exposures.

Appendix G gives an overview of which stations measured elemental and or black carbon (EC/BC) in 2017/18 and by which method. This is an answer to a particular request about this information from the ICP Materials stations. The list of the data sources and acknowledgements for the data from the stations, reported to the data centre from 2014 to 2018, is given in Appendix H. A complete list of participants and national contact centres, participating in the 2017–2018 trend exposure programme, is given in Appendix I.

A good database for dose-response evaluation should have data with a wide range of values for the most important parameters. The 2017-2018 environmental data have a good spread in values for all important gases, as well as for the most important meteorological parameters.

Trend exposure programme 2017 – 2018

Environmental data report

October 2017 to November 2018

1 Introduction

Airborne acidifying pollutants are known to be one major cause for corrosion of different materials including the extensive damage that has been observed on historic and cultural monuments. In order to fill some important gaps of knowledge in this field, the Executive Body for the Convention on Long-range Transboundary Air Pollution decided to launch an International Co-operative Programme on Effects of Air Pollution on Materials, including Historic and Cultural Monuments, ICP Materials. The programme was launched in 1985. Measurements have been running since September 1987 and has involved exposure of materials at more than 30 test sites in Europe (+ Israel) and North America.

Exposures were running for eight years at 39 test sites in 14 countries from 1987 to 1995 (Henriksen et al., 1997). A second phase of the project started in 1997 with an adjusted number of test sites: 30, and participating countries: 19 (Henriksen and Arnesen, 2003, Henriksen and Arnesen, 2000). During the interim period 1995 to 1997, trend analysis for metal corrosion and exposure of the glass and polymeric materials continued. In 2002-2003 the ICP Materials programme was combined with exposures in the EU project MULTI-ASSESS (EVK4-CT-2001-00044) (Henriksen et al. 2004). In 2005-2006, 2008-2009, 2011-2012 and 2014-2015 annual trend exposures with analysis of corrosion of materials samples, including samples of carbon steel, weathering steel, stainless steel, zinc, copper, aluminium and Portland limestone, and analysis of soiling of glass samples, were carried out. In 2017-2018 new exposures were started with the same materials and in addition corrosion samples of coil coated steel and soiling samples of limestone and marble.

For every period of the trend exposures, the environmental parameters are measured and reported. In 2005-2006, 22 stations in 13 European countries plus Canada participated. In 2008-2009, 24 stations in 14 European countries participated. In 2011-2012, 22 stations in 13 European countries participated. In 2014-2015, 24 stations in 16 European countries participated. In 2017-2018, 24 stations in 15 European countries and one in the USA participated.

NILU - Norwegian Institute for Air Research has been the sub-centre responsible for the environmental data collection, storing, evaluation and reporting during the whole programme. This report includes the environmental data reported from the 2017-2018 trend exposures. In addition it includes data for the climate parameters, temperature (T), relative humidity (RH) and precipitation (Prec.) from the end of the previous trend exposure period, November 2015. These climate data are reported as monthly values and as annual averages for the years 2015/16 and 2016/17.

The aim of the trend exposures, from 2005, is to follow the development of corrosion trends over time in Europe in the present situation with a changing pollution and climate situation.

The programme has changed focus during the time past. In 1987 the focus was on the impact of SO₂ and climate. Later the programme was enlarged to perform a quantitative evaluation of the effect of NO_x and other pollutants like ozone and sulphur in combination with climatic parameters, on the atmospheric corrosion of important materials. New parameters like HNO₃ and particulate matter were introduced in the EU-project MULTI-ASSESS, and the study was expanded from corrosion to include soiling. In the new trend exposure programme from 2005, main indicator materials are exposed every third year and environmental parameters are collected.

The environmental data for the ICP Materials programme has been collected since September 1987. The environmental data from the three trend exposure periods from 2005 to 2014 are reported in Grøntoft and Ferm (2017, 2014) and Grøntoft et al. (2011, 2007).

The programme has been and is organised with Sweden as lead country and the Swedish Corrosion Institute (SCI), - from 2005 named “the Corrosion and Metals Research Institute” (KIMAB), is serving as the Main Research Centre. Sub-centres in different countries have been appointed, each responsible for the provision and analysis of one or more materials. The present materials Sub-centres are:

Structural metals:

- Steel and zinc (Sub-centre responsible for evaluation: SVUOM Praha a.s., Prague, Czech Republic)
- Weathering steel (CENIM, Madrid, Spain)
- Zinc (EMPA Corrosion/Surface Protection, Dübendorf, Switzerland)
- Copper and aluminium (KIMAB, Stockholm, Sweden)

Painted materials. Coil coated steel (HAMK Sheet Metal Centre, Häme University of Applied Sciences, Hämeenlinna, Finland)

Stone materials. Portland limestone (Building Research Establishment Ltd., Department of Environment, Waterford, United Kingdom).

Glass and stone materials – soiling. Univerisite Paris XII (LISA)

NILU is, and has been through the whole programme, the sub-centre for the environmental database.

Other sub-centres through the history of the exposure programs, non-active in 2017-2018, are:

Paint coatings. Steel with silicon alkyd paint (Norwegian Institute for Air Research, Kjeller, Norway).

Glass materials. Two types of glass M1 and M3 (Institute of Chemistry, Academy of Fine Arts, Vienna, Austria)

Sub-centres for concrete and more stone materials, some of which are operational within the present trend exposure programme (see above), were active in the MULTI-ASSESS project 2002:

Stone and concrete materials:

- Standard Portland concrete, Latvian limestone (Riga Technical University, Riga, Latvia).
- Portland limestone, Carrara marble, Calcareous Baumberger sandstone (Building Research Establishment Ltd., Department of Environment, Waterford, United Kingdom).
- Gotland sandstone (Swedish Corrosion Institute, Stockholm, Sweden).

Soiling materials:

- Synthetic polymeric materials (Middelsex University, GB)
- Modern Glass (LISA – Universite Paris XII, Paris, France)

The range of materials that has been and can be exposed and related scientific partners/contacts is large.

Corrosion of carbon steel, zinc and Portland limestone and soiling of modern glass were measured in the trend exposures of 2005/6, 2008/9. In addition corrosion of weathering steel, copper and aluminium was measured in 2011/12, stainless steel in 2014/15, and coil coated steel and soiling of limestone and marble in 2017/18.

Simultaneously a range of environmental parameters was measured (for the 2017-18 campaign see Table 1 and Appendix A – B).

Extended environmental analyses. Passive HNO_3 and particle deposition measurements were introduced in the MULTI-ASSESS project (IVL Swedish Environmental Research, Gothenburg, Sweden), and were measured in the trend exposure programmes from 2005 to 2018. In 2011/12 also non-optional measurements of SO_2 , HCOOH , CH_3COOH , HCl and HF gas and optional measurements of NH_3 gas were performed with IVL passive sampling method. IVL provide passive samplers for SO_2 , NO_2 and O_3 to stations who do not measure these components with local instruments or samplers. The data reported from IVL is given in Appendix A to D.

2 The measuring programme

The measuring programme for the trend exposures in 2017-2018 is given in Table 1

Table 1: The environmental measurement programme for the ICP Materials trend exposures 2017 – 2018, “standard parameters”.

Components to be measured under topics	
Mandatory	Gases : SO ₂ , O ₃ , NO ₂ , HNO ₃ (IVL) Precipitation : mm, pH, Cl ⁻ Particulates : Particle deposition (IVL) Climate : Temperature, relative humidity
Optional	Precipitation : Conductivity, SO ₄ -S, NO ₃ -N, NH ₄ -N, Na ⁺ , Ca ²⁺ , Mg ²⁺ , K ⁺ Particulates : PM ₁₀

The measurements were partly performed with locally available equipment and partly with passive samplers from IVL-Sweden (Ferm, 1999).

The data were reported to the environmental sub-centre as monthly mean values, except for mm precipitation, which was reported as the monthly sum. Tri-monthly, or four-monthly in the case of the two Czech stations no. 1 and 3, mean data values from measurements with IVL passive methods were reported for HNO₃ gas concentrations and for particle deposition, for all sites, and for SO₂, NO₂ and O₃ gas concentrations where local monthly data were otherwise not available.

The data are presented as monthly (and three of four monthly for the IVL data) and annual average values for the project period.

The quality control of the reported data is the responsibility of the countries and partners that report the data. The environmental sub-centre will control the data reported for outliers and create the joint database. It will also perform an evaluation of the data files and look for trends in the data set.

3 Data from the monitoring test sites

The data are sent to the environmental sub-centre as Excel data files by e-mail.

All data presented by the environmental sub-centre are given with the same accuracy as in the reporting forms agreed upon. For data series which include values "below the detection limit", these are, by convention, replaced with one half of the reported detection limits when calculating the mean values.

4 Monthly mean concentrations

The average monthly data reported for the test sites for the trend exposure, October 2017 to November 2018, are given in Appendix A. The calculated average annual data are given in Appendix B. The tri-monthly (or four-monthly) values for particles and gases measured with IVL samplers are given with the monthly values in Appendix A. The calculated average annual values for particles and pollutant gases are given in Appendix B. The complete IVL data are given in Appendix C and D. The participating countries are reporting data on a monthly basis. The particle deposition, HNO₃, and additional to local sampling of the gases SO₂, NO₂ and O₃ is analysed and reported from IVL, Sweden.

5 Calculation of monthly values

For their own test sites the participants shall calculate the mean values in accordance with the following equations.

- Mean temperature (T_M)

$$T_M = \frac{\sum_1^i T_i}{i}$$

$$i = \text{number of records} \quad (1)$$

T_i = measured values

- Mean relative humidity (RH_M)

$$RH_M = \frac{\sum_1^i RH_i}{i} \quad (2)$$

- Mean gas concentrations G_M

$$G_M = \frac{\sum_1^i G_i}{i} \quad (3)$$

For some sites where complete information of the sampling period exists, another equation is used for mean gas concentrations

$$G_M = \frac{\sum_1^i (n_i \cdot G_i)}{\sum_1^i n_i} \quad (4)$$

n_i = sampling period

- Precipitation

$$mm = \sum_1^i mm_i \quad (5)$$

The amount of precipitation is reported as the total amount for that month (in mm). This can be done without adjustment if the availability is 100%. If there are some missing data, however, this needs to be taken into account. As an example, consider a case when sampling is made each day for a month consisting of 30 days and where data for two of the days are missing, making the availability 28/30 = 93%. If the total amount of precipitation for the 28 days is (say) 28 mm, corresponding to an average precipitation of 1 mm/day, this means that the expected total amount of precipitation for that month should be reported as [30 mm, D, 93%]. In this example it is of course important to distinguish between a day measured to have no rain (counted as 0 mm) and a day with missing data (counted as 1 mm).

- Weighted mean pH (pH_M)

$$pH_M = -\log^{-1} \frac{\sum_1^i [mm_i \cdot (10^{-pH_i})]}{\sum_1^i mm_i} \quad (6)$$

- Weighted mean values for cations, anions and conductivity (C_M)

$$C_M = \frac{\sum_1^i (mm_i \cdot C_i)}{\sum_1^i mm_i} \quad (7)$$

6 Sites

For the trend exposures taking place from 2017, a selection of exposure sites was made. The list of test sites over time for the UN/ECE ICP Materials project is given in Table 2 (extended from SCI, 2005). The sites with a not yet finalised measuring period onwards from 1987 (no end year) were participating in the 2017/18 trend exposures.

Table 2: List of test sites of UN/ECE ICP Materials exposure programme. Stations participation since 1995.

1	Prague	The Czech Republic	Urban	1987→
3	Kopisty	"	Industry	1987→
5	Ähtäri	Finland	Rural	1987→ 2003
7	Waldhof-Langenbrügge	Federal Republic of Germany	Rural	1987→ 2003
9	Langenfeld-Reusrath	"	Rural	1987→ 2003
10	Bottrop	"	Industry	1987→
13	Rome	Italy	Urban	1987→
14	Casaccia	"	Rural	1987→
15	Milan	"	Urban	1987→
16	Venice	"	Urban	1987→
21	Oslo	Norway	Urban	1987→
23	Birkenes	"	Rural	1987→
24	Stockholm South	Sweden	Urban	1987→
26	Aspvreten	"	Rural	1987→
27	Lincoln Cathedral	United Kingdom	Urban	1987→ 2003, 2008→ 2009
31	Madrid	Spain	Urban	1987→
33	Toledo	"	Rural	1987→
34	Moscow	Russia	Urban	1987→ 2003
35	Lahemaa	Estonia	Rural	1987→ 2009, 2014-15
36	Lisbon-Jeronimo Monastery	Portugal	Urban	1987→ 2003
37	Dorset	Canada	Rural	1987→ 2006
40	Paris	France	Urban	1997→
41	Berlin	Germany	Urban	1997→
43	Tel Aviv	Israel	Urban	1997→ 2001
44	Svanvik	Norway	Rural, industry	1997→
45	Chaumont	Switzerland	Rural	1997→
46	London	United Kingdom	Urban	1997→ 2003
47	Los Angeles	USA (CA)	Urban	1997→ 2003
49	Antwerp	Belgium	Urban	1997→ 2003
50	Katowice	Poland	Urban, industry	1999→
51	Athens	Greece	Urban,	2005→
52	Riga	Latvia	Urban,	2005→2012
53	Vienna	Austria	Urban,	2008→
54	Sofia	Bulgaria	Urban,	2008→2012
55	St. Petersburg	Russia	Urban	2011→2015
57	Hämeenlinna	Finland	Rural, urban	2014→
58	New Heaven	USA	Urban	2017→
59	Žilina	Slovakia	Urban	2014→
60	Split	Croatia	Urban, coastal	2017→
61	Zagreb	Croatia	Urban	2017→

7 Regularity and quality of the reported data

The test sites represent areas from background level of pollutants (rural) to urban and industry levels. The background sites have historically had the best regularity for the data reported. Many of these sites belong to the EMEP monitoring programme and have long and good data records.

In urban and industrial areas it is generally more difficult to maintain sites. In programmes like ICP Materials with long exposure periods, it is sometime necessary to move a test site due to local problems like new use of the property. In some countries the funding of the environmental measurements was limited in periods. This is reflected in the selection of measurement stations for the trend exposures.

A brief review of the quality of the reported data for the different test sites are given in the following pages.

7.1 Review of reported data in the trend exposure programme, 2014 – 2015.

Optional data

The reporting of data for cations in precipitation and for particle concentration, PM₁₀, were optional in the programme. Full sets of monthly data for cations in precipitation are reported for sites 10, 21, 23, 31, 33, 44, 60 and 61. Full sets of monthly PM₁₀ data are reported for sites 1, 3, 10, 13, 15, 16, 23, 24, 31, 33, 45, 51, 53, 57, 59, 60 and 61.

Non optional IVL data

IVL data for SO₂, NO₂ and O₃ are reported from a number of sites, mainly those that didn't have local (non IVL) measurement results for these parameters from the stations – in which case the IVL measurements are non-optional. The non-optional IVL data (HNO₃ and particulate matter deposition) are reported from all the sites, except 50 and 59.

The IVL tri-monthly and annual average data for HNO₃ and particulate matter deposition, and for SO₂, NO₂, O₃, where these were measured, are reported with the other station-data in Appendix A and B.

A review of the reporting of the mandatory data from the single countries and stations is given below.

Sites 1 and 3 Czech Republic

Sites 1 and 3 have complete sets of data, except for missing H⁺ and Cl⁻ data in some months with low precipitation: July 2017 for station no. 1 and February and July 2017 for station no 3.

Sites 10 and 41 Germany

Site 10 Bottrop has a complete data set for the period. For SO₂ values reported as < 10 mg/m³, a value of 5 mg/m³ was used for the calculation of the annual average. Site 41 report all data except pH in precipitation in November and December 2017 and Cl⁻ in precipitation, which are missing for the whole period. The gas data for station 41 are IVL data.

Sites 13, 14, 15 and 16 Italy

The Italian stations report most of the data. H⁺ and Cl⁻ in precipitation, are missing from all the stations. SO₂ and O₃ are missing from station no. 16, Venice. In addition all the data for November 2018 are missing from station no. 13. The gas data for station no. 14 are IVL data.

Sites 21, 23 and 44 Norway

The Norwegian stations report all the data, except for SO₂ in July 2018 at station 44. For station 21 and 44 the O₃ data is IVL data.

Sites 24 and 26 Sweden

Station 24 report all the data except H⁺ and Cl⁻ in March 2018. Station 26 report all the data. The gas data are IVL data for both stations.

Sites 31 and 33 Spain

The Spanish stations report all the data, except H⁺ and Cl⁻ in July 2018 when they were not measurable due to low rain amounts.

Site 40 France

Site 40, Paris report all the data, except Cl⁻ in October 2018. The SO₂, NO₂ and O₃ data are IVL data. The gas data are IVL data.

Site 45 Switzerland

All the data are available for Site 45, Chaumont. IVL data are reported for SO₂ and are reported, in addition to the local (non IVL) data, for NO₂ and O₃.

Site 50 Poland

Site 50, Katowice, report all the data, except H⁺ and Cl⁻ in precipitation, which are missing for the whole period.

Site 51 Greece

Site 51, Athens, report all the data, except Cl⁻ in precipitation and pH in precipitation in March and April 2017, and August and October 2018, due to low precipitation amounts.

Site 53 Austria

Site 53, Vienna, report all the data.

Site 57 Finland

Site 57, Hämeenlinna, report all data, except H⁺ and Cl⁻ in precipitation in May 2018, due to low rain amount. SO₂, NO₂ and O₃ gas concentrations were measured with IVL samplers. NO₂ is also reported from local measurements, in Hämeenlinna centre about 3 km from the exposure site.

Site 58 USA

Site 58, New Heaven report the climate data: T, RH and precipitation amount. The gas data and H⁺ and Cl⁻ in precipitation, are missing for the whole period.

Site 59 Slovakia

Site 59, Žilina, report all the data, except missing RH in June 2018, and missing SO₂ in June, August, October and November 2018. Regarding the value for O₃ reported from Žilina:

“A value of 153.5 µg/m³ was initially reported from the Faculty of Civil Engineering, University of Zilina for a station located 42 m for the exposure rack. This included some months with a value higher than 400 µg/m³. These high values were evaluated to be uncertain, and it was therefore decided to use the annual mean value for 2018, of 43.6 µg/m³, reported for the EEA Network NETSK-001 urban background station in Zilina (EEA, 2019: <https://www.eea.europa.eu/data-and-maps/dashboards/air-quality-statistics-expert-viewer>). This station is about 1.5 km away from the rack. It was evaluated that the O₃ concentrations would be relatively similar at the two measurements locations”

Sites 60 and 61 Croatia

The Croatian sites report all the data.

For Zagreb: PM₁₀, SO₂ and NO₂ were measured on Zagreb-2 station about 200 m away from 61-Zagreb; O₃ was measured on Zagreb-3 station about 5 km away from 61-Zagreb. All parameters measured by Croatian Meteorological and Hydrological Service.

For Split: Precipitation samples for split are collected on Split-Marjan station (about 3 km away from 60-Split) and analysed by Croatian Meteorological and Hydrological Service; PM₁₀, SO₂ and NO₂ are measured on Split-1 location (about 1 km away from 60-Split).

8 Data for regression analyses

8.1 The data base

For regression analyses the database for material damage for one year has to be correlated with the environmental database for the same period (Appendix B).

8.2 The data distribution

It is important for the evaluation of the dose-response correlation for the environmental impact on the materials that there is as large spread as possible in the concentrations of the most important pollution parameters. In the following figures the ranked distributions of the yearly mean values for the climate and pollution parameters, for the exposure year 2017-2018, are given. The diamonds represent values for measurements with the local (non IVL) station equipment, whereas the squares represent values from measurements with IVL passive samplers.

In Figure 1 the spread in the SO₂-concentrations for the year (2017-2018) is shown. The numbering of the sites is in accordance with Table 2. The measured SO₂ values range from 20.9 µg/m³ in Žilina (no. 59) down to 0.2 µg/m³ for Birkenes (no. 23). The distribution is uneven with about half of the stations below 2 µg/m³, then a gradually sharper increase between the stations to the highest value of 20.9 µg/m³. The distribution of the values for 2017-2018 was quite similar as for the period 2011/12 and 2014/15 (Grøntoft and Ferm, 2014), but with the highest value for Žilina closer to the highest value, for Kopisty, in 2011/12 (19.0 µg/m³), than, for Katowice, in 2014/15 (13.4 µg/m³). Somewhat higher values were measured at the five

highest measuring stations in 2017-2018, than in 2014/15. The range for the other stations were similar to 2014-2015 with values from 5 down to near 0 $\mu\text{g}/\text{m}^3$.

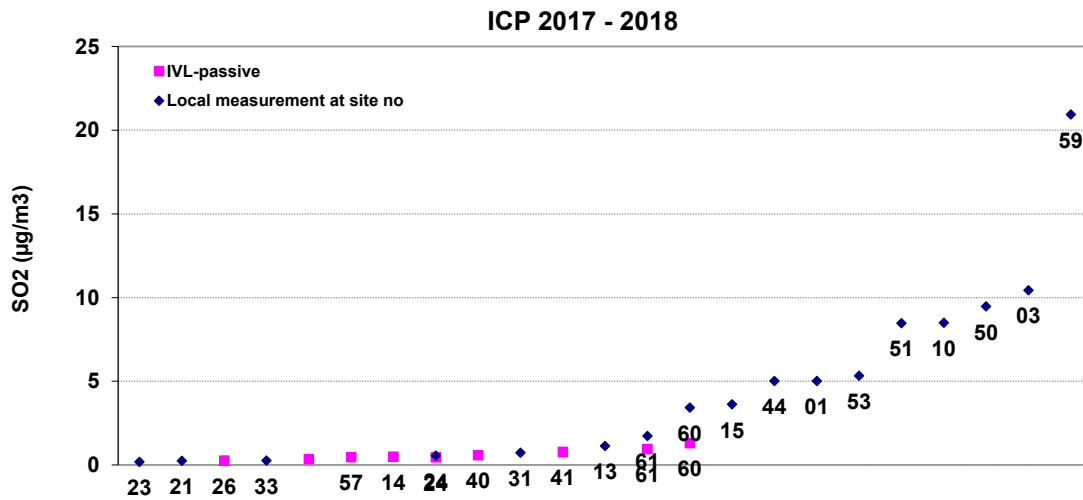


Figure 1: The spread in the yearly mean SO₂-concentrations at the test sites for the test period in ICP Materials.

In Figure 2 the spread in the NO₂-concentrations for the test period year is shown. The values range from 49.8 $\mu\text{g}/\text{m}^3$ for Rome down to 1.0 $\mu\text{g}/\text{m}^3$ for Birkenes. The distribution is fairly good, but with more station measuring values close to 20 $\mu\text{g}/\text{m}^3$ than in 2014-15. Where measurements were performed with IVL passive samplers in addition to being reported from locally administered measurement (LAM), the IVL results were considerably lower: For stations 24 (66 % of LAM), 45 (28 % of LAM), 57 (44 % of LAM), 60 (40 % of LAM), 61 (58 % of LAM), indicating that the concentration values at the position of the rack may be lower than at a measurement point at some distance from the rack. It is advised to use the values from the IVL samplers for correlation. The station with the lowest values are rural stations.

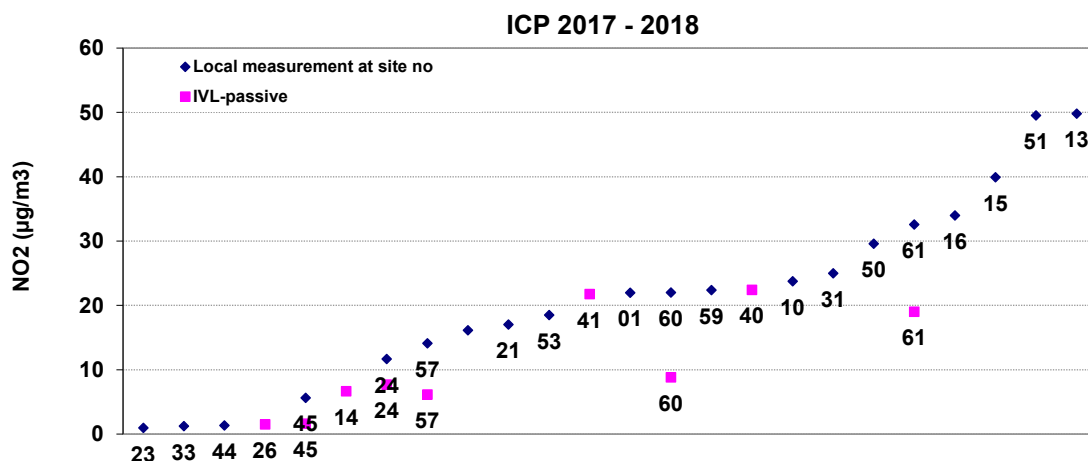


Figure 2: The spread in the yearly mean NO₂-concentrations at the test sites for the test period in ICP Materials.

In Figure 3 the spread in the O₃-concentrations for the test period is shown. The values range from 86.0 µg/m³ in Toledo to 14.6 µg/m³ for Athens. The Athens station is an urban traffic station where consumption of O₃ due to NO-emission is expected.

The distribution is fairly good between about 50 and 60 µg/m³, but with two stations (51, 41) measuring significantly lower values, 14.6 to 28.0 µg/m³, and three stations (60, 45, 33) measuring significantly higher values, 78.6, 80.7 and 86 µg/m³. For the four stations reporting both locally administered measurement (LAM) and IVL results, the values of the IVL results range from 0.94 (station no. 45) to 1.21 (station no. 23) to of the LAM results. (The reported LAM result for station 23 was corrected for “distance from rack” based on comparisons from a previous year)

The low values are observed in urban and industrial areas. The three highest values are in the south of Europe and close alpine area of Switzerland.

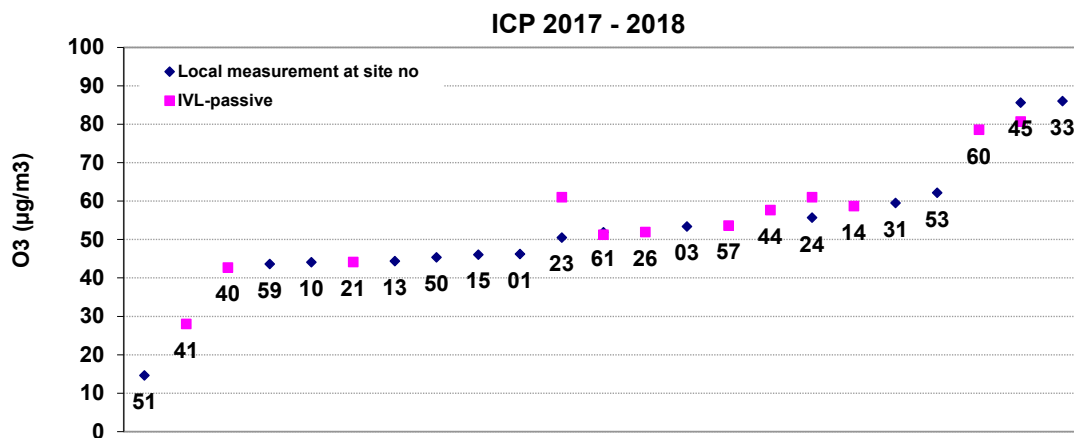


Figure 3: The spread in the measured yearly mean values for O₃-concentrations at the test sites for the test period in ICP Materials.

In Figure 4 the spread for HNO₃-concentrations, measured by IVL samplers, and in addition a separate local measurement at station no. 23, are shown. The figure shows yearly average values from tri-monthly sampling. The values range from 1.4 µg/m³ in Venice (no. 16) down to 0.07 µg/m³ for Svanvik (no. 44). The spread is fairly good, but with less stations (3 stations as compared to five stations in 2014/15) and a sharper rise in concentrations between stations above a concentration of 0.8 µg/m³, than in 2014/15.

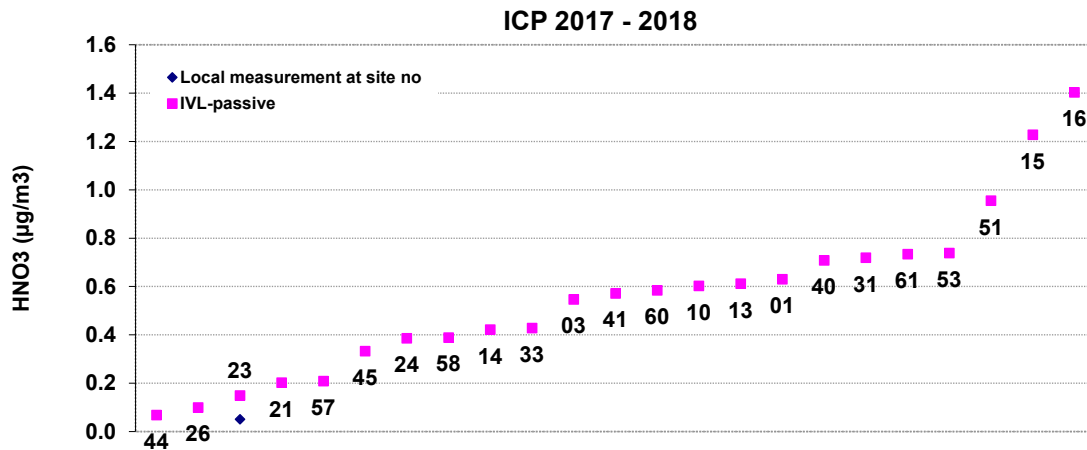


Figure 4: The spread in the measured yearly mean HNO₃-concentrations for the test sites for the test period for ICP Materials.

In Figure 5 the spread for pH in the test period is shown. The pH values range from 7.2 for Athens (no. 51), then 6.6 for Žilina (no. 59), down to 4.8 in Svanvik. The highest values are observed in cities in southern and central Europe, the lowest values at northern stations. The spread is good with reporting from about the same no. of stations as in 2014/15 (18 vs. 19).

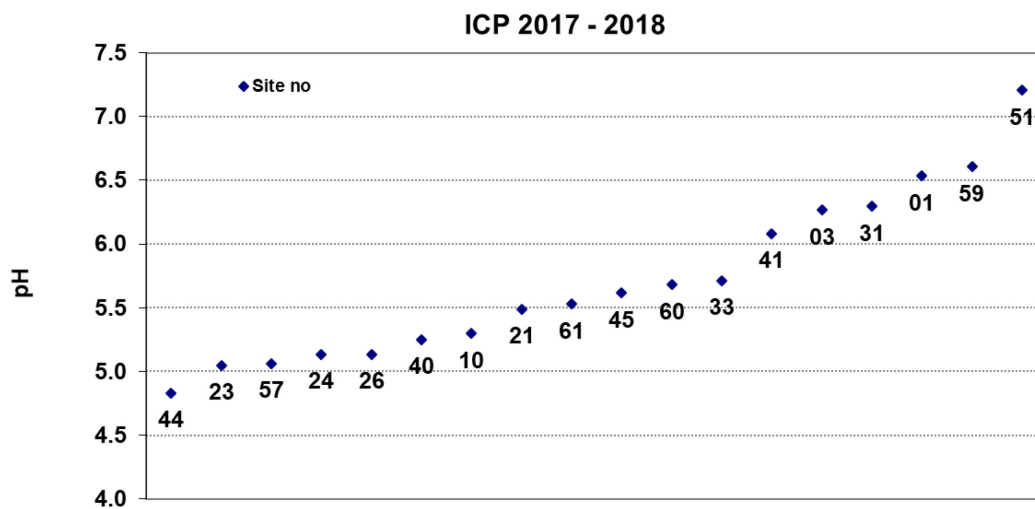


Figure 5: The spread in the measured yearly mean pH-values at the test sites for the test period in ICP Materials.

In Figure 6 the spread for temperature in the test period is shown. The yearly average temperature ranged from 19.6°C in Athens to 6.3°C in Hämeenlinna, as the next lowest value, down to 0.8°C for the far northern Svanvik station. The total range is slightly than in 2014/15. The temperature database covers the spread expected to be found over most of Europe.

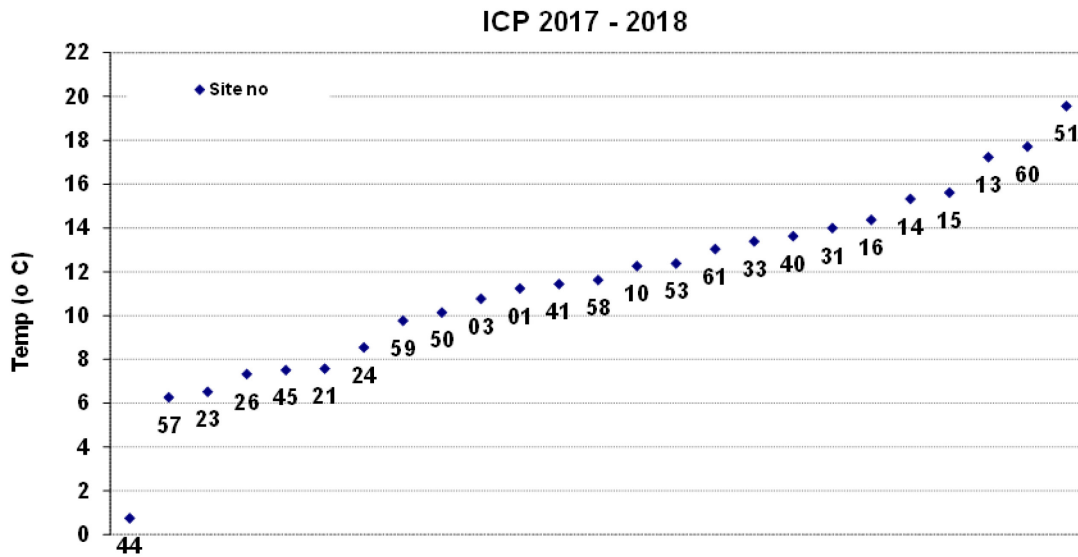


Figure 6: The spread in the measured yearly mean values for temperature at the test sites for the test period for ICP Materials.

In Figure 7 the spread for relative humidity in the test period is shown. The yearly average RH ranges from 79 % in Hämeenlinna down to 57 % in Athens. The spread is quite good, but with few station in the lower range up to about 68%. The RH database covers the spread expected to be found over Europe.

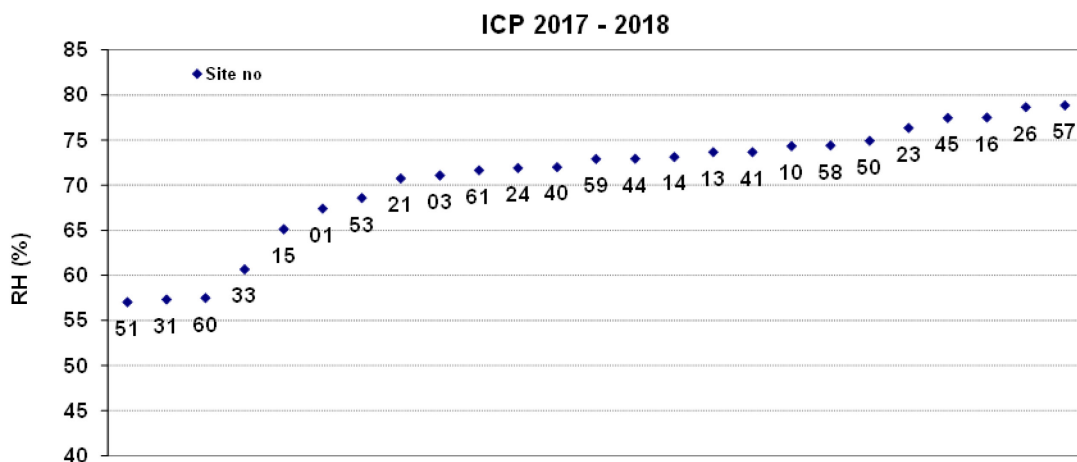


Figure 7: The spread in the measured yearly mean values for relative humidity at the test sites for the test period for ICP Materials.

In Figure 8 the spread for mm precipitation in the test period is shown. The spread is from 1425 mm at Birkenes (no. 23) down to 179 mm in Stockholm (no. 24). The value for Birkenes is significantly lower than in 2014/15 (2195), more similar to the value measured in 2011/12 (1544 mm), showing considerable fluctuations between years. The spread is good. It is expected that stations on the European west coast can have considerably higher average yearly precipitation amounts then recorded for the ICP stations, but this area is not well represented.

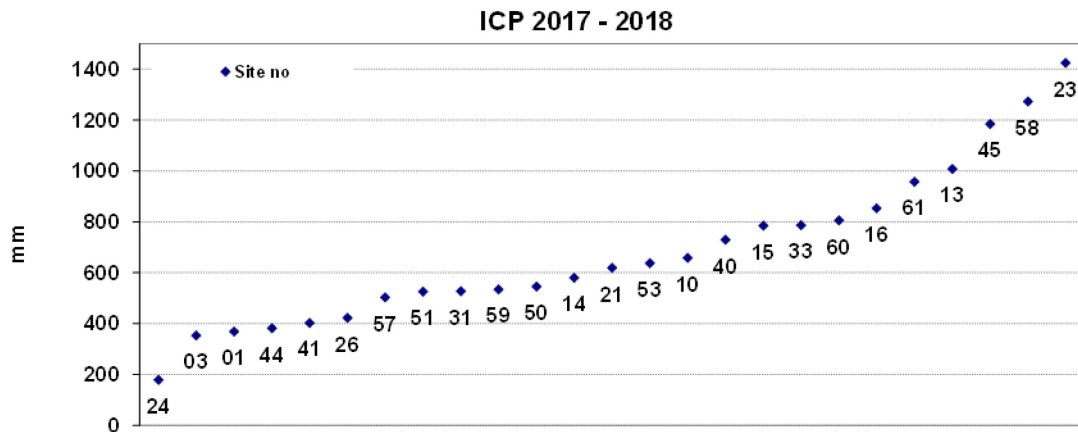


Figure 8: The spread in the measured yearly values for the total precipitation amount at the test sites for the test period for ICP Materials.

Figure 9 shows the spread in the amount of chloride (Cl⁻) in precipitation measured in the test period. The values range from 9.3 mg/l in Kopisty (no. 3) down to 0.15 mg/l in Chaumont (no. 45). Significantly higher values were measured at Kopisty than the maximum in Prague in 2014/15 (6.2 mg/l) and six stations measured above 2.5 mg/l, as compared to two stations in 2014/15. The spread is even from the low value of Chaumont up to the value of 3.6 mg/l for Oslo, but then significantly higher for stations no. 59 (Žilina, 5.2 mg/l), no. 60 (Split, 5.4 mg/l) and no. 3 (Kopisty).

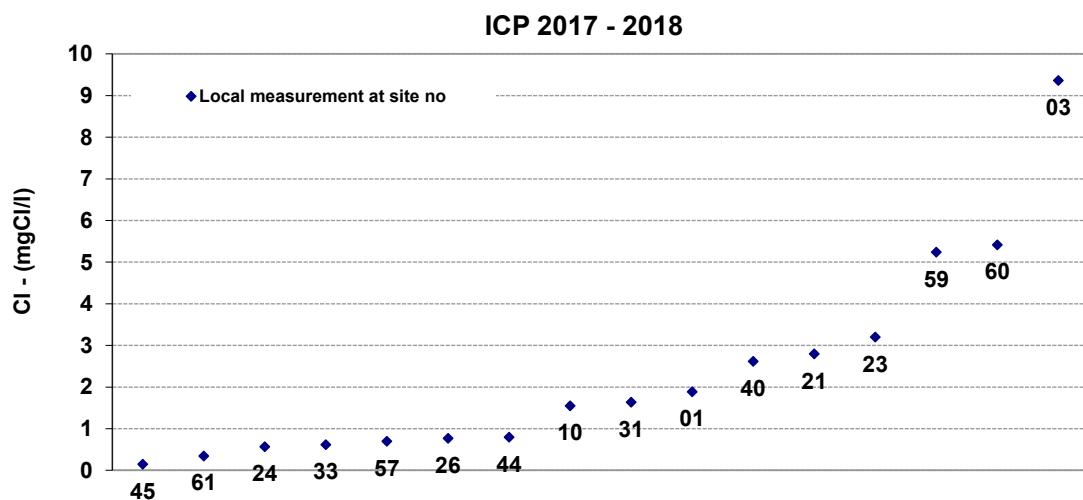


Figure 9: The spread in the measured yearly mean values for Cl⁻ in precipitation at the test sites for the test period for ICP Materials.

Figure 10 gives the yearly annual results from the measurements of particles. Values are shown for PM₁₀ (µg/m³) from local (non IVL) measurements at the stations and for yearly averages of particle deposition (µg/cm²·month) from tri-monthly sampling by using IVL passive particle deposition samplers exposed in a situation shielded from rain.

The PM₁₀-values range from 54.2 µg/m³ in Žilina (no. 59) to 5.1 µg/m³ in Birkenes (no. 23). The particle deposition values range from 116.2 µg/cm² per month in Athens (no. 51) to 3.8 µg/cm² per month in Aspvreten (no. 26). The spread is good, but with a much steeper increase in the

measured deposition values for the six highest measuring stations, from no 14 (Milan, 29.4 $\mu\text{g}/\text{cm}^2$ per month) to Athens. Some more stations measured values above 20 $\mu\text{g}/\text{cm}^2$ per month than in 2014/15. The variation between years for the Berlin station was large, up to 72.2 $\mu\text{g}/\text{cm}^2$ per month in 2017/18, from 43.5 $\mu\text{g}/\text{cm}^2$ per month measured in 2014/15.

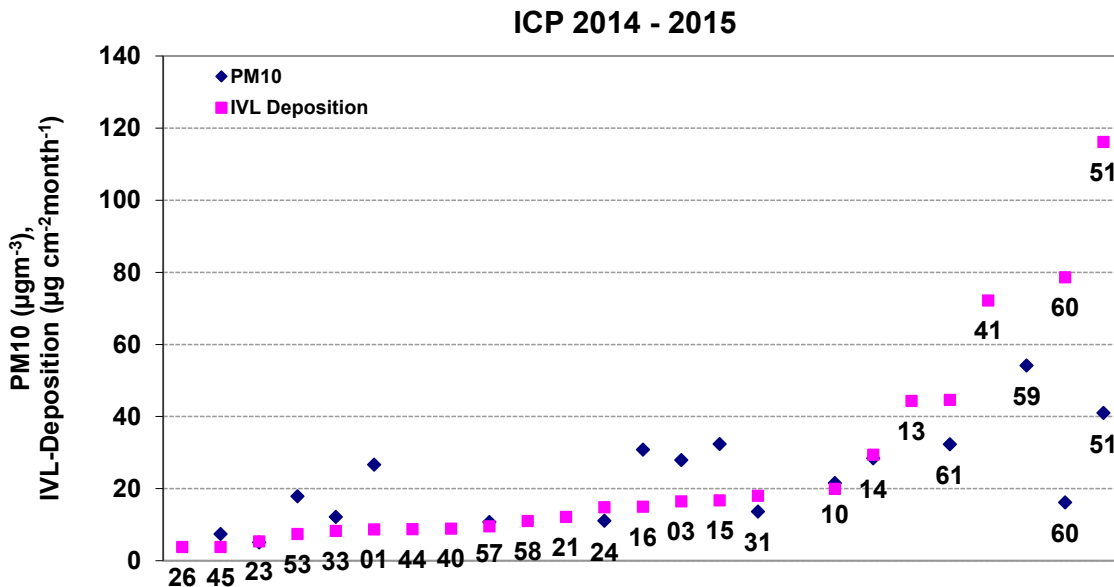


Figure 10: The spread in the measured yearly mean values for PM_{10} -concentration (blue diamonds) and particle deposition (red squares) at the test sites for the test period for ICP Materials. PM_{10} -measurements are optional and were not performed at all the stations.

Caution should be used in the interpretation of the optionally sampled PM_{10} -data as the distance from the sampling station to the exposure site for the materials and other environmental measurements is unspecified. Some information about the locations for the PM_{10} measurements is available in Tidblad and Gordon (2012).

Conclusions

The database obtained during the trend exposure period 2017-2018 has comparable regularity and quality with the previous years of the ICP Materials programme. Sites belonging to the national surveillance programmes and EMEP, have the best regularity. Some of the urban sites have a lower regularity.

For the period 2017-18, all the stations reported precipitation amounts. pH in precipitation was missing from eight stations and Cl⁻ in precipitation was missing from 10 stations (as compared to seven stations in 2014-15 and 10 stations in 2011-12). Data for SO₂ and O₃ were missing from station no. 16, Venice, and data for SO₂, NO₂ and O₃ from station no 58, New Heaven. Station 35, Lahemaa, did not report any environmental data for 2017/18.

Except the missing data for the precipitation quality (pH and Cl⁻) and for pollution gases from the two stations, the data coverage is, overall, quite good.

The spread in the data for the different environmental parameters is sufficient for statistical dose response analyses. The number of sites included in statistical treatment can be changed depending of the selection of parameters for the analyses.

9 References

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Appendix A

Monthly values for the test sites for the exposure period

Table A.1: Mandatory data including measurement with IVL samplers. The time for mounting and demounting of the IVL samplers are noted. Empty cells indicate that values are not available (n.a.) Measured zero values are reported as "0".

Site no	Mandatory															Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
	Sampling		Climate										Precipitation		Particles		
	Year	Month	Temp	RH	SO2	passive SO2 (Tri- or four-monthly value given in last month)	NO2	passive NO2 (Tri- or four-monthly value given in last month)	O3	passive O3 (Tri- or four-monthly value given in last month)	HNO3	passive HNO3 (Tri- or four-monthly value given in last month)	Amount	H+	Cl-		
01	2015	11	7.5	78	8.9		26.3		21				50.8	6.4	2.00		
01	2015	12	6.1	81	8.9		47.6		15				9.8	6.1	3.50		
01	2016	1	1.0	82	5.6		47.5		19				26.6	5.9	5.50		
01	2016	2	4.2	77	5.6		42.4		33				50.4	6.5	0.20		
01	2016	3	4.8	75	2.7		26.6		35				25.1	6.1	0.40		
01	2016	4	9.2	67	2.7		35.0		45				26.7	6.8			
01	2016	5	15.3	63	5.4		29.7		61				73.8	6.0	3.30		
01	2016	6	19.1	68	5.4		31.5		48				62.5	4.9	1.10		
01	2016	7	20.7	64	6.0		29.4		53				112.6	6.0	2.50		
01	2016	8	19.3	65	6.0		17.6		41				25.6	5.8	0.70		
01	2016	9	18.0	67	6.1		15.5		38				41.5	6.2	0.90		
01	2016	10	7.2	83	6.1		11.9		16				62.5	5.7	1.30		
01	2016	11	3.6	83	2.8		19.6		13				27.0	5.8	2.00		
01	2016	12	1.2	84	2.8		22.7		18				27.0	6.6	2.40		
01	2017	1	-4.2	82	8.8		7.1		26				18.3	6.7	22.40		
01	2017	2	2.7	75	8.8		28.8		27				20.9	6.6	5.70		
01	2017	3	7.6	67	8.1		21.1		36				32.1	6.4	1.10		
01	2017	4	8.4	68	8.1		16.6		51				59.8	6.5	1.50		
01	2017	5	15.6	62	8.9		11.9		48				44.9	6.1	12.90		
01	2017	6	20.2	54	8.9		12.2		59				105.5	6.0	1.30		
01	2017	7	20.4	64	4.9		8.1		54				66.8	4.6	1.40		
01	2017	8	20.4	64	4.9		20.0		48				88.8	6.2	1.10		
01	2017	9	13.2	76	4.2		19.1		30				32.4	6.1	1.50		
01	2017	10	11.0	80	4.2		18.4		24				53.5	5.5	1.30		
01	2017	11	5.2	83	10.6		27.0		15				33.8	6.4	1.10		
01	2017	12	2.2	79	10.6		25.0		22				26.3	7.0	1.60		
01	2018	1	3.6	81	3.6		27.7		25				22.5	6.4	2.10		
01	2018	2	-1.8	72	3.6		17.7		27		0.29		5.1	5.3	15.80	6	
01	2018	3	2.2	72	3.9		18.9		36				28.5	6.8	2.70		
01	2018	4	14.3	58	3.9		13.6		50				13.4	7.1	3.60		
01	2018	5	18.0	59	4.9		10.6		64				36.9	6.6	2.30		
01	2018	6	19.1	64	4.9		13.1		75		0.51		74.1	7.1	0.83	11	
01	2018	7	22.1	51	4.5		17.4		90				30.0				
01	2018	8	22.6	53	4.5		20.8		83				30.4	6.0	1.90		
01	2018	9	16.3	66	2.6		33.5		38				36.1	7.1	1.40		
01	2018	10	11.1	71	2.6		38.1		30				31.5	7.0	1.67		
01	2018	11	5.1	79	2.9		41.4		12		0.96		13.6	6.9	2.57	9	
01	2018	12	3.2	77	2.9		58.0		24				44.2	7.0	0.41		

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/cm ² mont)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
03	2015	11	6.8	80	6.6		25.0		32				52.0	7.9	4.50			
03	2015	12	4.8	87	11.0		20.8		20				16.6	4.4	2.30			
03	2016	1	-0.1	84	12.7		42.1		26				33.2	4.2	1.80			
03	2016	2	3.7	77	9.0		22.0		42				36.8	5.6	1.30			
03	2016	3	4.6	73	11.0		26.4		47				16.1	4.4	1.60			
03	2016	4	8.9	66	39.3		21.1		60				27.4	6.7	n			
03	2016	5	15.2	62	38.1		20.5		78				41.4	n	n			
03	2016	6	18.5	73	19.1		22.3		59				85.6	7.2	5.80			
03	2016	7	20.0	69	13.5		19.0		62				98.2	7.7	5.50			
03	2016	8	18.2	72	17.8		20.4		52				34.3	6.5	2.00			
03	2016	9	16.6	78	14.6		18.6		55				67.2	7.6	9.30			
03	2016	10	8.8	86	15.9		22.2		25				43.7	6.3	1.40			
03	2016	11	3.3	85	12.4		26.5		21				24.9	5.1	1.20			
03	2016	12	1.5	86	14.0		18.1		23				16.0	4.4	21.30			
03	2017	1	-4.1	81	13.4		29.7		30				33.2	4.8	16.30			
03	2017	2	2.0	79	25.6		53.8		35				8.2	4.7	4.10			
03	2017	3	7.3	69	15.8		27.4		51				32.2	n	n			
03	2017	4	8.6	67	16.5		23.5		64				30.5	6.4	12.00			
03	2017	5	15.7	63	15.5		11.9		65				14.2	n	n			
03	2017	6	19.8	61	12.8		9.6		69				83.6	6.6	2.90			
03	2017	7	20.0	67	9.9		12.9		67				45.8	6.4	1.20			
03	2017	8	19.3	73	8.5		12.1		58				101.0	6.7	2.80			
03	2017	9	12.9	81	9.3		19.2		36				45.2	4.1	1.40			
03	2017	10	11.2	79	7.7		37.4		34				61.3	6.4	1.30			
03	2017	11	4.8	85	7.1		19.9		25				28.8	6.8	1.50			
03	2017	12	2.4	82	11.0		21.8		31				27.6	6.7	2.20			
03	2018	1	3.1	86	10.6		23.8		30				46.0	6.1	1.30			
03	2018	2	-2.3	73	10.7		23.3		37				2.9					
03	2018	3	1.9	73	12.5		23.6		48				32.5	6.5	1.20			
03	2018	4	13.4	66	9.8		9.2		65			0.21	31.2	8.0	15.70		24/12/2017 12:00	04/04/2018 12:00
03	2018	5	17.9	61	8.1		7.7		84				33.5	5.7	8.20			
03	2018	6	19.3	63	12.3		5.3		74				27.2	7.7	64.10			
03	2018	7	22.1	52	10.1		8.4		88			0.76	11.2				04/04/2018 12:00	31/07/2018 00:00
03	2018	8	21.4	62	10.6		10.1		72				58.1	6.9	5.20			
03	2018	9	14.9	75	10.8		16.8		49				39.8	5.9	3.00			
03	2018	10	10.3	75	11.7		23.6		38				14.9	7.2	3.20			
03	2018	11	4.6	87	8.3		28.3		16			0.64	8.2	8.8	1.45	17	31/07/2018 12:00	01/11/2018 12:00
03	2018	12	2.7	84	8.4		28.4		32				58.0	5.3	0.83			

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	ML-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle deposition (µg/cm ² month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
10	2015	11	10.0	83	13.0		27.0		28				119.2	6.0	1.93			
10	2015	12	10.1	80	21.0		30.0		25				62.5	6.1	1.30			
10	2016	1	4.9	86	<10		30.0		25				98.3	5.1	1.53			
10	2016	2	4.5	81	<10		29.0		33				89.3	5.1	1.64			
10	2016	3	5.7	78	13.0		26.0		38				46.6	5.6	1.13			
10	2016	4	9.7	70	14.0		23.0		47				62.6	5.6	1.73			
10	2016	5	15.7	67	11.0		19.0		63				73.3	5.9	0.63			
10	2016	6	18.0	77	11.0		20.0		46				183.7	5.2	0.38			
10	2016	7	20.0	69	11.0		20.0		50				17.0	6.2	0.84			
10	2016	8	19.0	72	<10		23.0		43				47.3	6.0	0.84			
10	2016	9	18.4	69	<10		31.0		36				24.6	6.7	0.44			
10	2016	10	10.0	84	<10		24.0		16				46.3	6.3	1.07			
10	2016	11	6.1	82	<10		31.0		17				75.2	5.9	1.65			
10	2016	12	4.7	86	<10		38.0		14				31.3	6.0	2.37			
10	2017	1	0.9	84	<10		38.0		19				47.0	5.6	3.89			
10	2017	2	5.9	79	11.0		31.0		26				85.3	5.7	0.80			
10	2017	3	9.7	70	<10		26.0		44				59.5	5.9	1.14			
10	2017	4	8.9	68	<10		21.0		50				18.3	6.5	1.19			
10	2017	5	16.4	67	<10		19.0		57				30.5	6.6	0.38			
10	2017	6	19.8	67	<10		18.0		59				34.3	7.1	0.73			
10	2017	7	19.8	72	<10		16.0		51				122.3	6.2	0.42			
10	2017	8	18.4	78	<10		22.0		40				79.2	6.4	1.39			
10	2017	9	14.4	85	14.0		24.0		28				98.5	5.4	1.04			
10	2017	10	13.3	87	13.0		24.0		28				60.4	6.1	3.92			
10	2017	11	7.1	92	12.0		30.0		20				91.4	4.9	1.70			
10	2017	12	4.8	93	22.0		29.0		22				113.8	4.8	2.08			
10	2018	1	6.0	90	17.0		27.0		32		0.18		85.1	5.7	3.92	12	18/10/2017 12:49	17/01/2018 07:37
10	2018	2	0.6	79	8.0		27.0		33				15.9	5.9	1.39			
10	2018	3	5.2	75	8.0		25.0		41				57.7	6.8	0.91			
10	2018	4	13.9	69	11.0		25.0		51		0.31		29.4	6.6	0.90	18	17/01/2018 07:43	18/04/2018 09:25
10	2018	5	17.9	61	5.0		17.0		74				38.3	6.7	0.39			
10	2018	6	19.1	69	4.0		15.0		61				81.7	6.9	0.48			
10	2018	7	23.0	54	5.0		15.0		78			0.89	10.3	6.8	0.51	25	18/04/2018 09:28	11/07/2018 07:36
10	2018	8	21.0	63	7.0		21.0		55				46.7	6.8	0.72			
10	2018	9	16.0	71	7.0		26.0		36				60.8	6.4	0.95			
10	2018	10	12.6	77	8.0		28.0		26		1.02		27.6	6.6	1.64	25	11/07/2018 07:38	18/10/2018 12:53
10	2018	11	7.0	81	5.0		29.0		14				18.8	6.8	0.16			
10	2018	12	6.3	83	5.0		26.0		25				130.0	6.0	1.99			

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle deposition (µg/cm ² month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
13	2015	11	13.5	79	1.6		61.8		15				16.0					
13	2015	12	9.7	82	2.4		78.2		7				0.1					
13	2016	1	9.7	78	1.5		61.4		17				35.4					
13	2016	2	12.3	77	1.4		49.7		36				76.2					
13	2016	3	12.5	68	1.2		51.2		43				57.0					
13	2016	4	17.0	64	1.3		52.7		48				47.6					
13	2016	5	18.5	68	1.1		41.8		60				77.1					
13	2016	6	23.1	67	1.0		39.9		59				32.2					
13	2016	7	26.8	57	1.1		44.9		64				2.4					
13	2016	8	26.2	58	1.0		34.7		73				21.9					
13	2016	9	22.8	70	0.9		50.4		44				105.7					
13	2016	10	18.0	77	1.2		48.4		27				118.7					
13	2016	11	13.6	80	1.0		55.3		21				108.8					
13	2016	12	9.5	74	1.7		78.2		10				8.4					
13	2017	1	6.6	64	1.3		65.3		27				31.2					
13	2017	2	11.5	75	1.1		65.4		30				45.4					
13	2017	3	13.5	65	0.9		60.5		44				22.2					
13	2017	4	15.4	64	1.2		49.8		59				32.3					
13	2017	5	20.2	61	0.9		49.8		64				28.0					
13	2017	6	25.5	61	0.7		46.0		67				3.0					
13	2017	7	27.1	55	0.8		45.1		60				0.1					
13	2017	8	28.3	51	0.8		42.5		65				0.0					
13	2017	9	20.7	72	0.8		43.3		48				119.1					
13	2017	10	17.6	72	0.9		58.2		32				1.5					
13	2017	11	12.1	81	1.0		57.1		23				104.3					
13	2017	12	8.6	78	1.3		60.5		21				109.4					
13	2018	1	10.8	80	1.1		59.4		21			0.16	27.4			41	25/10/2017 12:00	25/01/2018 10:00
13	2018	2	7.6	78	0.8		48.6		34				100.2					
13	2018	3	11.2	78	0.9		54.2		47				142.7					
13	2018	4	17.5	68	0.9		52.9		51			0.20	48.8			36	25/01/2018 10:10	20/04/2018 10:00
13	2018	5	19.5	79	0.7		43.6		50				115.9					
13	2018	6	23.6	65	1.0		41.2		62				31.9					
13	2018	7	27.3	60	1.0		43.3		75			1.24	50.5			39	20/04/2018 10:15	25/07/2018 10:00
13	2018	8	26.0	70	0.9		38.3		61				114.9					
13	2018	9	23.2	71	2.8		51.4		48				37.0					
13	2018	10	19.4	76	1.2		47.3		39			0.77	124.3			60	25/07/2018 10:10	31/10/2018 10:00
13	2018	11	13.9	84	1.3		54.4		23				165.3					

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	ML-SO2 (µg/m3)	NO2 (µg/m3)	ML-NO2 (µg/m3)	O3 (µg/m3)	ML-O3 (µg/m3)	HNO3 (µg/m3)	ML-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	ML-Particle deposition (µg/cm²month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
14	2015	11	9.6	80									3.3					
14	2015	12																
14	2016	1	10.5	83									109.4					
14	2016	2	9.8	75									48.6					
14	2016	3	14.4	72									25.0					
14	2016	4	16.4	73									89.8					
14	2016	5	21.0	73									72.6					
14	2016	6	24.8	63									1.6					
14	2016	7																
14	2016	8	21.7	74									140.3					
14	2016	9	15.9	80									123.0					
14	2016	10	11.5	82									66.4					
14	2016	11	8.1	75									9.2					
14	2016	12	5.2	66									31.4					
14	2017	1	9.8	79									53.4					
14	2017	2	11.7	68									24.2					
14	2017	3	13.2	71									37.2					
14	2017	4	17.8	67									48.1					
14	2017	5																
14	2017	6	25.5	59									2.0					
14	2017	7	27.0	51									0.0					
14	2017	8	19.1	72									112.8					
14	2017	9	15.9	72									44.8					
14	2017	10	10.8	79									31.1					
14	2017	11	7.7	73									108.4					
14	2018	12	9.0	80									23.6					
14	2018	1	6.1	76		0.5		11.3		41		0.14	71.8			52	27/10/2017 14:00	26/01/2018 10:00
14	2018	2	9.4	79									127.6					
14	2018	3	15.5	71									44.4					
14	2018	4	18.1	79		0.6		6.9		59		0.21	81.0			24	26/01/2018 10:15	23/04/2018 09:00
14	2018	5	22.6	63									12.6					
14	2018	6	25.9	61									12.0					
14	2018	7	26.0	67		0.5		3.5		53		0.54	29.6			25	23/04/2018 09:15	17/07/2018 10:30
14	2018	8																
14	2018	9	17.5	76									38.1					
14	2018	10	12.2	84		0.4		4.9		79		0.75	154.8			18	17/07/2018 10:40	26/10/2018 11:00
14	2018	11	0.0	0									0.0					

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle deposition (µg/cm ² month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
15	2015	11	10.7	74	6.5		66.8		10				2.6					
15	2015	12	6.7	83	5.3		66.3		7				0.6					
15	2016	1	5.6	69	7.1		56.7		10				20.8					
15	2016	2	8.1	74	3.1		31.5		20				142.2					
15	2016	3	10.7	62	3.6		40.4		40				53.2					
15	2016	4	15.8	56	4.8		35.6		60				35.8					
15	2016	5	17.7	60	2.6		35.6		62				170.8					
15	2016	6	22.4	61	6.4		31.7		68				156.2					
15	2016	7	26.3	50	6.6		28.8		85				96.4					
15	2016	8	24.9	52	3.7		24.5		77				54.6					
15	2016	9	23.1	52	4.6		44.4		59				14.4					
15	2016	10	14.2	72	5.8		51.8		18				82.0					
15	2016	11	9.4	76	6.9		57.6		9				102.8					
15	2016	12	5.9	79	6.8		70.5		6				2.2					
15	2017	1	3.7	56	4.7		69.9		13				3.2					
15	2017	2	7.6	78	6.1		66.4		11				67.0					
15	2017	3	13.5	56	6.8		52.6		39				26.6					
15	2017	4	15.7	50	5.2		27.5		64				57.6					
15	2017	5	19.7	56	4.1		24.6		76				71.8					
15	2017	6	25.2	50	1.3		19.5		103				60.0					
15	2017	7	26.4	46	2.2		22.1		101				6.2					
15	2017	8	27.2	45	1.6		29.6		89				23.2					
15	2017	9	19.0	62	1.7		42.6		48				105.8					
15	2017	10	16.5	62	2.7		70.9		27				2.0					
15	2017	11	9.5	73	2.9		59.3		9				82.2					
15	2018	12	4.7	69	3.3		59.8		9				58.0					
15	2018	1	7.0	79	3.1		47.3		9				47.2					
15	2018	2	4.8	71	2.9		43.7		22		0.29		28.8			13	31/10/2017 11:15	01/02/2018 12:00
15	2018	3	8.2	75	3.2		44.3		33				131.6					
15	2018	4	17.0	60	3.5		42.6		60		2.74		105.4			26	01/02/2018 12:00	23/04/2018 11:30
15	2018	5	19.4	66	3.0		22.9		64				81.8					
15	2018	6	24.1	53	3.6		24.7		83				16.8					
15	2018	7	26.3	55	4.1		27.4		94				54.0					
15	2018	8	26.6	54	4.0		25.7		83		0.45		60.2			14	23/04/2018 11:30	01/08/2018 15:00
15	2018	9	22.7	58	4.6		39.5		61				8.4					
15	2018	10	17.1	69	5.3		41.9		28		1.74		110.8			14	01/08/2018 15:00	23/10/2018 10:00
15	2018	11	11.1	86	5.3		41.9		11				77.2					

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	ML-SO2 (µg/m3)	NO2 (µg/m3)	ML-NO2 (µg/m3)	O3 (µg/m3)	ML-O3 (µg/m3)	HNO3 (µg/m3)	ML-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle deposition (µg/cm ² month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
16	2015	11	9.3	84			55.1						10.0					
16	2015	12	4.6	92			47.6						1.6					
16	2016	1	4.1	85			66.6						49.6					
16	2016	2	7.5	86			48.4						171.6					
16	2016	3	9.7	79			45.0						47.0					
16	2016	4	13.8	80			38.5						50.6					
16	2016	5	17.0	76			35.3						139.4					
16	2016	6	21.7	75			27.0						109.2					
16	2016	7	25.0	72			27.8						46.0					
16	2016	8	23.5	69			27.9						88.0					
16	2016	9	21.6	75			37.1						59.0					
16	2016	10	14.0	82			37.3						89.8					
16	2016	11	9.9	84			45.3						124.4					
16	2016	12	4.4	84			59.3						2.4					
16	2017	1	1.9	73			60.6						29.8					
16	2017	2	6.8	85			52.9						94.0					
16	2017	3	11.7	75			52.2						10.4					
16	2017	4	14.0	74			32.9						50.4					
16	2017	5	18.4	75			31.5						47.0					
16	2017	6	24.1	70			31.8						47.4					
16	2017	7	24.8	70			30.6						60.8					
16	2017	8	25.6	69			31.2						15.0					
16	2017	9	17.1	80			29.8						157.8					
16	2017	10	13.0	84			45.0						13.2					
16	2017	11	7.6	83			47.3						95.8					
16	2018	12	3.4	85			56.6						52.4					
16	2018	1	6.1	86								0.18	18.8		12	03/11/2017 12:15	31/01/2018 12:00	
16	2018	2	4.1	77									78.6					
16	2018	3	7.2	85			39.1						147.6					
16	2018	4	11.7	75			33.1						26.8					
16	2018	5	20.8	73			24.7					0.67	78.0		14	31/01/2018 11:05	08/05/2018 10:00	
16	2018	6	24.0	69			22.6						67.4					
16	2018	7	25.9	72			22.2					2.17	74.0		5	08/05/2018 10:00	30/07/2018 10:00	
16	2018	8	26.0	69			23.1						88.4					
16	2018	9	20.4	76			30.6						41.2					
16	2018	10	15.2	80			40.6						84.2					
16	2018	11	10.2	85			36.2					1.31	103.2		14	30/07/2018 10:00	07/11/2018 14:00	

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	ML-SO2 (µg/m3)	NO2 (µg/m3)	ML-NO2 (µg/m3)	O3 (µg/m3)	ML-O3 (µg/m3)	HNO3 (µg/m3)	ML-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	ML-Particle depositon (µg/cm ² month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
21	2015	11	3.2	89									75.5					
21	2015	12	2.1	84									57.2					
21	2016	1	-5.5	83									43.0					
21	2016	2	-0.7	79									50.4					
21	2016	3	3.1	79									47.1					
21	2016	4	5.9	69									76.5					
21	2016	5	12.3	63									73.5					
21	2016	6	16.7	63									61.1					
21	2016	7	17.2	73									85.3					
21	2016	8	15.5	75									143.7					
21	2016	9	15.0	78									41.0					
21	2016	10	6.1	75									13.2					
21	2016	11	0.7	83									69.8					
21	2016	12	0.9	85									19.5					
21	2017	1	-1.4	87									25.7					
21	2017	2	-1.5	85									54.6					
21	2017	3	2.6	73									40.5					
21	2017	4	5.2	65									57.0					
21	2017	5	11.6	68									78.2					
21	2017	6	15.1	68									90.7					
21	2017	7	16.9	66									98.2					
21	2017	8	15.3	79									158.9					
21	2017	9	12.2	84									99.9					
21	2017	10	7.2	79	0.3		23.3						110.8					
21	2017	11	1.6	84	0.3		22.7						78.4	5.7	2.16			
21	2017	12	-1.5	86	0.3		23.4						48.1	5.7	2.00			
21	2018	1	-1.7	87	0.2		22.5			19		0.06	86.3	5.1	2.28	6	20/10/2017 10:00	12/01/2018 14:30
21	2018	2	-4.1	80	0.3		19.6						53.9	5.0	4.55			
21	2018	3	-2.3	66	0.2		15.0						13.6	6.1	5.29			
21	2018	4	6.5	63	0.2		13.2			46		0.16	35.6	6.3	1.27	10	12/01/2018 14:30	20/04/2018 14:00
21	2018	5	16.1	57	0.2		23.3						28.1	6.4	0.96			
21	2018	6	17.9	54	0.2		25.1						38.8	5.8	2.67			
21	2018	7	22.2	55	0.2		7.0			65		0.38	15.9	6.0	5.14	21	20/04/2018 14:00	20/07/2018 08:00
21	2018	8	16.3	69	0.2		9.5						57.1	5.6	2.06			
21	2018	9	12.5	72	0.2		11.0						124.7	5.7	2.72			
21	2018	10	7.4	76	0.2		12.1			45		0.20	38.6	5.8	6.16	11	20/07/2018 14:00	19/10/2018 10:30

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	ML-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositions (µg/cm ² month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
23	2015	11	3.5	93									147.3					
23	2015	12	2.6	95									206.7					
23	2016	1	-5.1	91									148.4					
23	2016	2	-1.0	84									145.2					
23	2016	3	1.8	85									130.2					
23	2016	4	4.8	-9900									101.4					
23	2016	5	10.8	69									112.6					
23	2016	6	14.2	73									95.3					
23	2016	7	15.3	79									113.3					
23	2016	8	13.6	80									139.4					
23	2016	9	13.3	84									47.1					
23	2016	10	5.9	78									123.2					
23	2016	11	0.8	86									203.7					
23	2016	12	2.4	86									54.1					
23	2017	1	-0.2	86									84.4					
23	2017	2	-1.1	85									127.9					
23	2017	3	1.9	81									89.4					
23	2017	4	4.6	70									60.3					
23	2017	5	10.6	72									81.3					
23	2017	6	13.8	70									140.2					
23	2017	7	14.2	73									97.1					
23	2017	8	13.2	81									133.4					
23	2017	9	10.9	88									511.3					
23	2017	10	7.5	82	0.1		0.8		44		0.01		449.9	5.1	1.56			
23	2017	11	1.4	87	0.1		0.5		42		0.01		205.9	5.0	3.70			
23	2017	12	-0.6	87	0.0		0.5		39		0.01		106.7	5.1	6.00			
23	2018	1	-0.8	89	0.1		0.9		42	45	0.02	0.03	253.9	4.9	2.14	2	27/10/2017 14:00	31/01/2018 14:00
23	2018	2	-4.1	85	0.2		1.6		47		0.02		174.7	5.0	2.89			
23	2018	3	-2.8	73	0.2		1.2		62		0.04		46.1	4.6	2.17			
23	2018	4	4.6	71	0.2		1.2		62	74	0.05	0.14	76.9	5.4	1.73	2	31/01/2018 14:00	27/04/2018 13:00
23	2018	5	13.6	65	0.4		1.0		67		0.16		64.0	5.8	0.27			
23	2018	6	15.6	64	0.4		1.0		56		0.07		72.8	5.1	0.95			
23	2018	7	19.1	61	0.3		1.0		56	74	0.11	0.35	23.2	5.5	0.39	9	27/04/2018 13:00	27/07/2018 05:00
23	2018	8	14.1	76	0.1		0.9		43		0.04		100.1	5.4	1.11			
23	2018	9	11.1	78	0.1		0.8		45		0.04		249.5	5.1	6.22			
23	2018	10	6.9	79	0.1		1.0		44	53	0.03	0.09	51.0	5.1	2.32	8	27/07/2018 05:00	26/10/2018 10:00

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	ML-SO2 (µg/m3)	NO2 (µg/m3)	ML-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/cm ² month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
24	2015	11			0.5		15.8		34									
24	2015	12			0.3		13.8		46									
24	2016	1			1.2		16.7		40									
24	2016	2			0.3		14.1		45									
24	2016	3			0.4		12.4		50									
24	2016	4			0.3		11.8		64									
24	2016	5			0.4		10.1		73									
24	2016	6			0.3		8.2		63									
24	2016	7			0.2		6.1		55									
24	2016	8			0.3		7.4		48									
24	2016	9			0.3		10.5		45									
24	2016	10			0.4		10.6		44									
24	2016	11			0.5		13.4		38									
24	2016	12			0.4		12.7		48									
24	2017	1			0.5		14.3		45									
24	2017	2			0.5		15.0		55									
24	2017	3			0.3		10.5		65									
24	2017	4			0.4		9.0		70									
24	2017	5			0.3		9.0		70									
24	2017	6			0.4		7.1		58									
24	2017	7			0.3		6.5		52									
24	2017	8			0.3		7.9		54									
24	2017	9			0.5		10.4		38									
24	2017	10	8.0	80	0.3		10.9		42				59.5	5.3	0.28			
24	2017	11	3.8	87	0.5		14.8		35				26.2	5.1	0.71			
24	2017	12	1.5	90	0.4		12.8		37				20.0	5.1	0.67			
24	2018	1	0.2	86	0.7	0.4	13.9	6.8	41	42		0.14	14.8	5.1	0.62	10	26/10/2017 09:00	30/01/2018 09:00
24	2018	2	-3.3	84	1.1		14.1		50				5.9	4.9	1.30			
24	2018	3	-1.7	71	0.8		15.9		64				3.2					
24	2018	4	6.6	69	0.5	0.7	13.2	11.2	70	67		0.32	11.2	6.1	0.44	22	30/01/2018 09:00	02/05/2018 14:00
24	2018	5	15.7	50	0.5		12.2		79				3.6	4.7	0.19			
24	2018	6	16.6	54	0.4		6.6		66				21.5	5.4	0.19			
24	2018	7	21.9	56	0.4		9.2		65				7.2	5.8	0.19			
24	2018	8	18.7	67	0.4	0.4	7.7	4.3	63	76		0.72	31.2	4.9	0.26	15	02/05/2018 14:00	21/08/2018 10:00
24	2018	9	14.0	71	0.5		8.5		55				24.7	5.2	0.64			
24	2018	10	8.6	78	0.6	0.4	11.0	9.7	45	55		0.29	9.9	6.5	1.70	13	21/08/2018 10:00	31/10/2018 10:00

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	ML-SO2 (µg/m3)	NO2 (µg/m3)	ML-NO2 (µg/m3)	O3 (µg/m3)	ML-O3 (µg/m3)	HNO3 (µg/m3)	ML-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	ML-Particle deponiton (µg/cm ² month)	Date for mounting of ML passive samplers	Date for demounting of ML passive samplers
26	2015	11	4.1	0									0.0					
26	2015	12	3.3	0									0.0					
26	2016	1	-3.8	83									27.4	4.5	1.36			
26	2016	2	-0.7	86									29.2	5.0	0.80			
26	2016	3	1.9	85									22.2	4.4	0.44			
26	2016	4	4.2	77									22.4	6.1	0.43			
26	2016	5	10.6	71									44.0	6.0	0.13			
26	2016	6	15.1	70									57.0	5.4	0.09			
26	2016	7	17.0	75									56.0	5.5	0.20			
26	2016	8	15.3	77									36.6	5.8	0.23			
26	2016	9	13.6	80									22.4	6.4	0.27			
26	2016	10	6.8	78									78.0	4.8	0.74			
26	2016	11	1.6	86									66.8	4.4	0.73			
26	2016	12	2.7	84									24.2	5.5	0.53			
26	2017	1	-0.1	88									27.3	5.0	2.75			
26	2017	2	-0.5	78									27.2	5.3	0.65			
26	2017	3	2.6	79									34.4	5.1	0.44			
26	2017	4	3.3	75									25.6	5.6	0.72			
26	2017	5	9.3	66									8.0	6.0	0.40			
26	2017	6	14.2	71									49.4	5.8	0.36			
26	2017	7	16.0	70									15.8	5.3	0.13			
26	2017	8	15.2	80									46.4	5.6	0.26			
26	2017	9	12.3	87									127.8	5.2	0.36			
26	2017	10	7.3	83									84.4	5.7	0.44			
26	2017	11	2.9	90									37.6	5.7	0.87			
26	2017	12	1.0	92									72.0	5.1	0.77			
26	2018	1	-0.4	90		0.3		1.7		38		0.06	56.8	4.7	1.28	1	26/10/2017 13:00	31/01/2018 11:00
26	2018	2	-3.9	88									21.9	4.5	1.04			
26	2018	3	-2.3	79									12.1	4.9	0.55			
26	2018	4	5.1	76									27.5	6.1	0.33			
26	2018	5	13.0	62		0.4		1.9		58		0.11	4.0	6.1	1.43	4	31/01/2018 11:00	02/05/2018 17:00
26	2018	6	15.1	64									43.5	5.9	0.37			
26	2018	7	20.1	64									8.6	5.9	0.81			
26	2018	8	17.5	76		0.2		1.0		62		0.14	53.0	5.7	0.35	5	02/05/2018 17:00	21/08/2018 13:00
26	2018	9	13.1	77									47.6	5.5	1.12			
26	2018	10	6.8	86		0.1		1.5		46		0.06	37.9	5.8	0.69	5	21/08/2018 13:00	31/10/2018 13:00
26	2018	11												4.7	0.76			
26	2018	12												4.7	0.33			

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	ML-SO2 (µg/m3)	NO2 (µg/m3)	ML-NO2 (µg/m3)	O3 (µg/m3)	ML-O3 (µg/m3)	HNO3 (µg/m3)	ML-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	ML-Particle depositon (µg/cm ² month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
31	2015	11	16.9	79									47.4					
31	2015	12	10.3	83									4.4					
31	2016	1	8.6	92									32.0					
31	2016	2	8.4	79									29.6					
31	2016	3	9.0	69									11.2					
31	2016	4	11.0	76									72.8					
31	2016	5	14.8	69									57.2					
31	2016	6	22.6	48									0.6					
31	2016	7	26.6	41									9.2					
31	2016	8	26.1	41									0.6					
31	2016	9	22.2	48									5.4					
31	2016	10	16.5	71									76.4					
31	2016	11	9.3	84									56.4					
31	2016	12	8.0	87									25.8					
31	2017	1	5.5	77									23.6					
31	2017	2	8.0	78									76.6					
31	2017	3	10.1	62									30.2					
31	2017	4	16.8	41									13.8					
31	2017	5	19.3	50									35.0					
31	2017	6	24.4	47									28.2					
31	2017	7	27.9	36									44.8					
31	2017	8	28.0	37									34.0					
31	2017	9	20.3	39									0.0					
31	2017	10	17.9	46	0.6		39.0		46				19.0	5.9	2.15			
31	2017	11	9.6	56	1.1		48.0		29				14.4	6.5	2.67			
31	2017	12	6.1	67	0.6		42.0		31				20.0	6.6	1.90			
31	2018	1	6.1	72	0.6		33.0		36			0.31	50.8	6.4	1.18	7	27/10/2017 12:00	31/01/2018 12:00
31	2018	2	5.0	61	0.6		33.0		43				60.5	6.2	0.65			
31	2018	3	7.0	71	0.6		14.0		68				165.8	6.1	1.70			
31	2018	4	11.5	65	0.6		18.0		69				68.2	6.3	1.39			
31	2018	5	15.3	59	0.6		18.0		74			0.32	67.2	6.6	1.28	17	31/01/2018 12:00	07/05/2018 12:00
31	2018	6	20.5	53	0.6		16.0		76				17.2	6.6	2.13			
31	2018	7	24.1	39	0.6		12.0		87									
31	2018	8	26.0	36	0.6		16.0		86			1.13	5.9	7.1	2.54	35	07/05/2018 12:00	02/08/2018 12:00
31	2018	9	22.5	48	1.2		24.0		71				19.4	6.6	2.55			
31	2018	10	14.2	61	1.1		26.0		44				38.1	6.8	3.26			
31	2018	11	9.0	80	0.6		25.0		34			1.20	72.1	6.3	2.50	15	02/08/2018 12:00	06/11/2018 12:00

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle deposition (µg/cm ² month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
31	2015	11	16.9	79									47.4					
31	2015	12	10.3	83									4.4					
31	2016	1	8.6	92									32.0					
31	2016	2	8.4	79									29.6					
31	2016	3	9.0	69									11.2					
31	2016	4	11.0	76									72.8					
31	2016	5	14.8	69									57.2					
31	2016	6	22.6	48									0.6					
31	2016	7	26.6	41									9.2					
31	2016	8	26.1	41									0.6					
31	2016	9	22.2	48									5.4					
31	2016	10	16.5	71									76.4					
31	2016	11	9.3	84									56.4					
31	2016	12	8.0	87									25.8					
31	2017	1	5.5	77									23.6					
31	2017	2	8.0	78									76.6					
31	2017	3	10.1	62									30.2					
31	2017	4	16.8	41									13.8					
31	2017	5	19.3	50									35.0					
31	2017	6	24.4	47									28.2					
31	2017	7	27.9	36									44.8					
31	2017	8	28.0	37									34.0					
31	2017	9	20.3	39									0.0					
31	2017	10	17.9	46	0.6		39.0		46				19.0	5.9	2.2			
31	2017	11	9.6	56	1.1		48.0		29				14.4	6.5	2.7			
31	2017	12	6.1	67	0.6		42.0		31				20.0	6.6	1.9			
31	2018	1	6.1	72	0.6		33.0		36			0.31	50.8	6.4	1.2	7	27/10/2017 12:00	31/01/2018 12:00
31	2018	2	5.0	61	0.6		33.0		43				60.5	6.2	0.7			
31	2018	3	7.0	71	0.6		14.0		68				165.8	6.1	1.7			
31	2018	4	11.5	65	0.6		18.0		69				68.2	6.3	1.4			
31	2018	5	15.3	59	0.6		18.0		74			0.32	67.2	6.6	1.3	17	31/01/2018 12:00	07/05/2018 12:00
31	2018	6	20.5	53	0.6		16.0		76				17.2	6.6	2.1			
31	2018	7	24.1	39	0.6		12.0		87									
31	2018	8	26.0	36	0.6		16.0		86			1.13	5.9	7.1	2.5	35	07/05/2018 12:00	02/08/2018 12:00
31	2018	9	22.5	48	1.2		24.0		71				19.4	6.6	2.6			
31	2018	10	14.2	61	1.1		26.0		44				38.1	6.8	3.3			
31	2018	11	9.0	80	0.6		25.0		34			1.20	72.1	6.3	2.5	15	02/08/2018 12:00	06/11/2018 12:00

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	ML-SO2 (µg/m3)	NO2 (µg/m3)	ML-NO2 (µg/m3)	O3 (µg/m3)	ML-O3 (µg/m3)	HNO3 (µg/m3)	ML-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle deposition (µg/cm²month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
33	2015	11	12.3	75									71.9					
33	2015	12	8.2	71									10.4					
33	2016	1	5.2	86									78.2					
33	2016	2	4.2	79									56.6					
33	2016	3	5.6	66									32.8					
33	2016	4	8.0	73									154.0					
33	2016	5	11.7	68									91.0					
33	2016	6	19.7	45									1.8					
33	2016	7	24.1	38									6.2					
33	2016	8	24.0	37									2.2					
33	2016	9	20.0	42									4.8					
33	2016	10	14.5	65									87.0					
33	2016	11	6.6	81									142.4					
33	2016	12	5.7	83									46.2					
33	2017	1	3.3	73									33.0					
33	2017	2	5.3	80									95.8					
33	2017	3	8.1	67									56.8					
33	2017	4	12.0	52									18.8					
33	2017	5	16.0	56									55.4					
33	2017	6	22.2	42									8.0					
33	2017	7	23.7	35									14.6					
33	2017	8	23.9	34									23.0					
33	2017	9	21.8	34									0.0					
33	2017	10	19.4	41	0.6		1.8		84				35.6	5.6	0.15			
33	2017	11	9.5	57	0.4		2.4		66				21.0	5.6	0.38			
33	2017	12	4.9	70	0.2		1.9		68				49.6	5.7	0.51			
33	2018	1	4.7	76	0.2		1.0		69			0.37	59.4	5.6	0.20	3	02/11/2017 12:00	31/01/2018 12:00
33	2018	2	2.9	68	0.2		1.8		76				58.1	5.6	0.23			
33	2018	3	5.0	75	0.2		0.5		87				267.1	5.6	1.08			
33	2018	4	9.8	69	0.2		0.7		93				109.6	5.9	0.74			
33	2018	5	14.1	64	0.2		1.0		96			0.17	44.7	6.9	0.16	10	31/01/2018 12:00	08/05/2018 12:00
33	2018	6	20.2	56	0.3		0.9		91				35.7	6.2	0.17			
33	2018	7	24.8	39	0.3		0.5		102									
33	2018	8	27.8	35	0.6		1.2		108			0.47	6.9	6.8	0.39	11	08/05/2018 12:00	02/08/2018 12:00
33	2018	9	23.5	50	0.3		1.6		101				18.5	6.6	0.22			
33	2018	10	13.5	69	0.2		1.5		75				115.9	6.0	0.34			
33	2018	11	7.7	81	0.1		0.9		68			0.70	101.6	5.5	0.44	8	02/08/2018 12:00	05/11/2018 12:00

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle deposition (µg/cm ² month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
40	2015	11	12.2	84									43.7					
40	2015	12	11.3	85									53.5					
40	2016	1	5.9	85									54.4					
40	2016	2	6.7	78									48.3					
40	2016	3	7.7	73									89.7					
40	2016	4	10.9	70									44.9					
40	2016	5	15.4	73									151.3					
40	2016	6	18.5	78									106.8					
40	2016	7	21.4	64									22.2					
40	2016	8	22.1	63									23.7					
40	2016	9	19.6	73									44.2					
40	2016	10	12.2	82									27.8					
40	2016	11	7.9	84									59.3					
40	2016	12	4.5	88									17.9					
40	2017	1	2.3	85									27.8					
40	2017	2	8.0	80									42.1					
40	2017	3	11.3	73									67.1					
40	2017	4	11.8	61									20.3					
40	2017	5	17.3	67									44.9					
40	2017	6	21.7	58									50.6					
40	2017	7	21.8	63									89.0					
40	2017	8	20.5	69									80.1					
40	2017	9	16.3	76									95.7					
40	2017	10	14.6	81									34.1					
40	2017	11	8.1	82									50.8	4.2	3.49			
40	2017	12	5.7	87									95.4	6.8	2.79			
40	2018	1	7.9	85		0.7		32.3		25		0.16	124.4	6.4	7.21	8	25/10/2017 16:00	24/01/2018 17:00
40	2018	2	2.4	77									51.6	5.3	2.94			
40	2018	3	8.0	75									79.5	6.7	1.78			
40	2018	4	14.6	65		0.8		22.7		45		0.40	57.7	7.9	1.11	12	24/01/2018 17:30	23/04/2018 17:00
40	2018	5	17.5	68									89.7	5.4	0.68			
40	2018	6	20.4	69									70.6	6.0	0.11			
40	2018	7	24.5	55		0.4		14.4		55		1.31	30.2	5.9	0.61	6	23/04/2018 17:05	31/07/2018 13:00
40	2018	8	22.1	61									52.4	5.9	0.61			
40	2018	9	17.9	66									8.2	8.4	5.16			
40	2018	10	14.4	74		0.6		21.0		46		0.92	18.9	7.2		10	31/07/2018 13:00	25/10/2018 12:30
40	2018	11	8.2	87									73.4					

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	ML-SO2 (µg/m3)	NO2 (µg/m3)	ML-NO2 (µg/m3)	O3 (µg/m3)	ML-O3 (µg/m3)	HNO3 (µg/m3)	ML-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	ML-Particle depositon (µg/cm ² month)	Date for mounting of ML passive samplers	Date for demounting of ML passive samplers
41	2015	11																
41	2015	12																
41	2016	1	-0.1	88														
41	2016	2	4.0	82														
41	2016	3	4.8	80														
41	2016	4	8.9	69														
41	2016	5	15.6	67														
41	2016	6	18.8	71														
41	2016	7	19.6	71														
41	2016	8	18.1	75														
41	2016	9	17.6	72														
41	2016	10	8.7	91														
41	2016	11	3.8	89														
41	2016	12	2.9	90														
41	2017	1	-1.1	89														
41	2017	2	2.1	82														
41	2017	3	7.3	75														
41	2017	4	8.2	73														
41	2017	5	14.9	70														
41	2017	6	18.0	71														
41	2017	7	18.5	76														
41	2017	8	18.6	75														
41	2017	9	13.5	82														
41	2017	10	11.4	86														
41	2017	11	5.8	89									69.4					
41	2017	12	3.6	87									39.9					
41	2018	1	3.7	86									66.5	6.2				
41	2018	2	-0.8	75									3.2	6.4				
41	2018	3	2.0	76									41.6	6.3				
41	2018	4	13.8	69							0.13		41.0	6.3	116		16/12/2017 12:00	07/04/2018 12:51
41	2018	5	18.2	60									13.2	6.8				
41	2018	6	19.4	66									15.3	7.0				
41	2018	7	21.6	63									70.5	6.0				
41	2018	8	21.7	63		1.1		27.5		51		1.00	4.8	6.7	50		07/04/2018 12:51	20/08/2018 16:00
41	2018	9	16.8	71									19.6	5.9				
41	2018	10	11.5	79									17.9	5.5				
41	2018	11	5.8	89		1.3		38.0		27		0.48	15.0	6.5	52		20/08/2018 16:00	20/11/2018 18:00
41	2018	12	5.8	90									50.6	6.6				

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	ML-SO2 (µg/m3)	NO2 (µg/m3)	ML-NO2 (µg/m3)	O3 (µg/m3)	ML-O3 (µg/m3)	HNO3 (µg/m3)	ML-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	ML-Particle depositon (µg/cm ² month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
44	2015	11																
44	2015	12	-7.0	85									31.7					
44	2016	1	-18.8	80									37.3					
44	2016	2	-7.1	82									26.4					
44	2016	3	-2.7	75									5.3					
44	2016	4	1.7	68									14.2					
44	2016	5	8.6	66									47.4					
44	2016	6	10.6	71									75.5					
44	2016	7	15.4	75									76.1					
44	2016	8	11.9	79									142.0					
44	2016	9	8.7	82									47.7					
44	2016	10	3.4	82									2.6					
44	2016	11	-4.0	83									21.1					
44	2016	12	-6.9	82									66.3					
44	2017	1	-8.8	77									17.0					
44	2017	2	-8.8	77									9.8					
44	2017	3	-4.9	72									27.9					
44	2017	4	-2.5	67									17.6					
44	2017	5	2.3	66									19.7					
44	2017	6	7.7	71									71.3					
44	2017	7	14.3	70									56.1					
44	2017	8	11.4	79									58.7					
44	2017	9	7.6	78									40.2					
44	2017	10	1.8	83									32.1					
44	2017	11	-4.8	81	24.7		1.5						22.9	4.9	0.93			
44	2017	12	-9.7	78	1.8		1.9						9.1	5.0	0.36			
44	2018	1	-11.9	77	4.2		3.5						24.0	5.1	0.43			
44	2018	2	-12.1	75	5.0		1.7			50		0.10	9.4	5.3	2.92	1	05/11/2017 12:00	12/02/2018 12:00
44	2018	3	-10.4	74	4.4		1.6						45.6	4.9	2.27			
44	2018	4	-0.3	70	4.8		2.7						20.9	4.7	0.84			
44	2018	5	7.8	59	4.9		0.4			78		0.08	5.5	4.6	0.78	3	12/02/2018 12:00	02/05/2018 10:20
44	2018	6	9.8	64	2.2		0.3						32.5	4.6	0.41			
44	2018	7	18.0	64			0.5						60.4	5.0	0.20			
44	2018	8	12.6	76	1.2		0.5			60		0.05	78.9	4.8	0.13	8	02/05/2018 10:30	12/08/2018 12:50
44	2018	9	8.7	76	1.1		0.5						38.4	4.7	0.48			
44	2018	10	1.4	80	0.8		1.1			45		0.04	34.2	5.1	1.83	24	12/08/2018 12:50	05/11/2018 09:10

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle deposition (µg/cm ² month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
45	2015	11	6.2	87									40.6					
45	2015	12	4.8	76									29.0					
45	2016	1	0.4	85									167.4					
45	2016	2	0.1	88									162.8					
45	2016	3	1.0	80									7.8					
45	2016	4	5.0	79									147.1					
45	2016	5	8.8	77									194.7					
45	2016	6	12.4	85									160.5					
45	2016	7	15.9	73									58.9					
45	2016	8	16.0	70									18.9					
45	2016	9	13.9	77									50.8					
45	2016	10	6.1	83									104.5					
45	2016	11	2.4	85									68.1					
45	2016	12	3.2	59									0.7					
45	2017	1	-3.6	76									88.1					
45	2017	2	2.0	79									50.2					
45	2017	3	5.3	75									56.8					
45	2017	4	5.4	69									48.8					
45	2017	5	10.7	75									83.2					
45	2017	6	15.9	71									66.1					
45	2017	7	15.8	73									78.7					
45	2017	8	16.3	73									99.7					
45	2017	9	9.6	79									30.6					
45	2017	10	9.1	73			4.4		75				51.8	5.8	0.38			
45	2017	11	1.7	83			5.7		63				92.6	5.4	0.13			
45	2017	12	-1.3	87			4.1		68				170.7	5.3	0.13			
45	2018	1	1.6	89		0.3	4.8	1.7	67	57		0.22	218.5	5.5	0.35	7	26/10/2017 13:00	30/01/2018 11:00
45	2018	2	-5.1	87			9.7		63				62.0	5.3	0.12			
45	2018	3	0.7	85			7.3		82				105.6	5.8	0.14			
45	2018	4	9.6	64		0.5	5.1	2.1	103	83		0.38	28.8	6.7	0.24	8	30/01/2018 11:10	30/04/2018 10:20
45	2018	5	11.2	79			5.3		98				126.6	6.4	0.08			
45	2018	6	14.3	76			3.9		92				117.5	6.2	0.04			
45	2018	7	17.6	66		0.3	4.4	1.0	119	104		0.41	102.1	6.0	0.06		30/04/2018 10:20	27/07/2018 09:15
45	2018	8	17.1	69			4.2		106				60.7	5.9	0.12			
45	2018	9	13.5	72			5.5		92				63.0	6.1	0.08			
45	2018	10	9.3	73			7.9		76				36.1	5.3	0.12			
45	2018	11	3.7	86			7.3		57				82.2	5.0	0.12			

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	ML-SO2 (µg/m3)	NO2 (µg/m3)	ML-NO2 (µg/m3)	O3 (µg/m3)	ML-O3 (µg/m3)	HNO3 (µg/m3)	ML-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle deposition (µg/cm ² month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
50	2015	11	7.9	80									25.2					
50	2015	12	4.2	84									14.2					
50	2016	1	-1.7	83									34.7					
50	2016	2	4.0	81									90.9					
50	2016	3	4.5	77									26.7					
50	2016	4	9.0	70									49.0					
50	2016	5	14.3	70									32.7					
50	2016	6	18.3	68									77.7					
50	2016	7	19.0	72									195.8					
50	2016	8	17.6	74									67.9					
50	2016	9	15.8	77									26.2					
50	2016	10	7.8	84									70.6					
50	2016	11	4.3	82									36.8					
50	2016	12	0.2	84									37.4					
50	2017	1	-5.4	82									14.6					
50	2017	2	0.7	81									29.7					
50	2017	3	6.4	72									53.0					
50	2017	4	7.5	73									105.8					
50	2017	5	13.9	72									27.9					
50	2017	6	18.6	62									34.1					
50	2017	7	19.0	69									45.2					
50	2017	8	19.9	69									53.1					
50	2017	9	13.4	83									191.9					
50	2017	10	9.8	85	8.0		29.0		28				75.1					
50	2017	11	4.5	86	11.1		31.0		20				62.3					
50	2017	12	2.0	84	12.7		27.0		27				24.2					
50	2018	1	1.6	85	15.2		28.0		28				23.5					
50	2018	2	-2.9	81	22.0		34.0		33				15.2					
50	2018	3	1.1	73	19.0		34.0		44				22.6					
50	2018	4	14.0	59	6.8		31.0		59				15.9					
50	2018	5	16.9	67	4.6		24.0		70				103.0					
50	2018	6	18.4	70	4.2		22.0		65				57.5					
50	2018	7	19.7	71	4.1		25.0		61				85.3					
50	2018	8	20.7	70	3.8		28.0		60				29.7					
50	2018	9	15.3	74	4.2		34.0		46				52.6					
50	2018	10	10.4	79	5.9		37.0		31				53.8					
50	2018	11	4.9	83	11.0		34.0		18				8.2					

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	ML-SO2 (µg/m3)	NO2 (µg/m3)	ML-NO2 (µg/m3)	O3 (µg/m3)	ML-O3 (µg/m3)	HNO3 (µg/m3)	ML-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle deposition (µg/cm ² month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
51	2015	11	16.9	65	5.6		55.8		12				41.2					
51	2015	12	11.1	66	7.9		59.7		10				0.6					
51	2016	1	10.8	67	4.8		47.4		10				23.2					
51	2016	2	14.3	66	4.6		50.2		9				15.0					
51	2016	3	13.7	63	5.4		43.7		14				41.6					
51	2016	4	19.2	52	8.2		50.0		10				0.0					
51	2016	5	20.9	52	4.8		42.2		11				1.6					
51	2016	6	27.2	47	3.2		46.3		21				19.2					
51	2016	7	29.4	39	2.3		40.5						0.0					
51	2016	8	28.8	42	2.2		38.3		41				0.0					
51	2016	9	24.2	50	3.4		48.5		29				6.0					
51	2016	10	19.7	60	3.0		50.7		23				43.0					
51	2016	11	15.1	65	5.5		52.9		14				78.2					
51	2016	12	8.7	57	6.5		52.5		17				22.0					
51	2017	1	7.6	65	5.8		51.5		20				39.8	7.2				
51	2017	2	11.4	64	7.4		55.6		20				13.2					
51	2017	3	14.0	57	4.9		58.1		23				70.4					
51	2017	4	16.8	50	5.7		56.0		24				4.2					
51	2017	5	21.4	52	9.8		53.8		21				49.6					
51	2017	6	26.0	54	5.1		64.3		11				57.6					
51	2017	7	29.3	40	4.8		51.9		32				5.2					
51	2017	8	29.1	38	2.9		41.8		45				1.0					
51	2017	9	24.8	52	4.2				7				23.6					
51	2017	10	19.0	54	3.9				9				6.2					
51	2017	11	14.9	67	4.2				7				115.4	7.2				
51	2018	12	12.4	63	8.8		56.0		7				27.4	7.2				
51	2018	1	11.0	65	9.2		54.9		21				45.4	7.2				
51	2018	2	12.1	67	9.0		49.4		8		0.13		69.0	7.2		170	14/11/2017 14:30	14/02/2018 10:30
51	2018	3	15.1	58	8.3		47.9		5				9.0					
51	2018	4	19.5	48	11.6		60.6		13				1.4					
51	2018	5	23.0	55	10.5		50.4		11		0.86		49.2	7.2		49	14/02/2018 10:30	15/05/2018 09:30
51	2018	6	25.8	51	11.6		45.8		13				62.0	7.2				
51	2018	7	28.5	53	9.4		47.8		7				55.2	7.2				
51	2018	8	28.5	44	5.4		38.9		36		1.94		5.0			69	15/05/2018 09:30	16/08/2018 14:00
51	2018	9	24.6	52	8.5		47.6		28				79.4	7.2				
51	2018	10	19.3	63	5.1		45.5		20				7.2					
51	2018	11	15.4	65	0.0		41.4		23			0.85	38.0	7.2		177	16/08/2018 14:00	14/11/2018 14:00

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	ML-SO2 (µg/m3)	NO2 (µg/m3)	ML-NO2 (µg/m3)	O3 (µg/m3)	ML-O3 (µg/m3)	HNO3 (µg/m3)	ML-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	ML-Particle deposition (µg/cm²/month)	Date for mounting of ML passive samplers	Date for demounting of ML passive samplers
53	2015	11	8.5	74	3.0		25.0		37				37.0					
53	2015	12	4.1	87	4.0		31.0		18				25.0					
53	2016	1	0.8	80	5.0		29.0		32				43.0					
53	2016	2	6.4	75	5.0		21.0		47				71.0					
53	2016	3	6.6	72	5.0		20.0		51				21.0					
53	2016	4	11.2	65	3.0		19.0		64				44.0					
53	2016	5	15.7	67	2.0		14.0		77				132.0					
53	2016	6	20.4	65	3.0		13.0		73				79.0					
53	2016	7	22.2	64	3.0		11.0		75				85.0					
53	2016	8	20.3	66	0.0		14.0		63				59.0					
53	2016	9	18.4	70	4.0		25.0		57				23.0					
53	2016	10	9.8	83	4.0		18.0		29				88.0					
53	2016	11	4.9	82	5.0		26.0		25				58.0					
53	2016	12	1.4	82	3.0		28.0		32				29.0					
53	2017	1	-3.4	77	7.0		27.0		48				21.0					
53	2017	2	3.1	78	6.0		34.0		39				29.0					
53	2017	3	9.4	62	4.0		17.0		63				40.0					
53	2017	4	10.1	66	5.0		13.0		73				73.0					
53	2017	5	16.7	64	6.0		14.0		76				44.0					
53	2017	6	22.2	53	5.0		12.0		88				32.0					
53	2017	7	22.2	58	3.0		12.0		81				66.0					
53	2017	8	22.6	58	4.0		15.0		79				42.0					
53	2017	9	14.9	73	4.0		15.0		56				93.0					
53	2017	10	12.1	75	5.0		20.0		43				64.0					
53	2017	11	6.2	78	3.0		23.0		30				41.0					
53	2017	12	3.0	76	3.0		23.0		34				43.0					
53	2018	1	4.2	82	5.0		22.0		33				46.0					
53	2018	2	-0.7	76	7.0		19.0		51		0.34		26.0			3	02/11/2017 14:00	02/02/2018 11:30
53	2018	3	3.5	72	7.0		24.0		60				50.0					
53	2018	4	15.8	59	5.0		16.0		77		0.71		8.0			11	02/02/2018 11:30	30/04/2018 11:00
53	2018	5	18.7	64	5.0		14.0		81				73.0					
53	2018	6	21.3	60	5.0		11.0		85				47.0					
53	2018	7	22.7	57	5.0		11.0		95		0.98		128.0			10	30/04/2018 11:00	27/07/2018 08:40
53	2018	8	23.4	58	5.0		17.0		84				48.0					
53	2018	9	17.4	69	6.0		20.0		65				99.0					
53	2018	10	13.0	72	8.0		22.0		51		0.92		29.0			6	27/07/2018 08:50	29/10/2018 10:30
53	2018	11	6.6	85	7.0		24.0		27				50.0					
53	2018	12	3.0	80	6.0		23.0		36				112.0					

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/cm ² month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
57	2015	10	4.6	86									14.6					
57	2015	11	3.8	94									69.1					
57	2015	12	1.6	90									58.7					
57	2016	1	-11.4	86									32.1					
57	2016	2	-1.1	90									60.0					
57	2016	3	0.0	81									7.7					
57	2016	4	4.6	75									62.1					
57	2016	5	13.6	64									32.4					
57	2016	6	15.3	68									71.4					
57	2016	7	17.3	77									47.3					
57	2016	8	15.4	81									69.8					
57	2016	9	11.8	82									41.7					
57	2016	10	3.8	83									15.5					
57	2016	11	-1.3	89									46.4					
57	2016	12	-1.6	91									16.6					
57	2017	1	-3.5	90									16.4					
57	2017	2	-4.1	87									24.0					
57	2017	3	0.5	78									20.1					
57	2017	4	1.9	75									50.4					
57	2017	5	9.3	58									12.0					
57	2017	6	13.3	70									84.1					
57	2017	7	15.3	76									62.7					
57	2017	8	15.0	89									106.4					
57	2017	9	10.5	89									55.6					
57	2017	10	4.5	92									112.8	5.3	0.20			
57	2017	11	2.1	94									51.1	5.1	0.50			
57	2017	12	0.0	93									71.2	4.9	0.90			
57	2017	1	-3.1	91		0.3		6.7		42		0.16	45.8	4.7	0.90	2	24/10/2017 15:00	24/01/2018 15:45
57	2018	2	-9.3	86									15.8	4.7	3.40			
57	2018	3	-5.8	76									20.5	5.0	0.70			
57	2018	4	4.6	74									36.7	6.0	1.10			
57	2018	5	15.0	54		0.9		9.0		60		0.26	20.8			10	24/01/2018 15:45	02/05/2018 13:15
57	2018	6	15.2	59									48.2	5.0	0.40			
57	2018	7	20.7	70									47.0	5.1	0.20			
57	2018	8	17.4	75		0.3		3.7		65		0.26	51.9	5.6	0.50	18	02/05/2018 14:00	02/08/2018 12:00
57	2018	9	12.5	84									58.4	5.5	0.50			
57	2018	10	6.0	90		0.3		5.0		48		0.15	35.9	5.2	0.80	8	02/08/2018 12:00	29/10/2018 12:00
57	2018	11	2.4	92									18.8					

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle deposition (µg/cm ² month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
58	2015	11																
58	2015	12																
58	2016	1																
58	2016	2																
58	2016	3																
58	2016	4																
58	2016	5																
58	2016	6																
58	2016	7																
58	2016	8																
58	2016	9																
58	2016	10																
58	2016	11																
58	2016	12																
58	2017	1																
58	2017	2																
58	2017	3																
58	2017	4																
58	2017	5																
58	2017	6																
58	2017	7																
58	2017	8																
58	2017	9																
58	2017	10																
58	2017	11	7.8	68									50.8					
58	2017	12	0.8	64									33.2					
58	2018	1	-0.3	70									43.2					
58	2018	2	4.2	79								0.19	147.3			8	15/11/2017 14:42	15/02/2018 10:32
58	2018	3	3.8	63									53.3					
58	2018	4	7.7	70									137.2					
58	2018	5	15.8	80								0.31	71.1			10	15/02/2018 10:36	15/05/2018 09:40
58	2018	6	19.6	77									61.0					
58	2018	7	24.1	79									101.6					
58	2018	8	24.8	81								0.65	94.0			17	15/05/2018 09:40	17/08/2018 17:01
58	2018	9	20.8	84									208.3					
58	2018	10	14.8	78									104.1					
58	2018	11	7.3	73								0.39	167.6			9	17/08/2018 17:03	14/11/2018 10:10

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	ML-SO2 (µg/m3)	NO2 (µg/m3)	ML-NO2 (µg/m3)	O3 (µg/m3)	ML-O3 (µg/m3)	HNO3 (µg/m3)	ML-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/cm ² month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
59	2015	11	4.4	90									86.1					
59	2015	12	2.4	93									25.8					
59	2016	1	-2.6	80									27.3					
59	2016	2	3.6	85									96.6					
59	2016	3	5.4	70									34.2					
59	2016	4	9.9	68									69.9					
59	2016	5	14.2	69									59.4					
59	2016	6	18.8	68									42.3					
59	2016	7	19.4	67									179.1					
59	2016	8	20.2										74.6					
59	2016	9	15.5	81									54.9					
59	2016	10	8.3	83									116.8					
59	2016	11	6.3	83									63.7					
59	2016	12	-1.2	88									22.1					
59	2017	1	-6.1	81									19.7					
59	2017	2	1.5	82									35.2					
59	2017	3	6.7	71									16.9					
59	2017	4	7.6	75									132.3					
59	2017	5	13.0	71									63.2					
59	2017	6	17.9	59									57.0					
59	2017	7	17.1	70									87.0					
59	2017	8	24.1	73									70.9					
59	2017	9	15.6	85									154.6					
59	2017	10	8.8	87	16.2		25.5		191				107.3	5.9	4.25			
59	2017	11	3.9	88	28.2		14.3		237				58.2	7.1	1.00			
59	2017	12	0.6	87	31.6		13.5		220				43.5	6.9	6.38			
59	2018	1	1.4	87	17.3		19.6		416				30.3	6.6	2.13			
59	2018	2	-2.4	77	30.3		14.6		413				21.4	6.8	3.12			
59	2018	3	2.1	70	36.1		24.7		44				29.1	6.7	2.84			
59	2018	4	14.2	60	23.7		17.1		319				10.4	7.1	3.61			
59	2018	5	16.4	65	20.6		4.4		139				51.3	7.8	6.03			
59	2018	6	18.2				15.0		63				93.1	6.8	1.00			
59	2018	7	20.1	57	6.2		82.6		65				71.4	6.5	1.00			
59	2018	8	20.9	67			17.5		62				55.1	6.0	5.92			
59	2018	9	14.8	73	1.7		12.5		46				72.3	6.9	17.00			
59	2018	10	8.4	84			18.0		31				51.7	6.9	4.61			
59	2018	11	2.5	75			29.0		24				4.9	6.7	1.00			

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle deposition (µg/cm ² month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
60	2015	11																
60	2015	12																
60	2016	1																
60	2016	2																
60	2016	3																
60	2016	4																
60	2016	5																
60	2016	6																
60	2016	7																
60	2016	8																
60	2016	9																
60	2016	10																
60	2016	11																
60	2016	12																
60	2017	1																
60	2017	2																
60	2017	3																
60	2017	4																
60	2017	5																
60	2017	6																
60	2017	7																
60	2017	8																
60	2017	9																
60	2017	10																
60	2017	11	12.2	63	2.6		21.6		0				88.0	5.9	8.38			
60	2017	12	9.0	60	2.2		18.9		0				61.6	6.0	8.24			
60	2018	1	10.0	67	3.4		21.0		0				76.0	5.4	3.94			
60	2018	2	7.6	62	3.0	1.3	19.5	10.9	0	58		0.25	118.5	5.4	3.86	24	10/11/2017 14:00	15/02/2018 13:00
60	2018	3	10.6	69	3.0		16.8		0				145.3	5.9	3.64			
60	2018	4	18.0	53	3.6		26.7		0				56.5	5.9	2.23			
60	2018	5	22.3	58	5.3	1.7	21.2	8.4	0	83		0.36	65.0	5.7	1.95	5751	15/02/2018 13:00	15/05/2018 13:00
60	2018	6	24.6	52	1.4		17.1		0				50.9	6.1	2.53			
60	2018	7	27.5	47	2.1		24.8		0				14.1	6.3	5.34			
60	2018	8	28.2	49	4.3	0.9	28.3	6.1	0	99		1.01	11.1	6.1	3.62	15	15/05/2018 13:00	17/08/2018 13:00
60	2018	9	23.4	52	4.3		23.7		0				20.9	5.7	5.29			
60	2018	10	19.1	58	5.9		24.1		0				97.4	5.7	7.67			
60	2018	11	14.4	64	6.3	1.2	18.7	9.8	0	75		0.71	120.8	5.6	2.70	44	17/08/2018 13:20	16/11/2018 13:45

Site no	Year	Month	Temp (°C)	RH (%)	SO2 (µg/m3)	ML-SO2 (µg/m3)	NO2 (µg/m3)	ML-NO2 (µg/m3)	O3 (µg/m3)	ML-O3 (µg/m3)	HNO3 (µg/m3)	ML-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/cm ² month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
61	2015	11																
61	2015	12																
61	2016	1																
61	2016	2																
61	2016	3																
61	2016	4																
61	2016	5																
61	2016	6																
61	2016	7																
61	2016	8																
61	2016	9																
61	2016	10																
61	2016	11																
61	2016	12																
61	2017	1																
61	2017	2																
61	2017	3																
61	2017	4																
61	2017	5																
61	2017	6																
61	2017	7																
61	2017	8																
61	2017	9																
61	2017	10																
61	2017	11	7.3	77	2.0		38.3		23				113.2	5.3	0.20			
61	2017	12	4.0	78	2.1		41.1		28				92.3	5.7	0.57			
61	2018	1	5.2	81	2.1		38.2		25				56.7	5.6	0.53			
61	2018	2	0.2	81	2.8	1.0	42.0	34.0	42	26		0.56	87.5	5.3	0.67	16	06/11/2017 13:30	06/02/2018 11:30
61	2018	3	5.2	75	2.7		41.6		60				72.2	5.7	0.54			
61	2018	4	16.1	61	0.9		29.1		64				65.8	6.4	0.37			
61	2018	5	19.5	66	1.3	1.5	30.3	18.0	68	57		0.72	68.7	6.7	0.17	1361	06/02/2018 11:30	07/05/2018 15:30
61	2018	6	21.4	66	0.4		22.3		69				127.8	6.2	0.11			
61	2018	7	22.5	67	0.5		23.4		78				85.2	6.1	0.18			
61	2018	8	23.7	63	2.4	0.5	22.8	9.2	65	73		0.86	40.7	5.6	0.10	13	07/05/2018 15:30	07/08/2018 11:20
61	2018	9	17.7	70	1.4		27.7		65				59.0	4.8	0.18			
61	2018	10	13.7	75	2.0		33.8		35				88.6	5.9	0.12			
61	2018	11	7.9	84	2.2	0.8	30.3	14.9	22	50		0.80	80.4	5.0	0.15	15	07/08/2018 11:20	06/11/2018 11:20

Table A.2: Optional data

Site no	Sampling		Optional										Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers	
	Period	Conductivity	Ions in precipitation						Ions in particle deposition (IVL)			Particles			
			SO42-	NO3-	NH4+	Na+	Ca2+	Mg2+	K+	Cl-	NO3-	SO42-			conc. PM10
Year	Month	µS/cm	mgS/l	mgN/l	mgN/l	mgNa/l	mgCa/l	mgMg/l	mgK/l	µg/cm ² month	µg/cm ² month	µg/cm ² month	µg/m ³		
01	2015	11	22	11.80	1.90								31.0		
01	2015	12	30		1.30								26.9		
01	2016	1	43	2.80	6.60								37.1		
01	2016	2	24	6.00	5.00								17.5		
01	2016	3	35	35.30	5.00								22.2		
01	2016	4	59	1.20									23.8		
01	2016	5	17	1.00	0.90								21.1		
01	2016	6	16	1.70	3.20								19.3		
01	2016	7	12	14.50	0.60								20.2		
01	2016	8	22	5.10	3.20								20.6		
01	2016	9	24	1.20	5.10								32.0		
01	2016	10	33	3.40	2.90								23.5		
01	2016	11	23	12.60	5.00								32.0		
01	2016	12	30	9.90	4.00								28.1		
01	2017	1	38	36.40	5.80								50.5		
01	2017	2	54	15.20	8.60								58.9		
01	2017	3	32	3.10	3.60								26.6		
01	2017	4	30	5.50	4.60								16.4		
01	2017	5	30	6.60	6.80								17.2		
01	2017	6	28	1.40	3.80								18.8		
01	2017	7	32	4.30	4.40								18.2		
01	2017	8	25	1.20	1.20								21.1		
01	2017	9	30	2.30	1.00								22.1		
01	2017	10	20	2.30	0.50								24.9		
01	2017	11	30	4.90	1.10								28.4		
01	2017	12	35	3.10	0.90								20.5		
01	2018	1	29	6.20	0.80								23.6		
01	2018	2	118		3.40					0.17	0.33	0.20	38.1	23/10/2017 12:00	02/02/2018 12:00
01	2018	3	41	6.40	1.40								35.7		
01	2018	4	103	12.30	4.70								31.0		
01	2018	5	41	6.30	2.00								26.7		
01	2018	6	21	3.90	0.98					0.10	0.33	0.20	17.3	02/02/2018 12:00	06/06/2018 12:00
01	2018	7											18.2		
01	2018	8	33	3.50	2.70								17.3		
01	2018	9	43	6.20	1.70								26.0		
01	2018	10	22	8.60	1.20					0.03	0.41	0.16	37.5		
01	2018	11	55	79.90	1.70								39.2	06/06/2018 12:00	02/11/2018 12:00
01	2018	12	17	12.30	0.70								20.4		

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l				Conc. PM10 µg/m ³	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
03	2015	11	160	23.00	2.50									28.2		
03	2015	12	72	13.80	0.70									27.3		
03	2016	1	43	6.90	0.30									34.6		
03	2016	2	32	5.40	0.40									19.7		
03	2016	3	55	8.20	2.30									22.4		
03	2016	4	72	2.50										22.1		
03	2016	5												18.6		
03	2016	6	228	14.50	2.20									21.4		
03	2016	7	160	23.00	0.20									20.0		
03	2016	8	44	2.90	1.90									22.3		
03	2016	9	213	7.90	4.20									33.7		
03	2016	10	89	11.00	1.20									23.0		
03	2016	11	31	7.60	1.20									32.1		
03	2016	12	73	27.60	2.40									29.6		
03	2017	1	27	13.40	1.10									51.0		
03	2017	2	67	18.50	3.50									50.3		
03	2017	3												24.8		
03	2017	4	307	43.20	23.50									19.6		
03	2017	5												22.5		
03	2017	6	69	5.80	1.40									18.8		
03	2017	7	143	5.60	17.00									18.3		
03	2017	8	85	4.20	0.50									19.4		
03	2017	9	59	8.50	1.00									21.2		
03	2017	10	34	3.70	0.70									21.1		
03	2017	11	60	2.70	0.60									24.4		
03	2017	12	57	7.00	0.90									20.1		
03	2018	1	26	2.40	0.70									25.1		
03	2018	2												41.6		
03	2018	3	36	10.50	1.30									40.7		
03	2018	4	302	19.10	2.20									29.3	24/12/2017 12:00	04/04/2018 12:00
03	2018	5	69	13.10	2.50									29.5		
03	2018	6	678		3.10									22.8		
03	2018	7												25.6	04/04/2018 12:00	31/07/2018 00:00
03	2018	8	116	14.80	3.60									27.5		
03	2018	9	43	2.50	1.60									27.8		
03	2018	10	60	20.00	1.24									36.1		
03	2018	11	100	54.30	2.10						0.04	0.23	0.46	43.4	31/07/2018 12:00	01/11/2018 12:00
03	2018	12	25	9.40	0.50									26.9		

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l					Conc. PM10 µg/m ³	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
10	2015	11	31	0.89	0.30	0.60	1.13	0.87	0.29	0.16					20.5		
10	2015	12	17	1.35	0.53	1.10	0.76	1.43	0.23	0.05					21.8		
10	2016	1	27	0.92	0.42	0.85	0.77	0.70	0.23	0.05					22.4		
10	2016	2	24	1.05	0.41	1.09	0.92	0.84	0.25	0.04					19.4		
10	2016	3	34	1.13	0.44	1.40	0.89	1.16	0.21	0.04					25.1		
10	2016	4	35	1.75	0.77	1.29	1.07	1.93	0.34	0.26					18.5		
10	2016	5	33	0.97	0.60	1.04	0.42	0.94	0.21	0.11					19.0		
10	2016	6	29	1.11	0.61	0.96	0.15	0.85	0.18	0.02					16.5		
10	2016	7	42	1.33	0.46	0.66	0.59	1.63	0.22	0.20					17.4		
10	2016	8	50	2.12	0.76	1.53	0.67	1.69	0.23	0.24					17.8		
10	2016	9	71	0.73	0.34	0.31	0.72	1.77	0.15	0.11					24.6		
10	2016	10	49	1.35	0.53	0.73	0.84	1.76	0.23	0.05					20.3		
10	2016	11	25	1.07	0.40	0.63	0.49	1.60	0.14	0.55					23.6		
10	2016	12	53	1.63	0.55	1.37	1.63	1.94	0.37	0.15					34.8		
10	2017	1	50	1.38	0.46	0.87	2.26	1.22	0.31	0.18					34.7		
10	2017	2	36	1.01	0.43	0.88	0.56	0.33	0.16	0.12					33.6		
10	2017	3	49	1.01	0.45	1.04	0.81	0.32	0.17	0.12					21.5		
10	2017	4	51	1.09	0.50	1.02	1.18	1.29	0.25	0.62					21.7		
10	2017	5	35	1.04	0.68	0.99	1.59	1.83	0.22	0.41					16.6		
10	2017	6	54	1.19	0.64	1.86	0.88	1.65	0.24	0.64					17.4		
10	2017	7	57	1.34	0.42	0.89	0.26	0.98	0.11	0.13					15.1		
10	2017	8	33	1.47	0.66	1.53	0.52	1.56	0.16	0.31					16.9		
10	2017	9	46	1.61	0.47	0.97	0.66	1.05	0.19	0.17					18.3		
10	2017	10	34	1.65	0.57	1.03	1.71	1.31	0.34	0.62					19.1		
10	2017	11	43	1.32	0.69	1.01	0.76	1.28	0.17	0.08					22.9		
10	2017	12	55	1.62	0.44	0.78	1.02	0.88	0.20	0.09					21.9		
10	2018	1	49	1.73	0.47	1.05	1.98	1.08	0.36	0.11	0.57	0.16	1.26		21.4	18/10/2017 12:49	17/01/2018 07:37
10	2018	2	50	1.27	0.38	0.91	0.92	1.23	0.15	0.08					27.3		
10	2018	3	52	1.15	0.69	1.50	0.71	2.19	0.07	0.12					25.7		
10	2018	4	0	1.68	0.79	1.63	0.72	2.34	0.26	1.18	0.20	0.52	1.23		29.9	17/01/2018 07:43	18/04/2018 09:25
10	2018	5	3263	0.81	0.78	1.24	0.26	1.75	0.08	0.24					20.2		
10	2018	6	5528	0.65	0.77	1.75	0.28	0.87	0.04	0.13					17.9		
10	2018	7	4338	0.52	0.31	0.47	0.82	2.32	0.19	0.42	0.21	0.91	0.69		16.9	18/04/2018 09:28	11/07/2018 07:36
10	2018	8	549	1.14	0.62	0.91	0.49	2.92	0.22	0.34					16.5		
10	2018	9	3117	0.83	0.68	1.45	0.59	1.15	0.10	0.20					18.4		
10	2018	10	1669	0.42	0.17	0.26	1.07	0.89	0.15	0.08	0.12	0.48	0.82		20.0	11/07/2018 07:38	18/10/2018 12:53
10	2018	11	1247	0.42	0.20	0.34	0.10	0.49	0.02	0.05					21.9		
10	2018	12	3750	1.26	0.25	0.60	1.19	1.02	0.27	1.31					17.2		

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l				Conc. PM10 µg/m ³	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
13	2015	11												42.1		
13	2015	12												67.6		
13	2016	1												41.1		
13	2016	2												33.2		
13	2016	3												28.0		
13	2016	4												30.9		
13	2016	5												23.8		
13	2016	6												25.7		
13	2016	7												29.0		
13	2016	8												22.5		
13	2016	9												24.7		
13	2016	10												27.0		
13	2016	11												33.5		
13	2016	12												59.7		
13	2017	1												39.5		
13	2017	2												39.0		
13	2017	3												32.3		
13	2017	4												26.1		
13	2017	5												23.2		
13	2017	6												27.3		
13	2017	7												26.5		
13	2017	8												29.4		
13	2017	9												21.8		
13	2017	10												28.6		
13	2017	11												31.9		
13	2017	12												43.3		
13	2018	1								10.33	0.35	2.06		42.7	25/10/2017 12:00	25/01/2018 10:00
13	2018	2												29.8		
13	2018	3												26.0		
13	2018	4								3.91	0.81	1.02		34.9	25/01/2018 10:10	20/04/2018 10:00
13	2018	5												20.9		
13	2018	6												17.7		
13	2018	7								0.63	2.30	0.56		22.5	20/04/2018 10:15	25/07/2018 10:00
13	2018	8												20.0		
13	2018	9												24.1		
13	2018	10								13.97	2.15	2.67		27.0	25/07/2018 10:10	31/10/2018 10:00
13	2018	11												29.5		

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l				Conc. PM10 µg/m ³	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
14	2015	11														
14	2015	12														
14	2016	1														
14	2016	2														
14	2016	3														
14	2016	4														
14	2016	5														
14	2016	6														
14	2016	7														
14	2016	8														
14	2016	9														
14	2016	10														
14	2016	11														
14	2016	12														
14	2017	1														
14	2017	2														
14	2017	3														
14	2017	4														
14	2017	5														
14	2017	6														
14	2017	7														
14	2017	8														
14	2017	9														
14	2017	10														
14	2017	11														
14	2018	12														
14	2018	1								10.59	0.58	2.09		27/10/2017 14:00	26/01/2018 10:00	
14	2018	2														
14	2018	3														
14	2018	4								1.04	0.46	0.38		26/01/2018 10:15	23/04/2018 09:00	
14	2018	5														
14	2018	6														
14	2018	7								0.24	1.24	0.27		23/04/2018 09:15	17/07/2018 10:30	
14	2018	8														
14	2018	9														
14	2018	10								1.95	0.84	0.45		17/07/2018 10:40	26/10/2018 11:00	
14	2018	11														

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l				Conc. PM10 µg/m ³	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
15	2015	11												64.3		
15	2015	12												83.3		
15	2016	1												68.6		
15	2016	2												39.7		
15	2016	3												33.3		
15	2016	4												33.6		
15	2016	5												22.0		
15	2016	6												22.2		
15	2016	7												22.7		
15	2016	8												18.4		
15	2016	9												33.5		
15	2016	10												38.4		
15	2016	11												50.5		
15	2016	12												73.1		
15	2017	1												77.3		
15	2017	2												67.9		
15	2017	3												48.2		
15	2017	4												28.2		
15	2017	5												18.8		
15	2017	6												20.1		
15	2017	7												17.6		
15	2017	8												20.5		
15	2017	9												21.8		
15	2017	10												64.4		
15	2017	11												53.7		
15	2018	12												50.2		
15	2018	1												45.3		
15	2018	2								0.31	0.48	0.45		34.6	31/10/2017 11:15	01/02/2018 12:00
15	2018	3												31.5		
15	2018	4								0.05	1.52	0.30		27.3	01/02/2018 12:00	23/04/2018 11:30
15	2018	5												20.1		
15	2018	6												20.3		
15	2018	7												18.5		
15	2018	8								0.29	0.85	0.35		17.8	23/04/2018 11:30	01/08/2018 15:00
15	2018	9												28.9		
15	2018	10								0.13	0.66	0.19		40.8	01/08/2018 15:00	23/10/2018 10:00
15	2018	11												28.7		

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l				Conc. PM10 µg/m ³	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
16	2015	11												68.0		
16	2015	12												93.8		
16	2016	1												97.2		
16	2016	2												40.2		
16	2016	3												33.6		
16	2016	4												27.3		
16	2016	5												17.9		
16	2016	6												18.4		
16	2016	7												19.9		
16	2016	8												16.6		
16	2016	9												25.7		
16	2016	10												27.8		
16	2016	11												46.2		
16	2016	12												75.1		
16	2017	1												71.5		
16	2017	2												62.5		
16	2017	3												42.2		
16	2017	4												24.5		
16	2017	5												20.5		
16	2017	6												21.9		
16	2017	7												18.9		
16	2017	8												22.6		
16	2017	9												19.2		
16	2017	10												58.6		
16	2017	11												48.8		
16	2018	12												62.8		
16	2018	1								1.46	0.41	0.75			03/11/2017 12:15	31/01/2018 12:00
16	2018	2														
16	2018	3												20.3		
16	2018	4												21.0		
16	2018	5							0.27	1.08	0.35			20.9	31/01/2018 11:05	08/05/2018 10:00
16	2018	6												20.3		
16	2018	7							0.03	0.24	0.08			23.0	08/05/2018 10:00	30/07/2018 10:00
16	2018	8												21.5		
16	2018	9												35.3		
16	2018	10												34.5		
16	2018	11							2.65	0.39	0.58			32.4	30/07/2018 10:00	07/11/2018 14:00

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l				Conc. PM10 µg/m ³	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
21	2015	11														
21	2015	12														
21	2016	1														
21	2016	2														
21	2016	3														
21	2016	4														
21	2016	5														
21	2016	6														
21	2016	7														
21	2016	8														
21	2016	9														
21	2016	10														
21	2016	11														
21	2016	12														
21	2017	1														
21	2017	2														
21	2017	3														
21	2017	4														
21	2017	5														
21	2017	6														
21	2017	7														
21	2017	8														
21	2017	9														
21	2017	10														
21	2017	11	16	0.33	0.42	0.28	1.18	0.49	0.14	0.62						
21	2017	12	13	0.22	0.30	0.27	1.18	0.39	0.09	0.08						
21	2018	1	17	0.31	0.42	0.28	1.30	0.33	0.14	0.10	0.75	0.12	0.19		20/10/2017 10:00	12/01/2018 14:30
21	2018	2	31	0.43	0.83	0.55	2.76	0.59	0.21	0.09						
21	2018	3	30	0.34	0.59	0.48	3.61	1.00	0.15	0.10						
21	2018	4	20	0.34	0.55	0.66	0.83	1.27	0.20	0.74	0.91	0.26	0.14		12/01/2018 14:30	20/04/2018 14:00
21	2018	5	22	0.40	0.63	0.78	0.64	1.49	0.24	0.98						
21	2018	6	36	0.87	1.26	0.90	1.54	1.81	0.44	1.22						
21	2018	7	93	2.80	3.64	3.48	2.97	4.76	0.83	2.34	0.10	0.49	0.10		20/04/2018 14:00	20/07/2018 08:00
21	2018	8	29	0.64	0.89	1.03	1.21	1.29	0.23	0.57						
21	2018	9	15	0.21	0.06	0.00	1.43	0.60	0.25	0.64	0.78	0.22	0.20			
21	2018	10	40	0.39	-0.01	0.03	2.33	3.44	0.41	0.44					20/07/2018 14:00	19/10/2018 10:30

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l				Conc. PM10 µg/m ³	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
23	2015	11														
23	2015	12														
23	2016	1														
23	2016	2														
23	2016	3														
23	2016	4														
23	2016	5														
23	2016	6														
23	2016	7														
23	2016	8														
23	2016	9														
23	2016	10														
23	2016	11														
23	2016	12														
23	2017	1														
23	2017	2														
23	2017	3														
23	2017	4														
23	2017	5														
23	2017	6														
23	2017	7														
23	2017	8														
23	2017	9														
23	2017	10	13	0.22	0.26	0.22	0.92	0.16	0.12	0.06				4.5		
23	2017	11	21	0.32	0.38	0.23	2.09	0.19	0.24	0.10				2.5		
23	2017	12	29	0.42	0.24	0.18	3.26	0.25	0.40	0.14				2.0		
23	2018	1	16	0.24	0.31	0.21	1.20	0.13	0.15	0.06	0.23	0.04	0.04	2.7	27/10/2017 14:00	31/01/2018 14:00
23	2018	2	29	0.49	1.04	1.15	1.59	0.17	0.19	0.10				6.8		
23	2018	3	22	0.51	0.54	0.50	1.26	0.14	0.15	0.09				4.4		
23	2018	4	15	0.28	0.34	0.51	1.10	0.24	0.13	0.11	0.13	0.26	0.11	5.8	31/01/2018 14:00	27/04/2018 13:00
23	2018	5	13	0.35	0.53	0.94	0.22	0.25	0.04	0.06				9.1		
23	2018	6	11	0.25	0.27	0.28	0.58	0.13	0.07	0.08				6.0		
23	2018	7	12	0.28	0.41	0.68	0.27	0.24	0.05	0.15	0.06	0.29	0.08	6.1	27/04/2018 13:00	27/07/2018 05:00
23	2018	8	14	0.26	0.41	0.63	0.67	0.17	0.08	0.09				4.0		
23	2018	9	29	0.41	0.19	0.23	3.52	0.19	0.41	0.14				5.5		
23	2018	10	15	0.24	0.17	0.11	1.35	0.14	0.17	0.06	1.66	0.16	0.30	6.2	27/07/2018 05:00	26/10/2018 10:00

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l				Conc. PM10 µg/m ³	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
24	2015	11														
24	2015	12														
24	2016	1											8.1			
24	2016	2											11.5			
24	2016	3											18.0			
24	2016	4											15.9			
24	2016	5											14.7			
24	2016	6											11.9			
24	2016	7											9.1			
24	2016	8											9.7			
24	2016	9											13.6			
24	2016	10											10.6			
24	2016	11											10.5			
24	2016	12											10.8			
24	2017	1											10.0			
24	2017	2											18.0			
24	2017	3											16.4			
24	2017	4											15.6			
24	2017	5											15.3			
24	2017	6											10.2			
24	2017	7											9.3			
24	2017	8											11.3			
24	2017	9											11.8			
24	2017	10											7.8			
24	2017	11											8.7			
24	2017	12											6.7			
24	2018	1								0.36	0.18	0.11	8.4	26/10/2017 09:00	30/01/2018 09:00	
24	2018	2											8.7			
24	2018	3											13.9			
24	2018	4								0.38	0.52	0.23	16.8	30/01/2018 09:00	02/05/2018 14:00	
24	2018	5											19.3			
24	2018	6											9.2			
24	2018	7											11.6			
24	2018	8								0.22	0.39	0.18	9.6	02/05/2018 14:00	21/08/2018 10:00	
24	2018	9											9.3			
24	2018	10								0.90	0.31	0.34	11.0	21/08/2018 10:00	31/10/2018 10:00	

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l				Conc. PM10 µg/m ³	Date for mounting of I/L passive samplers	Date for demounting of I/L passive samplers
26	2015	11														
26	2015	12														
26	2016	1														
26	2016	2														
26	2016	3														
26	2016	4														
26	2016	5														
26	2016	6														
26	2016	7														
26	2016	8														
26	2016	9														
26	2016	10														
26	2016	11														
26	2016	12														
26	2017	1														
26	2017	2														
26	2017	3														
26	2017	4														
26	2017	5														
26	2017	6														
26	2017	7														
26	2017	8														
26	2017	9														
26	2017	10														
26	2017	11														
26	2017	12														
26	2018	1										0.05	0.09	0.04	26/10/2017 13:00	31/01/2018 11:00
26	2018	2														
26	2018	3														
26	2018	4														
26	2018	5										0.13	0.34	0.10	31/01/2018 11:00	02/05/2018 17:00
26	2018	6														
26	2018	7														
26	2018	8										0.02	0.06	0.02	02/05/2018 17:00	21/08/2018 13:00
26	2018	9														
26	2018	10										0.10	0.13	0.05	21/08/2018 13:00	31/10/2018 13:00
26	2018	11														
26	2018	12														

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l				Conc. PM10 µg/m³	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
31	2015	11														
31	2015	12														
31	2016	1														
31	2016	2														
31	2016	3														
31	2016	4														
31	2016	5														
31	2016	6														
31	2016	7														
31	2016	8														
31	2016	9														
31	2016	10														
31	2016	11														
31	2016	12														
31	2017	1														
31	2017	2														
31	2017	3														
31	2017	4														
31	2017	5														
31	2017	6														
31	2017	7														
31	2017	8														
31	2017	9														
31	2017	10	19	0.25	0.26									18.0		
31	2017	11	29	0.47	0.42									18.0		
31	2017	12	25	0.46	0.45									16.0		
31	2018	1	14	0.32	0.23					0.27	0.38	0.21	10.0	27/10/2017 12:00	31/01/2018 12:00	
31	2018	2	9	0.20	0.18								9.0			
31	2018	3	16	0.30	0.18								6.0			
31	2018	4	14	0.33	0.29								15.0			
31	2018	5	36	0.56	0.74					0.19	0.40	0.26	10.0	31/01/2018 12:00	07/05/2018 12:00	
31	2018	6	30	0.66	0.56								13.0			
31	2018	7	0	0.00	0.00								14.0			
31	2018	8	75	1.91	1.35					0.08	0.89	0.25	22.0	07/05/2018 12:00	02/08/2018 12:00	
31	2018	9	43	1.08	1.03								19.0			
31	2018	10	41	0.68	0.50								12.0			
31	2018	11	23	0.56	0.29					0.07	0.48	0.15	11.0	02/08/2018 12:00	06/11/2018 12:00	

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l				Conc. PM10 µg/m ³	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
33	2015	11														
33	2015	12														
33	2016	1														
33	2016	2														
33	2016	3														
33	2016	4														
33	2016	5														
33	2016	6														
33	2016	7														
33	2016	8														
33	2016	9														
33	2016	10														
33	2016	11														
33	2016	12														
33	2017	1														
33	2017	2														
33	2017	3														
33	2017	4														
33	2017	5														
33	2017	6														
33	2017	7														
33	2017	8														
33	2017	9														
33	2017	10	4	0.11	0.12	0.04	0.12	0.41	0.05	0.03				15.0		
33	2017	11	9	0.16	0.21	0.22	0.20	0.39	0.10	0.14				9.0		
33	2017	12	6	0.13	0.13	0.17	0.20	0.23	0.06	0.07				5.0		
33	2018	1	4	0.07	0.07	0.04	0.20	0.17	0.03	0.08	0.11	0.16	0.05	10.0	02/11/2017 12:00	31/01/2018 12:00
33	2018	2	5	0.08	0.11	0.13	0.15	0.19	0.04	0.04				6.0		
33	2018	3	7	0.12	0.06	0.05	0.67	0.21	0.09	0.08				7.0		
33	2018	4	8	0.15	0.09	0.12	0.44	0.48	0.09	0.07				13.0		
33	2018	5	16	0.32	0.32	0.53	0.09	1.68	0.07	0.10	0.13	0.25	0.12	11.0	31/01/2018 12:00	08/05/2018 12:00
33	2018	6	7	0.10	0.22	0.37	0.06	0.31	0.03	0.05				15.0		
33	2018	7	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00				12.0		
33	2018	8	36	0.69	1.07	2.01	0.29	2.58	0.17	0.25	0.03	0.20	0.06	27.0	08/05/2018 12:00	02/08/2018 12:00
33	2018	9	18	0.33	0.60	1.00	0.13	1.21	0.10	0.09				20.0		
33	2018	10	10	0.22	0.23	0.28	0.18	0.87	0.06	0.07				11.0		
33	2018	11	5	0.12	0.08	0.10	0.24	0.17	0.04	0.07	0.05	0.34	0.10	7.0	02/08/2018 12:00	05/11/2018 12:00

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l				Conc. PM10 µg/m ³	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
40	2015	11														
40	2015	12														
40	2016	1														
40	2016	2														
40	2016	3														
40	2016	4														
40	2016	5														
40	2016	6														
40	2016	7														
40	2016	8														
40	2016	9														
40	2016	10														
40	2016	11														
40	2016	12														
40	2017	1														
40	2017	2														
40	2017	3														
40	2017	4														
40	2017	5														
40	2017	6														
40	2017	7														
40	2017	8														
40	2017	9														
40	2017	10														
40	2017	11	40	2.36	3.03	0.66	1.97	2.82	0.29	0.31						
40	2017	12	60	0.94	1.16	0.42	1.55	0.51	0.18	0.12						
40	2018	1	46	0.89	0.88	0.42	1.95	0.43	0.21	0.11	0.09	0.11	0.07	25/10/2017 16:00	24/01/2018 17:00	
40	2018	2	46	1.46	2.57	0.74	1.71	1.18	0.17	0.13						
40	2018	3	25	1.03	1.94	1.06	1.04	1.03	0.12	0.12						
40	2018	4	133	1.76	3.16	3.62	0.67	2.18	0.15	0.43	0.38	0.86	0.33	24/01/2018 17:30	23/04/2018 17:00	
40	2018	5	107	1.23	2.73	1.22	0.42	2.26	0.11	0.20						
40	2018	6	29	0.75	1.36	1.05	0.08	0.54	0.03	0.11						
40	2018	7	62	1.70	4.71	4.09	0.37	2.83	0.18	0.75	0.05	0.19	0.06	23/04/2018 17:05	31/07/2018 13:00	
40	2018	8	62	1.70	4.71	4.09	0.37	2.83	0.18	0.75						
40	2018	9	354	5.41	10.47	6.17	3.20	6.61	0.50	2.00						
40	2018	10									0.10	0.87	0.20	31/07/2018 13:00	25/10/2018 12:30	

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l				Conc. PM10 µg/m ³	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
41	2015	11														
41	2015	12														
41	2016	1														
41	2016	2														
41	2016	3														
41	2016	4														
41	2016	5														
41	2016	6														
41	2016	7														
41	2016	8														
41	2016	9														
41	2016	10														
41	2016	11														
41	2016	12														
41	2017	1														
41	2017	2														
41	2017	3														
41	2017	4														
41	2017	5														
41	2017	6														
41	2017	7														
41	2017	8														
41	2017	9														
41	2017	10														
41	2017	11														
41	2017	12														
41	2018	1														
41	2018	2														
41	2018	3														
41	2018	4										11.46	0.71	1.31	16/12/2017 12:00	07/04/2018 12:51
41	2018	5														
41	2018	6														
41	2018	7														
41	2018	8										0.26	1.74	0.46	07/04/2018 12:51	20/08/2018 16:00
41	2018	9														
41	2018	10														
41	2018	11										0.78	1.14	0.97	20/08/2018 16:00	20/11/2018 18:00
41	2018	12														

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l				Conc. PM10 µg/m ³	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
44	2015	11														
44	2015	12														
44	2016	1														
44	2016	2														
44	2016	3														
44	2016	4														
44	2016	5														
44	2016	6														
44	2016	7														
44	2016	8														
44	2016	9														
44	2016	10														
44	2016	11														
44	2016	12														
44	2017	1														
44	2017	2														
44	2017	3														
44	2017	4														
44	2017	5														
44	2017	6														
44	2017	7														
44	2017	8														
44	2017	9														
44	2017	10														
44	2017	11	12	0.39	0.15	0.02	0.50	0.34	0.09	0.09						
44	2017	12	8	0.22	0.20	0.13	0.19	0.15	0.04	0.01						
44	2018	1	7	0.20	0.15	0.03	0.23	0.14	0.06	0.02						
44	2018	2	17	0.34	0.12	0.06	1.57	0.23	0.21	0.09	0.07	0.04	0.09	05/11/2017 12:00	12/02/2018 12:00	
44	2018	3	14	0.26	0.07	0.04	1.31	0.08	0.17	0.06						
44	2018	4	14	0.44	0.24	0.06	0.52	0.27	0.09	0.04						
44	2018	5	25	1.09	0.37	0.44	0.53	0.31	0.13	0.06	0.13	0.07	0.11	12/02/2018 12:00	02/05/2018 10:20	
44	2018	6	16	0.62	0.11	0.08	0.26	0.15	0.07	0.07						
44	2018	7	12	0.38	0.11	0.05	0.10	0.08	0.26	0.64						
44	2018	8	9	0.32	0.10	0.09	0.09	0.08	0.03	0.04	0.12	0.05	0.12	02/05/2018 10:30	12/08/2018 12:50	
44	2018	9	14	0.46	0.12	0.09	0.29	0.13	0.07	0.11						
44	2018	10	13	0.28	0.11	0.15	1.02	0.12	0.13	0.16	0.33	0.11	0.23	12/08/2018 12:50	05/11/2018 09:10	

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l				Conc. PM10 µg/m ³	Date for mounting of I/L passive samplers	Date for demounting of I/L passive samplers
45	2015	11														
45	2015	12														
45	2016	1														
45	2016	2														
45	2016	3														
45	2016	4														
45	2016	5														
45	2016	6														
45	2016	7														
45	2016	8														
45	2016	9														
45	2016	10														
45	2016	11														
45	2016	12														
45	2017	1														
45	2017	2														
45	2017	3														
45	2017	4														
45	2017	5														
45	2017	6														
45	2017	7														
45	2017	8														
45	2017	9														
45	2017	10	6	0.11	0.16	0.23	0.22	0.21	0.04	0.04				6.5		
45	2017	11	4	0.05	0.12	0.13	0.07	0.05	0.01	0.01				4.6		
45	2017	12	3	0.04	0.09	0.06	0.07	0.03	0.01	0.02				2.4		
45	2018	1	4	0.05	0.08	0.08	0.20	0.06	0.03	0.02	0.03	0.18	0.08	3.4	26/10/2017 13:00	30/01/2018 11:00
45	2018	2	5	0.08	0.19	0.16	0.07	0.11	0.01	0.02				9.6		
45	2018	3	6	0.10	0.24	0.41	0.08	0.06	0.01	0.03				5.6		
45	2018	4	21	0.37	0.40	1.38	0.16	1.03	0.10	0.29	0.02	0.27	0.06	9.3	30/01/2018 11:10	30/04/2018 10:20
45	2018	5	11	0.23	0.32	0.76	0.04	0.56	0.05	0.14				9.0		
45	2018	6	4	0.10	0.12	0.25	0.04	0.26	0.02	0.03				8.2		
45	2018	7	8	0.19	0.28	0.61	0.05	0.37	0.02	0.06				10.2	30/04/2018 10:20	27/07/2018 09:15
45	2018	8	8	0.16	0.26	0.56	0.07	0.32	0.02	0.07				8.5		
45	2018	9	11	0.23	0.32	0.53	0.07	1.04	0.05	0.05				8.3		
45	2018	10	6	0.09	0.27	0.22	0.07	0.24	0.02	0.03				10.1		
45	2018	11	7	0.13	0.29	0.25	0.28	0.08	0.01	0.09				4.7		

Station 50: No optional data available

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l					Conc. PM10 µg/m ³	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
51	2015	11													50.0		
51	2015	12													59.1		
51	2016	1													47.6		
51	2016	2													47.1		
51	2016	3													45.3		
51	2016	4													51.7		
51	2016	5													43.6		
51	2016	6													43.4		
51	2016	7													32.5		
51	2016	8													36.1		
51	2016	9													34.5		
51	2016	10													30.7		
51	2016	11													39.0		
51	2016	12													41.7		
51	2017	1													41.0		
51	2017	2													43.5		
51	2017	3													32.0		
51	2017	4													30.3		
51	2017	5													30.4		
51	2017	6													38.1		
51	2017	7													33.5		
51	2017	8													34.9		
51	2017	9													34.5		
51	2017	10													29.9		
51	2017	11													44.8		
51	2018	12													37.2		
51	2018	1													38.1		
51	2018	2								10.81	5.47	6.24			30.6	14/11/2017 14:30	14/02/2018 10:30
51	2018	3													47.0		
51	2018	4													42.0		
51	2018	5								3.68	3.62	1.59			36.0	14/02/2018 10:30	15/05/2018 09:30
51	2018	6													32.1		
51	2018	7													32.7		
51	2018	8								10.93	2.61	3.31			33.3	15/05/2018 09:30	16/08/2018 14:00
51	2018	9													31.0		
51	2018	10													39.9		
51	2018	11								40.94	2.23	14.85			32.5	16/08/2018 14:00	14/11/2018 14:00

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l				Conc. PM10 µg/m ³	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
53	2015	11												21.0		
53	2015	12												26.0		
53	2016	1												23.0		
53	2016	2												15.0		
53	2016	3												19.0		
53	2016	4												18.0		
53	2016	5												14.0		
53	2016	6												11.0		
53	2016	7												11.0		
53	2016	8												11.0		
53	2016	9												19.0		
53	2016	10												15.0		
53	2016	11												22.0		
53	2016	12												19.0		
53	2017	1												34.0		
53	2017	2												29.0		
53	2017	3												15.0		
53	2017	4												14.0		
53	2017	5												12.0		
53	2017	6												12.0		
53	2017	7												12.0		
53	2017	8												13.0		
53	2017	9												12.0		
53	2017	10												16.0		
53	2017	11												16.0		
53	2017	12												14.0		
53	2018	1												17.0		
53	2018	2												28.0	02/11/2017 14:00	02/02/2018 11:30
53	2018	3												26.0		
53	2018	4												17.0	02/02/2018 11:30	30/04/2018 11:00
53	2018	5												17.0		
53	2018	6												13.0		
53	2018	7												14.0	30/04/2018 11:00	27/07/2018 08:40
53	2018	8												14.0		
53	2018	9												14.0		
53	2018	10												25.0	27/07/2018 08:50	29/10/2018 10:30
53	2018	11												26.0		
53	2018	12												20.0		

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l				Conc. PM10 µg/m ³	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
57	2015	10														
57	2015	11														
57	2015	12														
57	2016	1														
57	2016	2														
57	2016	3														
57	2016	4														
57	2016	5														
57	2016	6														
57	2016	7														
57	2016	8														
57	2016	9														
57	2016	10														
57	2016	11														
57	2016	12														
57	2017	1														
57	2017	2														
57	2017	3														
57	2017	4														
57	2017	5														
57	2017	6														
57	2017	7														
57	2017	8														
57	2017	9														
57	2017	10											6.5			
57	2017	11											6.4			
57	2017	12											5.1			
57	2017	1									0.06	0.16	0.09	7.1	24/10/2017 15:00	24/01/2018 15:45
57	2018	2											16.4			
57	2018	3											19.4			
57	2018	4											22.2			
57	2018	5									0.03	0.14	0.06	13.4	24/01/2018 15:45	02/05/2018 13:15
57	2018	6											8.1			
57	2018	7											10.1			
57	2018	8									0.11	0.47	0.15	6.9	02/05/2018 14:00	02/08/2018 12:00
57	2018	9											6.9			
57	2018	10									1.74	0.36	0.16	7.4	02/08/2018 12:00	29/10/2018 12:00
57	2018	11											9.3			

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m ³	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers	
58	2015	11												
58	2015	12												
58	2016	1												
58	2016	2												
58	2016	3												
58	2016	4												
58	2016	5												
58	2016	6												
58	2016	7												
58	2016	8												
58	2016	9												
58	2016	10												
58	2016	11												
58	2016	12												
58	2017	1												
58	2017	2												
58	2017	3												
58	2017	4												
58	2017	5												
58	2017	6												
58	2017	7												
58	2017	8												
58	2017	9												
58	2017	10												
58	2017	11												
58	2017	12												
58	2018	1												
58	2018	2								0.54	0.50	0.13	15/11/2017 14:42	15/02/2018 10:32
58	2018	3												
58	2018	4												
58	2018	5								0.39	0.45	0.21	15/02/2018 10:36	15/05/2018 09:40
58	2018	6												
58	2018	7												
58	2018	8								0.16	0.63	0.12	15/05/2018 09:40	17/08/2018 17:01
58	2018	9												
58	2018	10												
58	2018	11								5.79	0.54	1.93	17/08/2018 17:03	14/11/2018 10:10

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m³	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
59	2015	11											
59	2015	12											
59	2016	1											
59	2016	2											
59	2016	3											
59	2016	4											
59	2016	5											
59	2016	6											
59	2016	7											
59	2016	8											
59	2016	9											
59	2016	10											
59	2016	11											
59	2016	12											
59	2017	1											
59	2017	2											
59	2017	3											
59	2017	4											
59	2017	5											
59	2017	6											
59	2017	7											
59	2017	8											
59	2017	9											
59	2017	10	31	0.27	1.78								
59	2017	11	17	0.12	0.25						49.8		
59	2017	12	46	0.19	3.92								
59	2018	1	20	0.22	0.71								
59	2018	2									50.0		
59	2018	3	23	0.15	1.26						63.3		
59	2018	4									33.5		
59	2018	5	13	0.63	6.03						24.2		
59	2018	6											
59	2018	7											
59	2018	8									19.6		
59	2018	9	12	0.28	0.25						181.0		
59	2018	10	59	0.25	2.51						7.7		
59	2018	11											

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l				Conc. PM10 µg/m ³	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
60	2015	11														
60	2015	12														
60	2016	1														
60	2016	2														
60	2016	3														
60	2016	4														
60	2016	5														
60	2016	6														
60	2016	7														
60	2016	8														
60	2016	9														
60	2016	10														
60	2016	11														
60	2016	12														
60	2017	1														
60	2017	2														
60	2017	3														
60	2017	4														
60	2017	5														
60	2017	6														
60	2017	7														
60	2017	8														
60	2017	9														
60	2017	10														
60	2017	11	40	0.70	0.35	0.14	4.47	1.82	0.53	0.44						11.5
60	2017	12	50	0.62	0.43	0.22	4.47	2.07	0.52	0.45						12.8
60	2018	1	24	0.21	0.32	0.23	2.20	0.62	0.25	0.28						15.1
60	2018	2	30	0.44	0.29	0.23	2.11	1.37	0.27	0.23	834.30	176.14	266.78		10/11/2017 14:00	15/02/2018 13:00
60	2018	3	50	0.41	0.31	0.23	2.08	2.48	0.23	0.37						15.7
60	2018	4	37	0.29	0.20	0.16	1.26	2.01	0.19	0.36						29.8
60	2018	5	36	0.59	0.36	0.23	1.18	2.22	0.20	0.36	0.34	1.29	0.37		12/02/2018 13:00	13/02/2018 13:00
60	2018	6	26	0.50	0.49	0.33	1.42	2.07	0.23	0.34						1.4
60	2018	7	42	0.47	0.80	0.66	3.08	3.33	0.44	0.93						15.7
60	2018	8	65	0.63	0.67	0.19	2.12	4.64	0.34	1.28	13.77	1.12	2.40		15/05/2018 13:00	17/08/2018 13:00
60	2018	9	52	0.36	0.58	0.17	2.79	2.80	0.42	1.50						18.0
60	2018	10	78	0.22	0.16	0.06	4.24	1.65	0.46	0.36	1.12	0.78	0.49			24.1
60	2018	11	26	0.22	0.20	0.06	1.62	0.96	0.20	0.17					17/08/2018 13:20	16/11/2018 13:45

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l				Conc. PM10 µg/m ³	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
61	2015	11														
61	2015	12														
61	2016	1														
61	2016	2														
61	2016	3														
61	2016	4														
61	2016	5														
61	2016	6														
61	2016	7														
61	2016	8														
61	2016	9														
61	2016	10														
61	2016	11														
61	2016	12														
61	2017	1														
61	2017	2														
61	2017	3														
61	2017	4														
61	2017	5														
61	2017	6														
61	2017	7														
61	2017	8														
61	2017	9														
61	2017	10														
61	2017	11	17	0.32	0.19	0.21	0.09	0.63	0.03	0.05				34.6		
61	2017	12	14	0.10	0.18	0.13	0.33	0.77	0.06	0.04				25.9		
61	2018	1	15	0.18	0.19	0.13	0.31	0.58	0.07	0.06				40.6		
61	2018	2	18	0.27	0.33	0.27	0.39	1.11	0.05	0.18	1.12	0.78	0.49	45.3	06/11/2017 13:30	06/02/2018 11:30
61	2018	3	20	0.39	0.31	0.33	0.32	2.11	0.11	0.23				40.1		
61	2018	4	32	0.61	0.16	0.41	0.21	3.74	0.19	0.16				30.6		
61	2018	5	22	0.52	0.37	0.42	0.09	1.83	0.09	0.05	10.90	45.51	20.97	29.3	05/02/2018 13:00	06/02/2018 13:00
61	2018	6	18	0.21	0.23	0.37	0.05	1.28	0.08	0.05				22.2		
61	2018	7	19	0.36	0.44	0.69	0.29	1.90	0.10	0.09				21.4		
61	2018	8	18	0.35	0.28	0.47	0.04	0.49	0.06	0.05	0.05	0.29	0.21	25.1	07/05/2018 15:30	07/08/2018 11:20
61	2018	9	7	0.29	0.19	0.19	0.14	0.34	0.03	0.05				27.7		
61	2018	10	14	0.13	0.15	0.18	0.07	0.38	0.06	0.04				45.3		
61	2018	11	13	0.34	0.18	0.20	0.07	0.47	0.03	0.07	0.13	0.48	0.25	38.1	07/08/2018 11:20	06/11/2018 11:20

Appendix B

Annual average values for the test sites for the exposure period.

Table B.1: Mandatory data

										Mandatory																	
Climate					Precipitation					Climate					Precipitation					Particles	Particles						
Sampling period		Temp	RH	Amount	Sampling period		Temp	RH	Amount	Sampling period		Temp	RH		SO ₂	IVL-passive SO ₂ ¹	NO ₂	IVL-passive NO ₂ ¹	O ₃	IVL-passive O ₃ ¹	HNO ₃	IVL-passive HNO ₃ ¹	Amount	H ⁺	C ⁺	IVL passive sampler. Three-monthly averages ¹	
Site no	Year	°C	%	mm	Year	°C	%	mm	Year	°C	%	Site no	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mm	pH	mgCl/l	µg cm ⁻² month ⁻¹	mgm ⁻² year ⁻¹	
01	15/16	11.0	73	567.9	16/17	10.0	72	577.0	17/18	11.2	67	01	5.0		21.95			46			0.63	368.6	6.50	1.89	8.7	1046.5	
03	15/16	10.5	75	572.0	16/17	9.6	75	478.5	17/18	10.8	71	03	10.4		16.13			53			0.55	353.7	6.27	9.36	16.5	1981.6	
10	15/16	12.3	74	658.7	16/17	11.5	77	741.8	17/18	12.3	74	10	9.5		23.75			44			0.60	658.7	5.30	1.55	19.9	2390.7	
13	15/16	17.5	70	590.3	16/17	17.5	66	400.0	17/18	17.2	74	13	1.1		49.82			44			0.61	1007.3			44.4	5324.7	
14	15/16	15.6	76	639.0	16/17	15.0	69	429.5	17/18	15.3	73	14		0.5		6.7		58.7			0.42	580.2			29.4	3532.9	
15	15/16	15.5	64	829.6	16/17	15.8	60	528.4	17/18	15.6	65	15	3.6		39.93			46			1.23	785.2			16.7	2007.9	
16	15/16	14.3	80	861.8	16/17	14.3	77	652.6	17/18	14.4	78	16			33.99						1.40	853.2			15.0	1800.1	
21	15/16	7.6	76	767.5	16/17	7.1	77	903.8	17/18	7.6	71	21	0.2		17.04			44.1			0.20	619.1	5.49	2.80	12.2	1459.8	
23	15/16	6.6	83	1510.1	16/17	6.5	80	2032.9	17/18	6.5	76	23	0.2		0.96			50	61.0	0.1	0.15	1424.9	5.05	3.20	5.4	642.1	
24	15/16	8.3	75	284.6	16/17	7.6	74	295.3	17/18	8.6	72	24	0.6	0.5	11.66	7.7	56	61.0			0.39	179.4	5.14	0.57	14.9	1786.5	
26	15/16	7.3	78	395.2	16/17	7.0	79	537.1	17/18	7.3	79	26		0.3		1.5		52.0			0.10	422.5	5.14	0.77	3.8	460.4	
31	15/16	15.8	66	318.8	16/17	16.3	65	387.4	17/18	14.0	57	31	0.7		25.00			60			0.72	527.5	6.30	1.64	18.1	2167.3	
33	15/16	12.9	62	553.6	16/17	14.0	57	529.6	17/18	13.4	61	33	0.3		1.24			86			0.43	786.5	5.71	0.62	8.3	992.1	
35	15/16				16/17				17/18			35															
40	15/16	13.4	76	696.0	16/17	13.2	74	656.7	17/18	13.6	72	40		0.6		22.4		42.7			0.71	729.4	5.25	2.62	8.9	1068.7	
41	15/16	10.2	79		16/17	9.8	80		17/18	11.4	74	41		0.8		21.8		28.0			0.57	402.9	6.08		72.2	8660.4	
44	15/16	0.8	73	381.9	16/17	6.2	87	40.6	17/18	0.8	73	44	5.0		1.35			57.6			0.07	381.9	4.83	0.80	8.8	1056.0	
45	15/16	7.5	79	1205.8	16/17	7.7	74	722.9	17/18	7.5	77	45		0.4	5.63	1.6	86	80.7			0.33	1184.1	5.62	0.15	3.8	460.9	
50	15/16	9.9	77	767.0	16/17	9.0	76	704.6	17/18	10.1	75	50	9.5		29.58			45				545.6					
51	15/16	19.7	56	191.4	16/17	18.6	54	371.0	17/18	19.6	57	51	8.5		49.54			15			0.95	525.6	7.21		116.2	13944.7	
53	15/16	12.0	72	707.0	16/17	11.4	69	591.0	17/18	12.4	69	53	5.3		18.50			62			0.74	638.0			7.4	889.0	
57	15/16	6.2	81	567.8	16/17	5.0	82	607.5	17/18	6.3	79	57		0.5	14.12	6.2		53.6			0.21	503.3	5.06	0.73	9.5	1143.9	
58	15/16				16/17				17/18	11.6	74	58									0.39	1272.7			11.0	1325.6	
59	15/16	10.0	78	867.0	16/17	9.3	77	829.9	17/18	9.8	73	59	20.9		22.38			43.6				534.5	6.61	5.24			
60	15/16				16/17				17/18	17.5	58	60	3.6	1.3	21.73	8.8		78.6			0.58	926.1	5.67	4.55	78.7	5673.9	
61	15/16				16/17				17/18	13.0	72	61	1.7	0.9	32.56	19.0	52	51.2			0.73	957.7	5.53	0.35	44.6	2367.4	

Generally: IVL data should be used in material analysis rather than local data

1. Numerical values: Location measurement in addition to IVL values.

IVL passive samplers were used

Station 3: Two of three periods missing.

Station 23: The O₃ values were corrected according to "O₃ old/new Birkenes 2010" = 0.76. IVL sample data will be official.

Station 24: SO₂, NO₂ and O₃ values were reported as optional data. The main data are from passive samplers. The IVL sampling data are official. Data were taken from nearby stations: Kaanan and Sveavägen. For pH and Cl in March 2018: The current was turned off, and no sample was collected.

Station 26: T values are from station Berga Mo - 0.5°C. RH and Prec. data are from station Tullinge A. H⁺ and Cl⁻ data are from station Edeby.

Station 45: One of four periods missing.

Station 57: Hämeenlinna centre of town.

Station 58: Adjusted from inches.

Station 59: Zilina EEA urban background station.

Stations 60 and 61: Second period reported, of one days exposure with high deposition, disregarded in the annual average.

Table B.2: Optional data

		Optional								
		Precipitation								Particles
	Sampling period	Cond	SO ₄ ²⁻	NO ₃ ⁻	NH ₄ ⁺	Na ⁺	Ca ₂ ⁺	Mg ₂ ⁺	K ⁺	Conc. PM ₁₀
Site no	Year	µS/cm	mgS/l	mgN/l	mgN/l	mgNa/l	mgCa/l	mgMg/l	mgK/l	µg/m ³
01	17/18	36.55	5.12	1.52						26.69
03	17/18	133.06	9.65	1.90						27.96
10	17/18	46.35	1.20	0.60	1.14	0.85	1.39	0.17	0.19	21.57
13	17/18									28.40
14	17/18									
15	17/18									32.42
16	17/18									30.84
21	17/18	23.76	0.44	0.55	0.47	1.54	1.04	0.23	0.54	
23	17/18	21.18	0.34	0.40	0.42	1.81	0.18	0.21	0.10	5.08
24	17/18									11.10
26	17/18									
31	17/18	21.77	0.42	0.37						13.67
33	17/18	8.34	0.15	0.15	0.19	0.37	0.48	0.07	0.08	12.17
35	17/18									
40	17/18	64	1.30	2.33	1.45	1.13	1.47	0.16	0.26	
41	17/18									
44	17/18	12.44	0.37	0.12	0.08	0.46	0.13	0.11	0.16	
45	17/18	6.32	0.11	0.19	0.34	0.09	0.25	0.02	0.05	7.45
50	17/18									
51	17/18									37.05
53	17/18									17.92
57	17/18									10.78
58	17/18									
59	17/18	28.19	0.30	2.47						54.19
60	17/18	41.19	0.45	0.35	0.19	2.53	1.79	0.31	0.37	17.32
61	17/18	17.72	0.34	0.28	0.31	0.19	1.25	0.07	0.08	32.35
Station 45: Two of four periods missing										

Table B.3: Additional data

		Additional									
		gases			ions in particles						
Sampling period		NH ₃	HCOOH	CH ₃ COOH	Cl ⁻	NO ₃ ⁻	SO ₄ ²⁻	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺
Site no	Year	µg/m ³ ,STP			µg/cm ² month						
1	17/18				0.09	0.36	0.18				
3	17/18				0.04	0.23	0.46				
10	17/18				0.27	0.51	1.00				
13	17/18				7.31	1.43	1.60				
14	17/18				3.49	0.78	0.80				
15	17/18				0.20	0.86	0.33				
16	17/18				1.51	0.71	0.59				
21	17/18				0.64	0.28	0.16				
23	17/18				0.52	0.18	0.13				
24	17/18				0.43	0.35	0.20				
26	17/18				0.07	0.15	0.05				
31	17/18				0.16	0.53	0.22				
33	17/18				0.08	0.24	0.08				
35	17/18										
40	17/18				0.15	0.50	0.16				
41	17/18				4.10	1.24	0.88				
44	17/18				0.16	0.07	0.14				
45	17/18	1.1	0.9	0.5	0.01	0.11	0.04	0.09	0.01	0.01	0.02
50	17/18										
51	17/18	4.7			16.62	3.48	6.50	3.63	1.18	9.64	0.51
53	17/18				0.09	0.37	0.16				
57	17/18				0.07	0.23	0.09				
58	17/18				0.71	0.49	0.16				
59	17/18										
60	17/18				9.47	1.60	2.50	1.77	0.60	4.71	0.26
61	17/18				0.47	0.68	0.39	0.51	0.07	0.30	0.14
IVL passive samplers were used											
Station 3: Tw o of three periods missing.											
Station 45: One of four periods missing.											
Station 45: Tw o of four periods missing											

Table B.3: Reported start and end dates for the exposures

No	Name	Country	Rack Coordinates	Start date	End date, 1 year
01	Prague	Czech Republic	+50°06'20.8", 14°26'51.8"	2017-10-23	2018-11-02
03	Kopisty	Czech Republic	+50°32'39.4", 13°37'24.4"	2017-10-26	2018-11-01
10	Bottrop	Germany	+51°31'33.0", 06°58'37.4"	2017-10-19	2018-10-17
13	Rome	Italy	+41°54'20.0", 12°31'02.3"	2017-10-25	2018-10-31
14	Casaccia	Italy	+42°02'26.5", 12°18'09.5"	2017-10-27	2018-10-26
15	Milan	Italy	+45°28'42.7", 09°13'49.8"	2017-10-31	2018-10-23
16	Venice	Italy	+45°29'13.1", 12°13'20.6"	2017-11-03	2018-11-07
21	Oslo	Norway	+59°55'11.2", 10°41'23.2"	2017-10-20	2018-10-19
23	Birkenes	Norway	+58°23'20.5", 08°15'04.5"	2017-10-27	2018-10-26
24	Stockholm	Sweden	+59°19'00.3", 18°03'24.2"	2017-10-26	2018-10-31
26	Aspvreten	Sweden	+58°48'24.0", 17°22'25.0"	2017-10-26	2018-10-31
31	Madrid	Spain	+40°27'26.5", -03°51'54.7"	2017-10-27	2018-11-06
33	Toledo	Spain	+39°32'31.8", -04°20'26.7"	2017-11-02	2018-11-05
40	Paris	France	+48°51'49.1", 02°20'40.4"	2017-10-25	2018-10-25
41	Berlin	Germany	+52°30'59.6", 13°17'02.1"	2017-10-19	2018-11-04
44	Svanvik	Norway	+69°27'18.5", 30°02'27.5"	2017-11-04_07	2018-11-05
45	Chaumont	Switzerland	+47°02'58.3", 06°58'45.2"	2017-10-26	2018-10-30
50	Katowice	Poland	+50°15'52.5", 18°58'30.3"	2017-11-09	2018-11-09
51	Athens	Greece	+37°59'17.6", 23°43'39.6"	2017-11-14	2018-11-14
53	Vienna	Austria	+48°14'56.0", 16°21'24.6"	2017-11-02	2018-10-29
57	Hämeenlinna	Finland	+60°58'33.4", 24°32'02.5"	2017-10-24	2018-10-29
58	New Heaven	USA	+41°15'37.4", -72°59'15.7"	2017-11-15	2018-12-09
59	Žilina	Slovakia	+49°12'10.12", 18°45'19.03"	2017-11-17	2018-11-16
60	Split	Croatia	+43°51', 16°02'	2017-11-10	2018-11-16
61	Zagreb	Croatia	+45°49', 16°26'	2017-11-06	2018-11-06

Table B.4: Months included in the calculation of the annual averages

Site no	Year	Months included in annual average
01	17/18	Nov-Okt
03	17/18	Nov-Okt
10	17/18	Nov-Okt
13	17/18	Nov-Okt
14	17/18	Nov-Okt
15	17/18	Nov-Okt
16	17/18	Nov-Okt
21	17/18	Nov-Okt
23	17/18	Nov-Okt
24	17/18	Nov-Okt
26	17/18	Nov-Okt
31	17/18	Nov-Okt
33	17/18	Nov-Okt
40	17/18	Nov-Okt
41	17/18	Nov-Okt
44	17/18	Nov-Oct
45	17/18	Nov-Oct
50	17/18	Nov-Oct
51	17/18	Nov-Oct
53	17/18	Nov-Oct
57	17/18	Nov-Oct
58	17/19	Nov-Nov
59	17/18	Dec-Nov
60	17/18	Nov-Nov
61	17/18	Nov-Oct

Appendix C

Tri-monthly mean values for passive gas sampling and particle deposition on IVL samplers in a position sheltered from rain.

Table C.1: Particle deposition on IVL passive samplers sheltered from rain. Tri-monthly samples ($\mu\text{g cm}^{-2} \text{ month}^{-1}$). M = Missing values

station	start	stop	days	mass	Cl ⁻	NO ₃ ⁻	SO ₄ ²⁻	NH ₄ ⁺	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺
				$\mu\text{g cm}^{-2} \text{ month}^{-1}$								
ICP - 1 Prague	23/10/2017	02/02/2018	102	6	0.17	0.33	0.20					
ICP - 1 Prague	02/02/2018	06/06/2018	124	11	0.10	0.33	0.20					
ICP - 1 Prague	06/06/2018	02/11/2018	149	9	0.03	0.41	0.16					
ICP - 3 Kopisty				M	M	M	M					
ICP - 3 Kopisty				M	M	M	M					
ICP - 3 Kopisty	31/07/2018	01/11/2018	93	17	0.04	0.23	0.46					
ICP - 10 Bottrop	18/10/2017	17/01/2018	91	12	0.57	0.16	1.26					
ICP - 10 Bottrop	17/01/2018	18/04/2018	91	18	0.20	0.52	1.23					
ICP - 10 Bottrop	18/04/2018	11/07/2018	84	25	0.21	0.91	0.69					
ICP - 10 Bottrop	11/07/2018	18/10/2018	99	25	0.12	0.48	0.82					
ICP - 13 Rome	25/10/2017	25/01/2018	92	41	10.33	0.35	2.06					
ICP - 13 Rome	25/01/2018	20/04/2018	85	36	3.91	0.81	1.02					
ICP - 13 Rome	20/04/2018	25/07/2018	96	39	0.63	2.30	0.56					
ICP - 13 Rome	25/07/2018	31/10/2018	98	60	13.97	2.15	2.67					
ICP - 14 Casaccia	27/10/2017	26/01/2018	91	52	10.59	0.58	2.09					
ICP - 14 Casaccia	26/01/2018	23/04/2018	87	24	1.04	0.46	0.38					
ICP - 14 Casaccia	23/04/2018	17/07/2018	85	25	0.24	1.24	0.27					
ICP - 14 Casaccia	17/07/2018	26/10/2018	101	18	1.95	0.84	0.45					
ICP - 15 Milan	31/10/2017	01/02/2018	93	13	0.31	0.48	0.45					
ICP - 15 Milan	01/02/2018	23/04/2018	81	26	0.05	1.52	0.30					
ICP - 15 Milan	23/04/2018	01/08/2018	100	14	0.29	0.85	0.35					
ICP - 15 Milan	01/08/2018	23/10/2018	83	14	0.13	0.66	0.19					
ICP - 16 Venice	03/11/2017	31/01/2018	89	12	1.46	0.41	0.75					
ICP - 16 Venice	31/01/2018	08/05/2018	97	14	0.27	1.08	0.35					
ICP - 16 Venice	08/05/2018	30/07/2018	83	5	0.03	0.24	0.08					
ICP - 16 Venice	30/07/2018	07/11/2018	100	14	2.65	0.39	0.58					

ICP - 21 Oslo	20/10/2017	12/01/2018	84	6	0.75	0.12	0.19					
ICP - 21 Oslo	12/01/2018	20/04/2018	98	10	0.91	0.26	0.14					
ICP - 21 Oslo	20/04/2018	20/07/2018	91	21	0.10	0.49	0.10					
ICP - 21 Oslo	20/07/2018	19/10/2018	91	11	0.78	0.22	0.20					
ICP - 23 Birkenes	27/10/2017	31/01/2018	96	2	0.23	0.04	0.04					
ICP - 23 Birkenes	31/01/2018	27/04/2018	86	2	0.13	0.26	0.11					
ICP - 23 Birkenes	27/04/2018	27/07/2018	91	9	0.06	0.29	0.08					
ICP - 23 Birkenes	27/07/2018	26/10/2018	91	8	1.66	0.16	0.30					
ICP - 24 Stockholm, Söder	26/10/2017	30/01/2018	96	10	0.36	0.18	0.11					
ICP - 24 Stockholm, Söder	30/01/2018	02/05/2018	92	22	0.38	0.52	0.23					
ICP - 24 Stockholm, Söder	02/05/2018	21/08/2018	111	15	0.22	0.39	0.18					
ICP - 24 Stockholm, Söder	21/08/2018	31/10/2018	71	13	0.90	0.31	0.34					
ICP - 26 Aspvreten	26/10/2017	31/01/2018	97	1	0.05	0.09	0.04					
ICP - 26 Aspvreten	31/01/2018	02/05/2018	91	4	0.13	0.34	0.10					
ICP - 26 Aspvreten	02/05/2018	21/08/2018	111	5	0.02	0.06	0.02					
ICP - 26 Aspvreten	21/08/2018	31/10/2018	71	5	0.10	0.13	0.05					
ICP - 31 Madrid	27/10/2017	31/01/2018	96	7	0.27	0.38	0.21					
ICP - 31 Madrid	31/01/2018	07/05/2018	96	17	0.19	0.40	0.26					
ICP - 31 Madrid	07/05/2018	02/08/2018	87	35	0.08	0.89	0.25					
ICP - 31 Madrid	02/08/2018	06/11/2018	96	15	0.07	0.48	0.15					
ICP - 33 Toledo	02/11/2017	31/01/2018	90	3	0.11	0.16	0.05					
ICP - 33 Toledo	31/01/2018	08/05/2018	97	10	0.13	0.25	0.12					
ICP - 33 Toledo	08/05/2018	02/08/2018	86	11	0.03	0.20	0.06					
ICP - 33 Toledo	02/08/2018	05/11/2018	95	8	0.05	0.34	0.10					
ICP - 40 Paris	25/10/2017	24/01/2018	91	8	0.09	0.11	0.07					
ICP - 40 Paris	24/01/2018	23/04/2018	89	12	0.38	0.86	0.33					
ICP - 40 Paris	23/04/2018	31/07/2018	99	6	0.05	0.19	0.06					
ICP - 40 Paris	31/07/2018	25/10/2018	86	10	0.10	0.87	0.20					

ICP - 41 Berlin	16/12/2017	07/04/2018	112	116	11.46	0.71	1.31					
ICP - 41 Berlin	07/04/2018	20/08/2018	135	50	0.26	1.74	0.46					
ICP - 41 Berlin	20/08/2018	20/11/2018	92	52	0.78	1.14	0.97					
ICP - 44 Svanvik	05/11/2017	12/02/2018	99	1	0.07	0.04	0.09					
ICP - 44 Svanvik	12/02/2018	02/05/2018	79	3	0.13	0.07	0.11					
ICP - 44 Svanvik	02/05/2018	12/08/2018	102	8	0.12	0.05	0.12					
ICP - 44 Svanvik	12/08/2018	05/11/2018	85	24	0.33	0.11	0.23					
ICP - 45 Chaumont	31/01/2018	30/04/2018	89	7	0.03	0.18	0.08		0.19	0.01	0.02	0.02
ICP - 45 Chaumont	30/04/2018	27/07/2018	88	8	0.02	0.27	0.06		0.19	0.01	0.02	0.04
ICP - 45 Chaumont	27/07/2018	30/10/2018	95	M	M	M	M		M	M	M	M
ICP - 45 Chaumont			90	M	M	M	M		M	M	M	M
ICP - 51 Athens	14/02/2018	15/05/2018	90	170	10.81	5.47	6.24		4.22	0.80	5.72	0.50
ICP - 51 Athens	15/05/2018	16/08/2018	93	49	3.68	3.62	1.59		1.86	0.36	2.62	0.21
ICP - 51 Athens	16/08/2018	14/11/2018	90	69	10.93	2.61	3.31		2.24	0.75	6.04	0.36
ICP - 51 Athens	14/11/2017	14/02/2018	92	177	40.94	2.23	14.85		6.20	2.81	24.11	0.98
ICP - 53 Vienna	02/11/2017	02/02/2018	92	3	0.06	0.27	0.15					
ICP - 53 Vienna	02/02/2018	30/04/2018	87	11	0.23	0.52	0.23					
ICP - 53 Vienna	30/04/2018	27/07/2018	88	10	0.05	0.31	0.15					
ICP - 53 Vienna	27/07/2018	29/10/2018	94	6	0.03	0.38	0.09					
ICP - 57 Hämeenlinna	24/10/2017	24/01/2018	92	2	0.06	0.15	0.06					
ICP - 57 Hämeenlinna	24/01/2018	02/05/2018	98	10	0.06	0.16	0.09					
ICP - 57 Hämeenlinna	02/05/2018	02/08/2018	92	18	0.03	0.14	0.06					
ICP - 57 Hämeenlinna	02/08/2018	29/10/2018	88	8	0.11	0.47	0.15					
ICP - 58 West Haven	15/11/2017	15/02/2018	92	8	1.74	0.36	0.16					
ICP - 58 West Haven	15/02/2018	15/05/2018	89	10	0.54	0.50	0.13					
ICP - 58 West Haven	15/05/2018	17/08/2018	94	17	0.39	0.45	0.21					
ICP - 58 West Haven	17/08/2018	14/11/2018	89	9	0.16	0.63	0.12					

ICP - 60 Split	10/11/2017	15/02/2018	97	24	5.79	0.54	1.93		1.32	0.39	3.41	0.15
ICP - 60 Split	12/02/2018	13/02/2018	1	5751	834.30	176.14	266.78		171.33	59.18	427.87	30.08
ICP - 60 Split	15/05/2018	17/08/2018	94	15	0.34	1.29	0.37		0.79	0.06	0.43	0.05
ICP - 60 Split	17/08/2018	16/11/2018	91	44	13.77	1.12	2.40		1.40	0.72	5.88	0.29
ICP - 61 Zagreb	06/11/2017	06/02/2018	92	16	1.12	0.78	0.49		0.61	0.08	0.68	0.22
ICP - 61 Zagreb	05/02/2018	06/02/2018	1	1361	10.90	45.51	20.97		30.33	3.72	10.76	5.50
ICP - 61 Zagreb	07/05/2018	07/08/2018	92	13	0.05	0.29	0.21		0.26	0.04	0.03	0.08
ICP - 61 Zagreb	06/08/2018	06/11/2018	92	15	0.13	0.48	0.25		0.33	0.06	0.08	0.06

Table C.2: Gas concentration measurements with IVL passive samplers sheltered from rain. Tri-monthly samples ($\mu\text{g}/\text{m}^3$). M = missing values.

Customer													* STP=Standard Temperature and Pressure 20C 1013hPa			
ICP- Materials													* < = below detection limit			
Station	Start	Stop	Days	Count	Temp °C	SO ₂ $\mu\text{g}/\text{m}^3$ STP	NO ₂ $\mu\text{g}/\text{m}^3$ STP	NH ₃ $\mu\text{g}/\text{m}^3$ STP	30mm				HCOOH $\mu\text{g}/\text{m}^3$ STP	CH ₃ COOH $\mu\text{g}/\text{m}^3$ STP	Remark	Date Approved
									O ₃ $\mu\text{g}/\text{m}^3$ STP	HNO ₃ $\mu\text{g}/\text{m}^3$ STP	H ₂ O ₂ $\mu\text{g}/\text{m}^3$ STP	CH ₂ O $\mu\text{g}/\text{m}^3$ STP				
1 Prague	23/10/2017 12:00	02/02/2018 12:00	102	375	1	20.0							0.29			09/08/2018
1 Prague	02/02/2018 12:00	06/06/2018 12:00	124		1	20.0							0.51			09/08/2018
1 Prague	06/06/2018 12:00	02/11/2018 12:00	149		1	20.0							0.96		HNO3: No temp, protocol has not been signed	20/12/2018
3 Kopisty	24/12/2017 12:00	04/04/2018 12:00	100	311	1	20.0							0.21			09/08/2018
3 Kopisty	04/04/2018 12:00	31/07/2018 00:00	118		1	20.0							0.76			29/10/2018
3 Kopisty	31/07/2018 12:00	01/11/2018 12:00	93		1	20.0							0.64		No temp. Not signed protocol	20/12/2018
10 Bottrop	18/10/2017 12:49	17/01/2018 07:37	91	365	1	9.8							0.18		HNO3:small hole in the net	06/04/2018
10 Bottrop	17/01/2018 07:43	18/04/2018 09:25	91		1	9.0							0.31			09/08/2018
10 Bottrop	18/04/2018 09:28	11/07/2018 07:36	84		1	14.2							0.89		HNO3:small hole in the net	09/08/2018
10 Bottrop	11/07/2018 07:38	18/10/2018 12:53	99		1	16.5							1.02			20/12/2018
13 Rome	25/10/2017 12:00	25/01/2018 10:00	92	371	1	10.5							0.16			09/08/2018
13 Rome	25/01/2018 10:10	20/04/2018 10:00	85		1	12.1							0.20			09/08/2018
13 Rome	20/04/2018 10:15	25/07/2018 10:00	96		1	23.3							1.24			29/10/2018
13 Rome	25/07/2018 10:10	31/10/2018 10:00	98		1	22.9							0.77			20/12/2018
14 Casaccia	27/10/2017 14:00	26/01/2018 10:00	91	364	4	9.9	0.52	11.26		41.3	0.14				O3:30 mm	29/10/2018
14 Casaccia	26/01/2018 10:15	23/04/2018 09:00	87		4	10.4	0.55	6.94		58.5	0.21					29/10/2018
14 Casaccia	23/04/2018 09:15	17/07/2018 10:30	85		4	21.8	0.48	3.52		53.1	0.54				Broken burk,	29/10/2018
14 Casaccia	17/07/2018 10:40	26/10/2018 11:00	101		4	21.4	0.42	4.92		79.2	0.75				O3:30mm.it was two filters	20/12/2018
15 Milan	31/10/2017 11:15	01/02/2018 12:00	93	357	1	7.1							0.29			20/12/2018
15 Milan	01/02/2018 12:00	23/04/2018 11:30	81		1	9.4							2.74			20/12/2018
15 Milan	23/04/2018 11:30	01/08/2018 15:00	100		1	23.1							0.45			20/12/2018
15 Milan	01/08/2018 15:00	23/10/2018 10:00	83		1	22.8							1.74			20/12/2018
16 Venece	03/11/2017 12:15	31/01/2018 12:00	89	369	1	5.8							0.18			20/12/2018
16 Venece	31/01/2018 11:05	08/05/2018 10:00	97		1	8.6							0.67			20/12/2018
16 Venece	08/05/2018 10:00	30/07/2018 10:00	83		1	22.1							2.17			20/12/2018
16 Venece	30/07/2018 10:00	07/11/2018 14:00	100		1	20.1							1.31			20/12/2018
21 Oslo-Sköyen	20/10/2017 10:00	12/01/2018 14:30	84	364	2	0.7				18.9	0.06				O3:30 mm	29/10/2018
21 Oslo-Sköyen	12/01/2018 14:30	20/04/2018 14:00	98		2	-0.9				45.8	0.16				HNO3:crack lock	29/10/2018
21 Oslo-Sköyen	20/04/2018 14:00	20/07/2018 08:00	91		2	16.9				65	0.38				HNO3:30 mm,O3:30 mm	29/10/2018
21 Oslo-Sköyen	20/07/2018 14:00	19/10/2018 10:30	91		2	13.9				44.7	0.20				O3:30 mm HNO3:Protocol not signed	20/12/2018
23 Birkenes	27/10/2017 14:00	31/01/2018 14:00	96	364	2	0.3				44.9	0.03				O3:30 mm	29/10/2018
23 Birkenes	31/01/2018 14:00	27/04/2018 13:00	86		2	-0.9				73.9	0.14				No temp	29/10/2018
23 Birkenes	27/04/2018 13:00	27/07/2018 05:00	91		2	15.6				73.8	0.35					29/10/2018
23 Birkenes	27/07/2018 05:00	26/10/2018 10:00	91		2	11.3				53.0	0.09				O3:30 mm, HNO3: protocol has not been signed	20/12/2018
24 Stockholm	26/10/2017 09:00	30/01/2018 09:00	96	370	4	0.0	0.44	6.79		42.4	0.14				O3:30mm	29/10/2018
24 Stockholm	30/01/2018 09:00	02/05/2018 14:00	92		4	0.6	0.67	11.18		67.1	0.32				HNO3:Temp. from SMHI	29/10/2018
24 Stockholm	02/05/2018 14:00	21/08/2018 10:00	111		4	14.9	0.36	4.26		75.7	0.72				NO2:Temp. From SMHI	29/10/2018
24 Stockholm	21/08/2018 10:00	31/10/2018 10:00	71		4	20.0	0.37	9.68		55.4	0.29				NO2:No Temp.,O3:30 mm,	20/12/2018
26 Aspöreten	26/10/2017 13:00	31/01/2018 11:00	97	370	4	0.0	0.26	1.69		38.3	0.06				SO2:Lock out, bag closed,O3:30mm	29/10/2018
26 Aspöreten	31/01/2018 11:00	02/05/2018 17:00	91		4	0.6	0.38	1.94		58.3	0.11				HNO3:Temp. från SMHI	29/10/2018
26 Aspöreten	02/05/2018 17:00	21/08/2018 13:00	111		4	14.9	0.23	0.97		62.4	0.14					29/10/2018
26 Aspöreten	21/08/2018 13:00	31/10/2018 13:00	71		4	20.0	0.13	1.47		46.2	0.06				NO2:No temp.,O3:30 mm,	20/12/2018

Appendix D

Annual average values for particle deposition (per month) and for concentrations of NO₂, NH₃, HNO₃, O₃, SO₂, HCOOH, CH₃COOH, HCl and HF (pr. year) measured with IVL samplers for the exposure period.

Table D.1: Annual average particle deposition (per month - sheltered from rain)

		mass	Cl ⁻	NO ₃ ⁻	SO ₄ ²⁻	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺
No	Years	µg cm ⁻² month ⁻¹							
01	17/18	9	0.09	0.36	0.18				
03	17/18	17	0.0	0.2	0.5				
10	17/18	20	0.27	0.51	1.00				
13	17/18	44	7.31	1.43	1.60				
14	17/18	29	3.49	0.78	0.80				
15	17/18	17	0.20	0.86	0.33				
16	17/18	15	1.51	0.71	0.59				
21	17/18	12	0.64	0.28	0.16				
23	17/18	5	0.52	0.18	0.13				
24	17/18	15	0.43	0.35	0.20				
26	17/18	4	0.07	0.15	0.05				
31	17/18	18	0.16	0.53	0.22				
33	17/18	8	0.08	0.24	0.08				
40	17/18	9	0.15	0.50	0.16				
41	17/18	72	4.10	1.24	0.88				
44	17/18	9	0.16	0.07	0.14				
45	17/18	8	0.0	0.2	0.1	0.18	0.01	0.02	0.03
50	17/18								
51	17/18	116	16.62	3.48	6.50	3.63	1.18	9.64	0.51
53	17/18	7	0.09	0.37	0.16				
57	17/18	10	0.07	0.23	0.09				
58	17/18	11	0.71	0.49	0.16				
59	17/18								
60	17/18	79	19.0	2.8	4.5	3.40	1.13	9.34	0.46
61	17/18	45	1.3	1.5	1.0	1.20	0.18	0.79	0.36
	Missing								
	Two of four periods missing								
	Two of three periods missing								

Table D.2: Annual average concentration of gases ($\mu\text{g m}^{-3}$)

Station no	Years	T	SO ₂	NO ₂	NH ₃	O ₃	HNO ₃	HCOOH	CH ₃ COOH
		°C	$\mu\text{g/m}^3$ STP						
01	17/18	11.2					0.629		
03	17/18	10.8					0.546		
10	17/18	12.4					0.602		
13	17/18	17.5					0.611		
14	17/18	16.0	0.5	6.7		58.7	0.421		
15	17/18	15.8					1.227		
16	17/18	18.6					1.402		
21	17/18	7.6				44.1	0.202		
23	17/18	6.6				61.0	0.149		
24	17/18	8.5	0.5	7.7		61.0	0.386		
26	17/18	8.5	0.3	1.5		52.0	0.100		
31	17/18	14.0					0.719		
33	17/18	13.4					0.428		
40	17/18	15.5	0.6	22.4		42.7	0.708		
41	17/18	12.9	0.8	21.8		28.0	0.571		
44	17/18	1.0				57.6	0.068		
45	17/18	5.6	0.4	1.6	1.1	80.7	0.332	0.9	0.5
50	17/18								
51	17/18	19.6			4.7		0.954		
53	17/18	12.4					0.738		
57	17/18	6.7	0.5	6.2		53.6	0.208		
58	17/18	15.1					0.389		
59	17/18								
60	17/18	17.6	1.3	8.8		78.6	0.584		
61	17/18	13.4	0.9	19.0		51.2	0.733		
	Missing								
	One of four periods missing								

Appendix E

Data availability

Table E.1: Data availability in % for the months of exposure (Table B.4).

Station no	Mandatory									Optional			
	Climate		Gases (concentration)				Precipitation			Precipitation			Particles
	Temp	RH	SO ₂	NO ₂	O ₃	HNO ₃	Amount	H ⁺	Cl ⁻	Conduc- tivity	SO ₄ ²⁻	NO ₃ ⁻	PM ₁₀ (Conc)
	availability (%)												
01	100	100	100	100	100	0	100	92	92	92	83	92	100
03	100	100	100	100	100	0	100	83	83	83	75	83	100
10	96	96	99	95	99	0	100	100	100	100	100	100	100
13	100	100	95	93	99	0	100	0	0	0	0	0	99
14	86	86	0	0	0	0	86	0	0	0	0	0	0
15	99	99	93	90	98	0	99	0	0	0	0	0	93
16	99	99	0	58	0	0	99	0	0	0	0	0	68
21	100	100	91	97	0	0	97	97	97	97	97	97	0
23	99	99	99	99	98	99	100	99	100	99	100	100	97
24	100	100	100	100	100	0	100	92	92	0	0	0	100
26	A	A	0	0	0	0	A	A	A	0	0	0	0
31	100	100	99	98	98	0	100	92	92	92	92	92	100
33	99	99	99	98	98	0	100	92	85	92	85	85	100
35	0	0	0	0	0	0	0	0	0	0	0	0	0
40	100	100	0	0	0	0	100	100	92	92	92	92	0
41	100	100	0	0	0	0	100	83	0	0	0	0	0
44	100	100	92	99	0	0	97	98	100	98	100	100	0
45	100	100	0	97	97	0	100	100	100	100	100	100	100
50	100	100	100	99	97	0	100	0	0	0	0	0	0
51	100	100	97	88	92	0	100	67	0	0	0	0	95
53	A	A	100	100	100	0	A	0	0	0	0	0	100
57	100	100	0	100	0	0	100	92	92	0	0	0	100
58	92	92	0	0	0	0	92	0	0	0	0	0	0
59	100	100	67	100	100	0	100	100	100	50	50	50	58
60	100	100	95	93	0	0	100	100	99	100	99	99	100
61	100	100	89	94	89	0	100	96	96	95	96	96	97

The values give the local data availability, the colours show additional availability of IVL data

A = Data available. The % availability was not reported

IVL data available (gases+particel deposition)

IVL data available (gases+particel deposition). No local data

IVL data available (gases+particel deposition) One period missing

IVL data available (particel deposition). Two periods missing

Missing

Appendix F

Daily rain amounts in the last month before demounting of the samples in 2018

Daily precipitation amount in last month before demounting of samples in 2018 (mm). Gray cells indicate no annual 2017-18 material samples on rack.																																						
Trend exposure 2017-18			Month	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9									
Station no	Start:	End	Comment:	Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				
01	23/10/2017	02/11/2018																																				
03	26/10/2017	01/11/2018																																				
10	19/10/2017	17/10/2018	Data missing																																			
13	25/10/2017	31/10/2018																																				
14	27/10/2017	26/10/2018																																				
15	31/10/2017	23/10/2018																									0	0	0	0	0	0	0	0	0	0	0	0
16	03/11/2017	07/11/2018																																				
21	20/10/2017	19/10/2018																							0.3	2.6	19.1	0.1	0	0	0	0	0	4.8	0.2	0.1	0.1	
23	27/10/2017	26/10/2018	Rain indication given (less than real amount)																																			
24	26/10/2017	31/10/2018																																				
26	26/10/2017	31/10/2018	Only monthly data available																																			
31	27/10/2017	06/11/2018																																				
33	02/11/2017	05/11/2018																																				
35					3.8	0.9	0	0	0.8	0	0	0	0	1.2	12.7	12.7	0	0.5	6.4	0.0	15.0	0	0	0	0	0	0.5	0	0	11.1	8.0	0	2.2	19.1	19.1	19.1		
40	25/10/2017	25/10/2018			0	0	0	0	0	0	0.2	0	0	0	0	0.4	0.6	0	0	0	0	0.2	0	1	1.8	0.4	6.1	0	0	0	0	0	0	0	0	0		
41	19/10/2017	04/11/2018																																				
44	4-7/11/2017	05/11/2018	Weekly data available and given																																			
45	26/10/2017	30/10/2018																																				
50	09/11/2017	09/11/2018			2.1	7.4	0.6	3.8	0	0	0	0.4	0	0	0	0	0	17.8	0.1	0	0	0	0	0	4.9	0	13.4	1.9	0.2	0	0	0	0	0	0	0		
51	14/11/2017	14/11/2018																																				
53	02/11/2017	29/10/2018			39.6	25.7	7.1	0.2	0	0	0	0	0	0	0	0	2.7	0	0	0	0	0	0	16.8	0.1	6.5	0	0	0	0	0	0	0	0	0	0		
57	24/10/2017	29/10/2018			1.3	0	0	0	0	0	0	0	0.2	0.1	20.7	0.2	0	3.5	8.6	2.1	5.9	0	0	0	0.2	1	0	0.4	0	10.1	0	0	0.8	0	0	0		
58	15/11/2017	09/12/2018																																				
59	17/11/2017	16/11/2018																																				
60	10/11/2017	16/11/2018																																				
61	06/11/2017	06/11/2018																																				

Daily precipitation amount in last month before demounting of samples in 2018 (mm). Gray cells indicate no annual 2017-18 material samples on rack.																																	
Trend exposure 2017-18			10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10			
Station no	Start:	End	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
01	23/10/2017	02/11/2018	3.5	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0.2	4.6	1.4	0	0.3	3.5	17.6	0.2	0	0	
03	26/10/2017	01/11/2018	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	3.5	1.2	0.2	0	0.4	9.3	0	0	0	
10	19/10/2017	17/10/2018																															
13	25/10/2017	31/10/2018	9.7	0	0	0	16	22.6	1.6	0	2.4	0	0.4	0	0	0	0	0.1	0	0	0	42.3	0.2	0	0	0	0	3.1	8.4	7.8	9.7	0	
14	27/10/2017	26/10/2018								0	0	0	3	0.2	0	0	0	0	0.2	0	0	0	1.4	3	0	0	0						
15	31/10/2017	23/10/2018	7.4	0	0	0	0	0	0.2	0	0	0	8.2	0	0	0	0	0	0	0	0	0	0	0									
16	03/11/2017	07/11/2018							0	0.2	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	1.6	31	0.4	0	
21	20/10/2017	19/10/2018	0	2.6	4.4	0	0.4	0	0	1.3	0	0	0	0	0	0	0.2	2.1	0.8	0.2	0												
23	27/10/2017	26/10/2018	0	0.5	0	0	0.3	0	0	1.8	0	0	0	0	0	0	1.4	0	0	0	0.3	0	0	0.8	1.6	0	0	0.3					
24	26/10/2017	31/10/2018	0.19	0.19	0.76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.38	2.09	0	0	0	0	0	0	6.27	0	
26	26/10/2017	31/10/2018																															
31	27/10/2017	06/11/2018						0	0	0	0	1.7	7	0	0	0	0.8	0	0	0.6	7.6	0	0	0	0	0	2.4	0	0	0.96	17	0	
33	02/11/2017	05/11/2018					0	0	0	13.9	0	2.2	5.7	0.8	5.8	0	12.8	0	2.8	1.8	3.2	1.2	13.8	0	0	0	7.8	14	0	8.5	21.7	0	
35			3.2	1.6	11.5	1.0	5.7	5.1	4.5	3.2	1.1	0	0	0	0	0	0	0	2.5	0	0	2.5	0	5.3	6.7	3.8	26.1	27.7	3.2	0	0	2.9	
40	25/10/2017	25/10/2018	0	0.2	0	0	0	0.4	1.6	0	0	0	2.2	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0.6	0	0	12.1	2.4	2.4	
41	19/10/2017	04/11/2018					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.4	10.7	0.5	0.6	0.1	0	0.2	0	0.3	0	
44	4-7/11/2017	05/11/2018	0						3.5						9.1						11.8						10.5						
45	26/10/2017	30/10/2018	3.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.3	16.1	3.4	4.3	1.4		
50	09/11/2017	09/11/2018	1.7	1.7	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0	0	1.6	0.1	0.4	16.1	0.3	11.4	0	10.3	9.4	0	0	0	
51	14/11/2017	14/11/2018													0	0	0	0	0	0	0	0	0	0.4	0	0	0	0	0	0	0	0	
53	02/11/2017	29/10/2018	0.3	2.6	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0.1	0.2	22	0	0	2.3	0.7	0	0	0	
57	24/10/2017	29/10/2018	2.3	6.9	0.1	1.5	2.5	0	0	1.6	2.5	0	0.1	0	0	0	0	1.2	3.3	0	0	2.8	3.2	4.9	0.7	1.1	2	0.1	0	0	1.1	1	
58	15/11/2017	09/12/2018																															
59	17/11/2017	16/11/2018																0	0	2.5	5.1	13.6	15.6	0.1	0	0	1.6	0	0	2.6	1.8	0.6	0.2
60	10/11/2017	16/11/2018																0	0	0	0	0	0	0	0	0	0	0	0	4.4	9.7	0	0
61	06/11/2017	06/11/2018					0	2.6	18.6	5.9	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0.6	0.5	0.1	0	0	0	0	0	50.3	4.3	0

Daily precipitation amount in last month before demounting of samples in 2018 (mm). Gray cells indicate no annual 2017-18 material samples on rack.																																
Trend exposure 2017-18			11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11		
Station no	Start:	End	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
01	23/10/2017	02/11/2018	0	0																												
03	26/10/2017	01/11/2018	0																													
10	19/10/2017	17/10/2018																														
13	25/10/2017	31/10/2018																														
14	27/10/2017	26/10/2018																														
15	31/10/2017	23/10/2018																														
16	03/11/2017	07/11/2018	21.6	2.8	0	0	38.6	1	0																							
21	20/10/2017	19/10/2018																														
23	27/10/2017	26/10/2018																														
24	26/10/2017	31/10/2018																														
26	26/10/2017	31/10/2018																														
31	27/10/2017	06/11/2018	0	16	0	0	3.2	1.82																								
33	02/11/2017	05/11/2018	0	0	0	22.3	2.4																									
35			0	1.1	0	0	0	0	0	0	0	0	0	14.6	4.3	0.8	0	0	0	3.5	0	0	0.5	0.0	1.4	0	1.4	4.0	1.1			
40	25/10/2017	25/10/2018	5.2	0	0	0	0	0.6	4	0	1	9.4	13.7	5.1	0	0.4	0	0	0	0	0.6	1	0	0.4	5.8	1	4.8	1	15.1	0.4	0	0
41	19/10/2017	04/11/2018	0	0	0	0	0																									
44	4-7/11/2017	05/11/2018				5.3																										
45	26/10/2017	30/10/2018																														
50	09/11/2017	09/11/2018	0	3.4	0.1	0	0	0	0	0	0	0	0	0	1.6	0.4	0	0	0	0.7	0	1.4	0	0	0	0.6	0	0	0	0	0	
51	14/11/2017	14/11/2018	0	0	0	0	0	0	0	4.4	0	0	0	0	0	0																
53	02/11/2017	29/10/2018	0	6.8	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0	0	1.2	1.7	3.8	0.3	0.7	0	0	11.2	17.9	2.8	0	0	3.6
57	24/10/2017	29/10/2018	0	1.4	0.5	0	0	0.5	0.3	1	1.6	1.3	0.2	6.3	0.9	0.1	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	0
58	15/11/2017	09/12/2018									23.9	0	0	0.3	34	0	18.8	0.8	0	0	0	0	0	0	0	11.7	10.7	22.1	1.5	0	0	0.5
59	17/11/2017	16/11/2018	0	2.9	0.3	0	3.8	12.3	0	0	0	1.7	1.8	0.3	0	0	3	5.3														
60	10/11/2017	16/11/2018	0	5.3	0.3	0	2.5	0	0	0	0	0	0	0	0	0	0															
61	06/11/2017	06/11/2018	0	7.4	12.4	0.1	0	0																								

Daily precipitation amount in last month before demounting of samples in 2018 (mm). Gray cells indicate no annual 2017-18 material samples on rack.																																			
Trend exposure 2017-18			12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	
Station no	Start:	End	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
01	23/10/2017	02/11/2018																																	
03	26/10/2017	01/11/2018																																	
10	19/10/2017	17/10/2018																																	
13	25/10/2017	31/10/2018																																	
14	27/10/2017	26/10/2018																																	
15	31/10/2017	23/10/2018																																	
16	03/11/2017	07/11/2018																																	
21	20/10/2017	19/10/2018																																	
23	27/10/2017	26/10/2018																																	
24	26/10/2017	31/10/2018																																	
26	26/10/2017	31/10/2018																																	
31	27/10/2017	06/11/2018																																	
33	02/11/2017	05/11/2018																																	
35																																			
40	25/10/2017	25/10/2018	7	0.6	5.4	1.8	1.8	0.2	5.1	1.2	2.2	0	0.2	0	0.2	0	0.4	2.4	0	2.8	0	2.2	3.2	0.6	9.2	0	0	0	0	0	0.2	0.4	0.2		
41	19/10/2017	04/11/2018																																	
44	4-7/11/2017	05/11/2018																																	
45	26/10/2017	30/10/2018																																	
50	09/11/2017	09/11/2018																																	
51	14/11/2017	14/11/2018																																	
53	02/11/2017	29/10/2018	1.1	5.9	3.4	2.6	0	1.7	3.3	0	0.2	0.7	18.1	2.3	0	2.5	3.8	0	0	0	0	1.1	0.1	7.3	33.9	10.2	4.4	0	0	0.3	1.7	7.4	0		
57	24/10/2017	29/10/2018																																	
58	15/11/2017	09/12/2018	0.5	31.2	0	0	0	0	0	0	0																								
59	17/11/2017	16/11/2018																																	
60	10/11/2017	16/11/2018																																	
61	06/11/2017	06/11/2018																																	

Appendix G
Elemental and/or black carbon (EC/BC) measurements and
methods at the stations 2017/18

Availability of black or elemental carbon measurements at ICP-materials stations in 2018		
Station no.	Are there Black Carbon (BC) or Elemental Carbon (EC) measurements at the station? (Yes/No):	Method of measurement of BC and/or EC:
01	OC, EC, TC, PYC	EUSAAR. On a daily basis but also as yearly average.
03	NO	
10		No information
13	NO	
14	NO	
15	BC since 2013	Multi Angle Absorption Photometer (MAAP) Thermo Scientific Model 5012 - Aethalometer Magee mod. AE22
16	NO	
21	NO	
23	EC/OC since 2010	Thermal-optical_analysis. Analytical instrument manufacturer: Sunset Laboratory Analytical instrument model: OCEC Lab Instrument Model 5
24	BC at "Torkel, "	Aethalometer. AE33 made by "Aerosol": https://mageesci.com/our-products/ae33/ . Method: Optical method where the reduction in light is measured at seven wave-lengths (370, 470, 520, 590, 660, 880, och 950 nm) after passage of a filter with the collected particles on it. The measurement at 880 nm represents the concentration of soot particles (black carbon). The instrument applies a so called dual spot technique, which implies that the measured values are continuously corrected for non-linear effects at high filter load (low transmittanse).
26	NO	
31	NO	
33	EC	Thermal optical method. Six daily data per month on PM2.5 filters
35	EC/OC	Thermal-optical_analysis. Standard NISOH 5040, CEN/TR 16243:2011
40	NO	Unfortunately we don't have this measurement yet. But we have bought an aethalometer to do it during the next campaigns.
41	NO	
44	NO	
45	NO	
50	NO	
51	NO	
53	NO	
57	NO	
58	NO	
59	NO	
60	NO	
61	NO	

Appendix H

Data sources and acknowledgements to data

		1. Data sources
		2. Acknowledgements
1	Prague	1 SVUOM passive sampling. Czech meteo station 1-2 km away from exposure rack. 2
3	Kopisty	1 SVUOM passive sampling. Kopisty meteo station (where the material exposures are performed) 2
10	Bottrop	1 Landesamt für Natur, Umwelt und Verbraucherschutz Nordrhein-Westfalen (LANUV): meteorology, gases, rain amount, PM10 / Deutsches Bergbau-Museum Bochum: precepitation data 2 Landesamt für Natur, Umwelt und Verbraucherschutz Nordrhein-Westfalen (LANUV)
13	Rome	1 Pollutants: Istituto Superiore di Sanità. Meteorological parameters: SIARL - Servizio Integrato Agrometeorologico della Regione Lazio 2
14	Casaccia	1 Meteorological parameters: ENEA - Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile 2
15	Milan	1 ARPA Lombardia - Agenzia Regionale per la Protezione dell'Ambiente della Lombardia - U.O. Centro Regionale Monitoraggio Qualità dell'Aria (SO2, NO2, O3, PM10)- Servizio Meteorologico Regionale (T, RH, prec.) 2
16	Venice	1 NO2, PM10: ARPAV - Agenzia Regionale per la Prevenzione e Protezione Ambientale del Veneto. Meteorological parameters: Ente della Zona Industriale di Porto Marghera 2
21	Oslo	1 All parameters were measured by NILU at the Skøyen station, except Temp. and RH and Prec amount (mm) which were measured by the Norwegian Meteorological Institute at the Blindern station 3.5 km from Skøyen to the north east 2 NILU-Norwegian Institute for air research; Temperature and RH: The Norwegian Meteorological Institute, Met.no, klima (http://sharki.oslo.dnmi.no/)
23	Birkenes	1 All parameters were measured by NILU at the Birkenes station. The gases were measured to the Birkenes observatory about 100 m distance and 50m elevation from the samples. O3 was corrected according to O3 old/new Birkenes 2010 = 0.76 2 NILU-Norwegian Institute for air research; Temperature and RH for August 2015: The Norwegian Meteorological Institute, Met.no, klima (http://sharki.oslo.dnmi.no/)
24	Stockholm South	1 All reported parameters delivered by Lars Burman, SLB analysis (Stockholm Air and Noise Analysis), Stockholm Environmental Administration 2 SLB analysis (Stockholm Air and Noise Analysis), Stockholm Environmental Administration
26	Aspvreten	1 Data for Aspvreten (-2017) delivered by Zahra Hamzavi, Department of Environmental Science and Analytical Chemistry, Stockholm University. Data for other stations (2018-) from SMHI public data and processed by Johan Tidblad (Rise KIMAB). Data from Edeby delivered by Gunilla Pihl Karlsson, (IVL) 2 Department of Environmental Science and Analytical Chemistry, Stockholm University. Swedish Environmental Protection agency and County Administrative Board of
31	Madrid	1 Ministry for the Ecological Transition (MITECO); Air Quality Madrid Regional Government (CAM) 2 Ministry for the Ecological Transition (MITECO); Air Quality Madrid Regional Government (CAM); Carlos III Health Institute (ISCIII)
33	Toledo	1 AEMET-Spanish Meteorological State Agency 2 AEMET-Spanish Meteorological State Agency
35	Lahemaa	1 All parameters were measured by EERC at the Lahemaa station 2 Estonian Environmental Research Centre- EERC
40	Paris	1 Temp, RH and Amount of precipitation are Meteofrance data; pH and precipitation composition are measured in LISA (by Ion chromatography); Gases and PM10 by IVL 2

41	Berlin	1	Before 2016: All data except "H+ - pH" is from "Senatsverwaltung für Stadtentwicklung und Umwelt Berlin", "H+ - pH" is from "Rathgen-Forschungslabor Berlin"; From 2016 the T and RH and rain amount (mm) are from the meteorological station 403 Berlin-Dahlem (FU). Ph was measured by HTW Berlin
		2	See above
44	Svanvik	1	All parameters were measured by NILU at the Svanvik station.
		2	NILU-Norwegian Institute for air research
45	Chaumont	1	All gases, particles and precipitations was measured by Empa, all climate data (Temp, RH) was measured by MeteoSchweiz
		2	Empa data: NABEL (BAFU and Empa), data of MeteoSchweiz: MeteoSchweiz
50	Katowice	1	All meteorological parameters were mesured by Institute of Meteorology and Water Management National Research Institute in Poland. All pollution parameters were measured by Main Inspectorate of Environmental Protection in Poland
		2	All meteorological parameters were mesured by Institute of Meteorology and Water Management National Research Institute in Poland. All pollution parameters were measured by Main Inspectorate of Environmental Protection in Poland
51	Athens	1	SO ₂ ,NO ₂ ,O ₃ & PM ₁₀ : measured by National Network for Atmospheric Pollution Monitoring (NNAPM), Ministry of Environmemt & Energy/ Temp, RH, Rain: measured by National Observatory of Athens (NOA)
		2	SO ₂ ,NO ₂ ,O ₃ & PM ₁₀ : NNAPM, Ministry of Environmemt & Energy/ Temp, RH, Rain: NOA
53	Vienna	1	The measurements are mede by the ZAMG (Zentralanstalt für Meteorologie und Geodynamik = Central Institute for Meteorology and Geodynamics, Hohe Warte 38, 1190 Vienna/Austria
		2	
57	Hämeenlinna	1	Parameters measured by HAMK & KVVY (pH & Cl-), City of Hämeenlinna (NO ₂ and PM ₁₀), Finnish Meteorological Institute (temp, RH, precipitation amount)
		2	Finnish Meteorological Institute
58	New Haven	1	Temperature, RH, and Precipitation parameters obtained from NOAA Local Climatological Data, New Haven Tweed Airport, CT, US (41.26389°, -72.88722°), 8.44 kilometers from collection site.
		2	NOAA - National Oceanic and Atmospheric Administration
59	Žilina	1	Research Centre of University of Žilina, Slovakia; Slovak Hydrometeorological institute (SHMÚ) and Faculty of Civil Engineering, University of Žilina, Slovakia.
		2	Research Centre of University of Žilina, Slovakia; Slovak Hydrometeorological institute (SHMÚ) and Faculty of Civil Engineering, University of Žilina, Slovakia.
60	Split	1	Precipitation samples are collected on Split-Marjan station (about 3 km away from 60-Split) and analysed by Croatian Meteorological and Hydrological Service; PM ₁₀ , SO ₂ and NO ₂ are measured on Split-1 location (about 1 km away from 60-Split); data will be available on the Croatian Agency for Environment and Nature (CAEN) web pages in may and will be sent soon after that; O ₃ is not measured in Split; Geographical coordinates: 60-Split 43.511667N 16.464852E, ST-1 43.510653N 16.449342E, ST-Marjan 43.508333N
		2	Croatian Meteorological and Hydrological Service and Croatian Agency for Environment and Nature (CAEN)
61	Zagreb	1	All parameters measured by Croatian Meteorological and Hydrological Service; (PM ₁₀ , SO ₂ and NO ₂ measured on Zagreb-2 station (about 200 m away from 61-Zagreb; O ₃ measured on Zagreb-3 station (about 5 km away from 61-Zagreb). Geographical coordinates: 61, Zagreb: 45.8219N 16.0331E, ZG-2: 45.8237N 16.0358E, ZG-3: 45.7816N 16.0065E
		2	Croatian Meteorological and Hydrological Service and Croatian Agency for Environment and Nature (CAEN)

Appendix I
National contact centres, data sources and
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