

UK Automatic Urban Network London Air Quality Network Affiliated Sites

Management Report January to March 2008

**Prepared for the Department for Environment, Food and Rural
Affairs (DEFRA), Scottish Executive, Welsh Assembly Government
and the DoE in Northern Ireland**

Title	UK Automatic Urban Network London Air Quality Network Affiliated Sites Management Report, January to March 2008
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1 Introduction

This report details the equipment performance for the AURN affiliate sites where the King's College London Environmental Research Group (ERG) is contracted as the Central Management Unit and Control Unit (CMCU) by DEFRA under contract number EPG 1/3/168. The report highlights issues causing data capture to fall below 90% during the period January to March 2008.

2 Routine Data Handling

The routine handling of data from the air sampling through to the dissemination of verified data to the QA/QC Unit is a multi stage process. Data is stored on site in either an external logging system or in individual, in-built analyser logging systems. This is the first stage of quality control as many loggers and analysers are capable of diagnosing faults and identifying them as non-ambient data. Data is collected every hour from each air quality monitoring site using the MONNET data handling software and transferred to an MS-SQL database. After data collection, files are placed in an import queue to await processing, in practice the processing power of the KCL air quality server is such that files are processed in a matter of seconds. During this transfer process raw data is checked against algorithms to ensure data quality and data is scaled according to the last known calibration response. Both scaled and raw measurements are stored in the MS-SQL database, this ensures that data can be rescaled from the raw values if necessary.

Data is disseminated to the DDU on an hourly basis by email. Data collection calls are scheduled to complete within the first 20 minutes of each hour. This enables an email to be automatically assembled and dispatched at 27 minutes past the hour, arriving sufficiently early to update the National Air Quality Archive at 45 minutes past the hour.

Manual verification occurs twice daily, this aims to confirm valid data, record site events, identify and diagnose analyser faults.

Fifteen-minute mean measurements, including those diagnosed as non-ambient, are transferred to the QA/QC Unit at the start of each month in the format required. Data from the automatic overnight calibrations and routine LSO visits are also supplied.

2.1 Data Dissemination Performance

Between January and March 2008, ERG estimate that 98% of hourly e-mails arrived at the DDU to meet their timetabled requirements. Accurate figures of punctual e-mails can be obtained from the DDU.

3 Quality Control / Quality Assurance (QA/QC)

Sites affiliated to the AURN are operated in accordance with the Network Operations Manual and any additional QA/QC procedures requested. Through close liaison with the local authorities and the LSOs, the QA/QC unit is provided with unrestricted access to the monitoring sites.

3.1 QA/QC Site Audits

The QA/QC Unit (AEA) carried out routine equipment audits at the London affiliated AURN sites during the first quarter of 2008 to assess the performance of the instruments. The dates of these audits are shown in Table 1. Southwark Roadside has not been audited as the site is currently closed for relocation.

Site	Start Date
Stewartby	13/03/08
Camden Kerbside	18/02/08
Eltham	04/04/08
Haringey Roadside	19/02/08
London Haringey	20/03/08
London North Kensington	30/01/08
Marylebone Road	21/02/08
Horley	05/03/08
Southwark Roadside	Site Closed
Tower Hamlets Roadside	25/02/08
Stanford-le-Hope Roadside	22/01/08

Table 1: QA/QC audit dates

4 Changes to sites affiliated to the AURN

The AURN is in the process of reorganisation due to the requirements of the EU Directive on ambient air quality and cleaner air for Europe (PE-CONS 3696/07). This resulted in the de-affiliation of several sites from the LAQN at the end of September 2007 and the affiliation of several sites in networks managed by King's. The sites identified for affiliation to the AURN and the current status of each site is shown in Table 2

Site	Current Status
Horley	Affiliated 21/11/07
Stewartby	Affiliated 26/11/07
Stanford-le-Hope Roadside	Affiliated 22/01/08
London Haringey (NO _x)	Affiliated 29/11/07
London Bexley (PM _{2.5})	Affiliated 25/02/08
London Harrow	Awaiting installation of Defra PM _{2.5} instrument
Sandy Roadside	Awaiting QA/QC visit
Storrington Roadside	Awaiting site installation
Eastbourne Background	Awaiting site installation

Table 2: Sites managed by King's that have been identified for affiliation to the AURN

5 Quarterly Data Capture Statistics

Data capture rates for January, February and March are detailed in Table 3, Table 4, and Table 5. The data capture for each month was calculated from valid hourly averages, after excluding data lost due to calibration and the faults discussed. The overall data capture for the quarter January to March are detailed in the Table 6.

Specific issues affecting data collection and quality at each site are discussed in this section. Details of faults are specified where data capture fell below 90% for the quarter. Sites affiliated part way through the quarter all have data capture below 90% as this was calculated as a percentage of the whole quarter rather than since the affiliation date.

Site	Hourly Data Capture % for January 2008					
	CO	PM ₁₀	NO _x	O ₃	SO ₂	PM _{2.5}
Stewartby					99.6	
London Bexley						0
Camden Kerbside		99.5	99.6			
Eltham			99.6	99.6		
Haringey Roadside		99.7	99.7			
London Haringey			99.7	99.7		
London North Kensington	97.9	89.0	97.9	97.9	97.5	
Marylebone Road	99.7	82.0	99.5	97.3	99.7	
Horley			99.7			
Southwark Roadside		-	-			
Tower Hamlets Roadside	99.1		99.5			
Stanford-le-Hope Roadside		32.0	31.7		32.0	

Table 3: Hourly data capture for January 2008

Site	Hourly Data Capture % for February 2008					
	CO	PM ₁₀	NO _x	O ₃	SO ₂	PM _{2.5}
Stewartby					97.6	
London Bexley						16.7
Camden Kerbside		96.3	99.3			
Eltham			99.3	99.6		
Haringey Roadside		99.0	98.9			
London Haringey			99.9	99.7		
London North Kensington	99.0	99.3	89.7	99.0	81.2	
Marylebone Road	98.9	98.4	98.9	99.0	98.9	
Horley			99.7			
Southwark Roadside		-	-			
Tower Hamlets Roadside	98.9		99.4			
Stanford-le-Hope Roadside		99.9	99.9		99.9	

Table 4: Hourly data capture for February 2008

Site	Hourly Data Capture % for March 2008					
	CO	PM ₁₀	NO _x	O ₃	SO ₂	PM _{2.5}
Stewartby					92.6	
London Bexley						92.7
Camden Kerbside		97.3	99.6			
Eltham			99.5	99.5		
Haringey Roadside		91.7	98.9			
London Haringey			99.3	99.3		
London North Kensington	99.3	96.1	99.6	99.6	99.6	
Marylebone Road	99.6	98.8	99.3	99.5	99.6	
Horley			99.1			
Southwark Roadside		-	-			
Tower Hamlets Roadside	99.6		99.9			
Stanford-le-Hope Roadside		99.9	99.9		99.7	

Table 5: Hourly data capture for March 2008

Site	Hourly Data Capture % for January to March 2008					
	CO	PM ₁₀	NO _x	O ₃	SO ₂	PM _{2.5}
Stewartby					96.6	
London Bexley						36.9
Camden Kerbside		97.7	99.5			
Eltham			99.5	99.5		
Haringey Roadside		96.8	99.2			
London Haringey			99.6	99.6		
London North Kensington	98.7	94.7	95.8	98.8	93.0	
Marylebone Road	99.4	93.0	99.2	98.6	99.4	
Horley			99.5			
Southwark Roadside		-	-			
Tower Hamlets Roadside	99.2		99.6			
Stanford-le-Hope Roadside		76.7	76.7		76.7	

Table 6: Hourly data capture for January to March 2008

5.1 London Bexley PM_{2.5}

36.9%

This analyser was affiliated to the AURN following an audit by the QA/QC unit on 25th February. Data capture has therefore been calculated from that date.

5.2 Southwark Roadside All Analysers

0%

The site is currently closed for relocation. The local authority is currently waiting for the ownership of the building to be confirmed.

5.3 Stanford-le-Hope All Analysers

76.7%

This site was affiliated to the AURN following an audit by the QA/QC unit on 22nd January; the data capture has therefore been calculated from that date.

6 Contact Information

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Day-to-day operational issues can be directed to the ERG Duty Officer by telephone on 020 7848 4022 or by Email on airquality@erg.kcl.ac.uk