

# Network

The newsletter for the UK Air Quality Monitoring Network Issue 6

Sponsored by the Department for Environment, Food & Rural Affairs, The Scottish Executive, The National Assembly for Wales and the Department of the Environment (Northern Ireland)

**DEFRA**  
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## EC Directive 99/30/EC – DD1

# AURN responds to Directive Needs

As highlighted in the headline article in *Network* Issue 4, the automatic monitoring network has been expanded in recent months in order to comply with the requirements of the 1st European Daughter Directive (DD1). This has involved the procurement of additional equipment and housings on behalf of DEFRA and the devolved administrations,

alongside seeking approvals for planning applications, at sites in Preston, Blackpool, Wirral Tranmere, and Southend-on-Sea (as previously reported in *Network*) and additionally at Wrexham, Dumfries and Inverness. Moreover, the affiliation exercise undertaken by QA/QC in 2000 highlighted sufficient resources for the affiliation into the network of sites located at Bournemouth, Aberdeen, Brighton & Hove, Northampton, Cwmbran, Yarm, Coventry, Portsmouth, Wigan, Canterbury and Grangemouth. In the case of the affiliates, additional equipment for monitoring SO<sub>2</sub> and PM<sub>10</sub> were procured on behalf of DEFRA and the devolved administrations for inclusion at the sites in order to meet with the minimum compliance requirements.

DD1 came into force in the UK on 19 July 2001 with the adoption of separate Statutory Instruments for England, Scotland and Wales (Nos. 2315, 224 and 2683, respectively) through 'The Air Quality Limit Values Regulations 2001'.

The main requirement of the Directive is compliance with the new limit values set for SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub> and lead. However, in addition there are a number of other requirements:

- The need to make an assessment of air quality throughout each Member State i.e. not just the locations at which measurements are made (local authorities in the UK are very familiar with this concept!)

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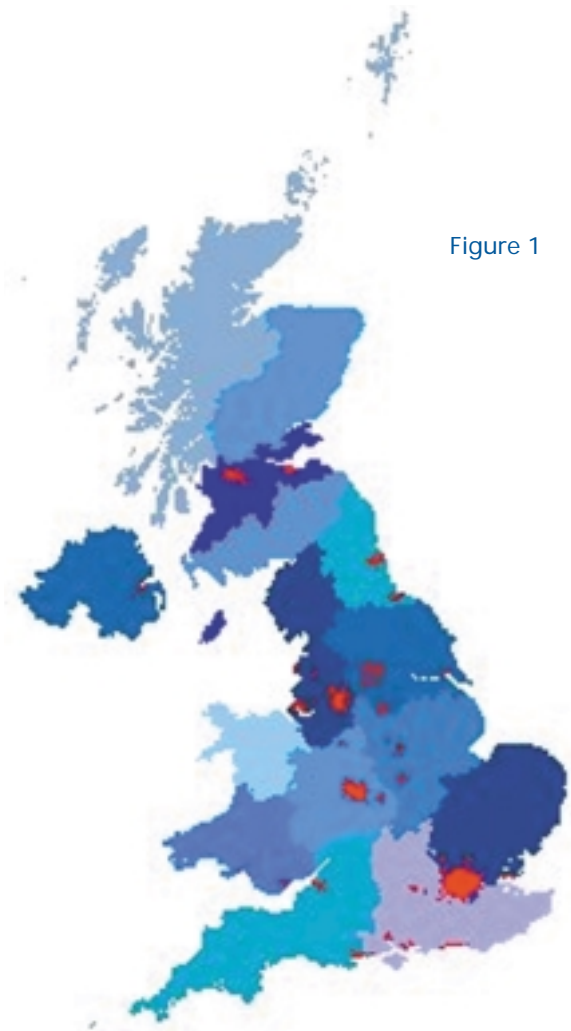
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Figure 1



# AURN responds to Directive Needs

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- Identification of agglomerations and zones within Member States
- Dissemination of air quality information to the public, and
- Specifics regarding monitoring methods and the use of reference methods set by CEN and/or equivalence with thereof.

For the UK a preliminary assessment of air quality was undertaken on the basis of existing information. Carried out by AEA Technology on behalf of DEFRA and the devolved administrations, the results of this assessment were summarized in *Network* Issue 4 and are now available in full at

<http://www.defra.gov.uk/environment/airquality/index.htm>

The agreed zones and agglomerations in the UK are shown in Figure 1 and are defined on the basis of population and land cover information; zones for England, Scotland, Wales and Northern Ireland were agreed by the respective administrations. In all, 28 agglomerations occur within the UK; the remainder of the country has been split into 16 zones.

Having achieved the task of getting the new sites installed and operational (barring the odd delay in planning approval and site vandalism), 2001 is the first year for which data are to be formally reported to the Commission under the Directive. Any reporting should include analysis of data in order that any zone or agglomeration with an exceedance of the limit value is reported. This work will be carried out under the new 'Communication of Air Quality Data and Information' contract let by DEFRA and the devolved administrations.

In addition, as in previous years, data are provided to AirBase, the database for air quality across Member States (for further details see <http://etc-acc.eionet.eu.int/database/airview.html>).

As to the future, the 2nd Daughter Directive on CO and benzene is published and comes into force on 13 December 2002. The preliminary assessment for these pollutants is well underway. In addition, the 3rd Daughter Directive on ozone (DD3) is almost finalized whilst the 4th Daughter Directive (DD4) covering arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons (PAHs) is currently being drafted.

# New European standards for network measurements



The EU Daughter Directives prescribe the maximum measurement uncertainties that are allowed for results to be reported to the European Commission, e.g. where SO<sub>2</sub> concentrations are near to the limit value they must have a maximum uncertainty of  $\pm 15\%$  (at the 95% level of confidence). The European Committee for Standardization (CEN) has been mandated by the EC to produce new standards. These will become mandatory for Member States to adopt and set out how measurements must be made to attain these standards.

Currently four standards are being drafted to cover SO<sub>2</sub>, NO<sub>x</sub>, CO and O<sub>3</sub>. The standards for SO<sub>2</sub> and NO<sub>x</sub> have been issued for comment to the national standardization bodies (BSI in the case of the UK) and have a proposed implementation date of 2002/2003. The standards covering CO and O<sub>3</sub> are at an earlier stage, but will be issued for comment within the next six months. All the new standards broadly address two components:

- requirements to carry out tests for the type-approval of an instrument before its acceptance for use in the field
- further requirements for QA/QC once it is deployed.

The type-approval test procedure requires that all contributions to the total measurement uncertainty of the method, e.g. linearity and cross-interference, be identified and tested against criteria specified in the CEN standards. A further requirement is that the combined expanded measurement uncertainty, calculated from all of these components, meets the figure set down in the Daughter Directive. These performance characteristics are evaluated by a series of laboratory and field tests, which could be done within the Environment Agency's MCERTS Scheme.

The requirements for quality assurance and quality control involve an initial evaluation at selected sites, and regular field calibrations to show that the performance continues to meet those requirements.

*For further information on CEN activities contact Peter Woods (Tel: 020 8943 7095 or email: [Peter.Woods@npl.co.uk](mailto:Peter.Woods@npl.co.uk))*

# Air Quality Forecasting.

## You can help!

The AURN is an invaluable database for use in forecasting pollution using sophisticated models carried out for policy support. Figure 2 shows an example of the back-trajectory plots frequently released by NETCEN in support of the mapping and forecast work.

The network now reports measurements from over 380 analyzers every hour. Whilst the use of software and manual inspection ensures that the data of the highest possible quality are reported, the sheer scale of the task means

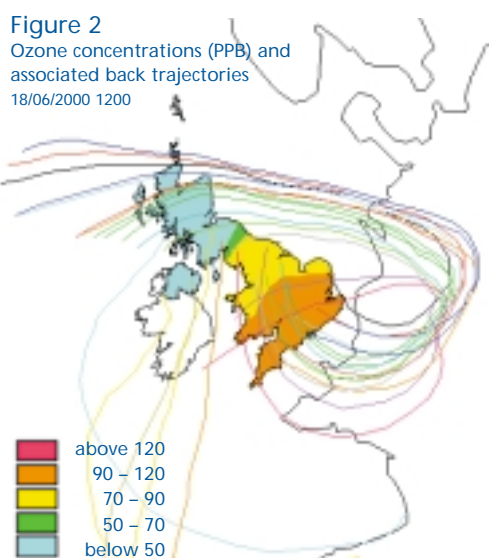
that anomalous results occasionally slip through. There are, however, a number of ways LSOs can help to minimize the amount of spurious data being disseminated. For example:

- Using the “out-of-service” switches during calibration visits,
- Prompt reporting of any alarms or fault messages to CMCU,
- Immediate notification of any activity close to the site that may give rise to high levels of pollution e.g. road works, building demolition or construction, fires or sand-blasting

Once anomalies have been highlighted, the data can then be published with an appropriate message or flag explaining the reason for increased levels. The additional information from site operators can also be used to help validate the air pollution forecasts, which are issued on a daily basis. If the situation is not representative of the “normal” pollution climate in an area then it is unlikely that an air pollution model will be able to accurately predict it.

Your help can greatly increase the accuracy of the national forecasts.

*For further information on UK forecasting contact Paul Willis (Tel: 01235 463643 or email: paul.willis@aeat.co.uk)*



19th July 2001 – mean anything? Probably not! – At least to many people on the street. (As for those involved in the AURN: you’d know by now!). It is, in fact, the date on which the UK was required to have all the necessary monitoring in place as direct response to Directive 99/30/EC – the First Daughter Directive (DD1) – on air quality.

Reaching this point has involved considerable time and effort on behalf of policy makers, consultants and researchers, and the CMCU and QA/QC units. In Issue 4 of *Network* we highlighted the details of the previous Article 5 Assessment summarizing the future monitoring requirements for formal compliance with DD1. We again re-visit the Article 5 Assessment in this issue that has taken the AURN to a total of 106 sites throughout the UK – a substantial increase over the previous 85 sites in the network 12 months ago. Quite an achievement!

Additionally in this edition of *Network*, we highlight the emerging issues with respect to the new standards of air quality networks across Europe with regards to uncertainty and monitor performance. Also, the assistance that you as LSOs can give for UK forecasts on air quality (and a few reminders besides!).

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### Acknowledgment:

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Jane Vallance-Plews, Ken Stevenson, Paul Willis, Paul Quincey, Ray Evans

### Reminders to LSOs

CMCU would like to remind LSOs of the following procedures that should be followed when undertaking routine site calibration visits:

- Do not conduct routine calibrations on a Friday
- Always have available the previous calibration values
- Send details of the calibrations through to CMCU and QA/QC units as soon as possible
- Complete all gas cylinder information and again, dispatch information to NPL and CMCU as soon as possible.

### Summer Inter-calibration Exercise

The summer inter-calibration exercise was completed in September 2001, with 106 sites being visited by QA/QC Units. A full report giving details of the inter-calibration results is under preparation and, when published, will be made available on the National Air Quality Archive web site.

AURN data for April-June 2001 have been ratified and will be available on the Archive by 1st October 2001. The next ratification report covering the 6-month period January-June 2001, will be prepared in October and made available on the Archive Web site. Copies of previous AURN data ratification and inter-calibration reports can be found at the following site

[http://www.aeat.co.uk/netcen/airqual/reports/research99\\_0/304.html](http://www.aeat.co.uk/netcen/airqual/reports/research99_0/304.html)

*Contact: Jane Vallance-Plews (AUN QA/QC Unit, NETCEN) or Paul Quincey (ARN QA/QC Unit, NPL).*

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*intercalibrations, cylinder supplies*

## Who does what in the AURN?

The successful operation of the AURN is dependent on the commitment and dedication from a large number of organisations, and the individuals within them.

A brief reminder of who does what:

### Central Management & Co-ordination Unit (CMCU):

Responsible for setting up new sites within the Network (including site selection and procurement of equipment); Network operation (appointment of ESUs and LSOs, co-ordination of equipment calibration and servicing); data collection and validation; data reporting.

### Quality Assurance/Quality Control (QA/QC) Units:

Responsible for providing independent QA/QC checks on Network operations. This includes routine inter-calibration audits and data ratification. The QA/QC Units also provide advice on operation issues to the CMCU.

### Equipment Service Units (ESUs):

Responsible for the routine and emergency servicing of analysers and ancillary equipment.

### Local Site Operators (LSOs):

Responsible for undertaking routine site calibrations. The LSOs also provide invaluable information and feedback on site performance to both CMCU and QA/QC Units, and undertake initial investigations of site problems.

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