

AIR QUALITY

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BULLETIN

SENSITIVE HABITATS

Clampdown on livestock

Farmers are finding the habitats directive affecting their business more than expected.

Habitats provisions in European directives have worked their way through to PPC regulations and now large pig and poultry farms must apply for permits. The aim is to cut ammonia and nitrogen pollution which adversely affects sensitive habitats.

A number of farms are located near wildlife sites where even relatively small emissions can have an impact. The Environment Agency has had about 1,000 applications from pig and poultry farmers of which 170 will require additional conditions in order to reduce impacts. It had expected about 10% would prove sensitive, this has turned out to be 20%.

Unusually for the Agency, it is carrying out the assessments



for the farmers. Normal practice is for installations to carry out their own modelling.

At the lower end of the scale some of the sites flagged up as having an impact may simply need further modelling. At the other end of the scale some farms may need substantial investment to comply. The Agency said: "There are a small number of farms (10) where the emissions are so large that it may not be practicable to seek improvements. However, at this stage, we have not decided if we will refuse their permits."

One of the reasons for the

higher than expected number of farms needing permits has been the move from the UNECE convention on long range transboundary pollution which is suggesting a more stringent target for ammonia.

The deadline for the Agency issuing permits is the end of October and the Agency is currently consulting farms on their draft permits. The farming industry is not too happy with the exercise given the current foot and mouth and bluetongue pressures and the need to avoid "undesirable burdens".

The Agency counters that it believes it has a mandate to go beyond best available technology if it is needed to meet critical load limits.

● The Agency has produced a briefing note on www.environment-agency.gov.uk/commondata/acrobat/briefing_1867292.pdf

LAQM

Defra updates review & assessment progress

A proposed air quality performance indicator could be finalised later this month.

The proposed indicator was consulted on by Defra earlier this summer (*AQB August p1*) and set out a possible way that councils could tot up air quality emissions to form an indicator. More details will be announced in this Autumn's comprehensive spending review, said Defra's Jon Lartice, speaking at last month's South Yorkshire Care4Air conference held in Sheffield.

Lartice, who took over from Defra's Carole Tidmarsh,

added: "It is difficult to give a detailed commentary as to what is going on. We don't want to be seen to be flip-flopping about or indecisive – but in October hope to give more details of what is going on."

The indicator is important, if agreed, as it will be one of the streamlined set of 200 currently being developed. But Lartice warned authorities: "I would like to clear up some confusion in some people's minds about what the indicator won't do – it won't replace councils' statutory duties on air quality."

Defra is currently working

out standard emission values for council activities such as street lighting, schools, social housing and fleets with the help of consultant AEA. This information will be used to create an online emissions calculator (similar to one on climate change gases). Lartice said this should lead to less duplication of data gathering by authorities.

The indicators will be used by authorities and central Government to encourage performance improvements. The council has over 30 indicators

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IN BRIEF

AEA in action

Bureau Veritas has lost the three year contract to run the action plan helpdesk for Defra.

AEA has won the contract, representing a coup for the firm that also recently won contracts in Kent, Scotland and Northern Ireland. The firm will manage the air quality action plan helpdesk and website, appraise local authority documents on draft and final action plans, and additionally appraise reports covering action plans, air quality aspects of local transport plans and local area agreements.

Speaking at the recent Sheffield Care4Air conference, AEA's Gwyn Jones explained plans to improve the service: "The website will be accessible via the Air Quality Archive (also run by AEA). It provides guidance and experiences, quantitative information, joint consideration of pollutant and climate change emissions and further information on integrating air quality with planning."

● See also feature, page 8

VOC dilemma

Scientists have tried to calculate whether it is better to release volatile organic compounds (VOCs) directly to the atmosphere or incinerate them. There are fears that the fuel used to incinerate VOCs might cancel out any benefit from breaking down VOCs with a high global warming potential.

Researchers conclude: "Only when the VOC has a low direct or indirect global warming potential and is burned with a large excess of fossil fuel in the incinerator with little heat recovery is it likely to be less favourable to incinerate rather than directly release the VOC to air from a climate change point of view."

● *Climate change consequences of VOC emission controls* can be viewed on www.airquality.co.uk/archive/reports/list.php

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that it can choose itself. In this way 'forgotten' subjects such as noise could conceivably be brought in.

Other topics covered by Lartice included:

- Local air quality management guidance is expected to be revised before the fourth round of review and assessment. Lartice said that consultation is 'aimed' for 2008 but he warned that revision of technical guidance was not assured due to funding difficulties at Defra.
- There are now 246 air quality management areas declared by 183 English local authorities. 143 draft action plans have been received, of which 100 have been finalised. "We are chasing those that haven't finalised their plans", added Lartice.
- Defra is producing new statutory instruments which exempt new-style fireplaces from Clean Air Act rules. New designs of biomass boilers and clean burning fireplaces have to be specifically exempted if used in smoke control areas, Lartice said local authorities need to enforce Clean Air Act provisions and Defra is currently looking at how effectively this is done.

West Mids revamp

Residents in the West Midlands will have quick and easy access to information on air quality following the launch of a new website.

The seven West Midlands Metropolitan local authorities in the area are working together to improve air quality across their region.

People will be able to:

- Check where, what and how air pollution is measured;
- View and download current and historical air pollution levels from over 30 sites across the region, including Birmingham International Airport;
- Read about sources and health implications of certain air pollutants;
- View the West Midlands' Pollution Index, allowing people with respiratory problems to make informed decisions about their daily activities.
- www.wmair.org

NEWS FROM THE SOUTH YORKS CARE4AIR CONFERENCE IN SHEFFIELD

Environment made a 'duty'

Local Area Agreements will for the first time impose a duty on councils to consider the environment in partnership with other agencies, Government Office for Yorkshire and Humberside's Tim Godson told the Care4Air conference.

Local authority agreements are a system introduced in the Local Government White Paper. Godson said: "The White Paper offer a stronger role for local authorities to lead their communities, shape their areas, and innovate in response to local needs in exchange for more bottom-up accountability, better and more efficient services and tougher intervention when things go wrong. The performance framework will include 200 national indicators of performance of the local authority and its partners – indicators shared across Departments but varying approaches currently being agreed with DCLG (*AQB August p1*)."

Godson added: "Local agreements are no longer about specific funding for specific targets rather agreed targets covering everything local government delivers on its own

or in partnership. Environment appears as a topic for the first time and for the first time agreements set a duty on local authorities to work in partnership with other agencies. He added: "There is a duty on local authorities and named partners to co-operate in agreeing local area agreement targets and to have regard to meeting them."

This autumn's comprehensive spending review will agree new public service agreement targets which could lead to direct targets on air quality and environmental issues – or address some of the causes. Feasibility testing is already underway in Leeds and Sheffield. Targets could include climate change, although Godson says this will be hard to measure. "Is performance judged against a scale, or according to progress on the Nottingham Declaration on climate change?"

Local Area Agreements have been criticised for missing issues such as noise, but Godson said that there is no bar on any local authority to choose noise as one of its 35 locally-set priorities. York City Council has taken this route.

A recent meeting of its neighbourhood services panel agreed to the five national priorities set out in the Rogers Review (*AQB April p1*) (air quality, alcohol licensing, food standards, workplace health and fair trading) but then added its own local priorities: contaminated land, noise nuisance, underage sales, support for business and promoting healthy lifestyles.

York EHO Mike Southcombe told *AQB*: "Air quality, which is on the national list, is definitely one of our priorities. And from within the local priority list we've included both noise and contaminated land. The heads of the environmental health and other departments met and whittled down what was a considerable number of local priorities to a shortlist. We've then taken the report to our members and said this is what Rogers has said and this is what we say our priorities are."

"It's about the what the issues are locally, and this decision will affect resourcing – and like most local authorities resources are finite – so come budget time we'll be looking to prioritise resources according to this decision."

New group sets low emission best practice

A team lead by Sheffield is developing good practice guidance on low emissions.

Speaking at the recent Care4Air conference, Sheffield City Council's Ogo Osammor explained that the guidance is aimed at helping local authorities make effective use of low emissions strategies using the planning process.

The group developing the *Planning for low emissions: best practice guidance* was formed in June this year and is separate from the low emissions forum also headed by Sheffield. Osammor said: "Although we are operating out of the same pool of ideas, the group is not a sub group of the low emission forum that is looking specifically at low emission zones. The best practice guidance group was initiated from discussions between Andrew Whittles of CENEX

and some Beacon authorities.

The group aims to:

- Act as a mechanism for improving joint working between local authority departments;
- To explain the underlying principles of low emissions strategies and highlight the main consideration for their use;
- Show what has been done, e.g., using section 106 agreements to improve the impact of developments;
- Serve as a tool for arriving at what can be done;
- Highlight the synergies between AQ and climate change;
- Serve as a mechanism for influencing developers;
- Help to provide a uniform approach nationally;
- Inform creation of a carbon mitigation strategy toolkit.

The best practice group hopes to release a draft report in December and publish early

(March) next year.

Freight groups spread

A South London freight quality partnership has been set up following the success of a West London partnership. The partnerships, often based on existing air quality cluster groups, aim to improve delivery practices to reduce emissions.

Alan Lewis of consultant TTR told the Sheffield conference that the South London partnership was formed as part of borough action planning on freight and as part of a TfL freight strategy.

One initiative concerns parking – badly parked cars can force lorries to block traffic while loading, increasing pollution. Lewis cited an initiative in Bromley whereby short term parking bays were created along with tougher enforcement of loading bays.

DIRECTIVES

Campaign reveals EU sanctions

A London based clean air campaign has revealed that the UK is being pursued by the European Commission for air quality breaches.

The Government has admitted that the UK has received a Letter of Formal Notice (first written warning) from the European Commission for failing to meet its legal obligations in relation to air quality. Other countries censured were France, Italy, Spain and Slovenia.

The admission came in a response to a Freedom of Information request submitted by the Campaign for Clean Air in London. The campaign has been tracking the air pollution issue closely and actively enlisting the support of European ministers and politicians to encourage the Government to step up action.

The letter for formal action focused on industrial emissions from a brickworks. The notice cited exceedences of hourly and daily limit values for sulphur dioxide.

While the breach is localised, the London campaign says that it sets a precedent for other pollution that is over limits: "Given that the legal position for PM₁₀ is effectively the same as that for SO₂, the Commission should issue a Letter of Formal Notice to the UK, at least in respect of London as a specific location, for breaching PM₁₀ limit values in 2005 (and subsequently for 2006)."

It also urged that the Commission "Take appropriate and early action in respect of



Editor's comment: The Campaign for Clean Air in London achieved a bit of coup with its uncovering of EU criticism of the UK – this is the first time we've seen air pollution as a page one splash in UK-wide newspapers.

the very high levels of NO₂ in London."

Simon Birkett who runs the Campaign for Clean Air in London, said: "We welcome the Government's disclosure of the European Commission's intervention in respect of air quality breaches of legal requirements. However, we are dismayed by the Government's continuing lack of transparency and action on air quality.

"We encourage the Government to begin rebuilding its credibility by producing credible plans to meet all of the EU's air quality requirements sustainably throughout London by no later than the London 2012 Summer Olympics."

Darren Johnson, a Green Party member of the London Assembly, said: "The failure of the Government and local authorities borders on the criminal and we need the European Commission to take firm action against them. We

have had over a decade of drift and complacency – a wasted decade in which we should have reduced air pollution down to the less damaging levels set by the European Union. Instead many Londoners are still dying and suffering unnecessarily from increased traffic pollution.

"Whilst I welcome the London Mayor's introduction of a low emission zone to deal with the older, more polluting heavy diesel vehicles, it won't be enough to guarantee the health of Londoners. We also need to reduce the total amount of traffic in London. The London Mayor has acted irresponsibly by giving the go ahead for major traffic generating developments such as the massive car parking at King's Cross, an area already breaching air quality limits."

● Campaign for Clean Air in London website
www.bbc.co.uk/dna/actionnetwork/G1956

MODELLING

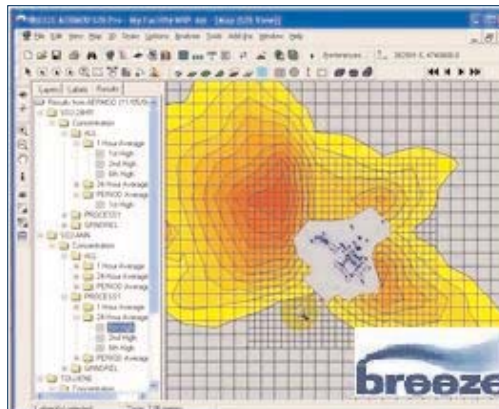
Aermod hits version 6

Trinity Consultants has released a new version of its Breeze Aermod dispersion modelling software.

Trinity says the release "is the most radical and major upgrade of the program ever released". "Every single function of the program has undergone a complete overhaul and many, new features have been added, some of which are extremely powerful. One of the new features available to users with complex modelling problems is

the option to spread the processing requirements over a number of different CPUs in the same PC or even over a number of separate PCs."

● More information on Aermod 6 or any of the other Breeze suit of models is available from



Trinity's UK reseller David Harvey (djh@admltd.com, Tel 01252 794484)

IN BRIEF

Allergy epidemic

Allergy has now reached 'epic proportions' says a House of Lords report on asthma. Air pollution may be to blame say the MPs.

They explain: "Treatment is a significant cost to the NHS. The burden of allergy is borne by the allergic individual on a daily basis, but the social and economic cost extends across the whole nation."

"Since the late 1950s, the incidence of allergy in developed countries has risen steadily. In the UK incidence has trebled in the last 20 years to become one of the highest in the world with about a third of the population developing allergy symptoms at some point in their lives. Although many hypotheses are proposed, the true reason for the allergy epidemic in the westernised world has yet to be found."

The committee looked at various possible causes of the increase in asthma including diet, tobacco smoke and air pollution. On air pollution it concluded: "As climate change and air pollution may significantly impact on the development of allergic disease, we support the thrust of the recommendations in the Air Quality Expert Group's *Air quality and climate change* report. We recommend that when developing policy for industry, transport or housing, the Government should take into account of the interlinkages between air quality, climate change and human health."

● *Allergy*: House of Lords Science and Technology Committee report website www.publications.parliament.uk/pa/ld/ldscstech.htm

Low Carbon Vehicles

£20m of funding has been agreed to support 'near to market' low carbon vehicle research, development and demonstration projects for public and private use.

● Details of the competition on the *Low Carbon Vehicles Innovation Platform* can be found on www.technologyprogramme.org.uk

IN BRIEF

Breckland no laggard

Breckland Council claims it has satisfied Defra that it is making satisfactory progress on its action plan.

Breckland was included in a list of action plan laggards released by Defra in summer (*AQB August p6*). But the list failed to reflect action taken by Breckland, the council says.

Breckland's Zandra Waterford told *AQB*: "From the time we had to declare an AQMA for PM₁₀ in our very rural area, we made it clear to Defra that we felt it was not necessary to produce an action plan as our declarations were based on two meteorologically bad years during which PM₁₀ concentrations were elevated.

"Having no obvious source of PM₁₀ within Breckland, or our Norfolk neighbouring local authorities, and the fact that we have not exceeded the permitted number of exceedences after 2004, it seemed a waste of time to produce the action plan – and Defra appears to have accepted this provided we back this up with a further two years of monitoring results."

Iapsc date agreed

Iapsc's second conference of the year will take place in Birmingham on Monday 3rd December.

Topics will include action plans, and NO₂ diffusion tubes for local air quality management.

● www.iapsc.org.uk

HPA looks at kids

The Health Protection Agency has published a report summarising current initiatives which address children and young people's environment and health issues in the UK.

It focuses on issues such as exposure to UV rays, obesity and air pollution. It says there appears to be a lack of research activities on the effects of air pollution and children's health.

● *Publications for the children's environment and health action plan for Europe*
www.hpa.org.uk/chemicals/publications/cehape/index.htm

NEWS FROM LAST MONTH'S DISPERSION MODEL USERS GROUP MEETING

Inspire: new duty to publish

A little known European directive will force authorities to publish information they have collected on issues such as air quality and noise.

The INSPIRE directive cleared Europe in May this year and has yet to be transposed into UK regulations. While it will not place any new duty on public authorities to collect new information, it will place a duty on them to release data they have collected.

For air quality, this includes monitored and modelled data which will have to be presented in standardised formats – which could include the need to present area data in interactive contour map form. This will have obvious implications for authorities that currently make money out of developers by charging for data.

Speaking at the Dispersion Model User Group meeting held in London last month, Bureau Veritas's Ana Grossinho told the audience: "The Inspire directive sees a move to electronic reporting based on a shared information system within the Inspire framework and we will

need to do quite a lot on this."

Inspire (Infrastructure for Spatial Information in the European Community) aims to:

- Ensure that spatial data are stored, made available and maintained at the most appropriate level;
- That it is possible to combine spatial data from different sources across the Community in a consistent way and share them between several users and applications;
- That it is possible for spatial data collected by one level of public authority to be shared with others;
- That it is easy to locate available spatial data, to evaluate their suitability for the purpose and to know the conditions applicable to their use.

Grossinho emphasised that information will need to be presented in a harmonised mapping form and showed examples of the varied nature of current air quality information sources. "We need to create a harmonised set of rules for collating, reporting and precise dissemination purposes. There

are prototyping opportunities for those willing to participate in current- and near-future European calls to set up air quality and Inspire related initiatives."

Editor's comment: While air quality is years ahead of noise in terms of action, noise may well have many lessons for air quality on presentation of data. Europe has demanded that member states map noise and present the data, and this has led to development of user-friendly noise maps that can be interrogated by the public. Just last month Scotland published its maps in a Google-maps style interface (www.scottishnoise.mapping.org).

It is worth looking at such sites as the public will expect to be able to plug in a postcode, and see what air quality they are exposed to, and whether they are in an air quality management area.

If the noise side is anything to go by, it will be hard for member states to agree a common format that is much more than the lowest common denominator.

Airtext aimed to cut London deaths

Cerc's Iarla Kilbane-Dawe told the DMUG conference how London's *Airtext* air pollution text forecasting service is put together.

Airtext was launched across many London boroughs (and Slough) earlier this year and provides a service alerting vulnerable people to days of poor air quality, rather like *SussexAir's* air alert system (*AQB February p2*).

Cerc provides the modelling expertise used by the *Airtext* system, which uses European satellite data, monitoring data and weather forecasts to predict street level air pollution a day in advance. Data is presented on an internet map as well as being distributed by telephone.

Kilbane-Dawe said: "In London alone, 1,000 people die early every year because of air quality, compare that to the 300 that die in road traffic accidents.

"We wanted a service targeted at the vulnerable. Currently most forecasts are provided by specialists and communicated

via mass media that do not understand it. They interpret the data, invariably either burying it or sensationalising it despite the fact that many people have high level of concerns. Unless the public understand the information, then they are not being given the opportunity to modify their behaviour. We can bypass national media and communicate directly via SMS, voice alerts or email."

Cerc, like AEA's forecasters, have found difficulties in getting it right. Kilbane-Dawe says: "We have had 65 episodes that should have been forecasted. We issued 23 alerts, of which 22 were correct. This is a major underestimation." He said forecasting procedures had now been updated and expected to improve performance, in particular solving the problem of the model underestimating release of VOCs. "Our traffic model is too simple – for instance while it copes with weekends and weekdays, it does not predict holiday periods

when there is less traffic so less NO_x around to absorb ozone."

Provisional results for the stage two improved forecasting suggests forecast accuracy has crept up from 33% to 63% with 25 out of 26 forecast events proving correct. 75% forecast accuracy is considered possible, but such accuracy could lead to more false alerts.

A survey of 200 users (from the current 1,200 users) was carried out. Half are asthmatic, 25% have COPD (wheeze) and 20% multiple illnesses. "97% said they really liked the service, and 80% reported changing their behaviour on receipt of an alert, this is quite an extraordinary outcome and amounts to a very powerful medical intervention."

He recounted one user's comments: "Texts help me immensely as my heart and lung condition has worsened and my exercise tolerance is very poor. So thank you for the continuing hard work and keeping people like myself informed."

NEWS FROM LAST MONTH'S DISPERSION MODEL USERS GROUP MEETING

Don't bother with models?

Local authorities need not bother with complicated dispersion models if comparisons carried out by Bureau Veritas are to be believed.

Speaking to the DMUG conference held in London last week, Bureau Veritas's Lakhu Luhana reported back from a comparison of different air quality dispersion techniques used to support local air quality management requirements. The complicated ADMS model proved to be little better than simple screening methods.

Two authorities with air quality management areas were studied – Bridgnorth (a 'typical town) and Daventry (a typically rural location). Each have monitored their areas with NO₂ tubes, and these monitoring results were compared with dispersion modelling carried out with DMRB (with recent NO_x-NO₂ update), the Dutch CAR (2007 version) method and ADMS (Roads, version 2).

Bridgnorth is a Shropshire market town with 12,000 inhabitants with street canyons and exceedences of NO₂ based on local traffic. A small AQMA has been tightly drawn up near to a busy junction in the town.

By contrast Daventry has declared Hayhog Farm which is one of the few farm houses within 100m of the M1 motorway which carries 110,000 vehicles per day, of which more than 20% are trucks.

The house has been declared an AQMA based on NO₂ exceedences. DMRB modelling treated the motorway as a single road in one run, and as two

separate roads (each carriageway being treated as a single road) in another run.

In the analysis carried out by Luhana, ADMS correctly predicted five out of nine exceedences/non-exceedences, CAR correctly predicted eight out of nine and DMRB five out of nine with the M1 treated as one link, and six out of nine when treated as two links (see table below).

Luhana summarised the results:

- Detailed model ADMS-Roads has performed well in both the assessment areas. However, in many instances its performance indices are slightly lower than the simple models

- Dutch simple model CAR has performed quite well in both the areas

- DMRB has performed well in Bridgnorth. However, at Haythog Farm DMRB didn't perform well if M1 is used as a single link. Using M1 as two separate links improved the performance of DMRB

"This exercise shows that simple models also have performed well for the assessment for long-term average NO₂ concentrations. Local authorities that are under

resource constraints could use these simple models for routine air quality assessments for LAQM purposes," she concluded.

David Carruthers of Cerc, developer of ADMS, told *AQB*: "Experience has taught us never to draw detailed conclusions from model comparisons with diffusion tube measurements. They are suitable for a broad indication of concentration patterns (ie where hotspots are etc) but not for coming to conclusions about models (unless they are very bad). Also note the road geometries were quite simple where simpler models might be expected to perform at their best.

"As regards local air quality management, more complex models like ADMS-Roads have other attributes, for example you can look in detail at the effects of changes in fleet mix on pollutant concentrations and easily allow for different primary NO₂ fractions on different road segments etc. Also just because a model has more complex algorithms it does not mean it is more time consuming to use; DMRB studies can be quite labour intensive."

Model performance: exceedences in Bridgnorth

Site no.	Modelled prediction		DMRB	actual tube result
	ADMS	CAR		
1	36.1	32.6	34.3	42.0
2	43.3	42.2	48.0	45.6
3	33.2	32.8	39.7	42.2
4	33.8	34.6	40.5	28.3
5	38.1	38.8	41.8	39.7
6	41.0	43.3	51.9	33.4
7	36.8	45.4	58.7	54.2

● = fail ● = pass

MODELLING

Climate could alter emissions, DMUG told

Andrew Malby of Lancaster University told the DMUG conference that climate change could change assumptions about exceedences from industrial stacks.

Much has been talked about the impact of climate change on air quality, but little has been done on the more local impact

of climate change on industrial stack emissions. Lancaster University and Environment Agency wanted to clarify what impacts might be seen under current climate predictions.

Malby told the conference: "We find that a small number of dispersion conditions give a very high number of local

impacts. Permits and management controls are tailored accordingly.

"Expected changes in climate and dispersion may change and alter impacts. We are keen that installations that currently comply are 'climate proofed' so they continue to comply in the future."

IN BRIEF

Ship emissions mapped

AEA's Chris Dore told the DMUG conference about efforts to improve knowledge of UK shipping emissions.

The UK shipping emissions inventory is being redone to a finer resolution (5km x 5km) and updated emissions factors. Research is being carried out to compare emissions by fuel and by movement, comparing results with those from other countries, and looking at using the comprehensive and expensive Lloyds Shipping Register as a tool for estimating emissions (Lloyds logs every ship movement and sells the information at a premium).

Dore said: "A lot of this is quite new and will deliver to the modelling community the information they need."

Free car checks

Middlesbrough is carrying out a series of free car emissions checks.

The council was one of the handful that carried out roadside emission testing a few years ago before DfT funding was withdrawn. Most authorities have now halted the checks.

The council hopes that motorists will use the free tests to check whether their engine is working efficiently and subsequently improve air quality. Advice is given to owners of failed vehicles.

Vintage paint scheme

Old fashioned high VOC paint is set to be retained for use by specialist restorers.

Restorers need high gloss, high VOC paint which is disallowed under new solvents regulations. But in a new consultation, the UK Government might introduce a derogation for the paint provided it is administered through a licensing scheme.

Licenses could cost up to £69 for individuals and up to £198 for companies in a scheme run by local authorities (SEPA in Scotland).

- www.defra.gov.uk/corporate/consult/paint-buildings-vehicles/index.htm

IN BRIEF

CO₂ locally...

AEA has released a report commissioned by Defra that provides "nationally consistent" carbon dioxide emission estimates at local authority and regional level for the year 2004.

● *Local and regional CO₂ emissions estimates for 2004 for the UK* can be viewed on www.airquality.co.uk/archive/reports/list.php

...and nationally

This report presents estimates of greenhouse gas emission inventories for England, Scotland, Wales and Northern Ireland for the years 1990, 1995, 1998 to 2005.

● *Greenhouse Gas Inventories for England, Scotland, Wales and Northern Ireland: 1990-2005* can be viewed on www.airquality.co.uk/archive/reports/list.php

Team tip off

King's College London ERG has launched an automatic notification service that will warn site operators when their Teom or FDMS filter needs changing.

Its MONNET data collection system automatically monitors the loading of each Teom and FDMS filter in the networks it manages. MONNET also predicts the date when filter loading will reach 90% and the filter needs to be changed. Once the filter loading reaches 80% (85% for FDMS and PM_{2.5} Teoms), MONNET will email the site operator, telling them the expected date that the filter will reach 90%.

This will typically provide three to five days warning for roadside sites and slightly longer for sites in background locations. If the filter hasn't been changed after three days, a reminder email will be sent. ERG hopes that this information will allow site operators to more effectively juggle their site visits and their other work demands. In this way it is hoped to reduce data loss due to overloaded filters.

● www.londonair.org.uk

MONITORING

Further probe on NO_x paint

Camden is undertaking a further trial to investigate the efficiency of NO_x reducing paint. It already has trialed NO_x reducing paving which suggested a 20% cut (*AQB April p5*).

A wall at an enclosed area at Central Saint Martins College will be partially painted with photocatalytic paint and a monitoring station with two NO_x analysers will monitor the air 10cm and 1.5m respectively from the painted wall.

Meteorological sensors will also monitor the impact of prevailing weather conditions.

The NO_x reducing paint contains titanium dioxide (TiO₂), which is a strong

photocatalyst that breaks down NO_x into nitrates in the presence of sunlight and water vapour.

To measure the difference in air quality the site will collect one year's data before the wall is painted and compare it with a year's data after the paint has been applied.

The site has been chosen for its location in the heart of Camden's busy commercial district, inside the congestion charge zone. It therefore experiences high NO_x concentrations with low dispersion conditions. These are the optimum conditions under which the paint should work.

The City of London carried out a similar study in 2006 but



NO_x benefits are elusive

for a shorter period of time and measurements were carried out further away from the wall (approximately 5m). That study found no identifiable effect of the paint.

VEHICLE EMISSIONS

Taxi clean up upheld by court

The Royal Courts of Justice has rejected calls by the London Cab Drivers' Club for a judicial review of the Public Carriage Office's implementation of the London Mayor's taxi emissions strategy.

The court awarded full costs to the Public Carriage Office, and commented that its implementation of the emissions strategy was entirely reasonable. The Mayor has asked the carriage office to implement an emissions strategy to ensure all

taxis meet Euro III standards by June 2008

Ken Livingstone, Mayor of London, said: "This is a great victory in the effort to clean up London's environment by tackling pollution. The London Cab Drivers' Club are a small, unrepresentative group of taxi drivers who have long been opposed to my strategy to improve London's air quality.

"Making London's taxi fleet cleaner and greener can only be good news for everyone who

lives in, works in or visits London – not least cab drivers themselves, who are among those most exposed to pollution from road vehicles."

The Public Carriage Office has approved several different emission reducing technologies to cut PM₁₀ and NO_x which cost about £2,500 to fit. Since April 2005, a 20p environmental surcharge has been added to the minimum fare to help owners meet the cost of fitting this technology to their vehicles.

REGULATION

Agency price rise less than inflation

The Environment Agency is consulting on its annual price hike for environmental permits. It is also consulting on new standardised waste permits.

For environmental permitting (replacing waste management licensing and Pollution Prevention and Control), EU Emissions Trading Scheme (EU ETS) and Integrated Pollution Control, the agency says that despite inflation and new regulatory duties pushing up Agency costs by 4.7%, charges will increase by 3.4%, below the 3.8% rate of inflation.

The Environment Agency is also consulting on whether the proposed Standard Permit system correctly identify the risks associated with a range of

waste management activities. The permits are intended to provide a quicker, easier and more cost-effective regulation but some local authorities fear that it will be harder to force waste firms to cut dust nuisance.

Under the proposed system, Pollution Prevention and Control (PPC) and Waste Management Licensing (WML) will be streamlined into the one regime – Environmental Permitting. This first consultation covers 28 low- to medium-risk operations that currently require a waste management licence, such as waste transfer stations, compost sites, civic amenity sites and mobile remediation plants.

● The consultation can be seen on www.environment-agency.gov.uk

IPPC news

Guidance has been produced for the ceramics sector.

Meanwhile a final consultation has been launched guidance for the organic solvents sector.

● *Final publication of IPPC SG 7: Secretary of State's guidance for the A2 ceramics sector including heavy clay, refractories, calcining clay and whiteware* and *Consultation on a draft second edition of IPPC SG6 for A2 activities in the solvents sector* can be viewed on www.defra.gov.uk/environment/ppc/index.htm

PUBLIC INVOLVEMENT

Agency wins lottery with OPAL

The UK lottery is funding a huge £12m project that will take air quality and other environmental issues to the public.

OPAL – The OPen Air Laboratory – won its £11.75m bid to the *Changing Spaces* programme of the Big Lottery Fund. The Environment Agency will play a key part in the programme, which will also involve many universities and research organisations, to reach over half a million people in the five years it will run.

The OPAL project bid was hosted by Imperial College London which is the home of the APRIL research network (Air Pollution Research in London). APRIL has various topic-driven sub-committees and the Natural Environment group has the lead on the OPAL bid.

OPAL consists of a number of co-ordinated individual projects to research all parts of the environment, e.g. how air quality is affecting plants; how soil and water quality affect their inhabitants.

They will be developed at a national level and rolled out to local people at a regional level with lead universities and researchers identified for every region.

Local people will be provided with up-to-date techniques to feed data into a self-generating local/national state of the environment report. Obvious deficiencies in the local environments will become

apparent and local buy-in can then push for solutions, says the organisers.

The programme will draw on the skills of some of the UK's leading environmental scientists and conservationists who will act as mentors for an innovative programme of community-based activities. The objective is to provide 'toolkits' containing everything communities will need to contribute to locally-based projects on biodiversity, pollution and climate change and to make them widely accessible.

Particular projects include:

- Air pollutants and nitrogen deposition along the Tyne corridor;
- Community-based mapping of pollution and biodiversity in the Yorkshire and Humberside region;
- Tracking pollution plumes from the major coal-fired power stations; mapping air pollution in inner city and industrial communities; developing environmental histories of industrial areas; using small mammals and amphibians as bio-indicators of contaminated land; assessing lichen re-invasion of areas with high historical levels of air pollution;
- Determine the extent to which the fertility of heathland soils in the East Midlands has been elevated by nitrogen deposition;
- Investigate recovery of heathland lichen communities from historical pollution.
- Evaluating the effects of

traffic-derived pollution on urban and rural green spaces in south east England;

- This will involve initially quantify the inputs of traffic-derived pollution to representative green spaces in a single urban area. Also use chemical and biological monitors to evaluate the extent to which ambient pollution is affecting the local environment, examine the potential to reduce the effects of air pollution in these areas, extend this to include other major towns and cities in south east England, and evaluate the extent to which the dense network of roads in the region is responsible for pollution effects on adjacent areas of conservation value;
- Effects of urban pollution on diversity and plant growth in Plymouth and the surrounding areas;
- Monitor diversity by comparing the inner city allotment site with a gradient of less polluted nursery and woodland in & around Dartmoor National Park;
- Detailed analysis of road pollution effects on tree saplings by looking at a transect across the Plymouth site;
- Controlled exposure of selected plant communities to air pollutants;
- Investigate the effects of elevated nitrogen deposition and effects of vehicle exhaust emissions on plant community performance and key ecosystem processes.
- www.biglotteryfund.org.uk

REGULATION

Good and bad in Agency end of year report

The Environment Agency reports good and bad outcomes in its summary of its activities in 2006.

Key findings from the latest 'Spotlight' report include:

- Since 2000, Agency regulated sites have reduced releases of most air pollutants, including lead by 41 per cent and sulphur dioxide by 50 per cent.
- NOx emissions remain unchanged, largely because of the increased economic output

of power stations and some metals manufacturers.

- Greenhouse gases are starting to creep up. Levels of these gases had decreased by 16.8 per cent since 1990, but in 2006 rose slightly meaning the sectors it regulates now account for over 34% of all of the UK's greenhouse gases.

Barbara Young, Chief Executive of the Environment Agency, said: "Penalties for environmental crime still aren't harsh enough. Some fines can

be as low as a thousandth of a per cent of a company's worth and despite the higher penalties, the average fine was still only £11,800. The law is there to protect our environment and so those businesses and individuals who think they can cut corners best watch out – we won't tolerate it."

- A copy of *Spotlight 2006* is available online at www.environment-agency.gov.uk/spotlight or by calling us it 08708 506 506.

IN BRIEF

Diffusion tube update

The air quality helpdesk has announced a revision to the diffusion tube database

The database, last updated in March, contains corrections to be used by tube users in a bid to standardise results.

- The updated database can be downloaded from www.uwe.ac.uk/aqm/review/diffusiontube300907.xls

Rushlight call

A new environmental award scheme will close for entries on 31 October 2007

The inaugural Rushlight Awards have been launched to promote and celebrate the leading environmental technology and innovation by organisations throughout UK and Ireland. There are 22 separate categories including air quality, noise, and contaminated land.

Organisers are looking for a technology or innovation relevant to the various categories. They are offering a 20% discount off the entry fee and a money back guarantee "if you do not gain from the experience".

- More details on website www.rushlightawards.co.uk

Green driving boost

The DfT is providing an extra £1.2million to train van drivers in greener, safer driving techniques.

The Safe and Fuel Efficient Drivers (SAFED) scheme aims to encourage driving techniques that save fuel, cutting costs, CO₂ and polluting emissions. Since its launch, the Department for Transport has invested nearly £2.2million in the scheme.

Drivers who completed the training found they achieved an average 16% improvement in miles per gallon, giving a potential annual fuel saving of £3.3million and CO₂ emissions reduction of 9,350 tonnes, equivalent to an average of £425 for each van driver and a reduction for CO₂ emissions of around 1.2 tonnes.

- More details of the competition can be found at www.safed.org.uk

R&A process under scrutiny

Ostensibly a review of the helpdesks – a survey of local authorities gives an insight into the success and failure of the process itself. First the review and assessment process ...

An evaluation of the local authority air quality review and assessment helpdesk has provided a down-to-earth snapshot of 'real life' in local authorities.

Defra last month published the three year review of the helpdesk, which is run by the University of the West of England and Air Quality Consultants. It showed that local authorities were broadly happy with both the helpdesk, and the entire review and assessment process. Good and bad feedback from over 100 local authorities is included in the review.

The helpdesk fields enquiries from UK authorities on behalf of Defra and the devolved regions, and marks air quality screening, detailed and further assessment reports. The evaluation covers the period from 2004 to 2007.

The review and assessment helpdesk was generally praised, the majority of respondents (86%) found the review and assessment process 'just about right' while 13% of respondents considered the process to be 'too complex'.

29% of respondents felt that the review and assessment system assisted them 'a lot' in providing them with more resources to deal with air quality (42% stated 'a little' while 30% stated 'not at all').

Again, the majority of respondents felt the process had helped 'a little' to incorporate air quality into the planning process, although only 12% felt this had been by 'a lot', and a substantial 20% felt it had not helped in this regard. This suggests that there is still work to be done to incorporate air quality considerations into the planning process within local authorities.

When considering what aspects of the process could be dropped, two main themes emerged including the exclusion of repetitive reporting on less problematic pollutants such as carbon monoxide, 1,3-butadiene and lead and readdressing the frequency of the review and assessment reports.

Recommendations stemming from the evaluation are as follows:

- Review and assessment report appraisal techniques: The use of direct contact between the appraiser and the local authority to clarify specific issues has been standard practice since 2004. It has been well received by the local authorities and appraisers alike, and should therefore be continued.

Defra and the Devolved Administrations will be informed of all future correspondence between the appraiser and

the local authority to ensure that they may maintain familiarity with air quality management at a local level. This will ensure that Government is aware of, and understands more fully, local air quality issues and can address them subsequently through any policy and technical development undertaken;

- Report tracking: Upon receipt of a report from a local authority, Defra and the Devolved Administrations should send the authority confirmation of receipt and an expected time scale for an appraisal response (i.e. 4-5 weeks);

- Helpdesk website: It is recommended that the review and assessment website is professionally redesigned, for instance including a search facility for the frequently asked questions on the site;

- Reporting timescales: It is recommended that the reporting timescales for the review and assessment process remain as they are rather than adopting the same timescales as local transport plans;

- Restructuring of the updating and screening assessment (USA) process: The potential for restructuring the USA process to a source-based rather than pollutant based approach should be investigated further when the Technical Guidance (TG(03) is updated in 2007.

If, for example, a particular local authority has no new industrial processes either in its area, or impacting on its area, it does not need to repeat the statement for each pollutant for which industrial processes may be an issue.

Where the local authority does have a new industrial process, it can then screen those pollutants for which the source may be an issue. Likewise, for traffic related sources, particular source types could be considered initially, and then screened by pollutants likely to be an issue. Therefore local authorities would not need to investigate the 'minor' pollutants explicitly, but still include a screening implicitly;

- When the technical guidance for review and assessment is updated in 2007, consideration should be given to:

- Inclusion of all relevant graphs, nomograms, checklists etc. in chapters rather than appendices;

- Integrating progress report and further assessment guidance into the general technical guidance document;

- Updating the policy guidance to take account of updates in advice on planning, transport planning and air quality action Plans;

- The need to make technical guidance available on-line in a more user-friendly way (searchable online document, ensuring that PDF documents are fully bookmarked and internally hyperlinked etc.); and

- The provision of a short document outlining the guiding principles of local air quality management aimed at new local authority officers, planners, transport planners etc.

- LAQM training for local authorities: Defra and the Devolved Administrations should consider supporting an annual LAQM training package offered to local authorities;

- The updated technical guidance to be prepared in 2007, plus the provision of any training for local authority officers, should emphasise the need for local authorities to take full ownership of any reports prepared for them by consultants;

- LAQM support helpdesks: Defra and the Devolved Administrations should publicly clarify the remit of the LAQM support helpdesks (LA support, review and assessment and action planning). There should be regular inter-helpdesk correspondence to ensure that consistent, non-contradictory advice is provided to local authorities;

- Defra and the Devolved Administrations should consider encouraging closer links between air quality and climate change policies when updating the LAQM Policy and technical guidance documents.

More assistance could be provided to local authorities through the expansion of the helpdesk as a portal to provide climate change information for local authorities. This could be in the form of a substantial climate change presence on the review and assessment website to include links to existing climate change information sources for local authorities;

- The potential for the inclusion of the additional information requested in LAQM *Policy guidance: Addendum (LAQM.PGA(05))*: as a minimum requirement in future LAQM reporting procedures and the provision of guidance on collating this information should be investigated further when the technical and policy guidance is updated in 2007.

The two evaluation reports can be viewed at at www.defra.gov.uk/environment/airquality/local/eval/ss-review.htm and www.defra.gov.uk/environment/airquality/local/eval/actionplan-nov06.htm.

... and evaluation of the planning helpdesk

A similar exercise has been carried out on the planning helpdesk. Recommendations have been made, and comments gathered on the working of the helpdesk, which has recently changed hands from Bureau Veritas to AEA (see news, page 1).

Successes ...

The review identified that the following aspects of action planning worked well:

- Action planning guidance documents and frequently asked questions have generally been found to be clear and very useful to local authorities in drawing up their action plans;
- Successful partnership working with internal departments and neighbouring authorities, through establishment of local and regional air quality steering groups.

This has encouraged authorities to work together to tackle air pollution problems;

- Increased awareness of air quality issues through air quality action plan development and consultation. This is notably the case within local authorities where closer relationships have been developed with planning and development control departments and the authority has subsequently set down Supplementary Planning Guidance on air quality issues;
- Successful partnership working with external organisations for many authorities on action plan measures. This has been highlighted in the evaluation questionnaire responses, notably with respect to joint working with the Environment Agency on industrial AQMA action plans;
- Successful implementation of action plan measures which will work towards the achievement of air quality objectives. This should improve through the integration of action plans into local transport plans (where local road traffic has been identified as the main emission source).

... and 'constraints'

The evaluation also noted where action planning process didn't work well:

- Where action plan measures lie substantially within the remit of an external organisation, there have been some difficulties encountered by some local authorities in engaging these organisations in the action planning process. Differing priorities can make it difficult to elevate air quality considerations on the political agenda;
- Timescales for local air quality management differ to those for submission of local transport plans. This hindered action plan integration into the local transport plans in many cases;
- Difficulties expressed by local authorities in undertaking the impact assessment and cost-effectiveness element of the action plan;
- Lack of expertise in-house, resources and time.

Based on this feedback, the evaluation

report made a series of recommendations:

- Provide additional guidance to local authorities on what is required for the assessment of air quality impacts and cost-effectiveness.

This could take the form of further examples of best practice and consideration to impacts and costs of schemes that have been successfully quantified. A large number of local authorities have not clearly understood what is required of them for these elements of the action planning process;

- Provide guidance aimed specifically at local authorities in the devolved administrations, to reflect differences in the action plan process and priorities.

This could take the form of frequently asked questions and further examples of best practice specific to authorities in Wales and Northern Ireland. A position statement for the road management units in Wales and Northern Ireland (similar to that by the Highways Agency in England) would help;

- Provide further advice on air quality action plan/local transport plan integration where timescales are out of alignment.

This could also take the form of frequently asked questions, once further information on DfT reporting requirements for LTPs becomes available. A further evaluation of the integration of action plans into the second round LTP in 2008/2009 is also recommended;

- Provision of examples on what action plan measures have been successfully implemented to improve air quality, perhaps as a new section on the website, reflecting the outcome of progress reports;
- Provide further advice on the consultation process for action planning eg. setting up workshops. This could take the form of frequently asked questions and further examples of best practice eg. through the Beacon scheme;
- More frequent action plan helpdesk website updates of frequently asked questions and a 'news' section. The 'news' section could include updates from conferences and the regional co-ordinators meetings relevant to action planning;
- Provide local authorities with notification when the helpdesk website has been updated;
- Provide additional examples of best practice on working between local authorities and external organisations (e.g. the Highways Agency). These could be drawn from existing action plans;
- Ensure all authorities have access to the Highways Agency spreadsheet updates on actions being undertaken within motorway/trunk road air quality management areas;
- Provide additional guidance to local authorities regarding the timescales for submission of final plans for appraisal, following the draft appraisal commentary, and the need to submit prior to final adoption by the authority;

- Ensure that there is a consistent approach to review of action plans by authorities to take on board the significant policy changes with respect to local transport plans and where implementation timescales for measures have now largely been completed.

This is especially relevant for older action plans, which may now be outdated and less relevant, where the opportunities through these policy changes were not available. This could take the form of the issue of further guidance to local authorities through frequently asked questions and a review of older plans by the appraisal team to check current relevance.

As with the evaluation on the review and assessment helpdesk, the evaluation of the action planning helpdesk involved a local authority survey which questioned authorities on the action planning process. Answers provide a very useful snapshot of how local authorities are finding the process. Notable findings are that the lifetime of action plans has been found to vary quite considerably, with many action plans having shorter term implementation targets of up to five years (41%).

This has largely been due to action plan measures being focused on delivering the air quality objectives by the required target dates (2004/2005) (most notably found in early action plans). The remaining local authorities included longer term implementation targets of 5-10 years (37%) and more than 10 years (22%).

On the integration of action plans into local transport plans, 30% of English local authorities stated that they had formally integrated their air quality action plans into the local transport plan. Three London boroughs had integrated their action plan into their local implementation plan. It follows that over two thirds of authorities have not formally integrated their action plans into LTPs. Reasons cited include:

- The timing did not allow its inclusion;
- The LTP authority wished only to deal with the air quality shared priority and not formally integrate the district authority action plans into the LTP;
- The action plan included other local authority measures outside of the scope of local transport (ie. motorways or industrial emissions) and thus beyond that of the LTP;
- The AQMA declaration related solely to a motorway/trunk road or a non-transport source.

Six local authorities rated as "excellent" under the Comprehensive Performance Assessment responded to the consultation exercise. All but one authority had chosen to voluntarily produce an action plan (for London boroughs an obligation to submit an action plan still exists).

When asked what benefits/constraints had been put on authorities that had not produced an action plan, this particular authority had found that the process had been allowed to drift and officer time had been dedicated elsewhere.

SCIENCE SHORTS

Susceptibility studied

A US study has looked at the impact of pollution on susceptible groups.

Data from four million cardiovascular hospital visits to 31 hospitals in Atlanta, Georgia between 1993 and 2000 were compared to ambient pollution levels.

The findings provided evidence of increased susceptibility to heart attack events associated with air pollution for those with high blood pressure, diabetes and COPD (wheeze).

Ambient air pollution and cardiovascular emergency department visits in potentially sensitive groups, Jennifer Peel et al, *American Journal of Epidemiology*, 2007, Vol. 165, pp625-633.

Desert dust

Spanish researchers have proposed a method of calculating the proportion of dust that can be attributed to natural sources such as Saharan dust storms.

The calculation is important as member states can reduce their apparent exceedences by claiming that those exceedences were caused by natural events such as Saharan dust storms.

A methodology for the quantification of the net African dust load in air quality monitoring networks, M Escudero et al, *Atmospheric Environment* Vol. 41 (2007) pp5516-5524.

Biodiesel emissions

US researchers have studied tailpipe emissions of vehicles using biodiesel.

In what is claimed to be one of the largest studies of biodiesel in on and off road applications with various vehicles including medium duty trucks, Humvees, a heavy truck, a bus, back up generators, a forklift and an airport tow vehicle, higher biodiesel blends showed a tendency for higher hydrocarbon and carbon monoxide emissions but lower particulate emissions.

Regulated emissions from biodiesel fuels from on/off road applications, Thomas Durbin et al, *Atmospheric Environment* Vol. 41 (2007) pp5647-5658.

GESTATION

Low birth weight found in US

Researchers have found that pollution in the US is likely to reduce birthweight.

Studies elsewhere in the world have found the effect, the researchers were keen to see if it could be replicated elsewhere.

Birth weights of nearly 400,000 babies born in Massachusetts and Connecticut between 1999 and 2002 were compared to concentrations of PM₁₀, PM_{2.5}, sulphur dioxide,

nitrogen dioxide and carbon monoxide.

Researchers found: "An interquartile increase in gestational exposure to NO₂, CO, PM₁₀ and PM_{2.5} lowered birth weight by 8.9g, 16.2g, 8.2g and 14.7g respectively. Lower birth weight was associated with exposure in the third trimester for PM₁₀, for the first and third trimesters for CO, the first trimester for NO₂ and SO₂, and the second and

third trimesters for PM_{2.5}.

Average air quality concentrations were below US objective levels, suggesting that even where complying with standards, pollution can still affect birthweight.

Ambient air pollution and low birth weight in Connecticut and Massachusetts, Michelle Ball et al, *Environmental Health Perspectives*, Vol. 115, no 7, July 2007, pp1118-1125.

RESPIRATION

Fine particles blamed for baby wheeze

Seattle researchers say that fine particles can prompt bronchiolitis.

Bronchiolitis occurs when small airways in the lungs called the bronchioles become infected and inflamed, leading to a build-up of mucus. Studies to date have tended to focus on respiratory impacts on children rather than infants under two.

Children admitted to hospital

in California with bronchiolitis were studied with estimates derived for their air pollution exposures (a month prior to hospitalisation and mean lifetime exposure).

Of the pollutants studied, only PM_{2.5} was associated with an increase in bronchiolitis hospitalisation (a 9% increase in risk per 10µg/m³ rise in PM_{2.5}). Researchers added: "These

unique data suggest that infant bronchiolitis may be added to the list of adverse effects of PM_{2.5} exposure at levels below current regulatory limits."

Effects of sub chronic and chronic exposure to ambient air pollutants on infant bronchiolitis, Catherine Karr et al, *American Journal of Epidemiology*, 2007, Vol. 165, pp553-560.

INDUSTRIAL POLLUTION

Copper smelter strike cuts health impacts

A retrospective study of a strike of copper smelter works has shown that during the strike shutdown, there was a health improvement.

The nine month strike took place in 1968 and led to the closure of a number of smelter plants. During the 1960s, copper smelters accounted for 90% of sulphate emissions in four south west states, these

concentrations dropped by 60% during the strike, and visibility improved. Researchers have delved through records of deaths during that period and estimated that the reduction in pollution led to a 2.5% reduction in mortality.

Researchers said: "The results of this study add to the growing body of evidence that ambient sulphate particulate matter and

related air pollution are associated with human health effects and that the reduction in this pollution can reduce mortality."

Mortality effects of a copper smelter strike and reduced ambient sulphate particulate matter air pollution, C Arden Pope et al, *Environmental Health Perspectives*, Vol. 115, no 5, May 2007 pp679-683.

GENETICS

Ultrafines lead to DNA damage

Danish researchers have found that ultrafine particles can cause oxidative stress and damage to DNA. Such damage can lead to increased susceptibility to cancer.

29 healthy volunteers were subjected to particles in a chamber study, some with exercise, some without.

Researchers said: "Exposure to ultrafine particles for six and 24 hours respectively increased

the levels of DNA strand breaks and FPG sites with a further insignificant increase after exercise. There was a significant dose response relationship between number concentrations and DNA damage, with the 57 nanometer mode as the major contributor to the effects. Simultaneous exposure to ozone, NO_x and carbon monoxide had no influence.

"The data support that ultrafine particles, mainly from diesel vehicles, cause systemic oxidative stress at exposure levels encountered in streets or in dwellings near busy roads."

Exposure to ultrafine particles from ambient air and oxidative stress-induced DNA damage, Elvira Vaclavik Brauner et al, *Environmental Health Perspectives* Vol. 115, No 8, Aug 2007 pp 1177-1182.

SCIENCE SHORTS

MONITORING

Central site monitoring flawed

A multi national study including UK experts such as Roy Harrison and Jon Ayres says central site monitors cannot properly represent exposures for health studies.

The very large international team of researchers studied continuous measurements of PM₁₀, PM_{2.5}, particle number concentration and soot concentrations at central sites in the cities of Amsterdam, Athens, Birmingham and Helsinki. The same measurements were also conducted directly outside 152 homes spread over the

metropolitan areas for a one week period.

For all particle measures, changes in concentrations over a 24 hour period matched well. Absolute concentrations levels varied substantially more within cities for number counts and coarse particles than for PM_{2.5}.

Researchers explained: "Daily average concentration measured at a central site reflected temporal variation near homes across urban areas of particle number count in every city.

"One fixed measurement site was not a good approximation

for particle number count absolute values over the wider urban area. It is virtually impossible to characterise the city average concentration of number counts at one site.

"This implies that epidemiological studies assessing health effects related to long term average exposure between cities should not rely on one central site."

Spatial variation of particle number and mass over four European cities, Arto Puustinen et al, *Atmospheric Environment*, Vol. 41, (2007) pp6622-6636.

PUBLIC HEALTH

Cancer risks ranked in the US

Various cancer risks have been ranked in an exercise carried out by US academics.

The researchers focussed on risks from hazardous organic air pollutants based on total personal exposure across different microenvironments and exposure pathways. Two different methods of assessing risks were used – the US Environmental Protection Agency method, and the Californian method.

Using the Californian unit risks, the highest ranking compounds are 1,3 butadiene, formaldehyde, benzene and dioxin, with risks of the order of one in 10,000 to one in 100,000. Using EPA unit risks,

the highest risk compounds were dioxin, benzene, formaldehyde and chloroform with risks at a similar magnitude. Particles were not included in the study, and it is accepted that if they were included, risks would rise.

Researchers elaborated: "Most of the PAHs, benzene, acetaldehyde and 1,3 butadiene came from outdoor sources, whereas indoor sources were primarily responsible for chloroform, formaldehyde and naphthalene risks. Although indoor exposures are responsible for nearly 70% of risk, when infiltration is accounted for, inhalation of outdoor sources contribute 50%

to total risk. If we consider exposures from the PAHs and dioxin in food to come from either mobile or industrial sources, then the outdoor source contribution becomes 65%.

"The risk to the general population is two orders of magnitude larger than the US EPA acceptable risk level. Including risks from highly exposed and susceptible subpopulations would increase this risk further."

Ranking cancer risks of organic hazardous air pollutants in the United States, Miranda Loh et al, *Environmental Health Perspectives* Vol. 115 No. 8 Aug 2007 pp1160-1168.

PUBLIC HEALTH

Stress leads to pollution vulnerability

Victims of violence are more susceptible to air pollution health effects, say Harvard researchers.

Exposure to violence was used as a marker of stress – the researchers postulating that those suffering stress might be more susceptible to air pollution effects.

A birth cohort of 413 children were studied, comparing nitrogen dioxide exposure levels, history of exposure to violence and asthma incidents. Researchers found that a set rise

in nitrogen dioxide (4.3ppb) led to a 63% increase in risk of assessment, with the increased risk occurring solely among those with an increased exposure to violence.

Researchers say: "Few studies have examined the influence of stress on pollution susceptibility.

"Our findings may support a theoretical model where individuals may become susceptible or 'primed' through social pathways to some environmental triggers,

including traffic related pollutants. These results agree with evidence elsewhere that chronic stress may shape biologic response in early life and potentiate effects of air pollution through common physiologic systems."

Synergistic effects of traffic related air pollution and exposure to violence on urban asthma etiology, Jane Clougherty et al, *Environmental Health Perspectives*, Vol. 115, No 8, Aug 2007, pp1140-1146.

City kids are high

Tests on children living in Mexico City have shown an increase in markers of high blood pressure.

81 children aged around eight were studied and compared with controls living outside of Mexico City. City children had higher plasma endothelin-1 and blood pressure, with association between outdoor time and cumulative levels of particulate.

Elevated plasma endothelin-1 and pulmonary arterial pressure in children exposed to air pollution, Lilian Calderon-Garciduenas et al, *Environmental Health Perspectives* Vol. 115, no 7, July 2007 p1248-1253.

Bird dust PM

Canadian researchers have estimated particulate emissions from commercial broiler house operations using real time particle analysers.

Averaged particle emissions were 0.11, 0.13 and 0.56kg per 1,000 birds per production cycle for PM₁, PM_{2.5} and PM₁₀ respectively. Across the whole year in Canada, this was 382, 472 and 2,025 tonnes respectively.

Size fractionated particulate matter emissions from a broiler house in Southern Ontario, Canada, Taylor Roumeliotis et al, *Science of the Total Environment*, Vol. 383, (2007), pp174-182.

Increased susceptibility

Elderly (above 51) residents of Oslo were studied and deaths compared to air pollution.

Death rates appeared to increase at concentrations above 40µg/m³ in the youngest age group and with a linear effect in the interval 20-60µg/m³ in the oldest. An effect of all indicators (NO₂, PM₁₀ and PM_{2.5}) was seen on cardiovascular causes, lung cancer and especially COPD (wheeze) in both age groups and sexes. Cardiovascular and cancer effects appeared to have a threshold.

Relation between concentration of air pollution and cause specific mortality: four year exposure to NO₂ and particulate matter in Oslo, Norway, Oyvind Naess et al, *American Journal of Epidemiology*, 2007, Vol. 165 pp435-443.

HOT AIR

A seasoned particle monitor man reacted with bemusement to the recent tale about 'lost mass' coming from Europe.

For the benefit of newbies, weighing a particle is riddled with difficulties and the agreed European standard ignores damaging volatiles. But what hope is there for measurement of particles in micrograms if Europe cannot agree the standard weight of a kilo?

It appears measurement of various

standard kilogram weights deposited throughout Europe differ by 50µg. Coincidentally, exactly the level of the European PM₁₀ objective.

Are the reference kilogram blocks losing their volatiles too?

The Met Office is well known for being a bit quirky and a law unto itself – many dispersion modellers mutter about the difficulties of dealing with an institution that still has the look and feel of Secret Service.

As Cerc's Iarla Kilbane-Dawe told DMUG delegates at last month's conference rather tellingly: "The PROMOTE project aims to open up access to data and services which will be independently validated. This will be something of a contrast to those familiar to the way the Met Office works. It prefers to hang on to its data."

We like the latest revamp of the Institution of Air Quality Management website, and we like it even more when we can see what air quality folk are up to in their spare time!

It reports that two members – Nikki Trought of Peter Brett Associates and Angela Spanton of Envirobods, braved the gruelling challenge of this years



Marathon modellers: Spaxton and Trought

London marathon to raise money for charity. Well done both.

The bad news was that it was the hottest race day for 11 years, the good news that the heat wasn't accompanied by pollution – the same is unlikely to be true for the forthcoming Chinese Olympics.

WHO air quality expert Michal Krzyzanowski has said spectators, let alone competitors, who were not in perfect health ought to think twice before travelling to the games because of the poor air.

But before we sneer too much, we have yet to see a London marathon take place in poor air quality. With increasingly early ozone events, we wonder whether anyone would have the confidence, or indeed authority, to stop the marathon to reduce exposure to runners and spectators if poor air was forecast?

Daly launched at Care4Air

Congratulations to Mark Daly of Sheffield, organiser of the Care4Air conference, who failed to make the conference having just delivered hours beforehand!



AIR QUALITY EVENTS 2007

2007

10th October

ADMS-URBAN & ADMS-ROADS USER GROUP

Meeting to be held in Birmingham, website www.cerc.co.uk

15-16th October

12th EIONET WORKSHOP

on air quality assessment and management to be held in Cyprus, website <http://air-climate.eionet.europa.eu>

7th November

AIR QUALITY UPDATE SEMINAR

NSCA autumn spring update seminar to be held in Birmingham, Contact Lucy Salter NSCA, 01273 878770

27th November:

ADMS 4 USER GROUP MEETING

This year's ADMS 4 User Group Meeting will be held on Tuesday 27th November at The Studio in the centre of Birmingham. www.cerc.co.uk/

3rd December

IAPSC

Investigation of Air Pollution Standing Conference meeting to be held in Austin Court, Birmingham. Sue Powditch 0870 190 6551

13-14th December

THE IMPORTANCE OF INDOOR AIR

Society for Chemical Industry conference to be held in London website <http://rsc-aamg.org/Pages/Meetings.html>

2008

21st February

NSCA SW CONFERENCE

Watershed, Central Bristol, email david.muir@bristol.gov.uk

24th January

AIR QUALITY IMPACT ASSESSMENT

EMAQ seminar to be held in Birmingham www.emaq.aeat.com

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