

AIR QUALITY

October 2009 Issue 42

BULLETIN

PLANNING

Air quality tested in court

A West Country council has taken the Government to court on air quality – and won.

In what may prove to be a landmark case, Mid Devon District Council challenged the Secretary of State after an appeal inspector ignored air quality policies in Mid Devon's supplementary planning document (SPD). The council felt this rendered its policy pointless so challenged the inspector's ruling in the High Court and won.

Mid Devon has an SPD which explicitly requires developers to take into account poor air quality found in towns such as Crediton (*AQB Sept p1*). The latest situation was prompted by an appeal for nondescript industrial units and the need for an £8,000 payment. Mid Devon's Simon

Newcombe told the Care4Air/LES conference in Sheffield: "The original refusal grounds were nothing to do with air quality, however during the appeal the inspector decided our SPD and requirement to contribute to air quality mitigation funding was not valid." The planning permission was then granted without the need to contribute to air quality, undermining the entire policy.

"In essence, having cause to dispute the inspector's decision, we decided to take the legal challenge to the High Court in an attempt to obtain an order quashing the inspector's (and by default the Secretary of State's) decision under the Town & Country Planning Act. We were successful and recouped costs."

The developer's argument was that the SPD had not been

adopted when planning permission was initially refused. However it had been adopted at the time of the appeal.

Mid Devon's SPD states that contributions are payable for any development in the wider Crediton area as they will impact on the air quality management area within the town centre. The original appeal inspector rejected this believing the payment was inappropriate as the industrial units did not have a "direct impact" on traffic elsewhere: "Imposing a condition requiring a financial contribution in this instance would be contrary to guidance in Circular 11/95."

● Mid Devon v Secretary of State for Communities and Local Government & Reliant Building Contractors Ltd, High Court claim no CO/1557/2009.

IN BRIEF

Defra pushed

Air quality campaigner Simon Birkett is increasing pressure on Defra and the London Mayor about what they intend to do on air quality.

Defra's air quality policy relies on actions set out in the Mayor's air quality strategy. But both the Western Extension to the congestion charging zone and stage three of the low emission zone are likely to be scrapped.

Birkett, of the Campaign for Clean Air in London, told *AQB* that – for eight months – he has waded through the standard and extended timetables of a freedom of information request and the formal review of the refusal to provide the information requested. "CCAL wants to know about communications between Mayor Johnson and the government in relation to air quality and the background to their meetings.

"The government has told the European Commission, in its time extension request for PM₁₀, that it expects the Mayor to replace any measures he suspends or cancels (such as Phase 3 of the low emission zone) with equal or more effective measures.

"If, however, as I suspect, Mayor Johnson has blown the government a raspberry over any such commitment or the government has had to threaten the Mayor with legal action, then the picture for the Commission is completely different. It looks like the government's plans for a time extension to comply with limit values for PM₁₀ in London are in tatters."

Birkett continued: "Most important, we need to know now whether plans to protect public health are credible or not. Having hit a brick wall, we're not giving up. CCAL has been offered pro bono help by top environmental lawyer, Gerry Facenna, and is now considering its options."

NATURAL EVENTS

Aussie smog echoes London 1950s event

A huge dust storm has enveloped eastern Australia bringing record PM₁₀ levels.

Government monitoring teams said that readings were the highest ever recorded: "On a clear day the PM₁₀ is typically 10-20µg/m³, during a bushfire we might see readings of around 300 to 500µg/m³. We now have readings hitting 15,500µg/m³. We have been operating since the 1970s and we have never experienced readings this high."

Seven years of drought have led to a slow decline in ground cover in the far west of the state and dust storms are stripping up to 10% of soil cover a year.

● www.environment.nsw.gov.au/AQMS/aqialerts.htm



PM₁₀ levels of 15,500µg/m³ were reached in New South Wales

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IN BRIEF

AURN sites fail

Eight automatic urban and rural network (AURN) monitoring sites do not meet European directive criteria and will need to be closed or relocated.

In a report for Defra, AEA reviews siting criteria of Defra-owned and affiliated sites to see whether they meet EU rules. The report states: "Of the sites identified as not being compliant, Brighton Roadside, Bristol Old Market, Great Dun Fell, London Cromwell Road 2 and Weybourne are not specifically required for Directive compliance. Bury Roadside, Sandwell West Bromwich and Leicester Centre, however, are required and so will require relocation or replacement.

● *Automatic urban & rural network: assessment of siting criteria* can be viewed on www.airquality.co.uk/archive/reports/list.php

New man at Defra

Former waste strategy guru Daniel Instone is joining Defra to look after air quality and other environment issues. Final details of his job description have yet to emerge but it is understood he will work alongside current head Martin Williams to bolster policy delivery.

NAO probe

The National Audit Office is currently carrying out a probe into air quality policy. It is due to complete a report and hand it to the Commons Environment Audit Committee later this year.

Pyrolysis questioned

A review claims that gasification, pyrolysis and plasma incinerators provide little or no benefit when compared to mass burn incinerators.

It adds: "The core impacts of all types of incinerators remain the same: they are toxic to public health, harmful to the economy, environment and climate, and undermine recycling and waste reduction programs."

● *An industry blowing smoke* www.toxicsaction.org/BlowingSmokeReport.pdf

HEALTH EFFECTS

Deaths five times higher?

Exhaustive analysis by air quality campaigner Simon Birkett has shown that London deaths due to air quality are far higher than previously thought.

Birkett, who runs Clean Air in London (CCAL), extracted previously unreleased spreadsheets off Defra using Freedom of Information laws. Birkett says the number of deaths from long term PM₁₀ may be 5,000 rather than the previously accepted figure of 1,000 a year. This figure climbs to 8,000 if Defra uses Comeap-recommended relative risks.

Birkett told *AQB*: "For many years, Londoners have been told that there were an estimated 1,031 premature deaths in London in 2005 due to PM₁₀. We submitted Freedom of Information requests to Defra and the GLA to uncover the relative risk used in the estimate."

The spreadsheets were particularly enlightening

because they confirmed that the government had used a coefficient of 0.75% per 10µg/m³ of PM₁₀ to calculate the number of premature deaths (i.e. those due only to short term exposure).

0.75 was the figure recommended by Comeap in 1998. In 2009 Comeap suggested risk estimates up to 6%, using the higher figure in the Defra model suggests 5,772 deaths a year. CCAL finds it 'extraordinary' that Defra is using thinking that is up to nine years out of date.

Birkett added: "Those wishing to improve air quality are in a communication 'battle' with those seeking delay and/or inaction. In the UK, for example, government ministers say: 'air quality is good over 99% of the UK; it has improved a lot since 1990; poor air quality has a maximum impact averaging seven to eight months across the UK population; and

the alert bands show air pollution as being mostly 'low' or moderate'."

He continued: "The reality is quite different. The UK has the worst nitrogen dioxide problem of any of the EU 27, annual mean levels of PM₁₀ in London have increased at a mean rate of around 0.4% since the late 1990s in London, a 'statistical victim' of PM₁₀ exposure may die up to 9.8 years early and air quality can be in the low band all year round but still breach EU limit values."

And CCAL is urging Mayor Johnson to apply the precautionary principle when developing his air quality strategy (currently being updated) and accept government recommendations for sensitivity analyses which suggest there may have been some 6,300 to 7,900 premature deaths in London in 2005 due to PM₁₀ alone.

● www.cleanairinlondon.org

SOCIAL EQUITY

Equal ops supplement to PM₁₀ demand

Air pollution disproportionately affects the poor, the UK government admits in its request for an extension to EU PM₁₀ deadlines.

Defra has released its racial equality impact assessment that accompanies the UK notification to the European Commission to extend the compliance deadline for meeting PM₁₀ limit values in ambient air to 2011.

It suggests: "There is a notable difference in the impact of delaying achievement of the limit values by ethnic group.

Both at the national level and when split by urban and rural areas, individuals who identify themselves as White – British are consistently exposed to lower concentrations of PM₁₀ particulate pollution. Therefore the expected health costs of not achieving limit values would be expected to be lower for this group than other ethnic groups."

Other findings include:

● Nationally for those living near busy roads, non-whites are exposed to 17.5% higher concentrations of PM₁₀;

● In urban areas, the average gap is 17.1% which is reduced in rural areas to 3.9%;

● Across the different areas, individuals identified as Black or Black-British African are exposed to the highest levels of PM₁₀ of up to almost 30% higher than White British.

The equalities assessment report concludes: "Policies need to evaluate if there are any measures that could justifiably be introduced to ensure that the preferred option does not have a disproportionate impact on minority ethnic groups."

COURTS

East London dust leads to large fine

A firm that was making concrete without a licence has been ordered to pay more than £11,000 in fines and costs.

Barking and Dagenham Council and the Environment Agency both received complaints about the level of dust coming from Ethos Recycling, Creek Road,

Barking, last year. EHO's including Ann Mark visited the site and encouraged the operator to get a permit. A request for an interview was ignored, leading to the decision to prosecute.

At Snaresbrook Crown Court Ethos pleaded not guilty to the charge of failing to reply to an information notice. It argued

that the plant was temporary and they had moved it to another borough after the inspection and would apply for a new permit there.

However, the court found in favour of Barking and Dagenham and Ethos was given a fine of £4,500 and costs of £6,598.29.

INTERNET

Website review: missing links?

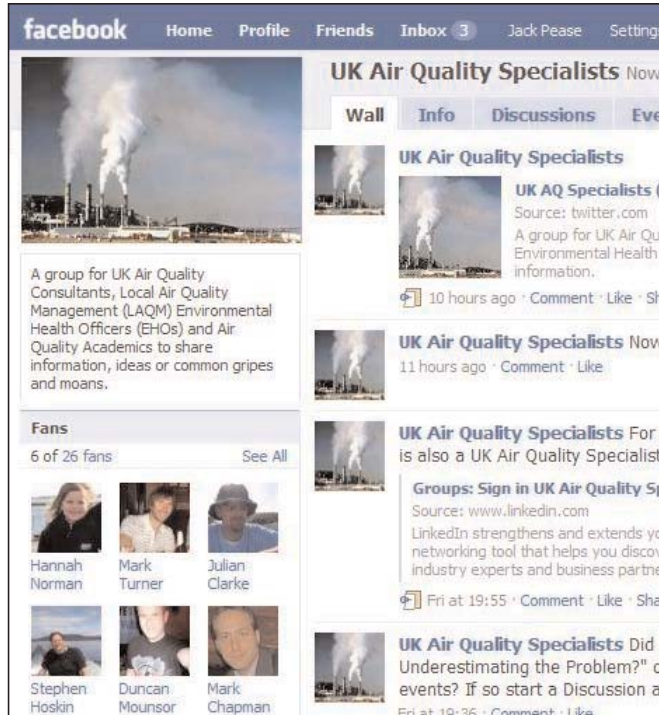
Our website review last month inevitably prompted some feedback where we have missed website features.

Perhaps our biggest omission was to miss **Swansea's** homepage link. We also missed the obvious – there is a **Facebook** page out there for air quality specialists who are active on FB. Run by Mark Chapman, it aims to bring together air quality folk in an informal setting. Already a number of 'usual suspects' can be seen lurking amongst the fanbase (along with some randomers, it has to be said).

Since we reviewed **Air Monitors'** page, a link to a brilliant video has appeared which explains air quality in a clever yet jokey fashion.

Iapsc has updated its website, this would push it up from its current number 60 slot. **Enviro Technology** has erased reference to **AQB's** competitor's defunct website which earns it a special mention. **Defra's** hideous site has also had a revamp although content appears unchanged.

On a further look, we decided we were mean with **Dudley** and should have given them four



Now you have a legitimate reason to be on FB in work time

stars rather than three. We said **Epuk** didn't have a links page, apparently it does, albeit tucked under the 'our work' section. We also missed the **London Air Quality**

Network links section, which is under the 'pollution guide' tab. We missed **Neath Port Talbot's** permits page, this can be viewed on www.npt.gov.uk/default.aspx?page=3245

PLANNING

Planning Act guidance

A number of guidance documents have been published as part of the 2008 Planning Act shake up.

The Act introduces the Infrastructure Planning Commission which will in future decide on large infrastructure projects such as power stations.

Included in the current batch of advice is guidance for developers on what matters must be consulted upon before finalising an application, and the shape of the consultation. In the past developers have been encouraged but not obliged to consult early. Now they must consult among interested groups including local authorities.

● *Planning Act 2008: Guidance on pre-application consultation and other guidance* www.communities.gov.uk/planningandbuilding/planning/planningpolicyimplementation/reformplanningsystem/planningbill/

COURTS

Magistrates' sentencing

A revised version of the Magistrates' guidance *Costing the Earth* has been released.

Costing the Earth was first published in 2002 by the Magistrates' Association in recognition of the increasing number and importance of these cases and lack of any available guidance. While essentially prepared to help sentencers and their legal advisers, other organisations have found the guidance informative and

helpful in preparation of cases.

"The offences are serious and magistrates are keen to play their part in effective punishment and deterrence. As magistrates deal with relatively few such offences, this guidance will be of great assistance to the courts in arriving at sentences that are just and appropriate."

It was written by Paul Stookes of Richard Buxton.

● www.magistrates-association.org.uk/Earth.

Questions in Parliament: prosecutions

Parliament has been told of the number of air quality offences recorded in recent years:

	Prosecuted	Convicted	Fined	Total of fines (£)
2005	42	42	41	418,650
2006	62	59	57	475,240
2007	37	34	32	561,796
2008	44	40	38	339,200
2009	23	22	21	509,850
Total	208	197	189	2,304,736

IN BRIEF

Thermo packs in

In a shock announcement, Thermo is pulling out of direct sales of Teom's and other ambient monitoring kit in the UK market.

Jim Mills' Air Monitors firm will now exclusively sell Thermo kit in the UK. More details next month.

● *Editor's comment: The move represents full circle for Mills who sold Teom equipment before Thermo abruptly ceased the arrangement. Mills, who eats, lives and breathes Teoms, eventually negotiated preferred-seller status and was able to clinch a huge Defra contract against Thermo. The market has now shrunk, so consolidation of sales firms was inevitable.*

VCM changes

There have been two recent changes made to improve the data capture of the corrected Teom particle measurements.

The volatile correction method relies on measurements of volatile particulate made by nearby FDMS instruments. Kings' ERG says: "Previously the three nearest sites within a 130 km radius from the Teom were chosen, using an algorithm that weighted distance with % data capture and % ratified data. The mean volatile PM (or purge measurement) was then used in the VCM correction.

"There were occasions when all three instruments were not working so there was no purge measurement. To eliminate as many of these periods as possible, the VCM now uses the two nearest FDMS purge measurements AND an average of all other purge measurements within 130 km. Using the two closest FDMS instruments maintains the element of proximity in the VCM while taking the average of the remaining available measurements maximises data capture. Similar changes have been made to temperature and pressure measurements.

● www.volatile-correction-model.info

NEWS FROM THE CARE4AIR / LOW EMISSION STRATEGY CONFERENCE IN SHEFFIELD LAST MONTH

Air pollution summit

Air quality minister Jim Fitzpatrick announced there is to be an air quality 'summit' later this year.

Speaking at the South Yorks Care4Air conference, he announced that the summit will be held to whip up enthusiasm among local authorities and local politicians. The aim is to get at local authorities that are doing little or nothing on air quality and try to replicate some of the best practice among the more active authorities.

Low emission office

Cenex's Andrew Whittles revealed that low emission vehicles are to be coordinated through an Office of Low Emission Vehicles, an agency which is currently being set up.

OLEV will have cross-Whitehall participation and is part of a £250 million scheme to encourage green motoring through research and grants for private and commercial vehicle users.

BB takes PB

UK construction group Balfour Beatty has taken over US-based consultant Parsons Brinckerhoff. Balfour Beatty paid \$626 million for the firm.

Balfour Beatty has agreed that Parsons Brinckerhoff will retain its name and organisational structure and operate as an independent but wholly-owned subsidiary.

More Teom time

Thermo has given Teoms a stay of execution.

It had issued a discontinuation notice affecting the popular Teom 1400ab monitor, cut-off dates have now been extended as follows:

- Last date accepting product orders: March 31, 2010;
- Last date for accepting service support: Mar 2020;
- Last date consumables and spare parts availability: March, 2020.

Observers note that the FDMS upgrade will continue even after March 2010.

- www.thermo.com/aqi

£400,000 boost for low emissions

The Low Emission Strategy initiative, born out of the air quality Beacon scheme, has won £400,000 in funding.

The Sheffield LES/Care4Air conference heard from coordinator Rob Pilling that the money will be used for a number of projects including developing a low emission toolkit (see right), a regional groups initiative, a relaunch of the low emissions forum and a joint low emission strategies/planners 'workshopweb' and new qualifications and courses on low emissions.

The LES Partnership has established a peer group of fifteen local authorities working together to support local implementation of LES and to demonstrate good practice. This may be through regional groupings – perhaps two or three chosen to develop good practice, a move away from the scattered authorities that were chosen as Beacon authorities.

Pilling said: "We are looking at maybe two or three groups, selection will be by open competition. We'll offer some local funding (e.g. to support a post in the region), plus national support as we did in the first

round. A joint application from a regional air quality group would be one obvious way to go, however the group will be looking for joined-up applications that include planners/transport planners and climate change interests."

Salford University has been commissioned to study the feasibility of the new qualification and courses. Salford's Andy Clark explained that the study will look at the need for and desirability of a nationally recognised air quality and greenhouse gas emissions management qualification.

It includes a detailed survey that is being sent to local authorities to establish responsibilities for emissions and views on the qualification. The project should be complete by November.

The initiative is being driven through by Sefton's Gary Mahoney. He told *AQB*: "For newcomers into the air quality profession, it is very hard to find courses and qualifications that cover what is required in local air quality management. Qualifications would strengthen air quality as a profession and show a degree of knowledge about the topic."

He added that rather than cut across initiatives being taken forward at the University of West of England or the Institute of Air Quality Management, the initial phase is a questionnaire to see whether there is demand for a qualification and what shape it should be.

Toolkit proposed

John Patterson of Greenwich outlined plans for a Low Emissions Strategy group toolkit to assess benefits of air quality policies that might be contained in planning conditions.

The aim is to replace "back of fag packet" mitigation calculations that may not be defensible during discussions with developers.

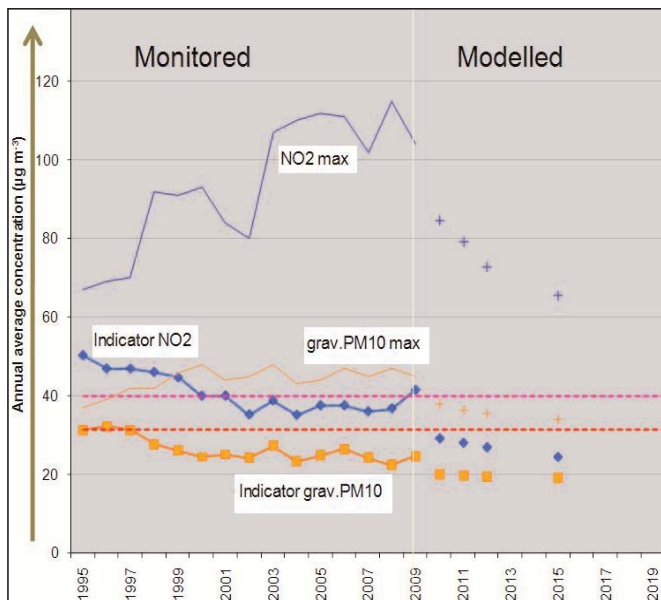
"New developments can increase pollution due to changed transport flows or new activity. There is an opportunity during the planning process to mitigate these risks through action plans, s106 agreements and supplementary planning document contributions.

"But we need an evidence-based approach to developing and implementing planning policy. This project will quantify the impact that low emission strategy measures can have in minimising and mitigating the impacts related to development. Robust quantitative conclusions will assist local authorities in assessing the benefits of low emission strategies as part of an air quality action plan."

The goal is to quantify baseline emissions of NO_x, PMs and CO₂ associated locally with developments and total emissions from vehicles associated with the developments. Benefits can be costed by insisting on lower emitting vehicles in terms of health benefits and damage costs.

The project will cost £125,000 and is being progressed with contributions from Wigan, Sheffield, Leeds, Wandsworth, Greenwich, City of London and Hillingdon.

Vaughan's leap of faith



Defra's Robert Vaughan once again presented modelling trends that assume a big drop in concentrations of key pollutants. Some consider these assumptions optimistic (more discussion, see p7)

The minister speaks

Ministers rarely say much of interest, but seeing as it's been so long since a minister made an effort on air quality, we give air quality minister Jim Fitzpatrick, who made it up to the Care4air/LES conference in Sheffield, some space...

“ It's a great pleasure to be in Sheffield this morning, because it affords me the chance to talk at the local level of our shared strategy to combat air pollution and raise awareness of its dangers.

“Shortly after taking up my post as environment minister in June, I was asked to chair an air quality meeting of key regional officials from across England. This meeting was intended to share best practice, to explore possible barriers to achievement of air quality objectives across England, and to act as a prelude to a larger, more comprehensive air quality summit later in the year.

“At the meeting there was a large degree of consensus (I won't tell you how many times I heard the word 'bus') – and no shortage of ideas: stronger links with transport policies; a national approach to low emission zones; best practice examples to encourage eco credentials and green policies such as South Yorkshire's EcoStars fleet recognition scheme; gas fleet incentives, promoting anaerobic digestion and modal shift from cars to walking, improving inter-departmental dialogue and so on.

“Air quality does not exist alone – it is connected to, and affected by, a wide range of themes including transport, health, social equity, urban planning, biodiversity, waste management, and others. This synergy means that air pollution must form part of a suite of measures at central, regional and local government level. The work of Beacon authorities, together with the Low Emissions Strategies project, have demonstrated the importance of having a joined-up approach to tackling air pollution, using technology, planning and behaviour to make a change.

“Reducing pollutants such as nitrogen dioxide is a difficult task and I can understand how easy it must be to get disillusioned at times with the scope of the problem and the difficulties, practically and economically, in fighting it. The rewards can sometimes be unclear. But the Care4Air Campaign makes it clear, in bold, bright colours, to the individual in the street, to organisations, schools and businesses – the bedrock of the community; it makes it clear that if we are to tackle air pollution, we must do it together, and we must do it, not just because the law says we must, but because it is in our best interests, and the interests of our children and future generations, to do so.

“Raising awareness, educating all of society on the dangers of air pollution is vital – but we cannot expect the public to solve air pollution as a policy objective; they simply cannot visualise NO₂ or PM₁₀. That's a world that we inhabit – the politicians, the scientists, policy advisors and consultants. The air quality world the public inhabits is largely invisible.

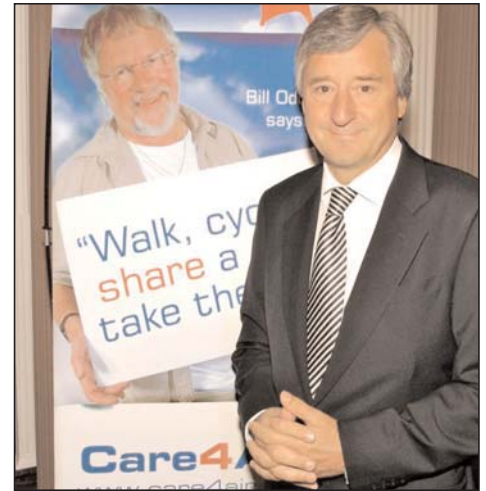
“Technology can provide solutions through retrofitting, low emission vehicles or other measures, but in the long-term the achievement of our goals will rely more on a willing and voluntary change in the public's attitudes and preconceptions, and less on direct action to combat air pollution. Walking, cycling, eco-driving, minimising our use of

electricity, insulating our homes, – not only do these benefit the environment and improve our health, but they also save us money. It is at this level that organisations and environmental campaigns can have their greatest success. ‘What can I do? Have fun! Ride your bike instead of using the car’ – this is the language of the Care4Air website; it is the kind of language we need to use to engage the public, not only in Yorkshire, but throughout the UK.

“We are continually breaking new ground in quantifying the effects of exposure to air pollutants on human health – in particular, the long-term effects of exposure to particulate matter, as recently reported by the Committee on the Medical Effects of Air Pollutants this year. As the science improves, so does the evidence. And the evidence is clear: long-term exposure to particulate matter and other air pollutants increases the risk of mortality – reducing life expectancy in the UK by an average of 7-8 months.

“While further studies are needed to better quantify the associative risk of ambient nitrogen dioxide on human health, we know that in traffic-dominated areas there is a strong correlation between NO₂ and primary particles, and that to ignore one at the expense of the other would be to our detriment.

“Some facts are non-negotiable: in the UK, air pollution causes up to 24,000 deaths per year (nine times more than traffic fatalities); children living in heavily built up areas, often in poorer conurbations, are more likely to develop chronic respiratory problems; those who suffer from asthma, lung and heart disease are at greater risk to air pollution. COPD affects three million people in this country and is Britain's fifth biggest killer, costing the NHS an estimated £1.5 billion per year. With other pollution-related illnesses, the hospital bill comes up to a staggering £20 billion per year.



Air quality minister Jim Fitzpatrick at Care4Air

Editor's comment

South Yorkshire's Care4Air is going from strength to strength and it is fitting that air quality minister Jim Fitzpatrick took the trouble to nip up to Sheffield to deliver a speech.

It was a good presentation delivered with conviction. Of course his civil servants wrote the speech – its not like the minister actually knows anything about air quality – but for the first time in several years a minister has made an effort. Indeed we cannot recall a decent ministerial speech on air quality since 'saint' Michael Meacher held the post.

The problem is that if he is genuinely any good, and not just full of bull, he'll get moved on to something more important. But having someone that talks the talk at a time when there are so many cuts on the horizon is surely a good thing.

“What we need to do, following the good example of a number of local authorities and organisations such as Care4Air, is to get these facts out to the public, not in the format of a scientific report, but in a media that is relevant to our day-to-day lives; to the reality of community living.

“For those individuals who feel their contribution would be too small to make any difference, we need to tell them that small things, taken together, can produce large effects; that the influence of a single child riding his or her bike to school, can set in motion a chain reaction across the planet.

“Air pollution will change for the better when we have changed for the better, in our minds, in the way we think, in the way we view our environment and our place in it. Today's event is to help us take a further step down that road.



IN BRIEF

PAH high

Levels of PAH in the UK are set out in a new report based on monitored 2007 concentrations.

AEA says that a number of monitoring sites show concentrations consistently above or close to the UK objective of 0.25ng/m³. Two sites have been, are at, or close to, the EU target value.

“Of the sites that were operating throughout the year, Derry Brandywell, Kinlochleven, Lisburn Dunmurry, Middlesbrough Longlands College, Port Talbot and Scunthorpe Town are consistently above or close to the UK air quality objective. The only sites where available annual means have been above the EU Directive target value are Scunthorpe Town and Kinlochleven (although the latter has improved since the aluminium smelter closed).

“As a result of the high concentrations of PAH found at sites such as Lisburn, Ballymena and Derry, it is recommended that Defra considers undertaking additional monitoring in locations that do not have access to a natural gas supply and are associated with high solid fuel use.”

● *Annual report for 2007 on the UK PAH monitoring and analysis network* can be viewed on www.airquality.co.uk/archive/reports/list.php

Zones for London

London Mayor Boris Johnson has announced the setting up of 10 low carbon zones in the capital.

They are: Barking Town Centre (London Borough of Barking and Dagenham), Muswell Hill (LB Haringey), Archway (LB Islington), Brixton (LB Lambeth), Lewisham Town Centre (LB Lewisham), Wandle Valley (Merton), Ham and Petersham (LB Richmond upon Thames), Peckham (LB Southwark), Hackbridge (LB Sutton) Queen's Park (Westminster).

The ten zones have a target to deliver 20.12% of carbon emissions savings by 2012.

Biomass: a new dawn?

Last month Epuk brought experts together to discuss the air quality impacts of biomass – are both sides any closer together?

Biomass burning has had bad press of late in air quality circles.

The enthusiasm of the climate change lobby, forestry interests and biomass boiler installers was seen to be trampling on the need to protect air quality in urban areas (*AQB January pl*). A flurry of modelling reports were carried out to assess impacts, air quality professionals were once again trying to explain why a small impact is still one they could do without in high pollution areas.

The Merton Rule, which requires that new developments supply 10% of their energy needs through on-site renewables, has led to a stampede of developments with biomass heat facilities. Environmental health teams, where they have been consulted, have had to advise planners whether emissions are acceptable. If last month's Epuk conference could go some way towards answering that question, it would be very useful indeed.

The pressure to install biomass is huge.

Decc's Caroline Season (who used to be on Defra's noise team) spelt out that the Government's renewable energy strategy, released earlier this year, contains scenarios on how the UK will meet its target of 15% renewable energy by 2020. The lead scenario is biomass heat and energy delivering around 30% of the overall target.

She accepts that growth must be maintained sustainably, and cannot cause a 'significant' reduction in air quality that would impact on health and quality of life. She explained that larger boilers will be regulated by the Environment Agency to tight emission standards. Smaller scale boilers won't, and Decc is considering emission performance standards, whether to limit Renewable Heat Incentives (RHIs) (grants) to such boilers, and how to ensure any installed

plant is maintained properly.

A consultation on RHIs is expected to emerge from Decc by the end of the year with a view to going live by April 2011. Michael Feliks of Decc added: “We want to avoid creating overlapping or duplicating regulations, and so we are also considering providing a class exemption under the Clean Air Act 1993 for such boilers in Great Britain, in conjunction with the introduction of the Renewable Heat Incentive.”

Feliks said he was aware of air quality fears: “No one is suggesting that we are trying to ‘get round’ air quality regulations. We are keen to avoid what happened with biofuels which wasn't a good idea.” He was referring to the policy U-turn on biofuels – it became clear that a requirement to substitute crude oil with renewable biofuels was in danger of grossly distorting the market with dubious benefits.

“Once the RHI is in place, we expect that the Merton Rule (with its inherent market distortion that pushes developers towards biomass) will be replaced and followed by a shift towards more commercially oriented off-grid developments.”

As well as Government encouragement, and planning requirements, there is also the push from manufacturers.

Chris Miles from Econergy pointed out that the reason for such an interest in biomass heat in new developments is that it is the most cost effective way of saving carbon after energy saving measures – easily half the cost of putting in solar panels.

His firm is a big player in installing biomass into larger developments, he outlined key air quality issues. Perhaps counter intuitively, a boiler under maximum load may not be the scenario that causes the biggest air quality problem – boilers on part loads, or which start up frequently, can lead to higher emissions, especially of

particulates. He recommends that systems are included with buffer storage for heat so that smaller boilers can be installed but worked at higher capacities.

He warns that abatement can be expensive. For a large boiler, advanced particle filters can add 30% onto the installed price, but for a small boiler, filters can double the price.

Miles does not like the 20g/GJ PM₁₀ and 50g/GJ NO_x emission limits being proposed as a condition of eligibility for the RHI grants. He believes these are too tight for particles, and simply not achievable for NO_x: “We support the principal of progressively tighter limits but not the current proposal. If these limits are adopted, there will be potentially very high costs and a major reduction in roll out.” He suggested use of existing Clean Air Act limits for areas outside of AQMAS, intermediate limits for AQMAS, and only in areas actually above limits would advanced filters be appropriate.

One issue which cropped up frequently during the day was the difficulty local authorities had trying to assess air quality impacts from developments where the developers were vague as to what will be installed.

Yvonne Brown of consultant Bureau Veritas works for developers and says that she often she has to push developers very hard to find out if they are planning to include biomass in an application – developers do not normally want to finalise the detail of what boilers they are installing when submitting an application. But then pollution officers find they cannot assess impacts unless they have the detail.

Other local authorities in the audience reported that developers frequently did not have any idea of what type of boiler they were going to use, or indeed what size. As boiler type has a huge impact on emissions, they agreed assessing acceptability and chimney heights becomes very hard.

The fall and rise of NO₂

Experts at Ciwem question whether the NO₂ problem is being underestimated

CIWEM – the Chartered Institute of Water and Environmental Health – has recently released a policy position paper on the problems of nitrogen dioxide and last month held a conference to discuss outstanding issues.

It proved quite stormy – with Defra getting a drubbing about its continued reliance on modelling that suggested sharp falls in NO₂ concentrations. The problem for Defra is that there is evidence from local authorities that NO₂ is ‘flatlining’.

The issue of NO₂ came to a fore earlier this year when Defra’s Robert Vaughan showed a graph of dramatic NO₂ falls which was juxtaposed with ERG’s Gary Fuller’s evidence from monitoring that showed static or even rising levels of NO₂. Defra was accused of deceit (*AQB May p3*).

The problem for Defra is that it relies totally on AEA to provide strategic forecasts, themselves relying on emission factors managed rather halfheartedly by the DfT. Emission factors have repeatedly overestimated the benefits of new Euro vehicle standards; promised emission benefits have failed to materialise.

There is frustration that Defra appears to still believe the forecasts that it is being given by AEA. At Ciwem’s conference, AEA’s modelling guru John Stedman said that the latest emission factors were now in and modelling for 2008 was nearing completion and showed an even more dramatic fall in emissions. He did all this with a straight face and appears to believe his own results, as does Defra.

The trouble is that the modelling appears to omit large swathes of towns and cities where local authorities report static or rising

NO₂ levels above the 40µg/m³ limit. This was eloquently put by Simon Newcombe of Mid Devon District Council. His is a predominantly rural district that wouldn’t be expected to have pollution problems, but two of its three market towns have street canyons and high exceedences.

He showed monitoring data from the canyons. Six years worth of data is showing no decline at all in levels of NO₂. Crediton and Cullompton are unremarkable in size, and there is no imminent prospect of being able to do anything about it through bypasses or traffic management.

Newcombe said that this picture is likely to be reflected across the country: “As technical guidance is updated, we are increasingly being pushed to look for NO₂ exceedences on roads with lower traffic flows. For instance TG03 gave a threshold of 10,000 vehicles per day, while in TG09 this drops to 5,000vpd. Bearing in mind that our exceedences are on roads with about 7,000vpd, we think that many more local authorities are going to have to go to detailed assessment and declare AQMAs.

“We find that AURN monitoring data is not reflecting the position in our market towns. We have 2.4km of exceedences along roads that are not being reflected in the national model. How can it be that there is six to seven years of evidence that NO₂ is flatlining but national policy is based on a model that shows dramatic falls?”

John Stedman of AEA explained the strategic modelling used by Defra to inform its predictions. It mostly deals with annual mean NO₂ as that is where most of the exceedences are, but Stedman warned: “Hourly NO₂ is also important. Defra

doesn’t want to apply for a derogation solely on annual mean grounds only to find that there are exceedences of hourly NO₂ and gets infracted anyway.”

Air Quality Consultants’ Duncan Laxen highlighted problems: “Numerous local authorities have declared air quality management areas based on NO₂ exceedences. There is something amiss with the modelling if these are not reflected in the results. The model is effective at showing that the national strategy brings down concentrations everywhere, but what the model can’t do is show what is happening at a local level. It appears to include places where there are no real exceedences, and exclude places found by local authorities to exceed.”

He suggested that the model be adapted to be more useful to local authorities battling with canyon streets and high NO₂. Stedman said this would be ‘quite difficult’.

Laxen also commented: “One of the big problems is that the model doesn’t appear to be able to adequately deal with congestion. If you can’t model congestion, you can’t model the effects of cutting congestion, then you can’t show the costs and benefits of doing something about it.”

Peter Brett’s Claire Holman, who is also chair of Ciwem’s air panel, said: “The model is grossly underestimating and I am not sure Defra has got to grips with small towns. With all policies geared to the national problem, I am not sure how local authorities will cope with their hotspots.”

At this point Laxen defended Defra and its model: “Defra is ahead of other countries which may not be sufficiently far advanced to spot the hotspots we are finding.

CIWEM SPEAKS OUT ON NO₂

The Chartered Institute of Waste and Environmental Management has produced a ‘position statement’ on the problem of NO₂. It warns that the scale of NO₂ may be underestimated in ‘forgotten’ towns.

CIWEM says: “We fear that monitoring of NO₂ could be failing to pick up localised exceedences which occur as a result of canyon effects that commonly occur in small, non-bypassed market towns where old houses sit very close to busy through-roads. This could make the scale of the problem far greater than Defra is currently planning for.” Other points include:

- Considerable progress has been made to reduce NO_x from vehicles, but the increasing proportion of NO₂ in exhaust means the UK is likely fail to comply with the European limit values;
- There are numerous small towns that have recorded high concentrations of NO₂ that are not easily explained by our current understanding of vehicle emissions and dispersion of pollutants. This is a topic that needs further research so that we can assess the measures needed to reduce concentrations.
- Forecasting of NO₂ concentrations in the future relies on good information regarding vehicle emissions and robust air quality monitoring. CIWEM is concerned that the emission information used to derive current emission factors does not include sufficient information on the most recent vehicle types;

- A new approach is required, that may require giving local authorities new powers to introduce low-emission strategies to ensure that the EU limit values are achieved by 2015. This will be necessary to ensure that the EU grants the UK government a time extension from the current requirement for compliance by 2010;
- The emission data used for most vehicles is based on emission testing of vehicles. We note with concern that although emission data is based on tests carried out on over a thousand vehicles, the majority of tests are on older vehicle types that are becoming less common in the current vehicle fleet. Some emission data for recent vehicles have been obtained from very few tests. There is an urgent requirement to obtain a more robust dataset. For vehicles meeting future emission standards it is assumed that emissions will drop in direct proportion to the improvement in the emission limits, which has historically proved to be an over simplistic approach. It is, therefore, hard to have confidence in this information when projecting forward into the future;
- Some benefits are difficult to quantify and therefore may not be fully accounted for. There is concern that Defra could conclude that it will be cheaper not to achieve compliance but pay any fines imposed by the European Commission.

Incineration: Safe?....

Incineration is hitting the headlines again, so it's time to wheel out another reassuring expert report

The growing numbers of incinerators planned across the country has spawned an even larger number of anti incineration protest groups.

Most air quality experts know that the pollutants emitted from the main stack of a modern well managed plant are vanishingly small. But they also know that air quality will be the main battleground for any incinerator proposal.

Waste authorities are caught between a rock and a hard place as they must reduce reliance on landfill. Waste minimisation and new technologies are all very well, but they are not going to solve the problems as quickly as an incinerator.

Back in the late 1990s the dash for incineration was met by a sustained and mostly effective campaign by the likes of

Greenpeace and Friends of the Earth – liberally coining dread terms involving the words cancer, toxic and dioxin. Many incinerators became a political embarrassment and were shelved.

But the waste mountain has not gone away. The industry has tried to rebrand incinerators as ‘energy from waste’ plants – or more laughably last month one in Cheshire was called a ‘Resource Recovery Park’. But the public are not fooled and the Health Protection Agency decided it would set the record straight with a reincarnation of a 2004 report extolling the nearly-safe incinerator industry.

It reiterates a number of points – which we reproduce on these pages, alongside some of the points from the anti-incineration brigade.

MORE INCINERATION

Municipal waste sent for incineration in England

Year	1000s tonnes
1997-98	1,634
1998-99	2,156
1999-2000	2,310
2000-01	2,411
2001-02	2,447
2002-03	2,607
2003-04	2,604
2004-05	2,818
2005-06	2,859
2006-07	3,237
2007-08	3,169

INCINERATORS ARE SAFE: THE ARGUMENTS FOR

The Health Protection Agency's general position remains unchanged from previous analyses by consultant Enviro in 2004. It says there is no evidence that incinerators are unsafe, and that emissions are so low that it is not worth setting up studies to prove the point any further.

The Health Protection Agency has reviewed research undertaken to examine the suggested links between emissions from municipal waste incinerators and effects on health. It concludes: "While it is not possible to rule out adverse health effects from modern, well regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable. This view is based on detailed assessments of the effects of air pollutants on health and on the fact that modern and well managed municipal waste incinerators make only a very small contribution to local concentrations of air pollutants."

Other key points include:

- Since any possible health effects are likely to be very small, if detectable, studies of public health around modern, well managed municipal waste incinerators are not recommended. Studies published in the scientific literature showing health effects in populations living around incinerators have, in general, been conducted around older incinerators with less stringent emission standards and cannot be directly extrapolated with any reliability to modern incinerators;
- The Health Protection Agency dismisses claims that the "wrong particles" are considered when estimating the possible effects on health of emissions from incinerators;
- It may be asked why studies of the specific impacts on health of the small increases in local concentrations of particles produced by incinerators are not done routinely.

The main reason for this is that the concentration increment produced by incinerators is likely to be too small to allow an impact on health to be identified in the local population. For example the Environment Agency has informed the Health Protection Agency of one incinerator modelling study that found a modelled ground level increment in PM₁₀ of 0.0005µg/m³ as an annual average;

- When carrying out studies which investigate health effects around point sources of pollution such as incinerators, or when mapping health effects around such sources, it is important to control for other factors which can influence the health outcomes under investigation before drawing any conclusions.

So when investigating the effect of a source of PM_{2.5} emissions on infant mortality rates, it would be important to control for other sources of PM_{2.5} emissions, and for factors which are known to influence infant mortality rates, for example, socio-economic factors or ethnicity. Maps showing death rates or levels of morbidity are useful in raising hypotheses, but they do not supply evidence of cause and effect.

No doubt this comment is aimed at the death plot analyses contained on Michael Ryan's *UK Health Register* website www.ukhr.org;

- Inhalation is a minor route of exposure and, given that Defra has calculated that incineration of municipal solid waste accounts for less than 1% of UK emissions of dioxins, the contribution of incinerator emissions to direct respiratory exposure of dioxins is a negligible component of the average human intake.

However, dioxins may make a larger contribution to human exposure via the food chain, particularly fatty foods. Dioxins from emissions could also be deposited on soil and crops and accumulate in the food chain via animals that graze on the pastures, though dioxins are not generally taken up by plants. Thus the impact of emissions on locally produced foods such as milk and eggs is considered in deciding whether to grant a permit. These calculations show that, even for people consuming a significant proportion of locally-produced foodstuffs, the contribution of incinerator emissions to their intake of dioxins is small and well below the recommended tolerable daily intake (TDI) for dioxins.

The Impact on health of emissions to air from municipal waste incinerators can be viewed on www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb_C/1251473372175

....or unsafe?

How does one start to summarise why people don't like incinerators? You could be here a long time.

Nimbyism? Pollution? Traffic? Noise and other nuisance? Reducing the incentive to recycle?

Like the HPA, it is worth focussing only on the air quality arguments put forward. A good summation of recent arguments is contained in an objection to the Irish Ringaskiddy incinerator in June by toxicologist Professor Vyvyan Howard. His arguments include the points:

- The majority of published epidemiological studies relate to older plants. With the more recent regulations, many older plants have closed, or been fitted with more stringent emission controls. While this is obviously desirable from a public health perspective, it does raise

issues of the relevance of studies around older plants, to populations affected by more modern facilities.

Proponents of new facilities tend to dismiss the older research as irrelevant. Opponents take a contrary view arguing, not unreasonably, that similar claims of safety were made in relation to those older facilities when they were operating; that the risk assessments relied upon to show new incinerators are safe would not, if applied to the older plants, reveal the levels of impacts reported in the literature thus indicating that the risk assessments do not validate in real-world situations; and that epidemiology, by its nature, involves retrospective studies.

Furthermore the modern incinerators tend to be much larger than those operated historically so that although the emissions concentrations have reduced the total mass

of pollutant emissions may even increase;

- There remains significant uncertainty about the level of health impacts associated with ultrafine particulates and other emissions from incinerators. The WHO emphasises that "priority needs for research include development and application of biomonitoring, both in human observational studies and in toxicological research, the use of pharmacokinetic models to assess the influence of factors such as metabolism and timing of exposures, and the analysis of all relevant environmental matrices, in order to evaluate chemical exposure pathways and to assess the exposure for specific subsets of the population."

Howard adds: "I consider that the evidence of risk of harm to human health and the environment is sufficiently high that a precautionary approach should be taken towards the permitting of new incineration capacity at least until there is much better information from biomarker studies.";

- Nanoparticles are a new and unknown danger. Inevitably the quantities of waste containing nanoparticles will increase rapidly but little thought has yet been given to the consequences of this. When products are incinerated, the thermal properties of nanoparticles determine their fate. There is evidence that at least some nanoparticles will pass through incinerators and be dispersed into the environment;

- Not only do a high proportion of the ultra fine particles escape the filters, but they are chemically reactive and carry a wide range of products of incomplete combustion and adsorbed metals with them. The subsequent direct uptake of these respirable particles and the ready transfer from the lungs into the blood stream may be part of the reason that traditional toxicology is at a loss to explain the level of impacts for such apparently low exposures.

The relative toxicity of ultrafine particles arising from different processes remains unresearched. The levels of heavy and transition metal inputs in municipal solid waste are very much higher than with conventional fuels. Such increases must inevitably be associated with an increase in toxicity and consequently the likelihood of adverse health effects among the local receptors;

- "In my opinion, there is also a need to determine the relative toxicity of the particulate aerosols in the gases emitted by different waste disposal routes, to facilitate rational decisions as to the best disposal method, particularly with respect to public health. This should be addressed urgently but, in the meantime with the significant prospects of serious harm to health, high weight must be given to the precautionary principle."

SMALL VICTORY FOR PROTESTERS

Incinerators attract much scrutiny, and the calming words used by incinerator developers can sometimes annoy protesters. And the HPA's ruling can be misused.

Annoyance can often start simply with the terminology – incinerators are usually labelled as something more fragrant, but these rarely deflect opposition for long, if at all. One being planned by Sita in the South West is called the Cornwall Energy Recovery Centre, recently the Advertising Standards Authority agreed that some of Sita's claims about this proposal within a promotional leaflet were unacceptable, and the leaflet should be withdrawn.

As part of its adjudication, the ASA had to unravel wording used by the Health Protection Agency on the safety of incinerators. It said: "We considered that readers were likely to infer from the claim 'The Health Protection Agency says that modern incinerators are safe' that the HPA had studied the effects of emissions from incinerators on the health of people living nearby and concluded that they posed no threat to health.

"We noted the HPA statement said 'The Agency has considered studies examining adverse health effects around incinerators and is not aware of any consistent or convincing evidence of adverse health outcomes. However, it is accepted that the lack of evidence of adverse effects might be due to the limitations regarding the available data.' We noted the findings of the health impact analysis which said that the HPA said incinerators were safe, however, we had not seen evidence that the HPA had made that claim.

"While we noted the HPA concluded that emissions from modern incinerators had little effect, we concluded that the claim 'modern incinerators are safe' was too absolute, had not been substantiated and could mislead." As such the leaflet breached rules on substantiation and truthfulness.

ASA continued on SITA's use of the term 'sustainable'. "We considered, that, in the context of a leaflet that talked primarily about recycling and energy recovery, consumers were likely to understand that the use of the term 'sustainable' in the claim 'a sustainable solution for the management of Cornwall's waste' was defined primarily in environmental terms.

"We understood the best practice guidance on environmental claims in Defra's *Green Claims Code* stated that green claims should not 'be vague or ambiguous ... Claims should always avoid the vague use of terms such as sustainable ...'.

"Whilst we acknowledged that the production of energy from waste could provide substantial environmental benefits we nonetheless considered that, in the light of Defra's current recommendations, SITA had not clearly explained the basis of the claim, and it was therefore likely to be meaningless to consumers and could mislead. On this point, the leaflet breached codes on substantiation, truthfulness and environmental claims."

SCIENCE SHORTS

Buses improve air

New bendy buses in Mexico City have cut commuters' exposure to CO, benzene and PM_{2.5} between 20 and 70%. Part of the reduction was ascribed to having to wait for less time at bus stops where there may be high personal exposure.

The impact of a bus rapid transit system on commuters' exposure to benzene, CO, PM_{2.5} and PM₁₀ in Mexico City, Henry Wohmschimmel et al, *Atmospheric Environment* Vol. 42 pp8194-8203.

Attachment effects

Compounds attached to fine particles can cause differing health effects.

German researchers extracted compounds from particles and tested them on lymphocytes with the effects on allergy and cancer development logged.

Different immunomodulatory effects associated with sub micrometer particles in ambient air from rural, urban and industrial areas, Gunnar Wichmann et al, *Toxicology* Vol. 257 (2009) pp127-136.

Trees and metals

Trees can be used to sample metal concentrations in urban areas, Italian researchers suggest.

Quercus ilex – Holly Oak – is suitable for use as a biomarker for airborne metal pollution.

Long term monitoring of metal pollution by urban trees, Loretta Gratani et al, *Atmospheric Environment* Vol. 42 (2008) pp8273-8277.

Gene damage to rats

Japanese researchers have studied the effects of diesel.

Using filtered diesel exhaust, (removing particles), unfiltered diesel and clean air, they found that pre natal exposure to diesel led to damaged testicles in rats. Because filtered air had the same effect as non filtered air, researchers point out that particles are not to blame.

Effects of in utero exposure to nanoparticle-rich diesel exhaust on testicular function in immature male rats, Chunmei Li et al, *Toxicology Letters* Vol. 185 (2009) pp1-8.

LANDFILL EMISSIONS

Distance a bad marker

Dispersion modelling and other techniques were used to assess air emissions from landfill.

Researchers headed by the UK Health Protection Agency found that no simple relationship existed between the relative individual exposure measured by distance from the site and by modelling.

ADMS was used with the landfill treated as an area source with a steady release rate over its entire active area. GIS

population data was then used to establish exposure.

Researchers commented: "A reassessment of exposure assessment in epidemiological studies around landfill sites was then undertaken with the refined estimates of exposure. This concluded that the use of a distance from the site as a proxy for exposure could lead to significant exposure misclassification in comparison with exposure assessment using

modelling and GIS."

They added that peak one hour exposures can be significantly higher than annual averages. Health impacts of such short term peak exposures are not well understood.

Evaluation of methodologies for exposure assessment to atmospheric pollutants from a landfill site, Richard Mohan et al, *Journal of Air and Waste Management Association*, Vol. 59, pp490-501.

VEGETATION

Pollutants affect tree leaves

Ambient levels of air pollution can adversely affect properties of leaves from trees, UK researchers believe.

A diesel generator was used to produce NO_x and NO₂ at concentrations found in urban areas. Plants subjected to this were found to flower at different

times and have different leaf surface characteristics.

Researchers concluded: "Traffic-derived pollution is responsible for substantial additional stress in urban environments, with important implications for plant performance and the health and

sustainability of urban ecosystems."

Responses of herbaceous plants to urban air pollution: Effects on growth, phenology and leaf surface characteristics, Sarah Honour et al, *Environmental Pollution* Vol. 157 (2009) pp1279-1286.

TRAFFIC POLLUTION

Petrol particles more toxic

A new study cautions that reductions in particle exhaust emissions will not necessarily be matched an equal reduction in the toxic effects of emissions on health and the environment.

Researchers studied the physical, chemical and toxic characteristics of particle emissions from one type of petrol Euro 4 vehicle and two types of diesel Euro 4 vehicles, one with a particulate filter.

The study found that overall, both the PM mass and PM number emissions from the conventional diesel were higher than PM emissions from either the diesel with filter or the petrol vehicles. In particular, under a driving cycle with mild accelerations, the number emissions from the petrol vehicle were half of those of the diesel vehicle equipped with the DPF. However, under more dynamic driving cycles, the petrol vehicle emitted more particle numbers than the diesel vehicle with the DPF – 20% more under urban driving scenarios and up to 870 times more under motorway driving scenarios.

All the PM samples

demonstrated a toxic effect when tested on bioluminescent bacteria. When the same mass of PM from each of the three samples was compared, the sample from the petrol vehicle appeared to be around 12 times more toxic. The diesel vehicle with the DPF appeared to be about nine times more toxic than the conventional diesel vehicle sample.

Researchers say: "One reason for these results could be the chemical composition of the PM emissions: the DPF and petrol samples contain higher relative concentrations of polycyclic aromatic hydrocarbons and metals, both of which are toxic to the bacteria. The physical characteristics of the emissions could also play a role, although many factors need to be considered when assessing the complex link between ecotoxicity and types of chemical emissions.

The comparatively higher toxicity of PM (on a weight for weight basis) from both the petrol and DPF means that although overall emissions levels from these two vehicle types are far lower than PM

emissions from the conventional diesel, they were actually only about 40% less toxic for petrol and 20% less toxic for the DPF than the conventional diesel.

This implies that when new PM control technologies are to be assessed, it should not be assumed that reductions in the level of exhaust emissions produce a similar level of reductions in the impact on health and the environment.

Analysis of other components of the particle emissions revealed that:

- Overall metal emissions from the DPF fitted diesel vehicle were 80% compared with the conventional diesel vehicle;
- Metal emissions from the petrol vehicle were similar to those from the diesel vehicle with the filter;
- Ammonium, nitrate and sulphate emissions were lowest in the petrol vehicle.

An investigation on the physical, chemical and ecotoxicological characteristics of particulate matter emitted from light duty vehicles, E Vouitsis et al, *Environmental Pollution* Vol. 157 (2009) pp2320-2327.

SCIENCE SHORTS

MODELLING

Risk can be judged by modelling

Modelling of air pollution exposure does provide a valid means of assessing risk.

The long running US Veterans Cohort has been used to compare long term survival rates against modelled concentrations of 16 pollutants – “the first American cohort mortality study to base estimated exposures of individual subjects on computed rather than measured ambient air quality”. There are 70,000 male war veterans in the cohort which was followed in the period 1976-2001.

Researchers concluded that survival of the veterans was robustly associated with

modelled estimates of both gaseous and particulate air pollution.

Other conclusions include:

- Benzene is among the strongest of associations – it is associated with 10% of all-cause mortality overall, and 20% in high traffic districts;
- Selected traffic-related air pollutants (benzene, formaldehyde, diesel particulate matter, NO_x, elemental carbon) are better predictors than traffic density;
- Modelled elemental carbon and NO_x exposures are better predictors than the measured air quality values used previously (yielding more precise risk

coefficients);

- Nickel appears to be the most important heavy metal as a risk;
- Air pollution epidemiology studies should consider a suite of potential causal agents before focussing on any one of them, including non criteria and hazardous species.

Air pollution and survival within the Washington University-EPRI veterans cohort: risks based on modelled estimates of ambient levels of hazardous and criteria air pollutants, Frederik Lipfert et al, *Journal of Air and Waste Management*, Vol. 59, pp473-489.

GLOBAL WARMING

Temperature can increase pollutant levels

Temperature can influence the amount of pollutants released into the atmosphere, Japanese researchers believe.

They compared modelling results to actual monitored data and found that higher temperatures can lead to underestimates of pollutant concentrations by dispersion models. Japan, like Europe, is finding that early reductions in urban pollutants has now been replaced by increases.

Findings include:

- An increase in temperature of 12 deg C leads to an increase in the maximum concentration of photochemical oxidants by

5.3ppb or 11%. The results also showed that an increase in vegetation-derived VOCs had double the impact of an increase in the rates of the photochemical reactions;

- It was shown that vegetation-derived VOCs have a significant effect on the concentration of photochemical oxidants, even in urban areas with comparatively little vegetation;

- Over the 10 sq km area of Osaka, vegetation-derived VOCs account for 38% of the daily cumulative emissions.

Researchers conclude: “In the future, when planning heat island mitigation measures for

urban areas, this model can be used to assess the anticipated effectiveness of these measures in alleviating air pollution, by evaluating the greening measures that directly affect vegetation-derived VOCs through increased biomass, as well as non-greening measures that have an indirect impact through changes in air temperature.”

The effect of the increase in urban temperature on the concentration of photochemical oxidants, Daisuke Narumi et al, *Atmospheric Environment* Vol. 43 (2009) pp2348-2359.

CHILD HEALTH

Infant health effects investigated

US researchers have attempted to assess the effects of air pollution on bronchiolitis among infants.

Bronchiolitis is an acute infectious disease of the lower respiratory tract that occurs primarily in those aged between two months and two years, especially young infants.

Researchers used a matched case control study (2,604 cases and 23,000 controls) of birth and infant hospital records for six year from 1997 in the Puget

Sound area. PM_{2.5} exposures 7, 30, 60 and total days before hospitalisation were derived from fixed site monitors.

For a 10µg/m³ increase in lifetime PM_{2.5}, there was a 14% increase in risk of respiratory syncytial virus bronchiolitis. There was a 17% increased risk for infants living within 150m of a highway.

Researchers concluded: “This study supports a developing hypothesis that here may be a modest increase risk of

bronchiolitis attributable to chronic traffic derived particulate matter exposure particularly for infants born just before or during peak virus season.”

Infant exposure to fine particulate matter and traffic and risk of hospitalisation for RSV bronchiolitis in a region with lower ambient air pollution, Catherine Karr et al, *Environmental Research* Volume 109 (2009) pp321-327.

PAH & preterm birth

PAH levels have been found to prompt preterm births and small babies in the US.

Black births in New York were monitored and a one unit log increase in PAH was found to double the risk of growth restriction, and cause a five fold increase in pre term birth among full term African Americans.

Prenatal exposure to airborne polycyclic aromatic hydrocarbons and risk of intrauterine growth restriction, Hyunok Choi et al, *Environmental Health Perspectives*, Vol. 116 no 5 pp658-665.

Antioxidants work

Antioxidants have been found to counter the effects of diesel exhaust on mice.

Missouri researchers pre-treated mice with antioxidants (thiols/mercaptans) and compared effects of diesel against untreated mice.

Treated mice had far fewer macrophages and less mucus, less oxidative stress and less lung damage. **N-acetylcysteineamide (NACA) prevents inflammation and oxidative stress in animals exposed to diesel engine exhaust, Atrayee Banerjee et al, *Toxicology Letters* Vol. 187 (2009) pp187-193.**

Arm waving cuts particle intake

Texas researchers have discovered that waving arms and other movement can affect air flow in the breathing zone.

Air flows around the human body can be affected by movement of arms – or if still, the thermal plume generated by body heat. When indoors, this plume can build up a circulation that draws floor-level particle pollution up into the breathing zone. This can lead to inhaled particle concentrations being four times higher than ambient concentrations.

Transport of particulate and gaseous pollutants in the vicinity of the human body, Donghyun Rim et al, *Building and Environment*, Vol. 44 (2009) pp1840-1449.

HOT AIR

After a quiet few months, Birkett is back with a vengeance.

The quiet, unassuming man behind the Campaign for Clean Air in London is at his best when sifting through government small print. He wanted to know what risk assessment was behind the oft-quoted '1,000 PM₁₀ deaths a year in London' claim. All the rest of us assumed it was correct – not Birkett.

At least Defra was able to try to explain its thinking, even if it was wrong. GLA couldn't. Its response was: "The GLA holds no information relating to the underlying data that was used to reach the figure of 1,031 premature deaths used."

GLA is fast becoming a laughing stock since the mass exodus of environmental excellence that coincided with Boris Johnson's arrival. The environment is more than planting a few token trees and warm words on carbon.

Epuk's well attended biomass event proved very interesting – not least because of barely concealed tensions between the various 'sides' of the debate.

For the benefit of anyone that hasn't been on the air quality scene for the past

few years, forestry interests, wood boiler manufacturers and climate change evangelists are pushing the use of biomass with zeal. Local authority pollution officers fear that all this will undo all their good efforts to reduce pollution.

Councils that dare to suggest there may be problems with plonking wood burners in urban areas are seen by the biomass zealots as party poopers. And if you think the term zealots is overdoing it, then see our Freedom of Information exchange (*AQB January p7*) showing the pressure that Scottish pollution officers found themselves under.

AQB's customary back seat at conferences has a purpose – we get to see how people react to various comments. We decided that Dundee's Rachel Brookes might need a nice back massage given the head shaking and shoulder-tensing that the Forestry Commission prompted. Their mantra? Burning Wood is Good. Yehhh, right.

And any self respecting EHO might ask a few questions based on the vision of the future in this picture. Does an urban



area really need fleets of agricultural tractors (using red diesel?) delivering wood chip to city centre offices?

We hope that common sense will prevail and the undoubted benefits of wood burning is harnessed away from pollution hotspots.

If city centre householders can get grants to install woodburners, we'll know common sense hasn't prevailed.

We admit to have been sceptical about the benefits of the Government car scrappage grant on the basis that it was not linked to environmental improvements. In the event we were wrong, consumers aren't daft and worked out that scrappage grants are good value when buying a new small car, but not a big car. Result.

The scheme is to be relaxed to include eight year old vans (the cut-off was previously ten years). Now how hard would it have been to link that into the third phase of the London low emission zone, scrapped by Boris Johnson on the basis that buying a new van was too expensive for small traders?

AIR QUALITY EVENTS 2009

12-16 October

AIR POLLUTION COURSE

introducing the fundamentals of air pollution to be held at Newcastle University run by Anil Namdeo, www.ceg.ncl.ac.uk/cpd

28-30th October

GUIDELINE ON AIR QUALITY MODELS: NEXT GENERATION

Air & Waste Management Association (A&WMA) conference to be held in Raleigh USA. www.awma.org/go/airqualitymodels09

4th November

BIOMASS AND AIR QUALITY CONFERENCE

EPUK conference to be held in Glasgow, www.environmental-protection.org.uk

12th November

AIR QUALITY UPDATE. NO₂: TIME FOR COMPLIANCE

Epuk conference to be held in Birmingham, Carry Keay 01273 878776 www.environmental-protection.org.uk

24th November

DMUG: PARTICLES AND PERSONAL EXPOSURE

How can we assess personal exposure to particles at the local, urban and national scales? Dispersion Model Users Group meeting event to be held at the CIEH, London Carry Keay 01273 878776 www.environmental-protection.org.uk

2nd December

INVESTIGATION OF AIR POLLUTION STANDING CONFERENCE

Iapsc's second conference of the year to be held at the Council House, Birmingham. Website www.iapsc.org.uk

9-10th December

MONITORING AMBIENT AIR 2009 AIR QUALITY – THE MAJOR

Challenges, AAMG conference to be held in London website <http://rsc-aamg.org/Pages/Meetings/MAA2009.html>

2010

18th-19th May

18TH INTERNATIONAL SYMPOSIUM TRANSPORT AND AIR

Pollution Conference to be held in Zurich www.empa.ch/plugin/template/empa/*/86139/---/1=2

12-16th September

15TH WORLD CLEAN AIR & ENVIRONMENTAL PROTECTION CONGRESS

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AIR QUALITY

BULLETIN

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