Local Air Quality Management

&

Integrated Pollution Prevention & Control

Local Air Quality Management - Review and Assessment

Aim: to protect public health from areas of poor air quality

- Identify **relevant** locations within the Local Authority where the air concentrations for **7 pollutants** are above **permitted levels**

What are the 7 pollutants & why are they important?

Pollutant	Health Effects
Benzene	Human carcinogen. Exposure to high levels have demonstrated an excess risk of leukaemia.
1,3 Butadiene	Human carcinogen. Exposure to high levels can lead to cancers of lymphoid system and blood forming tissues
Carbon Monoxide	Reduces capacity of blood to carry oxygen. Particularly important for people with existing diseases which effect delivery of oxygen e.g. angina.
Lead	Exposure to high levels can lead to problems in syntheses of haemoglobin, effects on kidneys, gastrointestinal tract, joints and damage to nervous system. Greatest concern is effects on brain development in young children and their intellectual development.
Nitrogen Dioxide	Can cause inflammation of airways at high concentrations particularly relevant to persons with respiratory diseases e.g. asthma.
Particles (PM10)	Associated with a wide range of health effects but mainly affects respiratory and cardiovascular systems. Particularly relevant to persons with pre-existing lung and heart disease.
Sulphur dioxide	Can cause constriction of the air ways by stimulating nerves in the lining of the nose, throat and lungs

Where do the pollutants come from?

Pollutant	Main Outdoor Source
Benzene	Combustion and distribution of petrol • Petrol engined vehicle exhaust • Petrol refining & distribution • Uncontrolled emissions from petrol station forecourts
1,3 Butadiene	Combustion of petrol & of other materials • Petrol engined vehicles • Industry
Carbon Monoxide	Incomplete combustion of carbons containing fuels • Road transport
Lead	Industry eg lead smelters
Nitrogen Dioxide	All combustion processes in air produce oxides of nitrogen • Road transport (50%) • Electrical supply industry (20%) • Industry (17%)
Particles (PM10)	Wide variety of sources • Mainly road traffic • Suspended soils & dusts
Sulphur dioxide	Combustion of sulphur containing fossil fuels principally coal & heavy oils • Power stations • Domestic solid fuel burning • Oil boilers

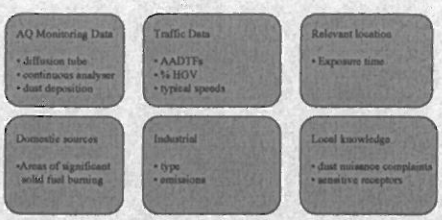
Air Quality Standards and Objectives

Pollutant	Air Quality Standard		Air Quality Objective (Deadline)
	Concentration	Measured as	
Benzene	16.25 µg/m³	Running annual mean	31.12.2003
	5.00 µg/m³	Annual mean	31.12.2010
1,3 Butadiene	2.25 µg/m³	Running annual mean	31.12.2003
Carbon Monoxide	10.0 mg/m³	Maximum daily 8-hour mean	31.12.2003
Lead	0.5 µg/m³	Annual mean	31.12.2004
	0.25 µg/m³	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m³ not to be exceeded more than 18 times a year	1 hour mean	31.12.2005
	40 µg/m³	annual mean	31.12.2005
Particles (PM_{10})	50 µg/m³ not to be exceeded more than 35 times a year	24 hour mean	31.12.2004
	40 µg/m³	annual mean	31.12.2004
Sulphur Dioxide	350 µg/m³ not to be exceeded more than 24 times a year	1 hour mean	31.12.2004
	125 µg/m³ not to be exceeded more than 3 times a year	24 hour mean	31.12.2004
	266 µg/m³ not to be exceeded more than 35 times a year	15 minute mean	31.12.2005

Stage 1 Updating & Screening Assessment

- Consider all 7 pollutants
- Decide whether there is a **risk** of a pollutant exceeding its air quality standard (permitted level)
- Hot spots

What information is needed for local air quality Review and Assessment

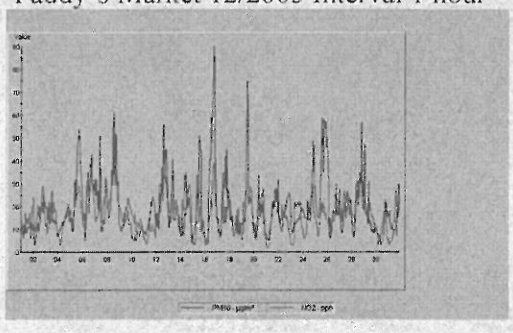


Stage 2 - Detailed Assessment Report

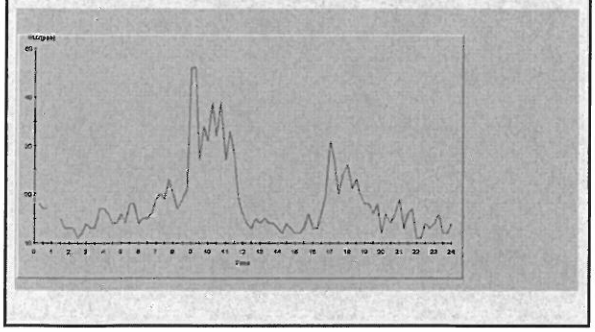
- Considers only the pollutant(s) thought to be a risk of exceeding air quality standards following completion of USA
- Much more detailed monitoring and modelling
- Decide whether the pollutant(s) **is likely** to exceed its air quality standard (permitted levels)
- Must include all relevant locations

Picture of an Air Quality Unit

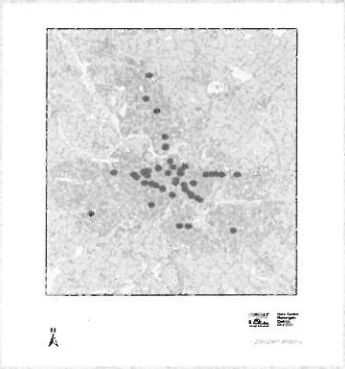
Monthly Station Report
Paddy's Market 12/2005 Interval 1 hour



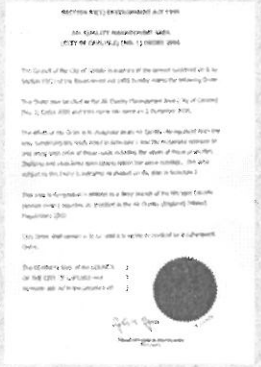
NO_2 (ppb) Daily Report Paddys Market 07/12/2005 Interval 15 min



Carlisle City NO_2 Monitoring Sites



Air Quality Management Area Order



Results of Review & Assessment - National Picture 1997 - 2005

No Air Quality Management Areas have been declared anywhere in UK for:

1, 3 Butadiene
Benzene
Lead
Carbon Monoxide

Different picture for

NO_2!!!
PM_{10}
SO_2

- 179 Local Authorities have declared one or more Air Quality Management Areas
- Majority (88%) due to annual mean NO_2 due to road traffic emissions

Timescales

Review and Assessment	Completion Date	Completed by Carlisle City Council	
Stage 1 Report	End of May 1998	Yes	1st Round
Stage 2 Report	End of April 1999	Yes	
Stage 3 Report	End of April 2000	Yes	
Updating and Screening Assessment	End of May 2003	Yes	2nd Round
Detailed Assessment	End of April 2004	Yes	
Progress Report	End of April 2005	Yes	
Updating and Screening Assessment	End of April 2006		3rd Round
Detailed Assessment	End of April 2007		
Progress Report	End of April 2007		
Progress Report	End of April 2008		
Updating and Screening Assessment	End of April 2009		4th Round
Detailed Assessment	End of April 2010		
Progress Report	End of April 2010		

Air Pollution

"Atmospheric pollution has therefore been with us since creation, but it became worse with the Garden of Eden and infinitely worse following the mechanical ingenuity of James Watt"

Public Health Bill

- First legislation to introduce smoke reduction
- Much debate about whether technically possible
- "How the scientific asses preach about their poisonous gases,making havoc amongst the habitations of the lower classes!" (Punch 1849)
- 1883 - Appointed "district inspectors - uninfluenced by local interests and prejudice

Public Health Act 1936

- Smoke abatement - regulation
- Great London smog 1952
- 1956 Clean Air Act - prohibit dark smoke
- Smoke Control Areas - after 1976 green field sites in urban areas
- Environment Awareness

Environmental Protection Act 1990

- Introduced Prevention and control of emissions
- The polluter pays principle
- Authorisations - prescriptive conditions on how the industry was to operate

Pollution Prevention and Control Act 1999

Introduced Integrated Pollution Prevention & Control

- Operator applies for permit
- Advertise application
- Consultation
- Grant permit
- Appeal

Permit Conditions

- Conditions are very specific and include
  - specifying amount of materials to be used (ie paint with less than x% solvent)
  - equipment used (ie low pressure, high volume spray guns)
  - training
  - management (EMS)

Principles to be followed

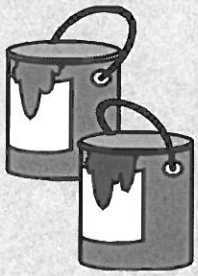
- Best Available Techniques
- No significant pollution
- Waste production avoided
- Energy efficiency
- Avoid pollution risk on closure

After the Permit is granted

1 Routine inspections
2 Inspections due to complaint or incident
3 Enforcement for causing pollution
   - Letter
   - Notice - Enforcement / Revocation
   - Prosecution

Industry Groupings

- A1 Environment Agency ie Sellafield
- A2 Local Authority ie.Crown Bevcan
- B's Local Authority ie.petrol stations , crushers ,crematoria, cement batchers, vehicle resprayers



Conclusion

- Pollution- industry vehicles and domestic
- Pollutants- Nox, SO_2, Smoke/Particulates, VOCs
- Green house gases
- Clean Environment