

Air pollution

General details	Air quality as monitored by the presence of pollutants
Area output	Site specific monitoring data
Time period	Local data for 2004
Source	Kirklees data from Environmental Services National data from Netcen via DEFRA
Provider	Kirklees MC and DEFRA
Comments	Air quality is monitored at sites which for national data are representative of different types of environment. Reported Kirklees data are from sites where air quality may be poor and are not representative of average air quality in Kirklees.

1 Introduction

1.1 Air quality is included as one of the government's Sustainable Development Indicators. Ozone (O₃) and particulates (PM₁₀s) are the chosen pollutants because exposure to them is known to have a significant impact on human health.

1.2 National air quality monitoring is undertaken using a network of 120 sites around the UK in a representative set of sites known as the Automatic Urban and Rural Network (AURN). Urban sites in AURN monitor SO₂ (sulphur dioxide), CO (carbon monoxide), NO_x (oxides of nitrogen), O₃ (ozone) and PM₁₀s (fine particles). Rural sites mainly monitor O₃.

1.3 A second national automatic network monitors hydrocarbons such as benzene and 1-3 butadiene and another non-automatic network measures smoke and SO₂.

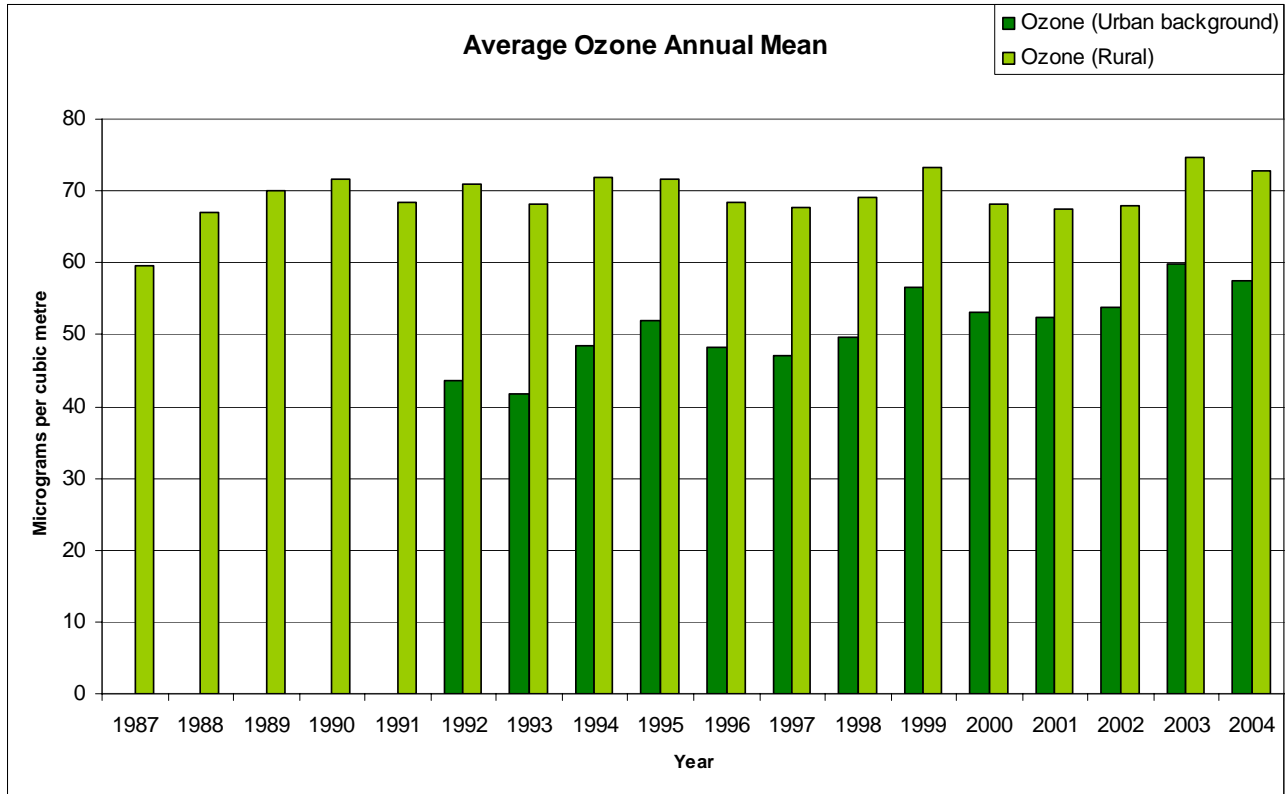
1.4 Local authorities were given a duty to review and assess air quality by the Environment Act of 1995. If air quality is found to be worse than prescribed standards, the local authority has to declare an Air Quality Management Area with defined geographical boundaries and develop an action plan to improve air quality in that area.

2 National and Regional Figures

2.1 There has been a very slight upward trend in background ozone levels due to rising hemispheric ozone levels (see Figure 1). There is a more marked increase in urban areas, due to the reduction in urban emissions of nitrogen oxides, which destroy ozone close to their emission source.

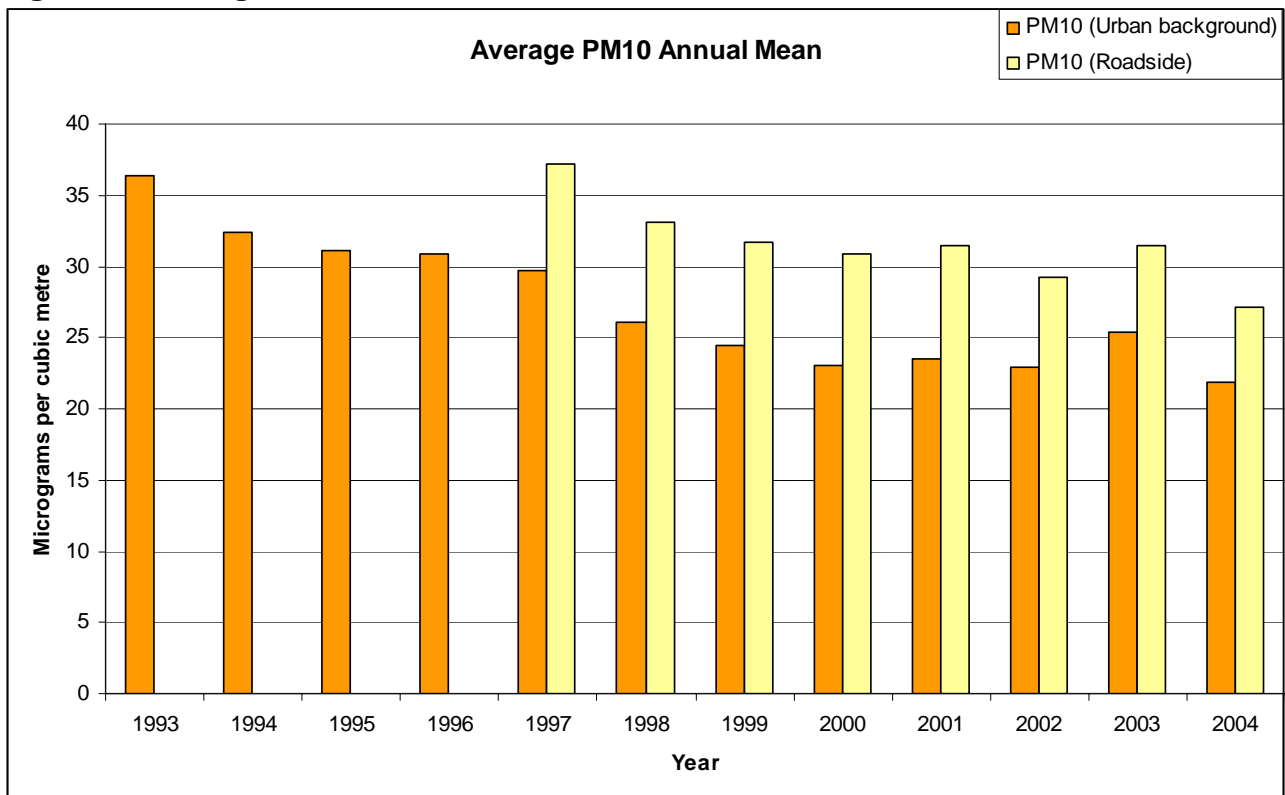
2.2 The presence of ozone in the atmosphere is increased in hot sunny weather and the high figures for 2003 are in part due to the hot summer that year.

Figure 1: Average annual ozone concentration 1987 to 2004



Source: netcen, DEFRA

Figure 2: Average annual PM10 concentration 1987 to 2004



Source: netcen, DEFRA

2.3 Exposure to particulates both long term and short term has been identified as a potential risk to health.

2.4 Particulate levels tend to be higher near busy roads and in urban areas. Urban background and roadside levels are shown in Figure 2. Annual average particulate levels have been decreasing since 1992 although the trend may be levelling off. Roadside concentrations tend to be higher, because of the emissions from road vehicles, but show a similar downward trend.

2.5 The Air Pollution Information Service produces a simple index based on the recorded concentrations of a basket of 5 indicators (CO, SO₂, Ozone, NO₂ and PM₁₀s). The index is calibrated in 10 index levels which in turn are banded into four categories.

Table 1: Air Pollution Index definitions

Index value	Band	Health Descriptor
1 to 3	Low	Effects are unlikely to be noticed even by individuals who know they are sensitive to air pollutants
4 to 6	Moderate	Mild effects, unlikely to require action, may be noticed amongst sensitive individuals.
7 to 9	High	Significant effects may be noticed by sensitive individuals and action to avoid or reduce these effects may be needed (e.g. reducing exposure by spending less time in polluted areas outdoors). Asthmatics will find that their 'reliever' inhaler is likely to reverse the effects on the lung.
10	Very High	The effects on sensitive individuals described for 'High' levels of pollution may worsen

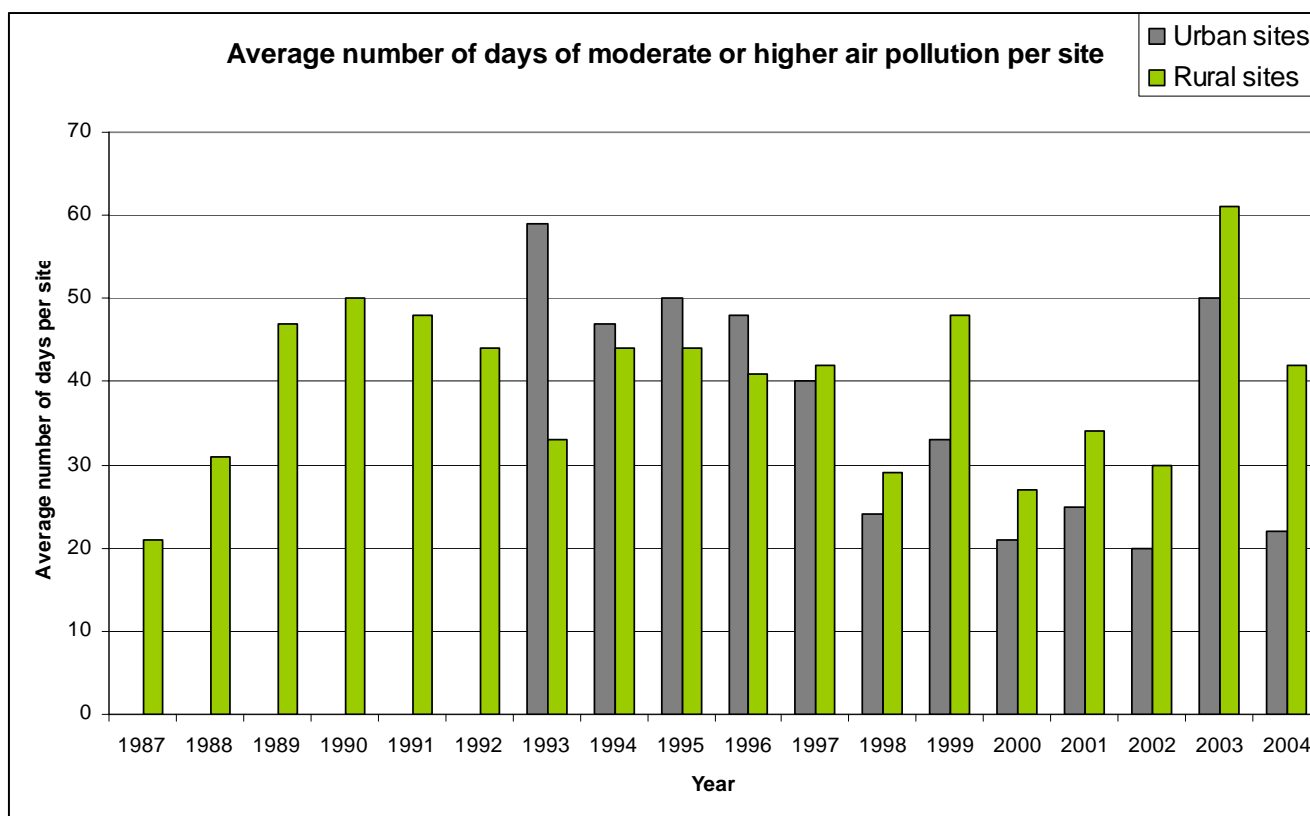
Source: netcen, DEFRA

2.6 The main causes of days of moderate or higher air pollution at urban sites are ozone and fine particles (PM₁₀). Sulphur dioxide also used to make a significant contribution but has now fallen to relatively very low levels. The other two pollutants included in the index, carbon monoxide and nitrogen dioxide, have very rarely reached moderate or higher levels since the index began in 1993 except in London.

2.7 Ozone causes the great majority of pollution days in rural areas and since 1999 it has also caused more days of poor air quality in urban areas than particles have, as pollution by particles has declined.

2.8 Figure 3 shows the declining trend in the number of days of moderate or higher air pollution although the data for 2003 reflect the high ozone levels that year due to extended periods of warm and sunny weather.

Figure 3: Average number of days of moderate or higher air pollution 1987 to 2004



Source: netcen, DEFRA

3 Kirklees Figures

3.1 Local authorities have a duty to review and assess air quality under the Environment Act of 1995 and are required to look at seven specific pollutants. If air quality is found to be worse than prescribed standards for any of these pollutants, the local authority has to declare an Air Quality Management Area with defined geographical boundaries and develop an action plan to improve air quality in that area.

3.2 The pollutants and objectives which have been assessed in the Local Air Quality Management process are a mixture of long term annual average concentrations and short-term levels, for which a certain number of exceedences are permitted. Table 2 lists the pollutants and their objectives.

Table 2: Local air quality objectives

Pollutant	Objective
Benzene	16.25 micrograms per cubic metre or less, when expressed as a running annual mean
1,3 -Butadiene	2.25 micrograms per cubic metre or less, when expressed as a running annual mean
Carbon monoxide	11.6 milligrams per cubic metre or less, when expressed as a running 8 hour mean
Lead	0.5 micrograms per cubic metre or less, when expressed as an annual mean 0.25 micrograms per cubic metre or less, when expressed as an annual mean
Nitrogen dioxide	200 micrograms per cubic metre, when expressed as an hourly mean, not to be exceeded more than 18 times a year 40 micrograms per cubic metre or less, when expressed as an annual mean
PM10	50 micrograms per cubic metre or less, when expressed as a 24 hour mean, not to be exceeded more than 35 times a year 40 micrograms per cubic metre or less, when expressed as an annual mean
Sulphur dioxide	Exceedence 1 - 125 micrograms per cubic metre or less, when expressed as a 24 hour mean, not to be exceeded more than 3 times a year Exceedence 2 - 350 micrograms per cubic metre or less, when expressed as an hourly mean, not to be exceeded more than 24 times a year Exceedence 3 - 266 micrograms per cubic metre or less, when expressed as a 15 minute mean, not to be exceeded more than 35 times a year

3.3 Whilst ozone is not a local air quality (because local concentrations may be a result of geographically distant activity) the standard in the National Strategy is:

Table 3: National air quality standard for ozone

Pollutant	Objective
Ozone	100 micrograms per cubic metre or less, when expressed as a maximum daily running 8 hour mean, not to be exceeded more than 10 times per year.

3.4 Local Air Quality Management has been a staged assessment process which initially identified the pollutants and the specific areas where objectives may not be met within a prescribed time period.

3.5 Stages 1 and 2 of the assessment concluded that the air quality objectives for benzene, 1-3 butadiene, lead and carbon monoxide would be met, but that further assessment was required for NO₂, SO₂ and PM₁₀s.

3.6 It was established that concerns over the level of SO₂ in Holmfirth, which were the reason for further assessment, were unfounded, following a period of continuous monitoring.

3.7 Geographical areas were identified (using a computer model) in which the objectives for NO₂ (nitrogen dioxide) might not be met and continuous monitoring equipment was installed in these areas.

3.8 Concentrations of NO₂ at all of these sites were found to be within the objectives and no air quality management areas have been declared. **It is therefore reasonable to conclude that air quality in Kirklees satisfies national standards.** Annual reports are now made to DEFRA on each year's air quality assessment, and these are available on Kirklees' web site

3.9 There are 6 stations which continuously monitor air quality in Kirklees and which are managed by Kirklees Environmental Services.

3.10 The sites chosen to locate continuous monitoring stations are in areas where it is felt that air quality problems might arise and are therefore potentially the "worst" areas for air pollution

3.11 Results for 2004 for these sites are:

Table 4: Kirklees continuous monitoring of NO₂ 2004

	Location	Dates	Annual Mean (micrograms per cubic metre=ug/m ³) (Max Limit = 40)	Exceedences of hourly standard (200ug/m ³) (18 permitted)
Trailer 1	A62 at Old Fieldhouse Lane		33.7	4
Trailer 2 (adjusted)	A62 Birstall Smithies	To July	39.0	0
Trailer 2	A62, Brooklands	From August	28.8	0
Huddersfield University	Huddersfield Ring Road		31.6	1
Roadside Unit 1 (adjusted)	A644 Scout Hill Dewsbury	From March 2004	24.7	0
Roadside Unit 2 (adjusted)	New Hey Road, Outlane	From May 2004	33.0	0

Source: Kirklees Environmental Services

3.11 In addition, Kirklees Environmental Services maintains a network of over 50 sites monitoring NO₂ using diffusion tubes at a range of roadside sites.

Table 5: Kirklees continuous monitoring of PM10s 2004

	Location	Dates	Annual Mean (micrograms per cubic metre) (Max Limit = 40)	Exceedences of daily standard (50 ug/m3) (35 permitted)
Trailer 1	Leeds Road Old Fleldhouse Lane		33.7	4
Trailer 2 (adjusted)	Birstall Smithies	To July	25.0	22
Trailer 2 (adjusted)	Leeds Road, Brooklands	From August	19.0	5
Roadside Unit 1 (adjusted)	Scout Hill Dewsbury	From March 2004	27	24
Roadside Unit 2 (adjusted)	New Hey Road, Outlane	From May 2004	19	5

Source: Kirklees Environmental Services

Table 4: Kirklees continuous monitoring of SO2 2004

	Location	Dates	Exceedence 1 (daily standard 3 permitted)	Exceedence 2 (hourly standard) 24 permitted	Exceedence 3 (15 minute standard) 35 permitted
Trailer 1	Leeds Road Old Fleldhouse Lane		2	0	0
Trailer 2	Birstall Smithies	To July	0	0	0
Trailer 2	Leeds Road, Brooklands	From August	0	0	0
Huddersfield University	Huddersfield Ring Road		1	1	4
Adult Education Centre	Holmfirth		0	0	0

Source: Kirklees Environmental Services

3.12 Ozone is monitored by both Trailers. In 2004 each Trailer recorded 2 exceedences of the 100 microgram per cubic metre 8 hour running mean although Trailer 2 only collected data from October.

4 Links and further information

Information on Greenhouse gas emissions in another indicator reference sheet.

Office for National Statistics

<http://www.statistics.gov.uk/default.asp>

Defra website for Sustainable Development Indicators

<http://www.defra.gov.uk/environment/statistics/airqual/kf/aqkf29.htm>

Kirklees Local Air Quality Assessment reports

<http://website/community/environment/airquality.shtml>

5 Indicator archive

Date of the original document	November 2005
Author	Steve Jones: KMC CDU
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