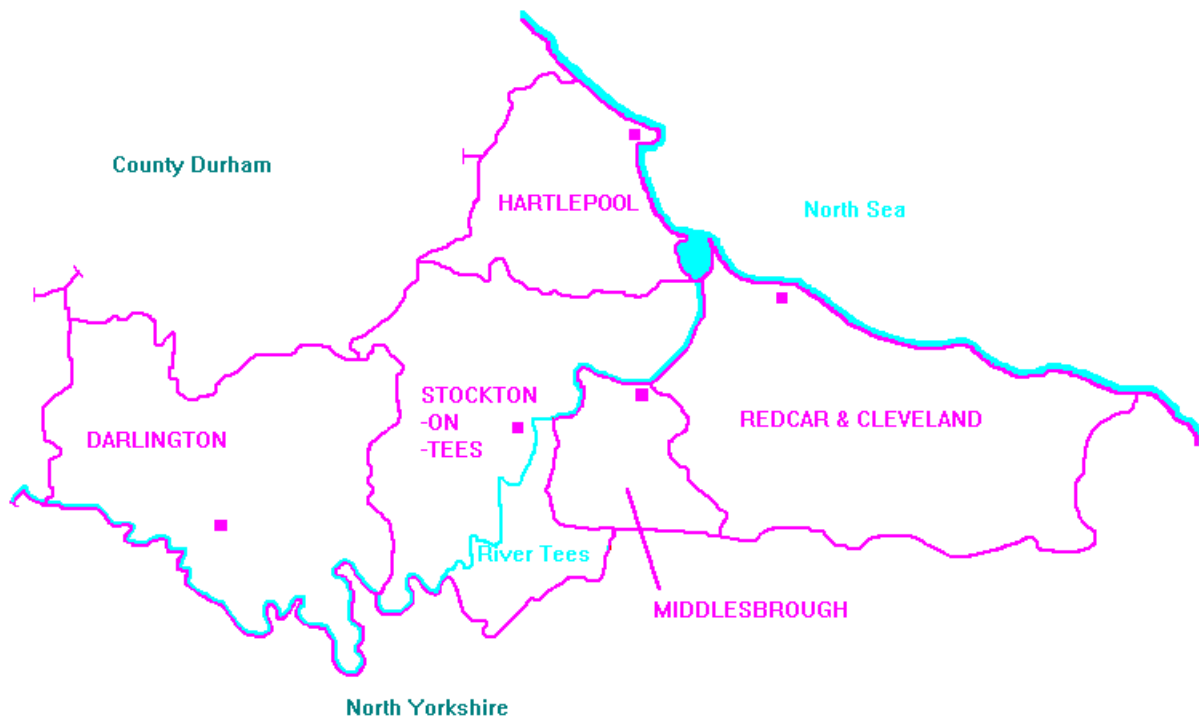


AIR QUALITY BANDING

Analysis of Tees Valley Monitoring Results

2004 – 2011

and a review of changes to the air quality bands from January 2012



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Summary

Air pollution forecasting uses a low – moderate – high banding system (appendix 1) to advise the public of potential health risks associated with air pollution. Any short-term air pollutant concentration forecast in the moderate band or above from a group of five of the more common air pollutants may pose a health risk to sensitive individuals, although only forecasts in the high band would require action by the individual.

Actual pollution concentrations over a year also form part of the air quality indicator published by the Government, which provides a measure of annual air quality and trends.

This report analyses actual air pollution concentrations in the Tees Valley for the five pollutants, and covers the eight year period 2004 – 2011. The pollutants are :

Pollutant	Averaging Period
nitrogen dioxide	1hour mean
carbon monoxide	8hour running mean
sulphur dioxide	15minute mean
particulate PM ₁₀	24hour mean
ozone	8hour running mean

Of these five pollutants, ozone is not regulated in view of the complexity of its formation.

Tees Valley results show that for nitrogen dioxide, carbon monoxide and sulphur dioxide, pollution concentrations rarely go outside of the low band and do not pose a risk to health or noticeable effects to health. This is at least as good as other urban areas of the UK.

For particulate PM₁₀, up to 0.6% of pollutant concentrations are in the moderate or higher bands, and may pose a slight health risk to sensitive individuals. This is below the national average of 2% for urban areas. Only rarely have concentrations been recorded in the high band, and not since 2008.

Ozone is a secondary pollutant formed by the action of strong sunlight on other air pollutants. Ozone pollution tends to peak during prolonged periods of sunny summer weather, especially in rural areas or seaside locations. Air pollution from the continent can cause significant pollution episodes along the east of the UK, most noticeably in the South. Within the Tees Valley, days when pollution concentrations are in the moderate band average less than 3%, again below the national average of 4%. There have been no high band concentrations.

The results confirm that air quality in the Tees Valley is generally good. As with other urban areas of the UK, the two pollutants of concern are particulate PM₁₀ and Ozone. This is recognised by Defra in the national indicator for sustainable development; see Reference 2.

This report also looks at changes to the banding parameters (reference 3) proposed by the Committee for the Medical Effects of Air Pollution (COMEAP), which have now been generally approved by Defra, and which will be introduced from January 1st 2012. The proposals (see also appendix 1) remove carbon monoxide from the banding system on the basis that **all** UK levels are well below potential health risk concentrations. The banding parameters for sulphur dioxide remain the same. Particulate PM_{2.5} has been added to the banding system, recognising the potential harm to health of this fine particle. The parameters for nitrogen dioxide, particulate PM₁₀ and ozone have been tightened to varying degree, reflecting latest evidence of potential harm to health. The health risk guidance has also been revised, as detailed in appendix 4.

The 2009 - 2011 Tees Valley data has been reassessed to give a comparison between the pre-2012 and the new 2012 banding parameters. Details are given in appendix 3.

For the new particulate PM_{2.5} proposal, there would have been 33 moderate / high band readings, 2.3% of the total and mostly associated with high traffic areas at times of cold still weather conditions. This is expected to be below the UK average.

For the particulate PM₁₀ proposal, readings in the moderate / high band would increase from 18 (<0.3%) to 181 (2.2%), again mostly associated with high traffic areas at times of cold still weather conditions. This level of increase will be seen across the UK as a result of the tightening of the banding parameters.

Nitrogen dioxide readings in the moderate / high band would increase from 4 (<0.01%) to 40 (<0.02%). This small level of increase will also be seen across the UK.

The (revised) ozone proposal would see moderate band readings over the two years stay the same at 195 (0.3%), mostly associated with sunny summer days.

Sulphur dioxide readings would continue to be entirely in the low band.

Overall, the new banding parameters will not significantly alter the air quality index for the Tees Valley, which will continue to be better than the UK average. Particulate pollution is the main concern with regard to health on an on-going basis, but ozone will be of concern during long periods of hot sunny weather, particularly near the coast.

AIR QUALITY BANDING

Introduction

The UK Government has developed a banding system (table 1 below) for five common air pollutants, which are recognised as being the most important for causing short term health effects. The banding system was developed to assist air pollution forecasting (see www.airquality.co.uk), but an analysis of annual data now forms part of the Air Quality Indicator for Sustainable Development (No 61, part of the social justice / environmental equality section, reference 2).

Four of the pollutants, nitrogen dioxide, particulate PM10, sulphur dioxide, and carbon monoxide, are regulated pollutants with set air quality objectives against which air quality is judged. The fifth pollutant is ozone, which is not yet regulated due to the complex nature of its formation.

Table 1

Band	Index	Health Effects
Low	1 - 3	Effects are unlikely to be noticed even by individuals who know they are sensitive to air pollutants.
Moderate	4 - 6	Mild effects, unlikely to require action, may be noticed amongst sensitive individuals.
High	7 - 9	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.
Very High	10	The effects on sensitive individuals described for 'High' levels of pollution may worsen

The pollutant concentrations that make up each index and band are detailed in Appendix 1.

The five Tees Valley Councils (Darlington, Hartlepool, Middlesbrough, Redcar & Cleveland, and Stockton-on-Tees) provide a comprehensive automatic air quality monitoring network for these pollutants (reference 1).

This report analyses the monitoring results over the years 2004 – 2011 in order to

1. Assess the quality of air within the Tees Valley.
2. Identify those pollutants that may affect sensitive individuals.
3. Compare the Tees valley with other UK urban areas.

Local Air Quality Management

The Tees Valley councils have assessed air quality annually against the regulated air quality objectives since year 2000, and have concluded that air quality is generally good where members of the public may be exposed, and that there is no need to establish Air Quality Management Areas. Government has accepted these conclusions.

Air Quality Banding

The full banding boundaries are shown in Appendix 1. The analysis of all Tees Valley monitoring data over the eight-year period is recorded in Appendix 2 (pages 1 – 8). This information is summarised below for each pollutant.

Nitrogen Dioxide – hourly mean data in $\mu\text{g}/\text{m}^3$, ten monitoring stations (see Appendix 2 pages 1 - 2)

Total 1hour periods available	Total 1hour data (% in brackets)	Hours in low band index 1-3	Hours in moderate band index 4-6	Hours in high band index 7-9	Hours in very high band index 10
598248	518877 (86.7%)	518864 (99.997%)	13 (0.003%)	0	0
	Index 1	515404 (99.33%)			
	Index 2	3392 (0.65%)			
	Index 3	68 (0.01%)			

Over 99.3% of readings are in the LOW band index 1. There are only thirteen 1hour excursions into the MODERATE band over the eight year period, confirming that Nitrogen Dioxide air quality at the 1hour mean is very good. Eleven of the moderate 1hour episodes have been recorded at the Billingham AURN site, which is a Council depot well away from areas of relevant public exposure, and is related to local Council vehicle exhaust emissions. A single episode was recorded at The Yarm kerbside AURN site, which is not an area of relevant public exposure, and a single episode was recorded at Middlesbrough Breckon Hill AURN site on a November 5th bonfire night.

Carbon Monoxide – 8 hour running mean data in mg/m^3 , four monitoring stations (see Appendix 2 page 8)

Total 8hour running mean periods available	Total period data (% in brackets)	8 hour periods in low band index 1-3	8 hour periods in moderate band index 4-6	8 hour periods in high band index 7-9	8 hour periods in very high band index 10
166427	137734 (82.8%)	137734 (100.0%)	0	0	0
	Index 1	137734 (100.0%)			
	Index 2	0			
	Index 3	0			

All readings over the five year period are in the LOW band index 1. Carbon Monoxide air quality at the 8 hour running mean is very good.

Sulphur Dioxide – 15 minute mean data in $\mu\text{g}/\text{m}^3$, four monitoring stations (see Appendix 2 page 6)

Total 15 minute periods available	Total period data (% in brackets)	15 min periods in low band index 1-3	15 min periods in moderate band index 4-6	15 min periods in high band index 7-9	15 min periods in very high band index 10
876480	672442 (76.7%)	672440 (99.999%)	2 (<0.001%)	0	0
	Index 1	671732 (99.9%)			
	Index 2	674 (<0.11%)			
	Index 3	34 (<0.01%)			

Over 99.8% of readings are in the LOW band index. There have been just 2 15minute excursions into the MODERATE band over the eight year period, confirming that Sulphur Dioxide air quality at the 15minute mean is very good.

Particulate PM₁₀ – 24 hour mean data in µg/m³ (gravimetric *), ten monitoring stations

(see Appendix 2 pages 3 - 4)

Total 24hour periods available	Total period data (% in brackets)	24hr periods in low band index 1-3		24hr periods in moderate band index 4-6	24hr periods in high band index 7-9	24hr periods in very high band index 10
24533	21695 (88.4%)	21575 (99.4%)		113 (0.52%)	7 (0.03%)	0
	Index 1	12991 (59.9%)	Index 4	79 (0.36%)		
	Index 2	7647 (35.2%)	Index 5	28 (0.13%)		
	Index 3	937 (4.3%)	Index 6	6 (<0.03%)		

* gravimetric equivalence calculated from unmodified TEOMs using Government guidance factor of 1.3 to 2008, then vcm method)

Over 99% of readings are in the LOW band, but there is a wider spread across the index levels 1-3.

There have been 113 24hour excursions into the MODERATE band over the eight year period, again showing a spread across the index levels 4-6. There have been 7 24hour excursions into the HIGH band index 7, all prior to 2009.

The potential sources of particulate are significantly more varied than other air pollutants, and it has not been possible to analyse the source data with any certainty. Most of the excursions out of the LOW band have tended to be associated with high-pressure winter weather episodes allowing a build-up of particles particularly close to busy roads, but others have been associated with short-term local building work, and import from continental sources.

Therefore, while Particulate PM₁₀ air quality at the 24hour mean is generally good, there are concerns in areas close to roads with high traffic flows.

Ozone – 8 hour running mean data in µg/m³, four monitoring stations

(see Appendix 2 page 7)

Total 8hour running mean periods available	Total period data (% in brackets)	8 hour periods in low band index 1-3		8 hour periods in moderate band index 4-6	8 hour periods in high band index 7-9	8 hour periods in very high band index 10
254029	215726 (84.9%)	213061 (98.8%)		2685 (1.2%)	0	0
	Index 1	62653 (29.0%)	Index 4	2419 (1.1%)		
	Index 2	109806 (50.9%)	Index 5	205 (0.1%)		
	Index 3	40602 (18.8%)	Index 6	41 (<0.1%)		

Over 98% of readings are in the LOW band, but there is a wide spread across the index levels 1-3.

There have been 2685 8hour running mean excursions across 362 days into the MODERATE band over the eight year period, again showing a spread across the index levels 4-6. There have been no excursions into the HIGH band.

Ozone is formed in the atmosphere by complex chemical reactions involving other air pollutants in the presence of sunlight. Ozone itself is a reactive oxidant, and will react with nitric oxide pollution (eg from vehicles) to form nitrogen dioxide. Therefore a relatively low nitrogen oxide area such as Redcar can have high levels of ozone on a sunny day, whereas a highly traffic congested area such as Yarm High Street can have low levels of ozone, but relatively high levels of nitrogen dioxide.

From time to time, ozone episodes occur across the UK as a result of air pollution import from the continent on easterly winds during summer months. These tend to be more severe in the south of the UK.

Ozone is not currently a regulated pollutant under Local Air Quality Management.

COMEAP (The Committee of the Medical Effects of Air Pollutants)

COMEAP are advisors to the Government on the health effects of air pollutants, and originally set the current air quality banding index around year 2000. COMEAP have recently reviewed the index in the light of latest medical health guidance, and other developments in the field of air quality. Their report 'Review of the UK Air Quality Index' (reference 3) was published in 2011, and has recommended some revision to the existing pollutants, the banding parameters, and the associated health guidance.

The existing pollutants under the banding system are nitrogen dioxide, particulate PM₁₀, sulphur dioxide, carbon monoxide and ozone. Of these, only ozone is not regulated under Local Air Quality Management. COMEAP proposals, now accepted by the Government and to be introduced from January 2012, remove carbon monoxide from the banding system, as pollution levels in ambient air have fallen so low as to have minimal harm to health across the UK. The proposals introduce particulate PM_{2.5} into the banding system as latest health evidence points to these fine particles being more harmful to health than the coarser particulate PM₁₀ fractions, and extensive monitoring has been introduced over recent years. Nitrogen dioxide, particulate PM₁₀, sulphur dioxide and ozone continue to make up the balance of the banding index pollutants. Of these, it is not proposed to change the banding parameters for sulphur dioxide. However, it is proposed to tighten the banding parameters for nitrogen dioxide, particulate PM₁₀, and ozone based on latest health evidence. In particular, the breakpoint between the LOW and MODERATE band has been reduced for nitrogen dioxide and particulate PM₁₀. The current and new banding parameters are shown in appendix 1 to this report. Changes to the accompanying health guidance are included as appendix 4.

To evaluate the effect of the new banding parameters on the analysis of Tees Valley air quality, results from all monitors over the period 2009 to 2011 have been compared under the pre-2012 and new banding index. The results are detailed in appendix 3, but are summarised below.

Data Analysis 2009 - 2011

Pollutant	LOW BAND		MODERATE BAND		HIGH BAND	
	pre-2012	2012 on	pre-2012	2012 on	pre-2012	2012 on
Nitrogen dioxide (1hr data)	196239	196203	4	40	0	0
Particulate PM ₁₀ (24hr data)	8281	8118	18	174	0	5
Particulate PM _{2.5} (24hr data)	-	1313	-	31	-	2
Sulphur dioxide (15min data)	202085	202085	0	0	0	0
Ozone (8hr running mean data)	58228	58228	195	195	0	0
Carbon monoxide (8hr running mean data)	27230	-	0	-	0	-

Under the new banding system, particulates will become the pollutants of most concern in the Tees Valley, as they will across much of the UK. The nitrogen dioxide moderate band readings are mostly associated with the Billingham monitor, which is not in an area of public exposure. Ozone is currently not regulated within the UK or Europe as there is little scope for local or national measures to reduce ozone pollution. This pollutant is of most concern during long hot summer periods, especially in coastal regions.

Conclusion

1. The banding index for the five pollutants provides another measure of air quality in the Tees Valley, which is confirmed as generally good, and better than the national average for UK urban areas.
2. Nitrogen dioxide, carbon monoxide and sulphur dioxide air quality is very good, with no significant impact on public health even for sensitive individuals.
3. Particulate PM₁₀ concentrations have more of a spread across the bands, with up to 1% of days in the moderate band, and a very rare excursion into the high band. This spread is due to a wider range of sources, some natural, and a greater dependency on prevailing weather conditions. Prolonged periods of calm weather normally associated with high-pressure episodes at any time of the year result in poor dispersal and particulate build-up. While mild effects may be felt on rare occasions by sensitive individuals, no action is needed.
4. Ozone concentrations also show a spread across the bands, and also a greater variance year on year dependent on the quality of summer weather. This is because ozone is not emitted from a source but results from complex reactions of other air pollutants, most severely in the presence of strong sunlight. Ozone pollution episodes tend to occur in rural and coastal areas in good summer weather, with the eastern areas of the UK particularly affected by European air pollution. Even so, Tees Valley concentrations are mainly in the low band, with an average of 4% days in the moderate band, varying between 2% and 6% annually, and with no high band readings. While mild effects may be felt during good weather summers by sensitive individuals, no action is needed.
5. The UK Government recognises that particulate PM₁₀ and ozone are the two air pollutants of most concern with regard to public health across the UK. While the results show this is also the case for the Tees Valley, the potential severity is significantly lower than other UK urban areas.
6. The new banding index proposed by COMEAP and now adopted by Defra for 2012 with some modification, has been assessed for 2009 – 2011 data. The number of moderate band readings will increase for nitrogen dioxide and particulate PM₁₀, but they will remain a small percentage of the total. There are few high band readings envisaged as a result of the banding proposals.
7. It is anticipated that the new banding index will continue to show that air quality in the Tees Valley is generally good, and better than the national average for UK urban areas.

Further Work

An annual review of the air quality indicator, using the banding index, will be carried out as an addition to the annual statutory air quality reporting (reference 1).

References

- Reference 1 Air Quality in the Tees Valley (Progress Report) published annually by the TVEPG.
Available on Tees Valley Council web-sites under air quality
- Reference 2 Air Quality Indicator for Sustainable Development published annually by Defra.
Available on the Defra.gov.uk web-site, search air quality indicators
- Reference 3 Review of the UK Air Quality Index, published by COMEAP.
Available on the COMEAP web-site, www.comeap.org.uk

Boundaries between Index Points for Each Pollutant

Index	Ozone		Nitrogen Dioxide		Sulphur Dioxide		Carbon Monoxide		PM ₁₀ Particles		PM _{2.5} Particles	
	8 hourly or hourly mean		hourly mean		15 minute mean		8 hourly mean		24 hour mean		24 hour mean	
	µgm ³		µgm ³		µgm ³		mgm ³		µgm ³ (gravimetric equivalent)		µgm ³ (gravimetric equivalent)	
	Current	2012	Current	2012	Current	2012	Current	2012	Current	2012	Current	2012
1	0-33	0-33	0-95	0-66	0-88	0-88	0-16	-	0-21	0-16	-	0-11
2	34-65	34 - 65	96-190	67-133	89-176	89-176	17-32	-	22-42	17-33	-	12-23
3	66-99	66 - 99	191-286	134-199	177-265	177-265	33-49	-	43-64	34-49	-	24-34
4	100-125	100 - 120	287-381	200-267	266-354	266-354	50-57	-	65-74	50-58	-	35-41
5	126-153	121 - 140	382-477	268-334	355-442	355-442	58-66	-	75-86	59-66	-	42-46
6	154-179	141 - 159	478-572	335-399	443-531	443-531	67-74	-	87-96	67-74	-	47-52
7	180-239	160-187	573-635	400-467	532-708	532-708	75-82	-	97-107	75-83	-	53-58
8	240-299	188-213	636-700	468-534	709-886	709-886	83-91	-	108-118	84-91	-	59-64
9	300-359	214-239	701-763	535-599	887-1063	887-1063	92-99	-	119-129	92-99	-	65-69
10	360 or more	240 or more	764 or more	600 or more	1064 or more	1064 or more	100 or more	-	130 or more	100 or more	-	70 or more

Pollutant	Station	max data	actual data	%	Low					Moderate index 4 - 6	High index 7 - 9	Very High index 10		
					index 1	index 2	index 3	total						
Nitrogen Dioxide														
hourly mean ug/m3														
					Band	0 - 95	96 - 190	191-286	0 - 286	%	287-572	573-763	>763	
NO2 Middlesbrough	Breckon Hill	2011	8760	8635	98.6	8627	8	0	8635	100.0	0	0	0	
	AURN	2010	8760	8536	97.4	8518	18	0	8536	100.0	0	0	0	
		2009	8760	8475	96.7	8472	3	0	8475	100.0	0	0	0	
		2008	8784	8660	98.6	8646	14	0	8660	100.0	0	0	0	
		2007	8760	8651	98.8	8632	19	0	8651	100.0	0	0	0	
		2006	8760	8436	96.3	8432	4	0	8436	100.0	0	0	0	
		2005	8760	8114	92.6	8076	33	4	8113	100.0	1 (514)	0	0	
		2004	8784	5730	65.2	5729	1	0	5730	100.0	0	0	0	
		MacMillan College	2011	8760	8391	95.8	8268	123	0	8391	100.0	0	0	0
		Local	2010	8760	8753	99.9	8615	138	0	8753	100.0	0	0	0
			2009	8760	8685	99.1	8676	9	0	8685	100.0	0	0	0
			2008	8784	8778	99.9	8767	11	0	8778	100.0	0	0	0
			2007	8760	8756	100.0	8743	13	0	8756	100.0	0	0	0
			2006	8760	7186	82.0	7186	0	0	7186	100.0	0	0	0
			2005	8760	8107	92.5	8105	2	0	8107	100.0	0	0	0
			2004	8784	8205	93.4	8200	5	0	8205	100.0	0	0	0
		Elm Street	2011	8760	8358	95.4	8353	5	0	8358	100.0	0	0	0
		Local	2010	8760	8754	99.9	8715	39	0	8754	100.0	0	0	0
			2009	8760	8526	97.3	8523	3	0	8526	100.0	0	0	0
			2008	8784	8353	95.1	8344	9	0	8353	100.0	0	0	0
		2007	8760	8681	99.1	8670	11	0	8681	100.0	0	0	0	
		2006	8760	7395	84.4	7395	0	0	7395	100.0	0	0	0	
		2005	8760	8571	97.8	8571	0	0	8571	100.0	0	0	0	
		2004	8784	8781	100.0	8781	0	0	8781	100.0	0	0	0	
NO2 Darlington	St Cuthbert's Way	2011	8760	7950	90.8	7722	227	1	7950	100.0	0	0	0	
	Local	2010	8760	8680	99.1	8628	52	0	8680	100.0	0	0	0	
		2009	8760	8671	99.0	8410	261	0	8671	100.0	0	0	0	
		2008	8784	8742	99.5	8612	129	1	8742	100.0	0	0	0	
		2007	8760	8284	94.6	8177	107	0	8284	100.0	0	0	0	
		2006	8760	8491	96.9	8441	50	0	8491	100.0	0	0	0	
		2005	2208	1936	87.7	1914	22	0	1936	100.0	0	0	0	
		2004	2880	1987	69.0	1976	11	0	1987	100.0	0	0	0	
		Cockerton Bridge	2011	8760	6829	78.0	6749	78	2	6829	100.0	0	0	0
		Local	2010	8760	8173	93.3	8107	66	0	8173	100.0	0	0	0
			2009	8760	8316	94.9	8278	38	0	8316	100.0	0	0	0
			2008	8784	6804	77.5	6794	10	0	6804	100.0	0	0	0
		2007	8760	8366	95.5	8361	5	0	8366	100.0	0	0	0	
		2006	8760	8747	99.9	8743	4	0	8747	100.0	0	0	0	
		2005	8760	8499	97.0	8493	6	0	8499	100.0	0	0	0	
		2004	5880	2660	45.2	2658	2	0	2660	100.0	0	0	0	
Total Mid / Dar			335280	312652	93.3	311107	1536	8	312651	100.000	1	0.000	0	

Pollutant	Station	max data	actual data	%	Low			total	Moderate index 4 - 6	High index 7 - 9	Very High index 10			
					index 1	index 2	index 3							
Nitrogen Dioxide														
hourly mean ug/m3														
					Band	0 - 95	96 - 190	191-286	0 - 286	%	287-572	573-763	>763	
NO2 Stockton	Billingham	2011	8760	8424	96.2	8231	185	8	8424	100.0	0	0	0	
	AURN	2010	8760	8423	96.2	8182	216	21	8419	100.0	4 (340 / 315 / 311 / 300)	0	0	
		2009	8760	7706	88.0	7572	128	6	7706	100.0	0	0	0	
		2008	8784	8658	98.6	8524	128	6	8658	100.0	0	0	0	
		2007	8760	8441	96.4	8302	129	5	8436	99.9	5 (506 / 397 / 392 / 313 / 292)	0	0	
		2006	8760	8568	97.8	8448	114	5	8567	100.0	1 (298)	0	0	
		2005	8760	8542	97.5	8411	128	3	8542	100.0	0	0	0	
		2004	8784	8709	99.1	8550	158	0	8708	100.0	1 (288)	0	0	
		Eaglescliffe	2011	8760	8687	99.2	8635	51	1	8687	100.0	0	0	0
		AURN	2010	8760	8650	98.7	8596	52	2	8650	100.0	0	0	0
		site started 26/01/09	2009	8760	7572	86.4	7554	18	0	7572	100.0	0	0	0
		(transferred from Yarm)	2008	8784	no data	-	-	-	-	-	-	-	-	-
			2007	8760	no data	-	-	-	-	-	-	-	-	-
		Yarm	2011	8760	no data	-	-	-	-	-	-	-	-	-
		AURN	2010	8760	no data	-	-	-	-	-	-	-	-	-
		site closed 31/08/08	2009	8760	no data	-	-	-	-	-	-	-	-	-
		(transferred to Eaglescliffe)	2008	8784	5693	64.8	5654	38	1	5693	100.0	0	0	0
			2007	8760	8698	99.3	8513	185	0	8698	100.0	0	0	0
			2006	8760	8666	98.9	8500	164	1	8665	100.0	1 (351)	0	0
			2005	8760	8682	99.1	8613	68	1	8682	100.0	0	0	0
		2004	8784	8671	98.7	8581	90	0	8671	100.0	0	0	0	
NO2 Redcar & Cleveland	Corporation Road	2011	8760	5805	66.3	5805	0	0	5805	100.0	0	0	0	
	AURN (to 30/09/2007)	2010	8760	2105	24.0	2104	1	0	2105	100.0	0	0	0	
	Local (from 01/10/2007)	2009	8760	4231	48.3	4231	0	0	4231	100.0	0	0	0	
	Local (from 01/10/2007)	2008	8784	5318	60.5	5318	0	0	5318	100.0	0	0	0	
		2007	8760	7726	88.2	7724	2	0	7726	100.0	0	0	0	
		2006	8760	7332	83.7	7332	0	0	7332	100.0	0	0	0	
		2005	8760	4438	50.7	4438	0	0	4438	100.0	0	0	0	
	2004	8784	8580	97.7	8580	0	0	8580	100.0	0	0	0		
NO2 Hartlepool	Stockton Road	2011	8760	7645	87.3	7645	0	0	7645	100.0	0	0	0	
	Local	2010	8760	1263	14.4	1263	0	0	1263	100.0	0	0	0	
	New station November 2010	2009	8760	no data	-	-	-	-	-	-	-	-	-	
	New station November 2010	2008	8784	no data	-	-	-	-	-	-	-	-	-	
		2007	8760	2178	24.9	2178	0	0	2178	100.0	0	0	0	
		2006	8760	5864	66.9	5863	1	0	5864	100.0	0	0	0	
		2005	8760	3770	43.0	3770	0	0	3770	100.0	0	0	0	
		2004	8784	7180	81.7	7180	0	0	7180	100.0	0	0	0	
Totals St / RC / H			262968	206225	78.4	204297	1856	60	206213	99.994	12	0.006	0	0
Totals Mid / Dar			335280	312652	93.3	311107	1536	8	312651	100.000	1	0.000	0	0
Total			598248	518877	86.7	515404	3392	68	518864	99.997	13	0.003	0	0

Pollutant	Station	max data	actual data	%	Low					Moderate			High index 7 - 9	Very High index 10			
					index 1	index 2	index 3	total	65-74	75-86	87-96	65 - 96					
Particulate PM10		24 hour mean ug/m3 (gravimetric)		Band	0 - 21	22 - 42	43-64	0 - 64	%								
PM10 Middlesbrough	Breckon Hill ALURN (FOMS -TEOM from 2009)	2011	365	308	84.4	214	79	14	307	99.7	1	0	0	1	0	0	0
		2010	365	318	87.1	260	56	2	318	100.0	0	0	0	0	0	0	0
		2009	365	274	75.1	202	60	12	274	100.0	0	0	0	0	0	0	0
		2008	366	269	73.5	184	66	15	265	98.5	4	0	0	4	0	0	0
		2007	365	363	99.5	230	119	7	356	98.1	3	3	1	7	0	0	0
		2006	365	362	99.2	204	136	18	358	98.9	3	0	0	3	1 (100)	0	0
		2005	365	359	98.4	155	168	29	352	98.1	4	1	0	5	2 (113/111)	0	0
		2004	366	362	98.9	224	123	12	359	99.2	3	0	0	3	0	0	0
		2011	365	356	97.5	250	89	16	355	99.7	0	1	0	1	0	0	0
		2010	365	364	99.7	276	86	2	364	100.0	0	0	0	0	0	0	0
		2009	365	363	99.5	283	71	9	363	100.0	0	0	0	0	0	0	0
		2008	366	366	100.0	256	89	16	361	98.6	3	0	0	3	2 (128/97)	0	0
2007	365	365	100.0	218	133	8	359	98.4	3	3	0	6	0	0	0		
2006	365	364	99.7	198	151	12	361	99.2	2	0	1	3	0	0	0		
2005	365	340	93.2	236	100	4	340	100.0	0	0	0	0	0	0	0		
2004	366	349	95.4	255	87	7	349	100.0	0	0	0	0	0	0	0		
PM10 Darlington	Elm Street Local (TEOM vcm corrected from 2008)	2011	365	361	98.9	240	105	14	359	99.4	1	1	0	2	0	0	0
		2010	365	365	100.0	261	101	3	365	100.0	0	0	0	0	0	0	0
		2009	365	340	93.2	256	77	7	340	100.0	0	0	0	0	0	0	0
		2008	366	350	95.6	223	102	21	346	98.9	4	0	0	4	0	0	0
		2007	365	365	100.0	231	120	9	360	98.6	4	1	0	5	0	0	0
		2006	365	329	90.1	169	137	20	326	99.1	2	0	0	2	1 (102)	0	0
		2005	365	355	97.3	188	156	11	355	100.0	0	0	0	0	0	0	0
		2004	366	366	100.0	222	129	13	364	99.5	2	0	0	2	0	0	0
		2011	365	350	95.9	111	189	46	346	98.9	3	1	0	4	0	0	0
		2010	365	364	99.7	155	175	33	363	99.7	1	0	0	1	0	0	0
		2009	365	365	100.0	143	201	20	364	99.7	1	0	0	1	0	0	0
		2008	366	350	95.6	107	208	30	345	98.6	3	1	1	5	0	0	0
2007	365	275	75.3	88	163	24	275	100.0	0	0	0	0	0	0	0		
2006	365	360	98.6	105	210	38	353	98.1	4	2	1	7	0	0	0		
2005	61	53	86.9	14	31	7	52	98.1	0	1	0	1	0	0	0		
2004	121	120	99.2	43	58	17	118	98.3	2	0	0	2	0	0	0		
PM10 Darlington	Cockerton Bridge Local (TEOM vcm corrected from 2008)	2011	365	351	96.2	225	106	20	351	100.0	0	0	0	0	0	0	0
		2010	365	347	95.1	247	94	6	347	100.0	0	0	0	0	0	0	0
		2009	365	354	97.0	263	82	9	354	100.0	0	0	0	0	0	0	0
		2008	366	292	79.8	199	86	7	292	100.0	0	0	0	0	0	0	0
		2007	365	306	83.8	201	97	7	305	99.7	1	0	0	1	0	0	0
		2006	365	360	98.6	250	107	2	359	99.7	0	1	0	1	0	0	0
2005	365	355	97.3	245	108	2	355	100.0	0	0	0	0	0	0	0		
2004	245	112	45.7	75	37	0	112	100.0	0	0	0	0	0	0	0		
Total Mid / Dar		13940	13027	93.5	7906	4492	549	12947	99.39	54	16	4	74	0.57	6	0.05	

STOCKTON, REDCAR & CLEVELAND, HARTLEPOOL

Air Pollution Banding Data 2004 - 2011

Pollutant	Station	24 hour mean ug/m3 (gravimetric)	max data	actual data	%	Band						total	%	Moderate index 4 - 6	High index 7 - 9	Very High index 10			
						index 1	index 2	index 3	index 4	index 5	index 6								
PM10 Stockton	Eaglescliffe AURN site started September 2008 transferred from Yarm (BAM from October 2008)	2011	365	361	98.9	274	75	12	361	100.0	0	0	0	0	0	0	0		
		2010	365	388	98.1	308	47	3	358	100.0	0	0	0	0	0	0	0		
		2009	365	363	99.5	308	48	7	363	100.0	0	0	0	0	0	0	0		
		2008	366	79	21.6	74	5	0	79	100.0	0	0	0	0	0	0	0		
		2007	365	no data	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		2011	365	300	82.2	190	91	19	300	100.0	0	0	0	0	0	0	0		
		2010	365	345	94.5	252	89	4	345	100.0	0	0	0	0	0	0	0		
		2009	365	345	94.5	271	65	9	345	100.0	0	0	0	0	0	0	0		
		2008	366	356	97.3	262	83	11	356	100.0	0	0	0	0	0	0	0		
		2007	365	345	94.5	233	104	6	343	98.4	2	0	2	0	0	0	0		
PM10 Redcar & Cleveland	Corporation Road AURN (to 30/09/2007) Local (from 01/10/2007) (TEOM vcm correlated from 2008)	2011	365	221	60.5	150	58	13	221	100.0	0	0	0	0	0	0	0		
		2010	365	85	23.3	53	32	0	85	100.0	0	0	0	0	0	0	0		
		2009	365	182	49.9	141	40	1	182	100.0	0	0	0	0	0	0	0		
		2008	366	321	87.7	210	101	7	318	99.1	1	2	0	3	0	0	0		
		2007	365	321	87.9	196	119	6	321	100.0	0	0	0	0	0	0	0		
		2006	365	330	90.4	170	135	22	327	99.1	2	1	0	3	0	0	0		
		2005	365	354	97.0	172	163	17	352	98.4	1	1	0	2	0	0	0		
		2004	366	363	99.2	190	153	20	363	100.0	0	0	0	0	0	0	0		
		PM10 Hartlepool	Stockton Road Local closed December 2005 restart January 2011 with BAM	2011	365	264	72.3	84	151	28	263	99.6	1	0	0	1	0	0	0
				2010	365	no data	-	-	-	-	-	-	-	-	-	-	-	-	-
2009	365			no data	-	-	-	-	-	-	-	-	-	-	-	-	-		
2008	366			no data	-	-	-	-	-	-	-	-	-	-	-	-	-		
2007	365			no data	-	-	-	-	-	-	-	-	-	-	-	-	-		
2006	365			no data	-	-	-	-	-	-	-	-	-	-	-	-	-		
2005	365			158	43.3	94	55	9	158	100.0	0	0	0	0	0	0	0		
2004	366			278	76.0	177	91	8	276	99.3	2	0	0	2	0	0	0		
Total	Headland, Town Wall Local start January 2011 with BAM			2011	365	295	80.8	47	194	47	288	97.6	5	2	0	7	0	0	0
				2010	365	8668	81.8	5085	3155	388	8628	98.54	25	12	2	39	0.45	1	0.01
		2009	13940	13027	93.5	7906	4492	549	12947	99.39	54	16	4	74	0.57	6	0.05		
		2008	24533	21695	88.4	12991	7647	937	21575	98.45	79	28	6	113	0.52	7	0.03		
		2007	10593	8668	81.8	5085	3155	388	8628	98.54	25	12	2	39	0.45	1	0.01		
		2006	13940	13027	93.5	7906	4492	549	12947	99.39	54	16	4	74	0.57	6	0.05		
		2005	24533	21695	88.4	12991	7647	937	21575	98.45	79	28	6	113	0.52	7	0.03		
		2004	10593	8668	81.8	5085	3155	388	8628	98.54	25	12	2	39	0.45	1	0.01		
		2003	13940	13027	93.5	7906	4492	549	12947	99.39	54	16	4	74	0.57	6	0.05		
		2002	24533	21695	88.4	12991	7647	937	21575	98.45	79	28	6	113	0.52	7	0.03		

Air Pollution Banding Data 2004 - 2011		MIDDLESBROUGH, STOCKTON										New Banding 2012 Onwards				Page 5 of 8
Pollutant	Station	max data	actual data	%	Band	index 1	index 2	index 3	total	Moderate index 4 - 6	High index 7 - 9	Very High index 10				
Particulate PM _{2.5}	24 hour mean ug/m ³ (gravimetric)				0 - 11	12 - 23	24 - 34	0 - 34	%	35 - 52	53 - 69	>69				
Particulate PM _{2.5} Middlesbrough	Breckon Hill	2011	337	92.3	238	57	28	323	95.8	14	0	0				
	AURN	2010	289	79.2	205	69	14	288	99.7	1	0	0				
	FDMS TEOM monitor	2009	no data	-	-	-	-	-	-	-	-	-				
Particulate PM _{2.5} Stockton	Eaglescliffe	2011	359	98.4	236	79	29	344	95.8	13	2	0				
	AURN	2010	361	98.9	269	68	21	358	99.2	3	0	0				
	BAM monitor	2009	no data	-	-	-	-	-	-	-	-	-				
Total		1460	1346	92.2	948	273	92	1313	97.55	31	2	0	0.21			

Pollutant	Station	max data	actual data	%	Low					Moderate index 4 - 6	High index 7 - 9	Very High index 10		
					index 1	index 2	index 3	total						
Sulphur Dioxide														
15 minute mean ug/m3														
					Band	0 - 88	89 - 176	177 - 265	0-265	%	266-531	532-1063	>1063	
SO2 Middlesbrough	Breckon Hill	2011	35040	33863	96.6	33847	16	0	33863	100.0	0	0	0	
	AURN	2010	35040	33161	94.6	33154	7	0	33161	100.0	0	0	0	
		2009	35040	33485	95.6	33462	22	1	33485	100.0	0	0	0	
		2008	35136	33989	96.7	33963	23	2	33988	100.0	1 (317)	0	0	
		2007	35040	33925	96.8	33881	41	3	33925	100.0	0	0	0	
		2006	35040	33722	96.2	33662	58	2	33722	100.0	0	0	0	
		2005	35040	33367	95.2	33321	45	1	33367	100.0	0	0	0	
2004	35136	34063	96.9	34020	43	0	34063	100.0	0	0	0			
SO2 Stockton	Billingham	2011	35040	27534	78.6	27529	5	0	27534	100.0	0	0	0	
	Local	2010	35040	28177	80.4	28153	22	2	28177	100.0	0	0	0	
		2009	35040	no data	-	-	-	-	-	-	-	-	-	
		2008	35136	no data	-	-	-	-	-	-	-	-	-	
		2007	35040	32242	92.0	32209	30	3	32242	100.0	0	0	0	
		2006	35040	10276	29.3	10276	0	0	10276	100.0	0	0	0	
		2005	35040	31570	90.1	31565	5	0	31570	100.0	0	0	0	
2004	35136	29615	84.3	29612	3	0	29615	100.0	0	0	0			
SO2 Redcar & Cleveland	Corporation Road	2011	35040	22790	65.0	22787	3	0	22790	100.0	0	0	0	
	AURN (to 30/09/2007)	2010	35040	8275	23.6	8275	0	0	8275	100.0	0	0	0	
	Local (from 01/10/2007)	2009	35040	14800	42.2	14800	0	0	14800	100.0	0	0	0	
		2008	35136	no data	-	-	-	-	-	-	-	-	-	
		2007	35040	29332	83.7	29221	105	6	29332	100.0	0	0	0	
		2006	35040	28778	82.1	28713	62	3	28778	100.0	0	0	0	
		2005	35040	31899	91.0	31807	88	4	31899	100.0	0	0	0	
2004	35136	33636	95.7	33532	96	7	33635	100.0	1 (285)	0	0			
SO2 Hartlepool	Stockton Road	2011	35040	no data	-	-	-	-	-	-	-	-	-	
	Local closed December 2007	2010	35040	no data	-	-	-	-	-	-	-	-	-	
		2009	35040	no data	-	-	-	-	-	-	-	-	-	
		2008	35136	no data	-	-	-	-	-	-	-	-	-	
		2007	35040	9490	27.1	9490	0	0	9490	100.0	0	0	0	
		2006	35040	23345	66.6	23345	0	0	23345	100.0	0	0	0	
		2005	35040	14880	42.5	14880	0	0	14880	100.0	0	0	0	
2004	35136	26228	74.6	26228	0	0	26228	100.0	0	0	0			
Total			876480	672442	76.7	671732	674	34	672440	100.000	2	0.000	0	0

Pollutant	Station	max data	actual data	%	Low					Moderate				High	Very High		
					index 1	index 2	index 3	total	index 4 - 6				index 7 - 9	index 10			
					Band	0 - 33	34 - 65	66 - 99	0-99	%	100-126	127-152	153-179	100 - 179	180-359	>359	
													hrs (days)				
O3 Middlesbrough	Breckon Hill	2011	8753	8679	99.2	1830	5146	1678	8654	99.7	25 (7)	0 (0)	0 (0)	20 (4)	0	0	
	AURN	2010	8753	7838	89.5	2361	4213	1244	7818	99.7	20 (4)	0 (0)	0 (0)	20 (4)	0	0	
		2009	8753	7493	85.6	1991	4168	1331	7490	100.0	3 (1)	0 (0)	0 (0)	3 (1)	0	0	
		2008	8777	8664	98.7	2058	4764	1797	8619	99.5	45 (11)	0 (0)	0 (0)	45 (11)	0	0	
		2007	8753	8613	98.4	2259	4765	1557	8581	99.6	30 (3)	2 (1)	0 (0)	32 (4)	0	0	
		2006	8753	8540	97.6	2148	4248	1997	8393	98.3	105 (18)	29 (3)	13 (3)	147 (24)	0	0	
		2005	8753	8387	95.8	2534	4597	1254	8385	100.0	2 (1)	0 (0)	0 (0)	2 (1)	0	0	
		2004	8777	8740	99.6	2210	4565	1878	8653	99.0	55 (5)	17 (3)	15 (2)	87 (10)	0	0	
O3 Redcar & Cleveland	Corporation Road	2011	8753	5892	67.3	955	4146	786	5887	99.9	5 (2)	0 (0)	0 (0)	20 (4)	0	0	
	AURN (to 30/09/2007) Local (from 01/10/2007)	2010	8753	1783	20.4	504	850	429	1783	100.0	0 (0)	0 (0)	0 (0)	0 (0)	0	0	
		2009	8753	4138	47.3	1121	2676	323	4120	99.6	18 (3)	0 (0)	0 (0)	18 (3)	0	0	
		2008	8777	6979	79.5	1834	2632	2064	6530	93.6	449 (45)	0 (0)	0 (0)	449 (45)	0	0	
		2007	8753	7332	83.8	1643	4186	1405	7234	98.7	96 (14)	2 (1)	0 (0)	98 (15)	0	0	
		2006	8753	7788	89.0	1893	3991	1703	7587	97.4	181 (18)	20 (5)	0 (0)	201 (23)	0	0	
		2005	8753	7008	80.1	1809	3844	1307	6960	99.3	48 (6)	0 (0)	0 (0)	48 (6)	0	0	
		2004	8777	8470	96.5	1773	4248	2243	8264	97.6	171 (20)	27 (2)	8 (3)	206 (25)	0	0	
O3 Stockton	Eaglescliffe	2011	8753	6355	72.6	1144	3493	1674	6311	99.3	44 (11)	0 (0)	0 (0)	44 (11)	0	0	
	Local site started 01/01/09 (transferred from Yarm)	2010	8753	8226	94.0	1972	4218	1961	8151	99.1	72 (15)	3 (1)	0 (0)	75 (16)	0	0	
		2009	8753	8019	91.6	1597	4197	2220	8014	99.9	5 (2)	0 (0)	0 (0)	5 (2)	0	0	
		2008	8777	no data	-	-	-	-	-	-	-	-	-	-	-	-	
		2007	8753	no data	-	-	-	-	-	-	-	-	-	-	-	-	
		2006	8753	no data	-	-	-	-	-	-	-	-	-	-	-	-	
		Billingham Local site closed 31/12/08	2011	8753	no data	-	-	-	-	-	-	-	-	-	-	-	-
			2010	8753	no data	-	-	-	-	-	-	-	-	-	-	-	-
			2009	8753	no data	-	-	-	-	-	-	-	-	-	-	-	-
			2008	8777	8528	97.2	2813	3782	1535	8130	95.3	378 (33)	20 (5)	0 (0)	398 (38)	0	0
			2007	8753	8114	92.7	3041	3743	1217	8001	98.6	106 (16)	7 (2)	0 (0)	113 (18)	0	0
		2006	8753	7006	80.0	1918	3205	1638	6761	96.5	186 (17)	54 (10)	5 (2)	245 (29)	0	0	
2005	8753	5522	63.1	712	2731	1863	5306	96.1	206 (30)	10 (2)	0 (0)	216 (32)	0	0			
2004	8777	8155	92.9	4387	2754	971	8112	99.5	43 (12)	0 (0)	0 (0)	43 (12)	0	0			
Yarm Local site closed 31/08/08	2011	8753	no data	-	-	-	-	-	-	-	-	-	-	-	-		
	2010	8753	no data	-	-	-	-	-	-	-	-	-	-	-	-		
	2009	8753	no data	-	-	-	-	-	-	-	-	-	-	-	-		
	2008	8777	5762	65.6	2473	2684	605	5762	100.0	0 (0)	0 (0)	0 (0)	0 (0)	0	0		
	2007	8753	8717	99.6	4097	3689	917	8703	99.8	14 (2)	0 (0)	0 (0)	14 (2)	0	0		
	2006	8753	8632	98.6	2337	4235	1952	8524	98.7	104 (18)	4 (1)	0 (0)	108 (19)	0	0		
	2005	8753	7637	87.3	3548	3586	503	7637	100.0	0 (0)	0 (0)	0 (0)	0 (0)	0	0		
2004	8777	8709	99.2	3691	4450	550	8691	99.8	8 (0)	10 (2)	0 (0)	18 (2)	0	0			
Total			254029	215726	84.9	62653	109806	40602	213061	98.8	2419 (314)	205 (38)	41 (10)	2665 (362)	1.2	0	

Pollutant	Station	max data	actual data	%	Low					Moderate index 4 - 6	High index 7 - 9	Very High index 10	
					index 1	index 2	index 3	total					
Carbon Monoxide	8 hour running mean mg/m3												
					Band	0 - 3.8	3.9 - 7.6	7.7-11.5	0 - 11.5	%	11.6-17.3	17.4-23.1	>23.1
CO	Breckon Hill	2011	8753	7183	82.1	7183	0	0	7183	100.0	0	0	0
Middlesbrough	AURN	2010	8753	8574	98.0	8574	0	0	8574	100.0	0	0	0
		2009	8753	7316	83.6	7316	0	0	7316	100.0	0	0	0
		2008	8777	7723	88.0	7723	0	0	7723	100.0	0	0	0
		2007	8753	8357	95.5	8357	0	0	8357	100.0	0	0	0
		2006	8753	8032	91.8	8032	0	0	8032	100.0	0	0	0
		2005	8753	8190	93.6	8190	0	0	8190	100.0	0	0	0
		2004	8777	8063	91.9	8063	0	0	8063	100.0	0	0	0
CO	Corporation Road	2011	8753	no data	-	-	-	-	-	-	-	-	-
Redcar & Cleveland	AURN (to 30/09/2007)	2010	8753	no data	-	-	-	-	-	-	-	-	-
	Local (from 01/10/2007)	2009	8753	4157	47.5	4157	0	0	4157	100.0	0	0	0
	monitoring stopped	2008	8777	no data	-	-	-	-	-	-	-	-	-
	31/12/2009	2007	8753	3639	41.6	3639	0	0	3639	100.0	0	0	0
	31/12/2009	2006	8753	7443	85.0	7443	0	0	7443	100.0	0	0	0
		2005	8753	7728	88.3	7728	0	0	7728	100.0	0	0	0
		2004	8777	8526	97.1	8526	0	0	8526	100.0	0	0	0
CO	Yarm	2011	8753	no data	-	-	-	-	-	-	-	-	-
Stockton	AURN	2010	8753	no data	-	-	-	-	-	-	-	-	-
	monitoring stopped	2009	8753	no data	-	-	-	-	-	-	-	-	-
	30/09/2007	2008	8777	no data	-	-	-	-	-	-	-	-	-
		2007	8753	6403	73.2	6403	0	0	6403	100.0	0	0	0
		2006	8753	8562	97.8	8562	0	0	8562	100.0	0	0	0
		2005	8753	8562	97.8	8562	0	0	8562	100.0	0	0	0
		2004	8777	8234	93.8	8234	0	0	8234	100.0	0	0	0
CO	Stockton Road	2011	8753	no data	-	-	-	-	-	-	-	-	-
Hartlepool	Local	2010	8753	no data	-	-	-	-	-	-	-	-	-
	monitoring stopped	2009	8753	no data	-	-	-	-	-	-	-	-	-
	31/10/2005	2008	8777	no data	-	-	-	-	-	-	-	-	-
	31/10/2005	2007	8753	no data	-	-	-	-	-	-	-	-	-
		2006	8753	no data	-	-	-	-	-	-	-	-	-
		2005	8753	3793	43.3	3793	0	0	3793	100.0	0	0	0
		2004	8777	7249	82.6	7249	0	0	7249	100.0	0	0	0
	Total		166427	137734	82.8	137734	0	0	137734	100.0	0	0	0

COMEAP (The committee of the Medical Effects of Air Pollutants)

A comparison of 2009 - 2011 Tees Valley data under the old banding system to end 2011, with the new banding system 2012

		Nitrogen Dioxide 1 hour mean $\mu\text{g}/\text{m}^3$				2009 / 2010 / 2011				
Band	Index	up to end 2011	2012		Available 1 hour data		Tees Valley Data analysis 2009 - 2011			
		banding breakpoints	banding breakpoints	9 monitors	pre-2012	2012				
LOW	1 - 3	0 - 286	stricter	0 - 199	196243	82%	196239	196203		
MODERATE	4 - 6	287 - 572		200 - 399	Middlesbrough - 3 Stockton - 2		4	B-0/4/0	40	B-3/21/4, E-0/1/1
HIGH	7 - 9	573 - 763		400 - 599	Darlington - 2 Hartlepool - 1		0		0	
VERY HIGH	10	> 763		> 599	Redcar - 1		0		0	
		Particulate PM_{10} 24 hour mean $\mu\text{g}/\text{m}^3$ gravimetric				2009 / 2010 / 2011				
Band	Index	up to end 2011	2012		Available 24 hour data		Tees Valley Data analysis 2009 - 2011			
		banding breakpoints	banding breakpoints	10 monitors	current	proposed				
LOW	1 - 3	0 - 64	stricter	0 - 49	8299	87%	8281	8118		
MODERATE	4 - 6	65 - 96		50 - 74	Middlesbrough - 3 Stockton - 2		18	M-4, D-6, H-8	174	D-18/21/43, R-1/0/5 M-8/0/28, H-1/1/35, S-5/1/9
HIGH	7 - 9	97 - 129		75 - 99	Darlington - 2 Hartlepool - 2		0		7	D-0/0/1, H-0/0/2, M-0/0/2 S-0/0/2
VERY HIGH	10	> 129		> 99	Redcar - 1		0		0	
		Particulate $\text{PM}_{2.5}$ 24 hour mean $\mu\text{g}/\text{m}^3$ gravimetric				2009 / 2010 / 2011				
Band	Index	up to end 2011	2012		Available 24 hour data		Tees Valley Data analysis 2009 - 2011			
		banding breakpoints	banding breakpoints	2 monitors	pre-2012	2012				
LOW	1 - 3	-	new	0 - 34	1346	92%	-	1313		
MODERATE	4 - 6	-		35 - 52	Middlesbrough Breckon Hill Stockton Eaglescliffe		-	31	M-1/1/14, E-1/3/13	
HIGH	7 - 9	-		53 - 69			-	2	E-1/0/2	
VERY HIGH	10	-		> 69			-	0		
		Sulphur Dioxide 15 minute mean $\mu\text{g}/\text{m}^3$				2009 / 2010 / 2011				
Band	Index	up to end 2011	2012		Available 15 minute data		Tees Valley Data analysis 2009 - 2011			
		banding breakpoints	banding breakpoints	3 monitors	pre-2012	2012				
LOW	1 - 3	0 - 265	no change	0 - 265	202085	77%	202085	202085		
MODERATE	4 - 6	266 - 531		266 - 531	Middlesbrough Breckon Hill Stockton Billingham		0	0		
HIGH	7 - 9	531 - 1063		531 - 1063	Redcar Corporation Road		0	0		
VERY HIGH	10	> 1063		> 1063			0	0		
		Ozone 8 hour running mean $\mu\text{g}/\text{m}^3$				2009 / 2010 / 2011				
Band	Index	up to end 2011	2012		Available 8 hour data		Tees Valley Data analysis 2009 - 2011			
		banding breakpoints	banding breakpoints	3 monitors	pre-2012	2012				
LOW	1 - 3	0 - 99	stricter (at higher bands)	0 - 99	58423	74%	58228	58228		
MODERATE	4 - 6	100 - 179		100 - 159	Middlesbrough Breckon Hill Redcar Corporation Road		195	195	All areas affected, more so coastal areas	
HIGH	7 - 9	180 - 359		160 - 239	Stockton Eaglescliffe		0	0		
VERY HIGH	10	> 359		> 239			0	0		
		Carbon Monoxide 8 hour running mean mg/m^3				2009 / 2010 / 2011				
Band	Index	up to end 2011	2012		Available 8 hour data		Tees Valley Data analysis 2009 - 2011			
		banding breakpoints	banding breakpoints	2 monitors	pre-2012	2012				
LOW	1 - 3	0 - 11.5	stopped	-	27230	78%	27230	-		
MODERATE	4 - 6	11.6 - 17.3		-	Middlesbrough Breckon Hill Redcar Corporation Road		0	-		
HIGH	7 - 9	17.4 - 23.1		-			0	-		
VERY HIGH	10	> 23.1		-			0	-		

Health Advice to Accompany the 2012 Daily Air Quality Index

Air pollution banding	Value	Accompanying health messages for at-risk groups and the general population	
		At-risk individuals *	General population
Low	1 - 3	Enjoy your usual outdoor activities	Enjoy your usual outdoor activities
Moderate	4 - 6	Adults and children with lung problems and adults with heart problems, who experience symptoms , should consider reducing strenuous physical activity, particularly outdoors	Enjoy your usual outdoor activities
High	7 - 9	Adults and children with lung problems, and adults with heart problems, should reduce strenuous physical exertion, particularly outdoors, and particularly if they experience symptoms. People with asthma may find that they need to use their reliever inhaler more often. Older people should also reduce physical exertion	Anyone experiencing discomfort such as sore eyes, cough or sore throat should consider reducing activity, particularly outdoors
Very High	10	Adults and children with lung problems, adults with heart problems, and older people, should avoid strenuous physical activity. People with asthma may find that they need to use their reliever inhaler more often	Reduce physical exertion, particularly outdoors, especially if you experience symptoms such as cough or sore throat
* Adults and children with heart or lung problems are at greater risk of symptoms. Follow your doctor's usual advice about exercising and managing your condition. It is possible that very sensitive individuals may experience health effects even on LOW air pollution days. Anyone experiencing symptoms should follow the guidance overleaf.			

ADDITIONAL INFORMATION ON THE SHORT-TERM EFFECTS OF AIR POLLUTION

The daily air quality index (DAQI) has been developed to provide advice on expected levels of air pollution. In addition, information on the short-term effects on health that might be expected to occur at the different bands of the index (LOW, MODERATE, HIGH, VERY HIGH) is provided. It is possible that very sensitive individuals may experience health effects even on LOW air pollution days. This advice applies to anyone experiencing symptoms.

Short-term effects of air pollution on health

Air pollution has a range of effects on health. However, air pollution in the UK does not rise to levels at which people need to make major changes to their habits to avoid exposure; nobody need fear going outdoors.

Adults and Children with lung or heart conditions – It is known that, when levels of air pollutants rise, adults suffering from heart conditions, and adults and children with lung conditions, are at increased risk of becoming ill and needing treatment. Only a minority of these who suffer from these conditions are likely to be affected and it is not possible to predict in advance who will be affected. Some people are aware that air pollution affects their health: adults and children with asthma may notice that they need to increase their use of inhaled reliever medication on days when levels of air pollution are higher than average.

Older people are more likely to suffer from heart and lung conditions than young people and so it makes good sense for them to be aware of current air pollution conditions.

The general population – At VERY HIGH levels of air pollution, some people may experience a sore or dry throat, sore eyes or, in some cases, a tickly cough even in healthy individuals.

Children need not be kept from school or prevented from taking part in games. Children with asthma may notice that they need to increase their use of reliever medication on days when levels of air pollution are higher than average.

Action that can be taken

When levels of air pollution increase it would be sensible for those who have noticed that they are affected, to limit their exposure to air pollutants. This does not mean staying indoors, but reducing levels of exercise outdoors would be reasonable.

Older people and those with heart and lung conditions might avoid exertion on HIGH pollution days.

Adults and children with asthma should check that they are taking their medication as advised by their health practitioner and may notice that they need to increase their use of inhaled reliever medication.

Adults with heart and circulatory conditions should **not** modify their treatment schedules on the basis of advice provided by the air quality index: such modification should only be made on a health practitioner's advice.

Some athletes, even if they are not asthmatic, may notice that they find their performance less good than expected when levels of a certain air pollutant (ground level ozone) are HIGH, and they may notice that they find deep breathing causes some discomfort in the chest. This might be expected in summer on days when ground level ozone levels are raised. This does not mean that they are in danger but it would be sensible for them to limit their activities in such days.

TEES VALLEY ENVIRONMENTAL PROTECTION GROUP

For further information, contact:

Tim Crowther, Group Co-ordinator

Tees Valley Environmental Protection Group

c/o Stockton Borough Council

Environmental Health Unit

16 Church Road

Stockton

TS18 1XD

Tel: 01287 280120 Fax: 01642 526584

e-mail: tim.crowther1@ntlworld.com