

Coventry City Council

Air Quality Progress Report 2008



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Executive Summary

Pollutants from sources such as our cars lead to levels of air pollution which have a marked affect on our health and the natural environment. The Air Quality Progress Report compares levels of pollution in Coventry with UK air quality objectives set in light of what is known about the effect of the pollutant on health. The report also provides information on how levels of air pollution have changed since the previous Progress Report in 2005 and lists developments which might impact on local air quality. Progress reports form part of a reporting programme for Local Authorities introduced in the Environment Act in 1995 as local air quality management (LAQM).

The Environmental Protection Section monitors air pollution at around 70 sites in the City. Monitoring is performed using both automatic monitoring stations, which measure real-time data, and diffusion tubes that give monthly averages. Most monitoring in Coventry is for nitrogen dioxide, which is the only pollutant that has been found to exceed UK air quality objectives. The major source of this pollutant, and many other air pollutants, is road traffic. Other pollutants monitored are benzene, ozone and PM₁₀ (particles less than 10 micron in diameter).

Where levels of a pollutant exceed a UK objective Local Authorities must designate an Air Quality Management Area (AQMA) and produce an Air Quality Action Plan (AQAP) to try to reduce pollution levels. In Coventry there are 3 AQMA's, for nitrogen dioxide, and an Air Quality Action Plan for these was completed in September 2007. It has been recognised by DEFRA that as Coventry's AQAP has been in place for less than one year little progress would be expected as yet. However, in AQMA 1 (City Centre) concentrations of pollution have dropped considerably between 2005 and 2007, up to 43% in Burges, but still remain high in Hale Street and Trinity Street. Nitrogen dioxide levels in AQMA 2 (Ball Hill) and AQMA 3 (Queensland Avenue / Allesley Old Road) have remained relatively stable over this time.

In 2006 an Updating and Screening Assessment showed that the annual mean objective for nitrogen dioxide might also be exceeded in further areas of the city. A Detailed Assessment of these areas confirmed this in December 2007. The Progress Report indicates exceedences of the annual mean objective at:

- Stoney Stanton Road
- Foleshill Road / Longford Road
- Beake Avenue / Radford Road junction
- Tollbar End
- Croft Road / Victoria Road
- London Road near the Ringway
- Holyhead Road
- Fairfax Street

but not at Spon End / Hearsall Lane as indicated by the Detailed Assessment. Coventry City Council will now have to designate these areas AQMA and produce an Action Plan.

The allowed number of exceedences of hourly levels of nitrogen dioxide was exceeded at Ball Hill last year but this is believed to be due to roadworks in the first week of April 2007.

There does not appear to be any clear trend in concentrations of nitrogen dioxide or PM₁₀. Nitrogen dioxide concentrations reduced in the Memorial Park and AQMA 1 but both have remained relatively constant elsewhere.

There are a number of new developments in the City, which may effect pollution concentrations. The impact of these will be considered in the 2009 Updating and Screening Assessment.

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Maps

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1 Introduction

1.1 Purpose Of Report

The purpose of this report is to provide an update on Air Quality and Air Quality Management in Coventry since the previous USA (2006) and the Detailed Assessment (2007). The report contains information on which air pollutants are monitored in Coventry and where they are monitored and shows trends in air pollution levels in areas where long-term monitoring has been carried out.

1.2 Introduction to Local Air Quality Management

1.2.1 Legislation and Procedure

Part IV of the Environment Act 1995 requires local authorities 'from time to time' to review and assess the air quality in their areas against objectives in the Air Quality Strategy for England, Scotland, Wales and Northern Irelandⁱ. Where objectives are not likely to be met the local authority is required to designate an Air Quality Management Area (AQMA). The local authority must then draw up an action plan setting out the measures it intends to take in pursuit of the air quality objectives within the area covered by the AQMA.

Review and assessment is the initial step in the formal Local Air Quality Management (LAQM) process. The structure of the reviews and assessment are set out in the statutory guidance made under the Environment Act. Since 2003 the process is has been carried out in two steps:

Step One is an **Updating and Screening Assessment (USA)** for identifying those aspects that have changed since the previous rounds of review and assessment. The USA should include an explanation of all conclusions reached as to whether a local authority should proceed to Detailed Assessment or not; and Step Two, a **Detailed Assessment** of those pollutants and specific locations that have been identified as requiring further work. The Detailed Assessment should conclude whether or not Air Quality Objectives are unlikely to be met by the relevant target year and hence whether an Air Quality Management Area (AQMA) should be declared. In years when a USA or Detailed Assessment is not being carried out a **Progress Report** must be produced.

1.2.2 Air Quality Standards and Objectivesⁱⁱ

Standards for air pollution are concentrations over a given time period that are considered to be acceptable in the light of what is scientifically known about the effects of each pollutant on health and on the environment. They can also be used as a benchmark to see if air pollution is getting better or worse.

An exceedence of a standard is a period of time (which is defined in each standard) where the concentration is higher than that set down by the standard. In order to make useful comparisons between pollutants, for which the standards may be expressed in terms of different averaging times, the number of days on which an exceedence has been recorded is often reported. An objective is the target date on which exceedences of a standard must not exceed a specified number.

The objectives adopted in the UK are defined in the latest [Air Quality Strategy for England, Scotland, Wales and Northern Ireland](#), published on 17th July 2007. Those which are limit

values, required by EU Daughter Directives on Air Quality, have been transposed into UK law through the [Air Quality Standards Regulations 2007](#) that came into force on 15th February 2007. A summary of the current UK Air Quality Objectives is provided here.

Table 1: UK Air Quality Objectives for protection of human health, July 2007

Pollutant	Air Quality Objective		To be achieved by
	Concentration	Measured as	
Benzene			
All authorities	16.25 $\mu\text{g m}^{-3}$	Running annual mean	31 December 2003
England and Wales Only	5.00 $\mu\text{g m}^{-3}$	Annual mean	31 December 2010
Scotland and N. Ireland	3.25 $\mu\text{g m}^{-3}$	Running annual mean	31 December 2010
1,3-Butadiene	2.25 $\mu\text{g m}^{-3}$	Running annual mean	31 December 2003
Carbon Monoxide			
England, Wales and N. Ireland	10.0 mg m^{-3}	Maximum daily running 8-hour mean	31 December 2003
Scotland Only	10.0 mg m^{-3}	Running 8-hour mean	31 December 2003
Lead	0.5 mg m^{-3}	Annual mean	31 December 2004
	0.25 mg m^{-3}	Annual mean	31 December 2008
Nitrogen Dioxide	200 $\mu\text{g m}^{-3}$ not to be exceeded more than 18 times a year	1-hour mean	31 December 2005
	40 $\mu\text{g m}^{-3}$	Annual mean	31 December 2005
Particles (PM10) (gravimetric)			
All authorities	50 $\mu\text{g m}^{-3}$, not to be exceeded more than 35 times a year	24-hour mean	31 December 2004
	40 $\mu\text{g m}^{-3}$	Annual mean	31 December 2004
Scotland Only	50 $\mu\text{g m}^{-3}$, not to be exceeded more than 7 times a year	24-hour mean	31 December 2010
	18 $\mu\text{g m}^{-3}$	Annual mean	31 December 2010
Particles (PM2.5) (gravimetric) *	25 $\mu\text{g m}^{-3}$ (target)	Annual mean	2020
All authorities	15% cut in urban background exposure	Annual mean	2010 - 2020
Scotland Only	12 $\mu\text{g m}^{-3}$ (limit)	Annual mean	2010
Sulphur dioxide	350 $\mu\text{g m}^{-3}$, not to be exceeded more than 24 times a year	1-hour mean	31 December 2004
	125 $\mu\text{g m}^{-3}$, not to be exceeded more than 3 times a year	24-hour mean	31 December 2004
	266 $\mu\text{g m}^{-3}$, not to be exceeded more than 35 times a year	15-minute mean	31 December 2005
PAH *	0.25 ng m^{-3}	Annual mean	31 December 2010
Ozone *	100 $\mu\text{g m}^{-3}$ not to be exceeded more than 10 times a year	Daily maximum of running 8-hour mean	31 December 2005

* not included in regulations at present

Shaded data shows new objectives

1.2.3 Coventry's Local Air Quality Management History

Coventry and the other six West Midlands Authorities began the Review and Assessment Process as a joint effort in 1998.

In Coventry the second round of review and assessment resulted in the designation of three AQMA's for exceedence of the objective for the annual mean concentration of nitrogen dioxide. These are:

AQMA 1: the City Centre and is composed of an area in the region of Cross Cheaping, the Burges, Hales Street, Trinity Street, and Ironmonger Row.

AQMA 2: an area around the A4600 Walsgrave Road between Brighton Street and Shakespeare Street in the Ball Hill area of Coventry.

AQMA 3: an area surrounding the junction of Allesley Old Road B4106, Four Pounds Avenue and Queensland Avenue.

Maps of the AQMA's are shown below. An Action Plan for improving air quality in these areas was finalised in September 2007.



Figure 1: AQMA 1; Burges, Trinity Street and Hales Street



Figure 2: AQMA 2; Walsgrave Road near Brays Lane Junction



Figure 3: AQMA 3; Junction of Allesley Old and Queensland Avenue

An Air Quality Action Plan for these areas was approved by Coventry City Council's cabinet and submitted to DEFRA for approval in September 2007.

The 2006 USA showed that further areas of Coventry exceeded the annual mean objective for nitrogen dioxide and this was confirmed by the Detailed Assessment 2007. The areas identified were;

- Croft Road
- Foleshill Road
- London Road at Tollbar Island
- Radford Road at its junction with Beake Avenue
- Spon End / Hearsall Lane
- Stoney Stanton Road

The USA 2006 can be found on the Coventry City Council web site at www.coventry.gov.uk/airpollution under >Air Quality in Coventry > Reviewing and Assessing Air Quality in Coventry. The Detailed Assessment will become available in the next few months and can be obtained on request.

2 Air Quality Monitoring

2.1 Monitoring Methods

The main pollutants of concern in Coventry, as in most Local Authorities, are nitrogen dioxide and PM₁₀ (particulate matter under 10 microns in diameter).

Nitrogen dioxide levels are measured in two ways. The cheapest method of monitoring is by the use of passive diffusion tubes. These are small glass tubes containing a metal grid with an absorbent. They are exposed for a period of 4-5 weeks and then replaced and sent for analysis. They can only be used to find annual mean concentration of nitrogen dioxide, not

hourly means. Because of their low cost diffusion tubes can be used for wide spread assessment of nitrogen dioxide in problem areas, however they are only +/- 25% accurate.

Chemiluminescent analysers are a more accurate method of monitoring nitrogen dioxide. They provide real time data and therefore can be used to find hourly and annual means and to look for trends. Their use is limited as they cost around £20,000 - £40,000 and require regular maintenance and calibration.

PM₁₀ is monitored in Coventry using TEOM's (Tapered Element Oscillation Microbalance). TEOM's measure the amount of particulates in the air by calculating the weight landing on a filter. As they provide real-time data they can be used to find both 24 hour and annual mean concentrations of PM₁₀. Standard TEOM's work at a temperature of 50°C and therefore some volatile material evaporates. Results in this document have been corrected by multiplying by 1.3 as described in LAQM. TG(03). FDMS (filter dynamics measurement system) TEOM's have been introduced in the last 2 years. These enable both volatile and non-volatile particles to be removed.

2.2 Quality Assurance / Quality Control (QA/QC)

The purpose of quality assurance is to ensure that the concentrations of pollutants measured represent the actual concentrations of pollutants in the atmosphere. In addition the data must be consistent over time and sufficiently accurate and precise to enable a comparison with the objectives in the air quality strategy. Coventry City Council follows QA/QC procedures laid down in Technical Guidance provided by DEFRA in LAQM. TG(03), which can be found at <http://www.defra.gov.uk/environment/airquality/local/guidance/pdf/laqm-tg03.pdf>

Data capture of at least 75% is required from automatic analysers to ensure data is accurate therefore data below this level has been omitted from the Progress Report.

2.3 Monitoring Sites

Coventry City Council monitor air pollution at about 70 sites throughout the city. The maps below show the sites where monitoring takes place in Coventry. The references on the map refer to sites monitored for nitrogen dioxide using diffusion tubes. Results for these are given in section 3.2.2. Air Quality monitoring stations are shown on the maps and are described in section 2.4. Most monitoring is performed along main roads because the major source of most pollutants is road traffic and levels decrease very quickly as distance from the road increases. Some monitoring is performed at background sites to see what pollution is like away from sources of pollution.

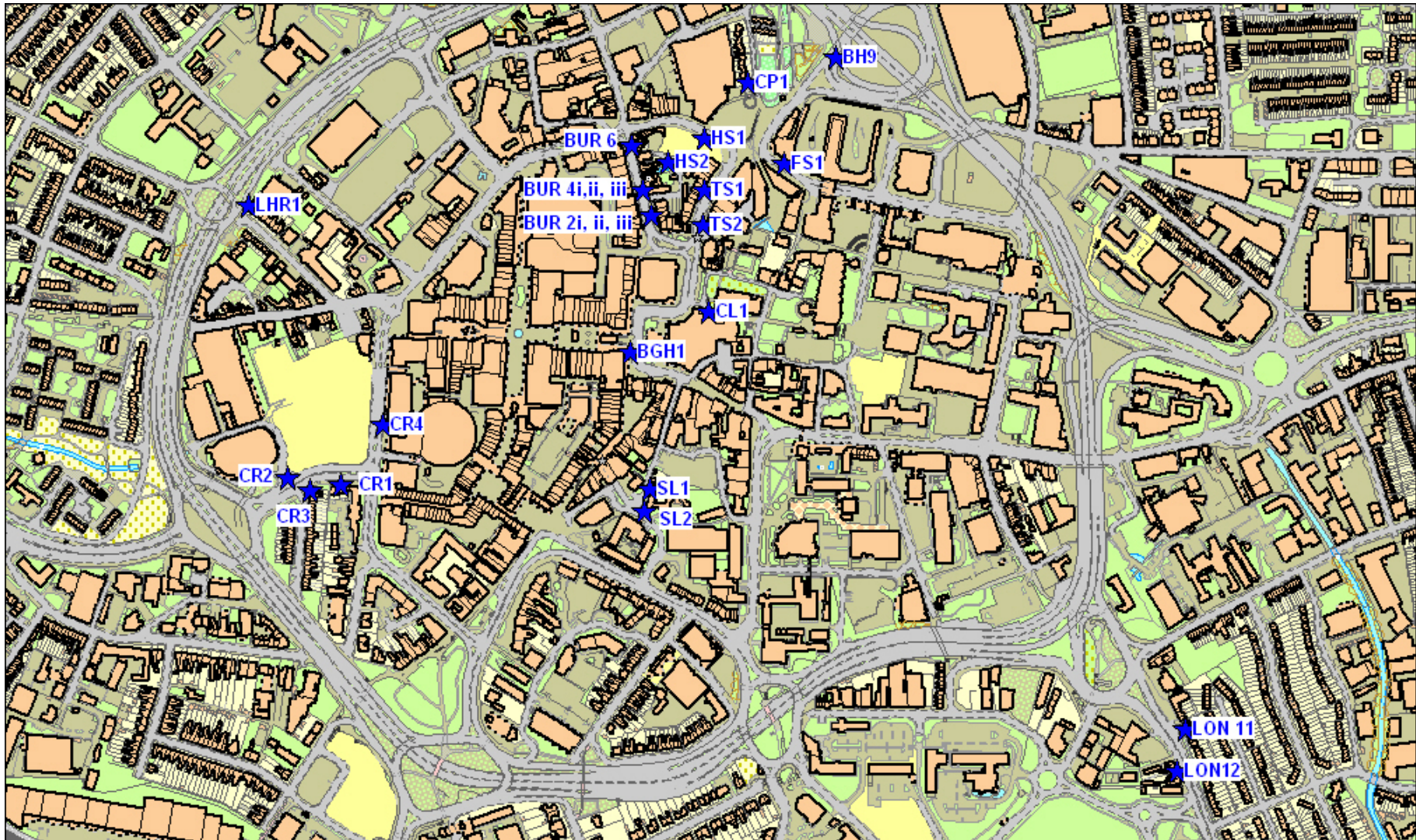


Figure 4: City Centre, including AQMA 1

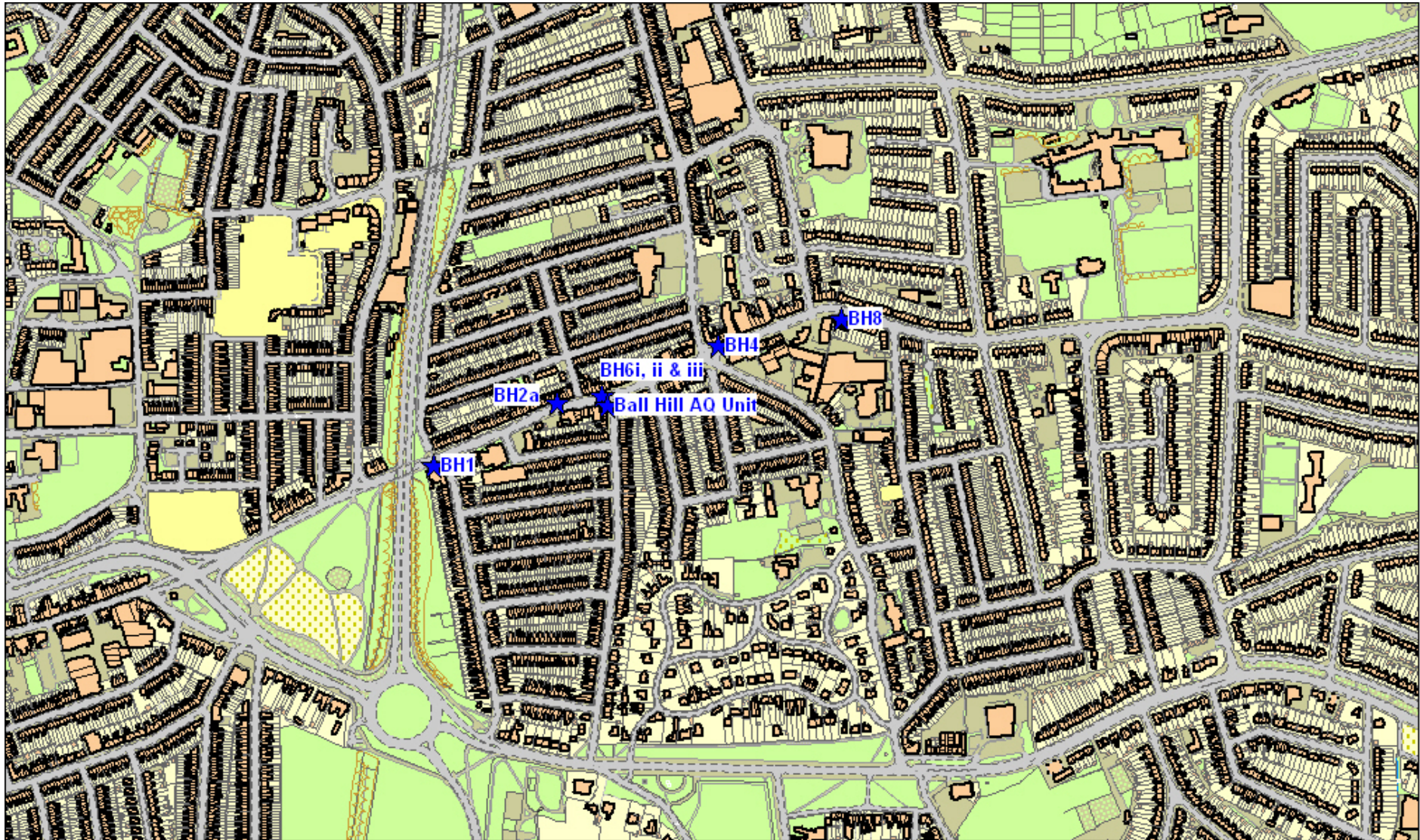


Figure 5: Ball Hill (AQMA 2)



Figure 6: Tollbar End



Figure 7: Monitoring in AQMA 3, Spon End and Earlsdon



Figure 8: Foleshill Road, Longford Road and Burnaby Road



Figure 9: Holyhead Road, Beake Avenue, Foleshill Road and Stoney Stanton Road.

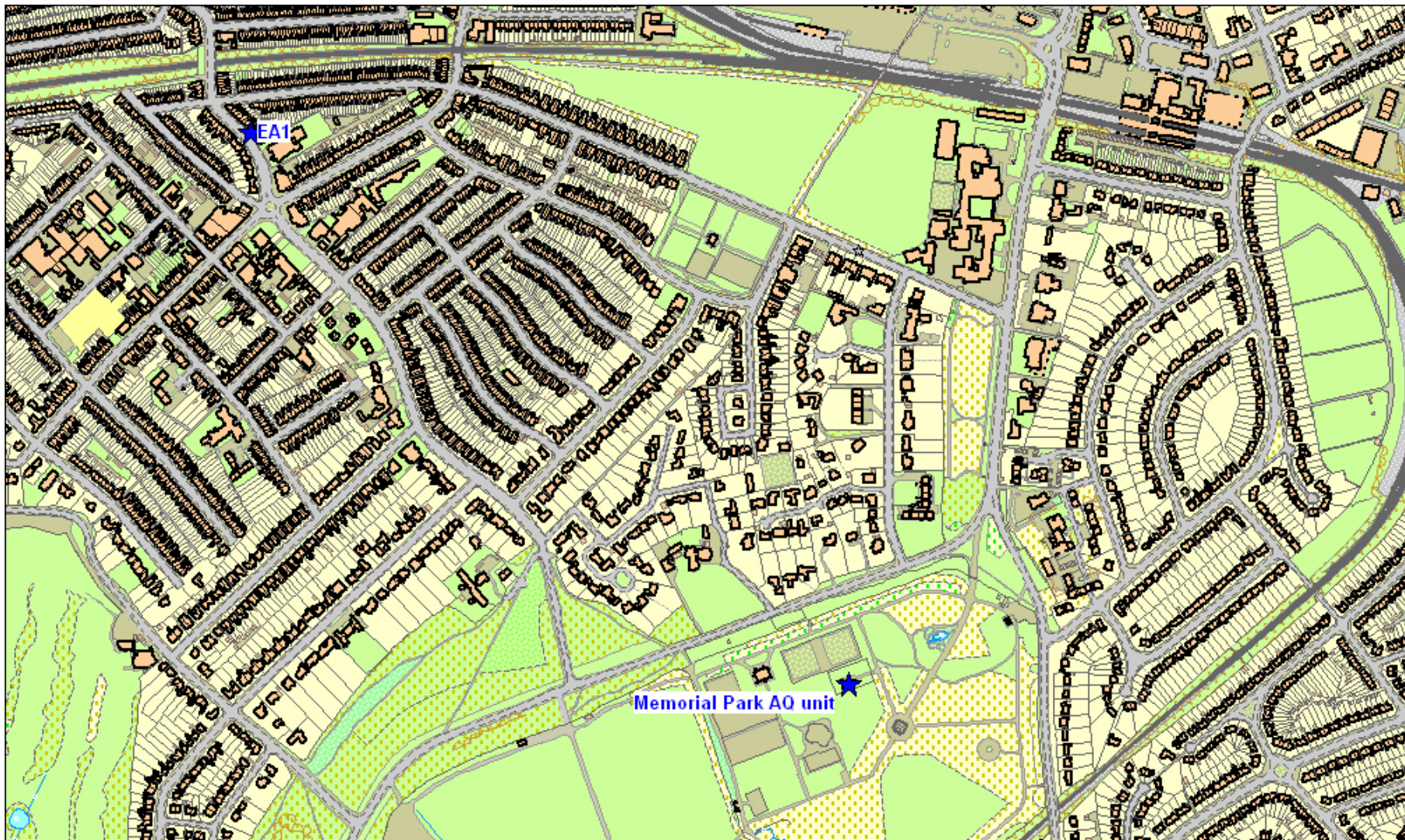


Figure 10: Memorial Park

2.4 Automatic Monitoring Sites

2.4.1 War Memorial Park

The Air Quality Monitoring station in the Memorial Park is owned by DEFRA and run by Coventry City Council as part of the Automatic Urban and Rural Network (AURN).

The site is also part of the Non-Automatic Hydrocarbon Network. Data from the site can be obtained from the Local Air Quality Archive at <http://www.airquality.co.uk>

Coventry Memorial Park is classed as an urban background site. This means that it represents the levels of pollution, which are found in Coventry in areas away from sources of pollution such as major roads. The site houses monitors for nitrogen oxides, particulates, ozone and benzene. In 2007 DEFRA reviewed its UK monitoring scheme. As part of this carbon monoxide monitoring and sulphur dioxide monitoring ceased in the Memorial Park in September 2007.

The TEOM's which measures PM₁₀ in the park was converted to an FDMS TEOM this year which resulted in data capture lower than 75% for 2007 and therefore can not be reported.

As table 1 shows, pollution levels in Coventry Memorial Park are well below the national objectives.

Table 1: Monitoring Results for the Memorial Park 2007

Pollutant	Monitoring Method	Objective	Target Date	Level 2007
Nitrogen Dioxide	Chemiluminescent	200 μgm^{-3} 1 hour mean not to be exceeded more than 18 times a year	31.12.2005	No exceedences
		40 μgm^{-3} annual mean	31.12.2005	18 μgm^{-3}
Particles (PM10)	TEOM FDMS	50 μgm^{-3} 24 hour mean not to be exceeded more that 35 times a year	31.12.2004	No data
		40 μgm^{-3} annual mean	31.12.2004	No data
Carbon Monoxide	Infra-red	10 mgm^{-3} maximum daily running 8 hour mean	31.12.2003	No exceedences (2007)
Ozone*	Ultra violet absorption	100 μgm^{-3} 8 hour mean not to be exceeded more than 10 times a year	31.12.2005	16 exceedences
Sulphur Dioxide	Ultra violet fluorescence	350 μgm^{-3} 1 hour mean not to be exceeded more that 24 times a year	31.12.2004	No exceedences (2006)
		125 μgm^{-3} 24 hour mean not to be exceeded more that 3 times a year	31.12.2004	No exceedences (2006)
		266 μgm^{-3} 15 minute not to be exceeded more that 35 times a year	31.12.2005	No exceedences (2006)
Benzene	Pumped diffusion tube	16.25 μgm^{-3} running annual mean	31.12.2003	No exceedences
		5.00 μgm^{-3} annual mean	31.12.2010	0.61 μgm^{-3}

* Ozone is a national rather than a local authority problem.

2.4.2 City centre (AQMA 1)

The Automatic monitoring station in AQMA 1 was sited in Ironmonger Row. This unreliable and was turned off in 2007. A monitoring station containing nitrogen oxides analyser was purchased by Environmental Health in early 2007 and was to be placed in Trinity Street. However concerns have been raised about the appearance of the air quality unit and permission for siting the unit has not been gained.

2.4.3 Ball Hill (AQMA 2)

This station was moved to the opposite side of the road from its original position on April 13th 2007 and the analyser housed in a walk-in unit rather than a street box. The unit now stands on Walsgrave Road at its junction with Marlborough Road and is next to a bus stop. The air quality unit measure nitrogen oxides. Due to the move and some technical problems data capture for this year has been poorer that expected.

2.4.4 Queensland Avenue (AQMA 3)

This is a mobile air quality unit which was placed at the junction of Four Pounds Avenue and Allesley Old Road in January 2005. It contains analysers for nitrogen oxides and particulate matter (dust).

2.4.5 Foleshill Road

This station monitors particulate matter (dust) and nitrogen oxides. It is situated opposite the junction with Blackwell Road. It has been at this site since 2001.

2.4.6 Tollbar End

This station is sited behind the noise barrier at the Tollbar Island. It contains analysers for nitrogen oxides and particulate matter (dust). The nitrogen oxide analyser and logger at the site are old and have suffered a number of technical failures. Data for nitrogen oxides from 2007 has proven to be unusable. New equipment has been purchased and part paid for by West Midlands International Airport (more commonly known as Coventry Airport). This following equipment should be installed in the unit shortly; logger, nitrogen oxides analyser, conversion of TEOM to FDMS TEOM. Discussions are on going with the Highways Agency regarding re-siting the unit prior to works by the Agency to improve traffic flow at Tollbar Island.

3 Air Quality Monitoring Data

3.1 Benzene

The main source of benzene in the UK is from the combustion and distribution of petrol i.e., combustion in motor vehicles, petrol refining and distribution and uncontrolled emissions at

petrol stations. Under EU legislation since January 2000 the amount of benzene in petrol has been below 1%. Benzene is a known carcinogen.

Benzene is monitored in the Memorial Park using pumped diffusion tubes. The annual mean concentration of benzene in 2007 was $0.61\mu\text{gm}^{-3}$ compared to the UK Objective of $5.00\mu\text{gm}^{-3}$ to be obtained by 2010. Benzene concentrations in Coventry have been falling consistently since 2004.

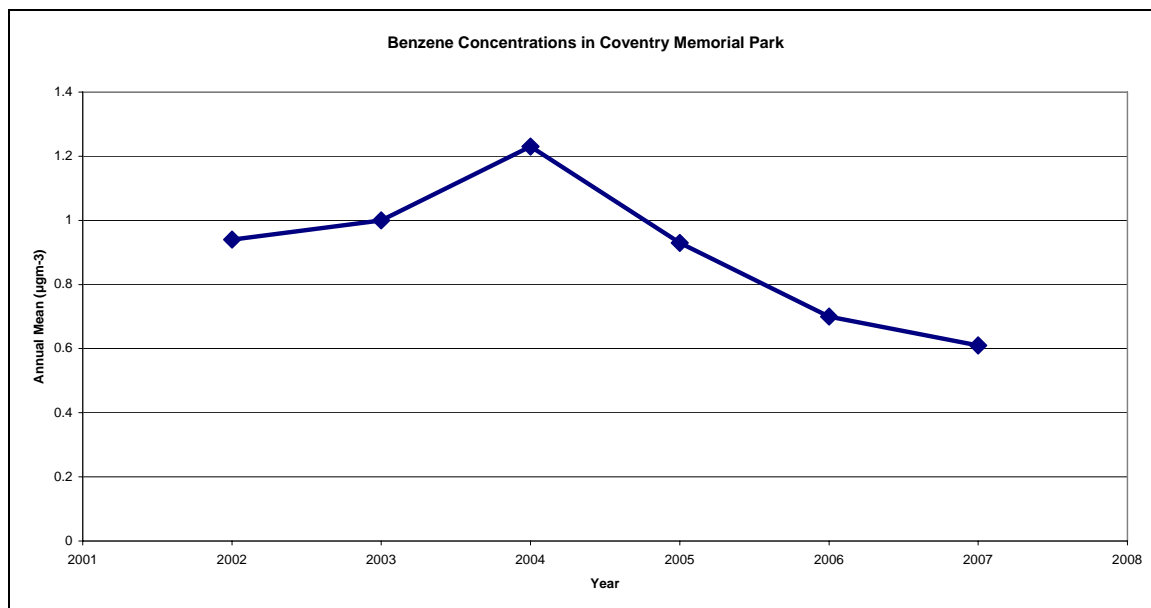


Figure 11: Annual Mean Benzene Concentrations

3.2 Nitrogen Dioxide (NO₂)

Oxides of nitrogen (NO_x) are produced when fossil fuels are burned in air. The greatest source of NO_x is road transport. Power stations, industry and domestic properties are also sources.

Exposure to NO₂ enhances the response to allergens in sensitive individuals such as those with asthma or bronchitis and there is evidence that hospital admissions of people with respiratory diseases are related to concentrations of nitrogen dioxide. UK work has also shown that nitrogen dioxide may increase the prevalence of respiratory infections in children.

3.2.1 Nitrogen Dioxide at Roadside Monitoring Stations

Roadside nitrogen dioxide monitoring is performed at Foleshill Road, Ball Hill, and Queensland Avenue. Table 1 shows the annual mean nitrogen dioxide concentrations at automatic monitoring stations in Coventry since 2005. The UK target for nitrogen dioxide annual mean is $40\mu\text{gm}^{-3}$. Only the air quality unit at Ball Hill does not reach this target.

Table 2 shows times when the hourly mean nitrogen dioxide levels were exceeded. The UK target for these is that 18 exceedences of the mean are allowed at each site annually. Ball Hill is the only site where more than the allowed number of exceedences have occurred. Exceedences of the hourly readings in March-April are due to road works being carried out next to the station. Therefore although the UK target for the hourly mean has been exceeded more than the allowable 18 times this is believed to be exceptional and highly unlikely to reoccur. At other sites most hourly exceedences occur around bonfire night.

The results shown are those measured at the monitoring station and are not corrected for distance to receptors.

Table 2: Annual Mean NO₂ at Roadside Monitoring Stations (µgm⁻³)

	Foleshill Road	Ball Hill (AQMA 2)	Queensland Avenue (AQMA 3)
2005	27.8 (92%)		
2006	24.4 (80%)	48.9 (83%)	31.1 (82%)
2007	34.4 (94%)	48.1 (87%)	29.4 (98%)

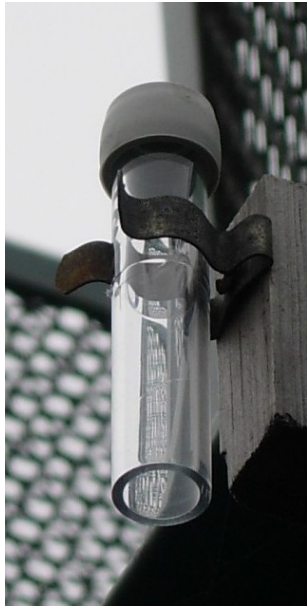
Numbers in bracket show data capture %

Table 3: Exceedences of the Hourly Mean (200µgm⁻³)

Foleshill Road			Ball Hill (AQMA 2)			Queensland Avenue (AQMA 3)		
Date	Time	µgm ⁻³	Date	Time	µgm ⁻³	Date	Time	µgm ⁻³
12/05/2007	11:00	701	07/02/07	10:00	201	04/11/2007	2100	289
12/05/2007	10:00	351	30/03/07	9:00	321	05/11/2007	2000	229
03/11/2007	22:00	214	30/03/07	8:00	294	06/11/2007	1900	218
04/11/2007	21:00	362	30/03/07	10:00	287	10/11/2007	1000	214
04/11/2007	20:00	341	30/03/07	12:00	241	04/11/2007	2100	289
04/11/2007	22:00	325	30/03/07	13:00	230			
04/11/2007	19:00	205	30/03/07	11:00	230			
28/11/2007	9:00	367	30/03/07	14:00	204			
12/05/2007	11:00	701	02/04/07	15:00	265			
			02/04/07	14:00	253			
			02/04/07	16:00	241			
			02/04/07	11:00	230			
			02/04/07	10:00	219			
			02/04/07	13:00	219			
			02/04/07	12:00	214			
			03/04/07	8:00	286			
			03/04/07	7:00	266			
			03/04/07	9:00	222			
			04/04/07	11:00	302			
			04/04/07	8:00	300			
			04/04/07	9:00	293			
			04/04/07	10:00	278			
			04/04/07	7:00	250			
			04/04/07	16:00	231			
			04/04/07	13:00	230			
			04/04/07	14:00	229			
			04/04/07	15:00	226			
			04/04/07	12:00	215			
			05/04/07	9:00	300			
			05/04/07	5:00	219			
			05/04/07	7:00	400			
			05/04/07	8:00	388			
			05/04/07	6:00	365			
Total		8			33			5

3.2.2 Diffusion Tube Results

Diffusion tubes are small plastic tubes around 8 cm in length which contain a grid with a chemical that “traps” nitrogen dioxide from the air as it flows past the tube. They are low cost allowing widespread surveys to be carried out. Coventry’s Environmental Health currently employs 98 diffusion tubes. Diffusion tubes are replaced once a month when they are sent to the laboratory for analysis. Coventry City Council uses 20% TEA/water diffusion tubes provided and analysed by Gradko International Limited. Diffusion tubes have poor accuracy so they must be corrected using a bias correction factor that is gained by collocation studies with more accurate automatic analysers. Data here has been corrected using the national bias factor from <http://www.uwe.ac.uk/aqm/review/> for 2007 which is 0.87.



Wherever possible diffusion tubes are placed on the facades of residential properties in order to monitor pollutant concentrations receptors are exposed to. Where this is not possible tubes can be attached to lampposts or other suitable street furniture. These diffusion tube results have been corrected to façade where necessary.

At some sites diffusion tube data is not for a full 12 month period. When diffusion tube data is for at least 9 months the annual mean is considered representative for indicative purposes and has not been corrected for the purpose of the Progress Report. At some sites monitoring had only been carried out for 8 months. Section A1.39 of TG(03) notes that in cases where there are 6 (or more) months' data, the bias adjusted mean is likely to be representative of the "real" annual mean to within +/-15%.

Diffusion tubes put in place since the Detailed Assessment are highlighted in green.

Table 4: Diffusion Tube Results 2007

Site Reference	Address	Siting Category	Easting	Northing	Uncorrected Average	No. months	Bias Adjusted	Concentration at Façade
HOLYHEAD ROAD								
LHR1	Lower Holyhead Road	Roadside	432880	279180	41.7	12	36	32.7
6Nd	Holyhead Road	Roadside	431990	279644	50.6	12	44	39.6
6N*	Holyhead Road, United Reform Church	Roadside	431990	279644	51.9	12	45	40.7
CCO1*/1N	Holyhead Road, Beaumont Court	Roadside	432105	279578	49.3	12	43	38.6
CCO3/3N*	Moseley Avenue, Coundon Social Services,	Background	432299	279898	25.3	12	22	22.0
CCO4/5N*	Brackley Close, 16	Background	431683	281446	27.7	12	24	21.7
BALL HILL (AQMA 2)								
BH1	Walsgrave Road, Library	Roadside	434966	279204	49.3	12	43	38.6
BH2a	Walsgrave Road, 161	Roadside	435125	279284	52.3	10	45	45.5
BH4	Walsgrave Road, 243	Roadside	435331	279358	55.4	11	48	45.8
BH6i	Walsgrave Road, Post Office	Roadside	435181	279294	57.3	12	50	49.9
BH6ii	Walsgrave Road, Post Office	Roadside	435181	279294	56.8	11	49	49.4
BH6iii	Walsgrave Road, Post Office	Roadside	435181	279294	57.4	10	50	49.9
BH8	Walsgrave Road, 190	Façade	435490	279392	41.4	12	36	36.0
BH9	Walsgrave Road, 347	Roadside	435645	279371	50.2	11	44	39.3
CITY CENTRE (AQMA1)								
BUR 2i	Burges	Roadside	433398	279168	47.4	12	41	37.1
BUR 2ii	Burges	Roadside	433398	279168	47.6	12	41	37.2
BUR 2iii	Burges	Roadside	433398	279168	51.6	11	45	40.4
BUR 4i	Burges, Plaza Studio	Roadside	433387	279199	49.4	12	43	40.8
BUR 4ii	Burges, Plaza Studio	Roadside	433387	279199	51.8	11	45	42.9
BUR 4iii	Burges, Plaza Studio	Roadside	433387	279199	51.1	11	44	42.2
BUR 6	Burges, Kong	Roadside	433373	279257	57.2	12	50	49.8
HS1	Hales Street	Roadside	433467	279267	57.9	12	50	50.4
HS2	Hales Street, Palmer lane	Roadside	433420	279236	37.5	12	33	32.6
TS1	Trinity Street	Roadside	433465	279200	61.0	9	53	50.4
TS2	Trinity Street	Roadside	433465	279154	59.5	9	52	49.2
CITY CENTRE outside AQMA								
BGH1	Broadgate House, Room 311	Façade	433370	278990	46.3	11	40	40.3
FS1	Fairfax Street, Pool Meadow	Roadside	433569	279234	73.0	12	64	60.4
CP1	Chantry Place, 1	Façade	433522	279339	35.5	12	31	30.9
CR1	Croft Road	Roadside	432998	278820	47.7	10	42	41.5
CR2	Croft Road	Roadside	432929	278828	45.1	8	41	N/A
CR3	26A Starley Rd	Façade	432959	278812	39.8	12	35	34.6
CR3a	26A Starley Rd	Façade	432959	278812	40.8	12	35	35.5
CR4	Queen Victoria Rd	Roadside	433052	278897	56.7	8	51	51.4
CR4a	Queen Victoria Rd	Roadside	433052	278897	58.7	8	53	53.3
SL1	Salt Lane	Roadside	433396	278814	39.2	10	34	34.1
SL2	Salt Lane	Roadside	433389	278786	40.3	10	35	33.3
LON 11	45 London Road	Façade	434086	278505	39.5	12	34	34.4
LON12	80 London Road	Roadside	434074	278451	49.4	11	43	43.0
TOLLBAR END								
LON 7i	London Road, Glengary Hotel	Intermediate	436540	275725	51.5	9	45	44.8
LON 7ii	London Road, Glengary Hotel	Intermediate	436543	275718	47.1	12	41	41.0
LON 7iii	London Road, Glengary Hotel	Intermediate	436546	275711	44.1	12	38	38.3
LON 8	London Road, Glengary Hotel	Intermediate	436548	275712	44.9	12	39	39.0
LON 8a	London Road, 703	Intermediate	436551	275703	41.8	12	36	36.4
SD1	Siskin Drive	Roadside	436450	275578	41.3	12	36	N/A

BEAKE AVENUE / RADFORD ROAD								
BA1	Beake Avenue/Radford Road	Roadside	432531	280769	46.0	10	40	40.0
BA1d	Beake Avenue/Radford Road	Roadside	432531	280769	46.7	10	41	40.7
EARLSDON / SPON END								
SE1	Spon End, 58a	Roadside	432091	279042	43.1	11	37	37.5
SE1d	Spon End, 58a	Roadside	432091	279042	42.4	10	37	36.9
SE2	28 Allesley Road	Roadside	432015	279046	36.1	11	31	31.4
SE3	97 Spon End	Roadside	432305	279027	44.7	12	39	38.9
EA1	132 Earlsdon Ave North	Roadside	432013	278188	35.4	12	31	30.8
EA2	169 Earlsdon Ave North	Roadside	431840	278395	34.8	12	30	30.2
AL1	32 Albany Road	Roadside	432309	278472	37.6	12	33	32.7
QAV 12	Queensland Avenue, 2	Roadside	431073	279047	40.8	12	35	35.5
QAV 13	Hearsall Lane, 181	Roadside	431761	278656	45.8	12	40	39.9
QUEENSLAND AVENUE (AQMA 3)								
QAV 01	Queensland Avenue, Fairytale Flowers	Roadside	431595	278991	52.8	12	46	43.7
QAV01d	Queensland Avenue, Fairytale Flowers	Roadside	431595	278991	54.4	12	47	45.0
QAV 9	Queensland Avenue, 81	Roadside	431601	278934	40.5	12	35	35.2
QAV 10	Allesley Old Road, 164	Roadside	431559	279020	38.7	11	34	33.7
QAV 11	Allesley Old Road, 87	Façade	431631	278992	36.6	12	32	31.8
FOLESHILL ROAD								
R1	Foleshill Road	Roadside	434250	281513	39.9	12	35	26.1
R2	Foleshill Road	Roadside	434250	281513	40.8	12	35	26.6
R3	Foleshill Road	Roadside	434250	281513	40.9	12	36	26.7
R4	Foleshill Road, Surestart	Roadside	434233	281526	44.1	9	38	38.4
R5	Foleshill Road, 275	Roadside	433716	280503	52.2	12	45	45.4
R6	Foleshill Road, 193	Roadside	433617	280276	59.7	12	52	51.9
R6a	Foleshill Road, 193	Roadside	433617	280276	55.8	11	49	48.5
R7	Foleshill Road, 1139	Roadside	434757	282828	44.1	11	38	38.3
R8	Foleshill Road, 415	Roadside	433992	281008	45.1	12	39	39.2
R9	Foleshill Road, 324	Roadside	434061	281100	49.8	12	43	41.1
LR1	23 Longford Road	Roadside	434836	283030	50.1	12	44	43.6
LR2	24 Longford Road	Roadside	434880	283077	49.8	12	43	43.4
MR1	14/16 Mason Rd (faces Phoenix Way)	Roadside	434548	282079	44.5	10	39	34.9
LL1	34 Lockhurst Lane	Roadside	434707	281906	38.3	12	33	33.3
BRN2	Burnaby Road, 19	Roadside	433605	281965	42.5	11	37	36.9
BRN2a	Burnaby Road, 19	Roadside	433605	281965	43.7	12	38	38.0
STONEY STANTON ROAD								
SS1	Stoney Stanton Road, 154	Roadside	434064	280083	45.2	12	39	39.3
SS2	Stoney Stanton Road, 155	Roadside	433994	279969	47.9	12	42	41.7
SS3	R/O 21 Torcastle Close (faces SS Rd)	Roadside	434842	281272	46.2	12	40	40.2
SS4	611 Stoney Stanton Rd	Roadside	434591	281056	45.9	12	40	40.0

Figures in red are those that exceed the UK air quality objective for annual mean concentration of nitrogen dioxide.

These results confirm the results of the Detailed Assessment 2007 that showed that there are exceedences of the UK annual mean objective for nitrogen dioxide at:

Stoney Stanton Road
Foleshill Road / Longford Road
Beake Avenue / Radford Road junction
Tollbar End

Croft Road / Victoria Road

But not at Spon End / Hearsall Lane as indicated by the Detailed Assessment.

Exceedences were also measured at;

London Road near the Ringway
Holyhead Road
Fairfax Street.

3.2.3 Trends in Nitrogen Dioxide Concentrations

Trends in nitrogen dioxide concentrations are discussed below. In 2003 estimates for air quality levels in the UK were that as vehicle technology became "cleaner" nitrogen dioxide levels would decrease. Over the last 18 months it has been noticed that in many urban areas levels of nitrogen dioxide are not reducing as expected but are remaining stable or increasing. This is because concentrations of nitrogen dioxide emitted by diesel engines, HDV's and buses in particular, has increased due to changes in engine technology. Most notably many designs of particle traps reduce particulate emissions but increase NO₂ emissions. Due to this uncertainty it has been decided not to predict future nitrogen dioxide concentrations in Coventry.

3.2.3.1 Outside AQMA's

Cleaner technology has led to reduction in levels of nitrogen oxides. However in some areas, the increase in road traffic volume and direct emission of NO₂ from diesel engines has meant that NO₂ levels have not been decreasing as expected. Figure 12 shows the trend in background concentrations of NO₂. At the Memorial park there has been a general decrease in NO₂ since 2003 but at the other background concentrations are variable. At roadsides levels decreased slightly in AQMA's 2 & 3 but have increased some other areas. Foleshill Road showed a significant increase in NO₂ concentrations last year.

There are several reasons for variability in nitrogen dioxide levels. One of the most prominent reasons for variation will be due to annual weather conditions. At roadside sites variation can be due to roadworks, which alter traffic flows.

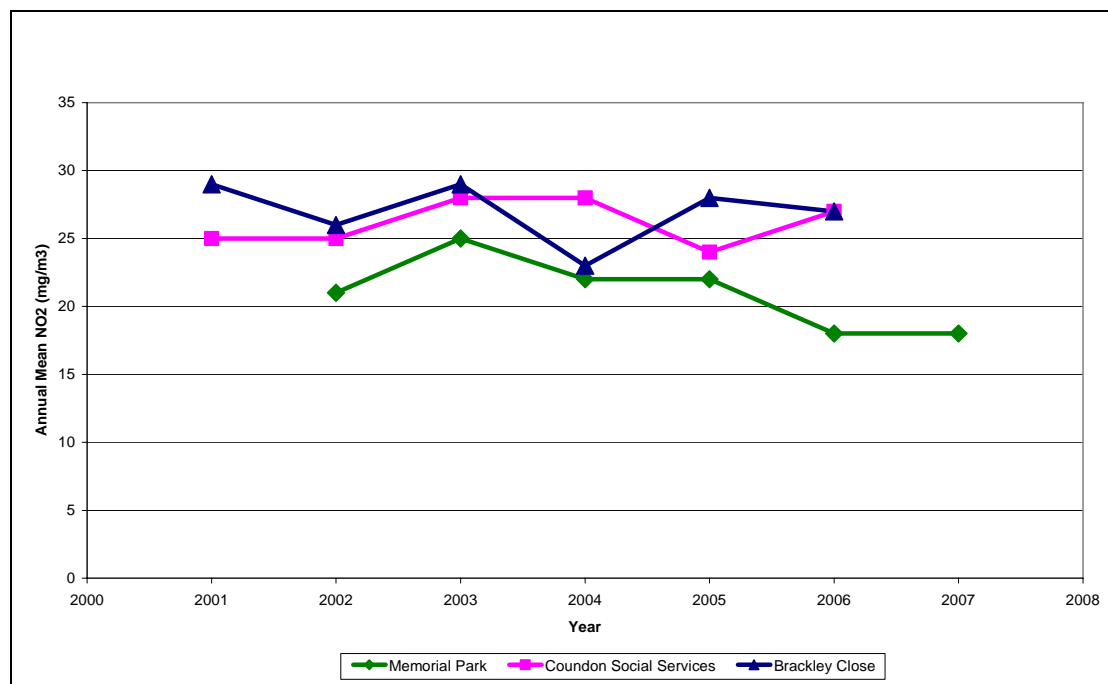


Figure 12: Trend in Nitrogen Dioxide at Background Sites

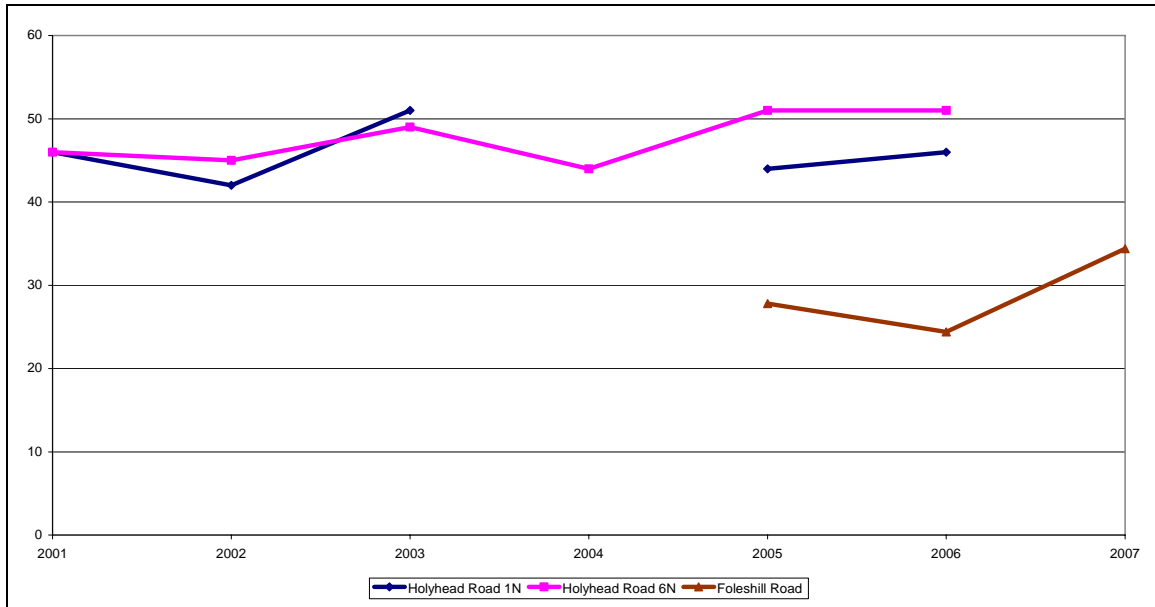


Figure 13: Trend in Nitrogen Dioxide at Roadside Sites

3.2.3.2 AQMA 1: City Centre

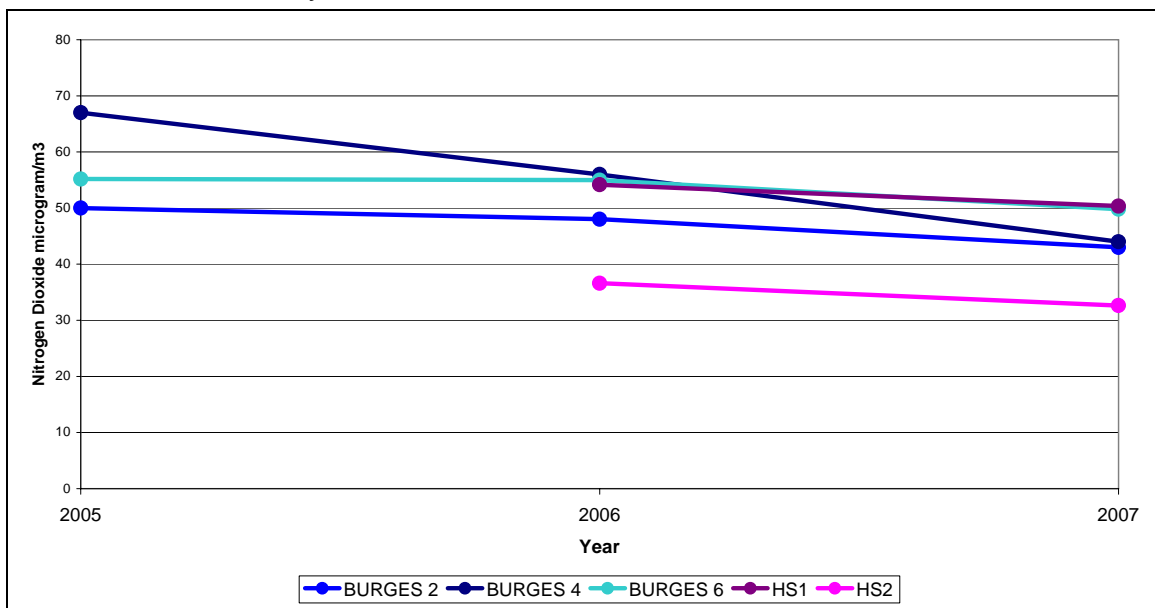


Figure 14: Trend in Nitrogen Dioxide Concentration in AQMA 1

Since 2005 concentrations of nitrogen dioxide in Burges have reduced considerably, by between 9% and 34%. Although concentrations have reduced levels on Hale Street and the lower end of Burges still have concentrations 25% above the UK objective at residential properties. HS2 is a monitoring site on Palmer Lane and shows the level of air pollution away from the roadside in AQMA 1. Monitoring in Trinity Street recommenced this year and shows that concentrations there were similar to Hale Street in 2007.

3.2.3.3 AQMA 2: Ball Hill

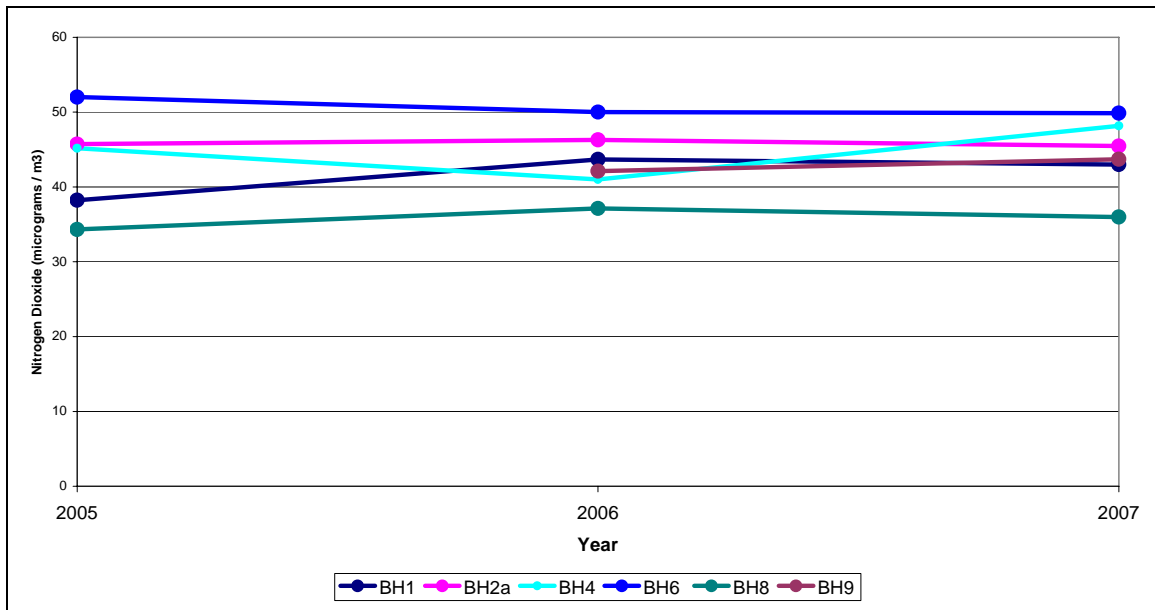


Figure 15: Trend in Nitrogen Dioxide Concentration in AQMA 2

There has been some variation in nitrogen dioxide concentrations from one year to the next at each monitoring site. However across the AQMA the concentration remains constant at 43-44 $\mu\text{g m}^{-3}$, for diffusion tubes that have been in AQMA 2 for three years.

3.2.3.4 AQMA 3: Queensland Avenue

The only exceedence in AQMA 3 is at Fairytale Flowers at the junction of Queensland Avenue and Allesley Old Road (Qav1 and 1d). Figure 4 shows that nitrogen dioxide concentrations in the AQMA are constant.

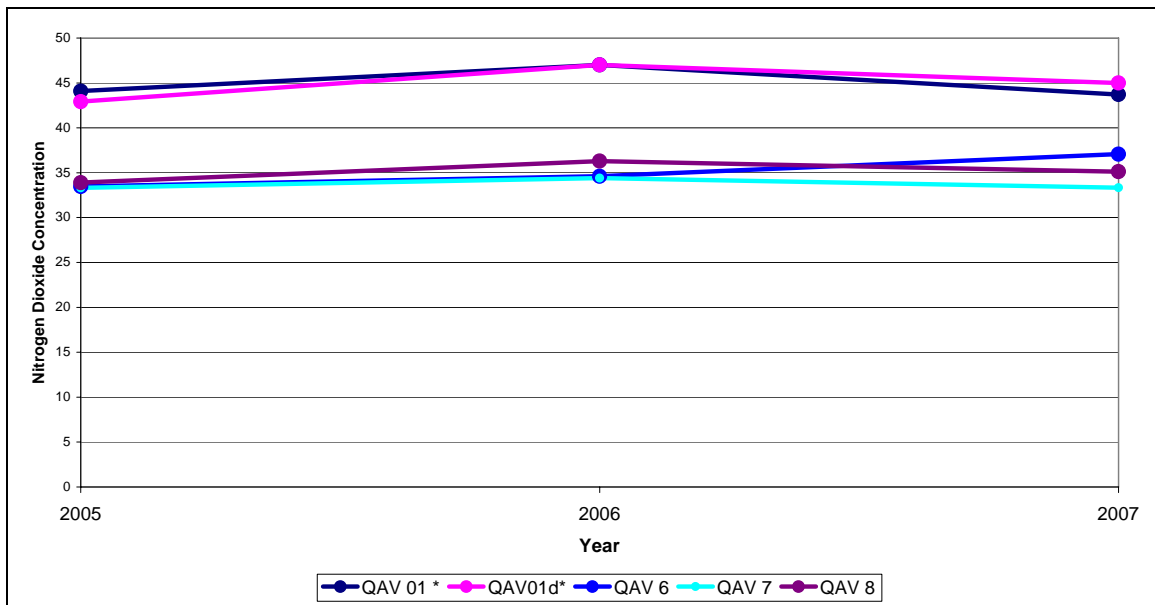


Figure 16: Trend in Nitrogen Dioxide Concentration in AQMA 3

3.3 Particles (PM₁₀)

PM₍₁₀₎ is the acronym for particulate materials which are under 10 microns in size and covers solid materials, aerosols and droplets. Particulates come from a number of sources that can be both natural and man-made. Some particulates are caused by interaction of other pollutants, such as ammonia reacting with nitrogen oxides and sulphur dioxide. In Coventry a large proportion of particulates are from road vehicles.

In the last few years' links have been found between day-to-day variations in levels of airbourne particulates and healthⁱⁱⁱ. These include daily deaths, admissions to hospital for the treatment of respiratory and cardiovascular diseases and symptoms amongst patients suffering from asthma. There is also evidence from the United States that long-term exposure to particulate air pollution is associated with a decrease in life expectancy. Although there are UK air quality objectives for particulate levels it is recognised that there is no safe threshold level for this pollutant.

3.3.1 Particles (PM₁₀) at Roadside Monitoring Stations

Roadside particulate monitoring is carried out at Foleshill Road, Queensland Avenue and Tollbar End. Levels of PM₁₀ at roadsides in Coventry appear to be stable.

Table 5: Particulate Concentrations at Roadside Sites (corrected µgm⁻³)

	Foleshill Road	Queensland Avenue	Tollbar End
2005	20 (75%)	21 (82%)	N/A
2006	23 (82%)	22 (88%)	28 (79%)
2007	22 (98%)	20 (98%)	28 (83%)

Numbers in bracket show data capture %

Table 6: Exceedences of the 24 hour mean for PM₁₀ 2008

Foleshill Road		Queensland Avenue		Tollbar End	
Date	µgm-3	Date	µgm-3	Date	µgm-3
4-Feb	51	11-Apr	82	2-Feb	50
25-Mar	85	25-Mar	76	4-Feb	52
26-Mar	54	28-Mar	61	2-Mar	57
27-Mar	71			25-Mar	77
28-Mar	66			26-Mar	53
30-Mar	57			27-Mar	73
31-Mar	58			28-Mar	73
2-Apr	57			31-Mar	53
11-Apr	102			2-Apr	65
				11-Apr	67
				11-May	50
				6-Aug	51
				9-Oct	51
Total	9		3		13

3.4 Trends in PM₁₀ Concentrations

PM₁₀ concentrations at the Memorial Park reduced between 2002 to 2004 but since that time they have increased again. At all sites concentrations have been not altered significantly since 2005.

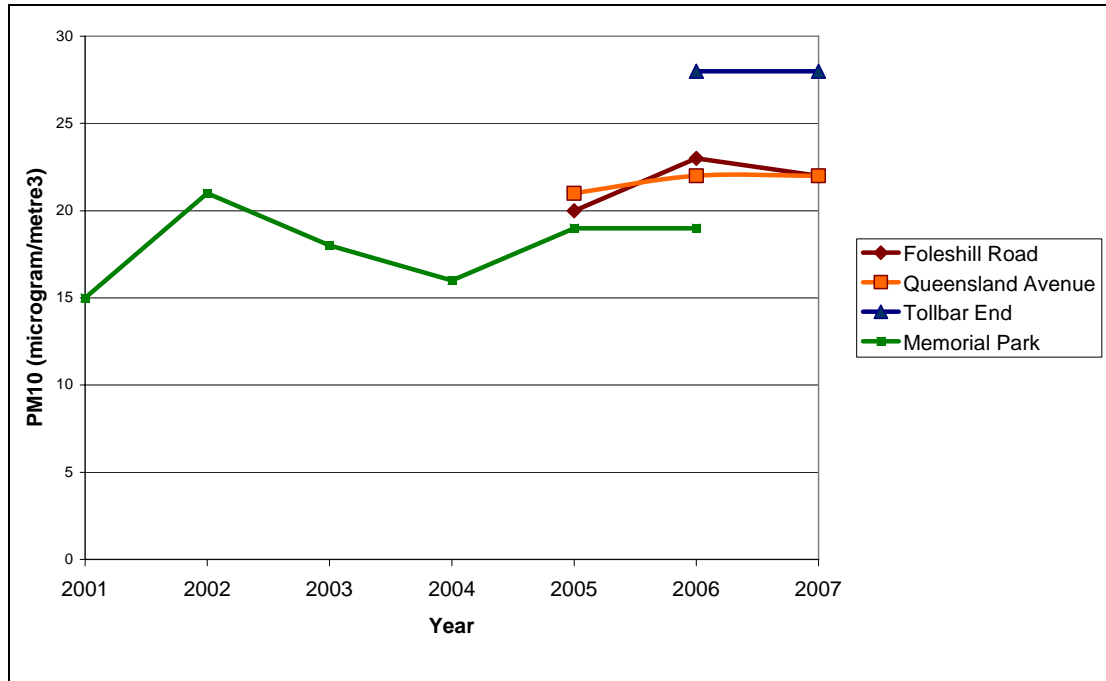


Figure 17: Trends in Particulate Concentrations

Based on PM₁₀ concentrations over the last few years it is difficult to predict concentrations of PM₁₀ in the near future.

3.5 Ozone

Ozone is not emitted directly from any human-made source but is caused by the reaction of man-made pollutants in sunlight. It can take hours or days to form as pollutants drift across continents. Because of this ozone is not covered by Local Air Quality Management and is not the responsibility of Local Authorities. Ozone is monitored in the Memorial Park on behalf of DEFRA and Coventry City Council put out warnings when concentrations of ozone are at levels which may have health impacts. High levels of ozone can cause irritation to the eyes and nose. Ozone increases the incidence of respiratory symptoms and increases hospital admissions and mortality.

Due to its short-term health effects ozone the UK objective for ozone is over a short time period of 8 hours and is 100µgm⁻³. It is allowed to be breached 10 times per year. Figure 18 below shows trends in ozone since 2001, the number of exceedences is shown along with the annual mean. This indicates that concentrations of ozone and the number of exceedences of the UK objective have reduced in Coventry since 2005.

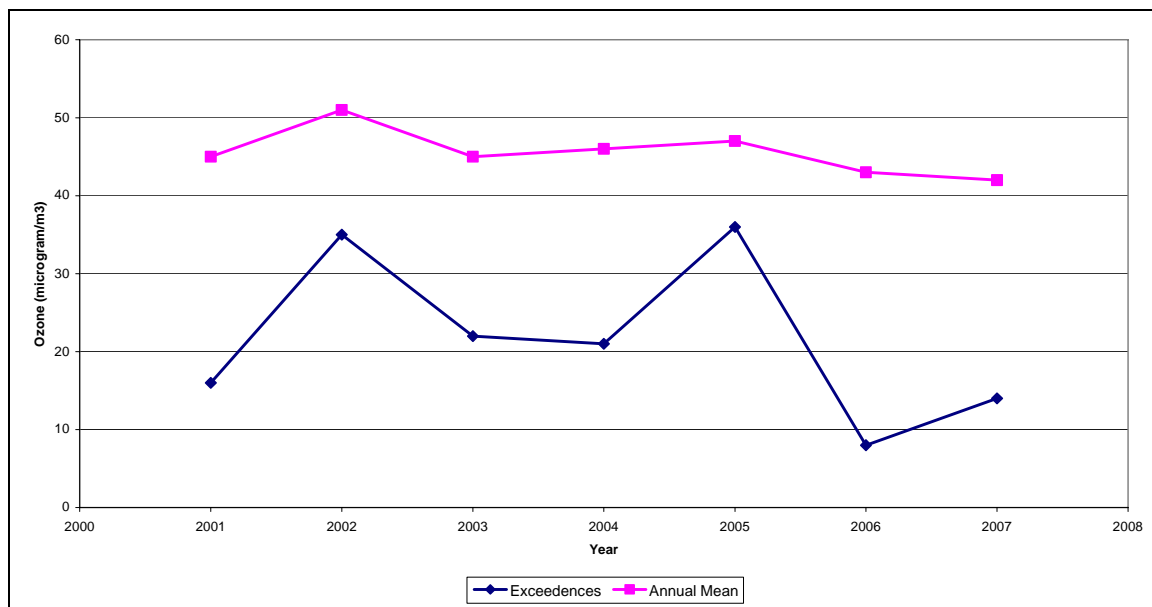


Figure 18: Trends in Ozone Concentrations

4 List of New Developments

4.1 New Industrial Installations

4.1.1 Part A1 Installations

There have been four new A1 installations in the city since 2004. All of these are in the metal production and processing sector.

Advanced Surface Treatments Ltd
Alpha Business Park, Deedmore Road, Coventry CV2 1EQ
Licence number ZP3239PJ

Brita Finish Ltd
Bodmin Road, Coventry CV2 5DX
Licence number ZP3639PX

PMD (UK) Ltd
Broad Lane, West Midlands, CV5 7AY
Licence number TP3935PJ

Surface Technology Plc
Godiva Place, Coventry, CV1 5PN
Licence number KP3732MP

Of these only PMD (UK) Ltd appears to release any pollutants relevant to local air quality management. Further details can be found in the pollution inventory at the Environment Agencies web site www.environment-agency.gov.uk.

4.1.2 Part A2 Installations

There are no new A2 processes in Coventry.

4.1.3 Part B Installations

No new Part B installations that would release significant quantities of pollutants have been opened in Coventry since 2004. Information on Coventry's Permitted Processes can be viewed on the Public Register at www.coventry.gov.uk/airpollution

4.2 New Retail

There has been one major retail development since the 2005 Progress Report. This is an A1 retail store on Croft Road in the City centre which has ~900 car parking spaces.

4.3 New Road Schemes

The following road schemes have been instigated, many of which are part of the Air Quality Action Plan for Coventry.

- Coventry's first Red Route went live on 18th October 2007. This scheme runs from the Ring Road to the M6, along Sky Blue Way, Walsgrave Road, through Ball Hill, Ansty Road and Hinckley Road. This includes AQMA 2
- Junction improvements at Spon End, and at Ball Hill (AQMA 2)
- Improved bus and taxi lane on Foleshill Road
- Coventry City Council are opening the Coventry Traffic Management Centre (CTMC) this year. Variable messaging will provide information on parking and journey times and prioritise bus movements.

Other road alterations have occurred due to new developments.

4.4 New Mineral Development

There are no new mineral developments in Coventry.

4.5 New Landfill Development

There are no new land sites in Coventry.

4.6 New Mixed Use Development

There have been several new mixed-use developments in Coventry since the previous Progress Report. Those listed below are already completed or in the process of being built.

- Banner Lane - residential, class B1, (office, light industry, research and development), B2 (general industrial) Class B8 (storage and distribution) uses, a nursing home, retention and management of open space areas including creation of new pond; associated car parking, landscaping and infrastructure (including off site highway) works.
- Humber Road and Aldermoor Lane - Demolition of existing buildings and redevelopment of the land to create buildings for employment (use class B1, B2) residential dwellings and a local centre (use classes A1-A5, B1, D1 and D2 and Live-work); the creation of replacement playing fields incorporating sports pitches and changing facilities; creation of new highway infrastructure including re-alignment of Humber Road, creation of east west & north south links, partial stopping-up and diversion of existing footpath, pedestrian and cycle links, associated vehicle parking and servicing; creation of open space, and landscaping.
- Bond Street, Hill Street, Ringway Hill Cross and Upper Well Street - Demolition of existing mixed residential and commercial building, enclosure of highways and construction of three multi-storey buildings to provide two hotels, casino, retail and catering units and residential apartments. Extension to multi-storey car parks and formation of new public squares, mall and service areas and refurbishment of existing public square. Alterations to existing vehicular access way and formation of new vehicular accesses.
- Coventry College, The Butts/Albany Road - Erection of residential apartment blocks to include optional catering outlets (Use Class A3 and A4) on ground floor of blocks E & F and multi-storey car park, commercial office building to incorporate offices (Use Class B1), restaurants (Use Class A3), drinking establishments (Use Class A4), non-residential institutions (Use Class D1), assembly and leisure (Use Class D2) and multi-storey car park, demolition in-part and change of use of existing college building for mixed use as restaurant and cafe (Use Classes A3 and A4) and offices (Use Class B1) or residential and retention of theatre, new access, landscaping and amenity areas and associated works.
- Swanswell Regeneration Project – This development includes demolition of existing housing and other buildings and the erection of College of Further Education with associated multi-storey car park and offices, revised and new access arrangements, surface level car parking, landscaping and highway closure.
- Land Between Capmartin Road & Daimler Road - Development of a 3-storey apartment block (comprising 24 apartments), a community centre building incorporating, a floodlit multi use games area, associated access, car parking, and landscaping.
- Prologis Park, Bennetts Road & Central Boulevard – development of site for use as Office/Research and Development and Light Industry (Use Class B1), General Industry (Use Class B2) and Storage and Distribution (Use Class B8) A1(retail) and A3 (food & drink); residential development; local centre; countryside park with associated road and rail infrastructure and landscaping.
- Land Between Butts And York Street - Erection of one mixed-use block consisting of 90 one and two bedroom apartments, with associated secure underground parking, and leisure club and one block consisting of 17 elderly person homes.

5 Air Quality Action Plan

Coventry City Council produced an Air Quality Action Plan (AQAP) for its three AQMA's in September 2007 and has submitted this to DEFRA for comment. No comment has been received to date. DEFRA agreed that as measures in the Action Plan have been implemented for less than a year there would be little to report as yet and therefore an update on the measures in the AQAP have not been included in this Progress report. Monitoring in the AQMA's is reported in section 3.2.3.

6 Conclusions

- Concentrations of benzene in Coventry have been falling since 2004. Concentrations in the Memorial Park were $0.61 \mu\text{g m}^{-3}$ in 2007 compared to the UK Objective of $5.00 \mu\text{g m}^{-3}$.
- Nitrogen dioxide monitoring has shown that there were exceedences of the annual mean objective at:
 - Stoney Stanton Road
 - Foleshill Road / Longford Road
 - Beake Avenue / Radford Road junction
 - Tollbar End
 - Croft Road / Victoria Road
 - London Road near the Ringway
 - Holyhead Road
 - Fairfax Street.But not at Spon End / Hearsall Lane as indicated by the Detailed Assessment.
- The number of permitted exceedences of the hourly mean for nitrogen dioxide was exceeded at Ball Hill in 2007 but this is believed to be due to roadworks at the beginning of April 2007.
- Nitrogen dioxide concentrations in AQMA 1 (City Centre) have decreased noticeably from 2005 to 2007. Concentrations in AQMA 2 (Ball Hill) and AQMA 3 (Queensland Avenue) have remained at the same levels as 2005.
- PM_{10} levels at roadside monitoring sites have not altered significantly since 2005.
- A number of new developments have taken place. The impact of these will be assessed as part of the Updating and Screening Assessment in 2009.
- The Air Quality Action Plan for the 3 current AQMA's was submitted to DEFRA in September 2007. DEFRA have agreed that it is too early to report on progress of actions in the plan at this time.

ⁱ Air Quality Strategy for England, Scotland, Wales and Northern Ireland, volume 1, DEFRA, July 2007

ⁱⁱ <http://www.airquality.co.uk/archive/laqm/information.php?info=objectives>

ⁱⁱⁱ "The Air Quality Strategy for England, Scotland, Wales and Northern Ireland – A consultation document for options for further improvements in air quality" DEFRA, April 2006.