2011 Air Quality Progress Report for *Stoke-on-Trent City Council*

In fulfillment of Part IV of the Environment Act 1995
Local Air Quality Management

Date April 2011

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Executive Summary

New monitoring data

Nitrogen dioxide monitoring for 2010 revealed that there are areas of the city where the annual mean objective is being exceeded.

The annual mean nitrogen dioxide Air Quality Management Area (AQMA) covers the whole of the city, therefore, all exceedances of the objective lie within the boundary of the AQMA and a detailed assessment is not required.

Monitoring shows:

- A downward trend at background sites.
- A downward trend at sites representative of relevant exposure in all areas with the exception of :Basford, Bucknall and Meir.
- A possible exceedance of the nitrogen dioxide 1-hour mean objective at Basford. The city-wide nitrogen dioxide annual mean AQMA will be amended on 9 May, to include exceedance of the 1-hour mean objective.

PM_{10} monitoring for 2010 revealed that there may no longer be an exceedance of the 24-hour mean objective within the Fenton PM_{10} AQMA. However, steps to revoke the AQMA will not proceed until there is sufficient evidence to show that an exceedance of the 24-hour mean objective is sustainable.

Air Quality Action Plan (AQAP) progress

Indicators for the city-wide AQAP for nitrogen dioxide show progress is being made.

Monitoring shows that significant progress has been made in the Fenton AQMA for particulates.

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1 Introduction

1.1 Description of Local Authority Area

Stoke-on-Trent covers an area of over 9,000 hectares located mid-way between Birmingham and Manchester and has a population of 239,000. The M6 motorway and the West Coast mainline provide the principle transport links to the north and south for the city. The A50 trunk road and the Crewe to Derby rail line provide links to the east and west of the area.
The neighbouring authorities are Newcastle-under-Lyme Borough Council, Stafford Borough Council and Staffordshire Moorlands District Council.
There are two pollutants of major concern for the city; nitrogen dioxide (NO_2) emitted from road traffic and particulates (PM_{10}) from an industrial source.

1.2 Purpose of Progress Report

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the Local Air Quality Management process.

They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedance of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

1.3 Air Quality Objectives

The air quality objectives applicable to Local Air Quality Management (LAQM) **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), and the Air Quality (England) (Amendment) Regulations 2002 (SI 3043). They are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre $\mu g/m^3$ (for carbon monoxide the units used are milligrams per cubic metre, mg/m^3). Table 1.1 includes the number of permitted exceedances in any given year (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in England.

Pollutant	Concentration	Measured as	Date to be achieved by
Benzene	16.25 $\mu g/m^3$	Running annual mean	31.12.2003
	5.00 $\mu g/m^3$	Annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu g/m^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Maximum daily running 8-hour mean	31.12.2003
Lead	0.5 $\mu g/m^3$	Annual mean	31.12.2004
	0.25 $\mu g/m^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu g/m^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu g/m^3$	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 $\mu g/m^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu g/m^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu g/m^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu g/m^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

Table 1.2 summarises previous review and assessment reports.

Table 1.2 Review and Assessment summary

Round 1		
Stage 1	Dec-99	Only 1,3 butadiene expected to meet the specified objective in 2005. All others; benzene, carbon monoxide, lead, nitrogen dioxide, particles and sulphur dioxide were likely to fail to meet their respective objective(s) in one or more areas of the City. Furthermore, as a result of the widespread nature of airborne particles in the UK as a whole, every part of the City is likely to fail to meet the air quality objective for particles.
Stage 2/3	Dec-00	Likely breach of the nitrogen dioxide annual mean objective at Cliff Vale, and 24-hour PM_{10} objective at Fenton.
AQMA	Nov-01	AQMA declared for annual mean nitrogen dioxide at Cliff Vale. Map included in Appendix F.
AQMA	Aug-02	AQMA declared for PM_{10} at Fenton. Order and map included in Appendix F
Stage 4 NO_2	Oct-03	Possible but not likely breach of nitrogen dioxide annual mean objective due to traffic emissions at: Cliff Vale (west), North Street, Copeland Street, Brook Street, Maclagan Street, Cobridge traffic lights, Hanley (Bucknall New Road Traffic lights), Bucknall Bridge, Joiners Square, Heron Cross, Meir. Breach of the objective was unlikely at Victoria Place.
Fenton AQAP	Apr-04	Fenton AQAP published. Map included in Appendix f
Stage 4 PM_{10}	May-04	Stage 4 concluded breach of 24-hour PM_{10} objective likely to continue at Fenton.
Round 2		
USA	Dec-03	PM_{10} continuing to breach 24-hour objective and detailed assessment needed for NO_2 at several areas of the city.
Detailed Assessment	May-05	Breach of nitrogen dioxide annual mean probable at: Burslem, Cobridge, Hanley, Bucknall Bridge, Joiners Square, Victoria Place and Meir. A beach unlikely at Heron Cross.
City-wide AQMA	Apr-06	City-wide nitrogen dioxide AQMA declared. Map included in Appendix F

Round 3		
USA	Jun-06	PM_{10} continuing to breach 24-hour objective. Two additional areas of exceedance of the nitrogen dioxide annual mean objective at Tunstall and Basford (areas covered by city-wide AQMA).
FA	Aug-07	Confirms exceedances of nitrogen dioxide annual mean objective.
Draft city-wide AQAP	Sep-07	
PR	Jan-08	Breach of nitrogen dioxide annual mean objective and 24-hour PM_{10} objective at locations previously identified.
Round 4		
USA	Apr-09	PM_{10} no longer breaches 24-hour objective, but AQMA will not be revoked until monitoring confirms that low concentrations are sustained. NO_2 The area of exceedance at Tunstall no longer exceeds the annual mean objective, following the opening of the Tunstall Northern By-pass. New monitoring data for nitrogen dioxide confirms that exceedances of the annual mean objective still exist in other areas identified in previous rounds of review and assessment.
PR	Apr-10	PM_{10} not breaching 24-hour objective, but AQMA will not be revoked until monitoring confirms that low concentrations are sustained. NO_2 monitoring shows a downward trend in concentrations in all but three areas of the city. Diffusion tube monitoring indicates a possible exceedance of the NO_2 1-hour mean objective at Basford. The city-wide AQMA will be amended to include an exceedance of the 1-hour mean objective. A funding bid will be submitted to Defra for a grant to enable the purchase/hire and operation of an automatic monitor to confirm whether the 1-hour mean is being breached.

Figure 1.1 Map of Fenton AQMA Boundaries

Figure 1.2 Map of City-wide AQMA Boundaries

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Nitrogen dioxide (NO_2) was monitored at six and particulates (PM_{10}) at two automatic sites operated by the council. In addition, the Stoke-on-Trent Centre Automatic Urban and Rural Network (AURN) site, located in the city-centre, monitored NO_2, PM_{10}, Ozone (O_3), black smoke and hydrocarbons.

Automatic monitoring site locations are shown in Figures 2.1a and 2.1b. Concentrations below the nitrogen dioxide annual mean objective are displayed in green and those above the objective in red. The Clarice Cliff PM_{10} monitor is shown in yellow.

During 2010, three automatic monitoring sites, Scrivener (NO_2), Copeland (NO_2), and Park Hall (NO_2) were closed down. Budget cuts forced a review of monitoring costs and consequently a reduction in the number of sites in operation. The Scrivener site was chosen because the monitor is significantly closer to the A500 than the residential properties, and though there had been a breach of the annual mean objective in 2008, data before and after 2008 was below the objective. The Scrivener site was closed at the end of August 2010. The Copeland site was chosen because there had never been a breach of the annual mean objective in previous years. The Copeland site was decommissioned at the end of December 2010 and will be relocated to Basford to confirm whether the nitrogen dioxide 1-hour objective is being breached there. The Park Hall background site has proven to be unreliable over the previous three years. Data from the Park Hall monitor has not been included in this report. The total number of council operated sited sites has been reduced from six to three.

QA/QC

- Routine, fortnightly calibrations were carried out on NO_2 analysers by local authority officers.
- Tapered Element Oscillating Microbalance (TEOM) filters were changed and TEOM head cleaned when 80% of the filter loading was reached.
- The King's College Volatile Correction Model (VCM) was applied to TEOM PM_{10} data. Details of VCM calculations are included in Appendix A
- Forty-eight hour call-out and six monthly service contracts are held for each monitor.
- Site audits have not been carried out.
- Data validation and ratification of monitors for 2009 was performed by Casella.
- Casella procedures are included in Appendix A

Figure 2.1a Map of Automatic Monitoring Sites

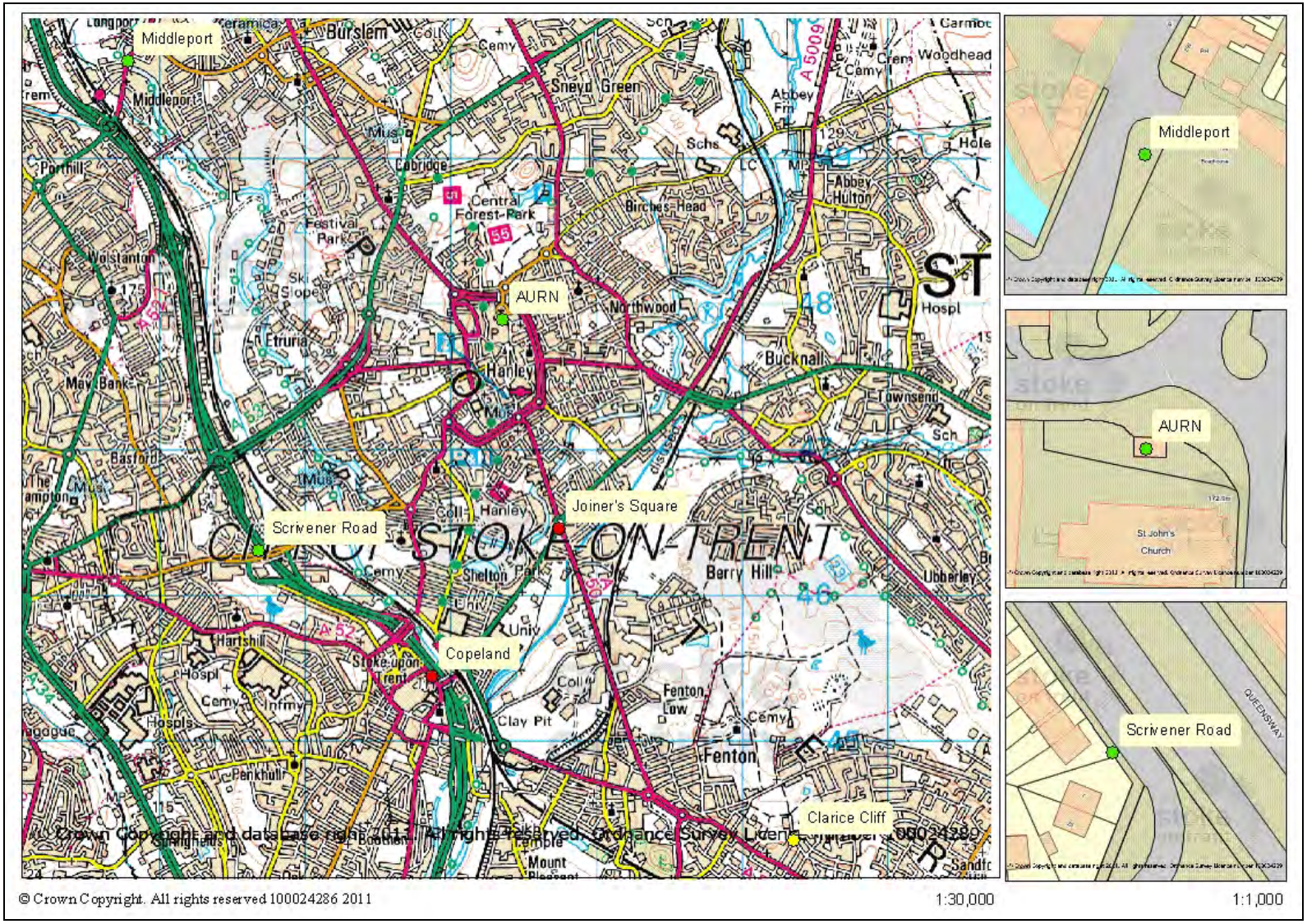


Figure 2.1b Map of Automatic Monitoring Sites

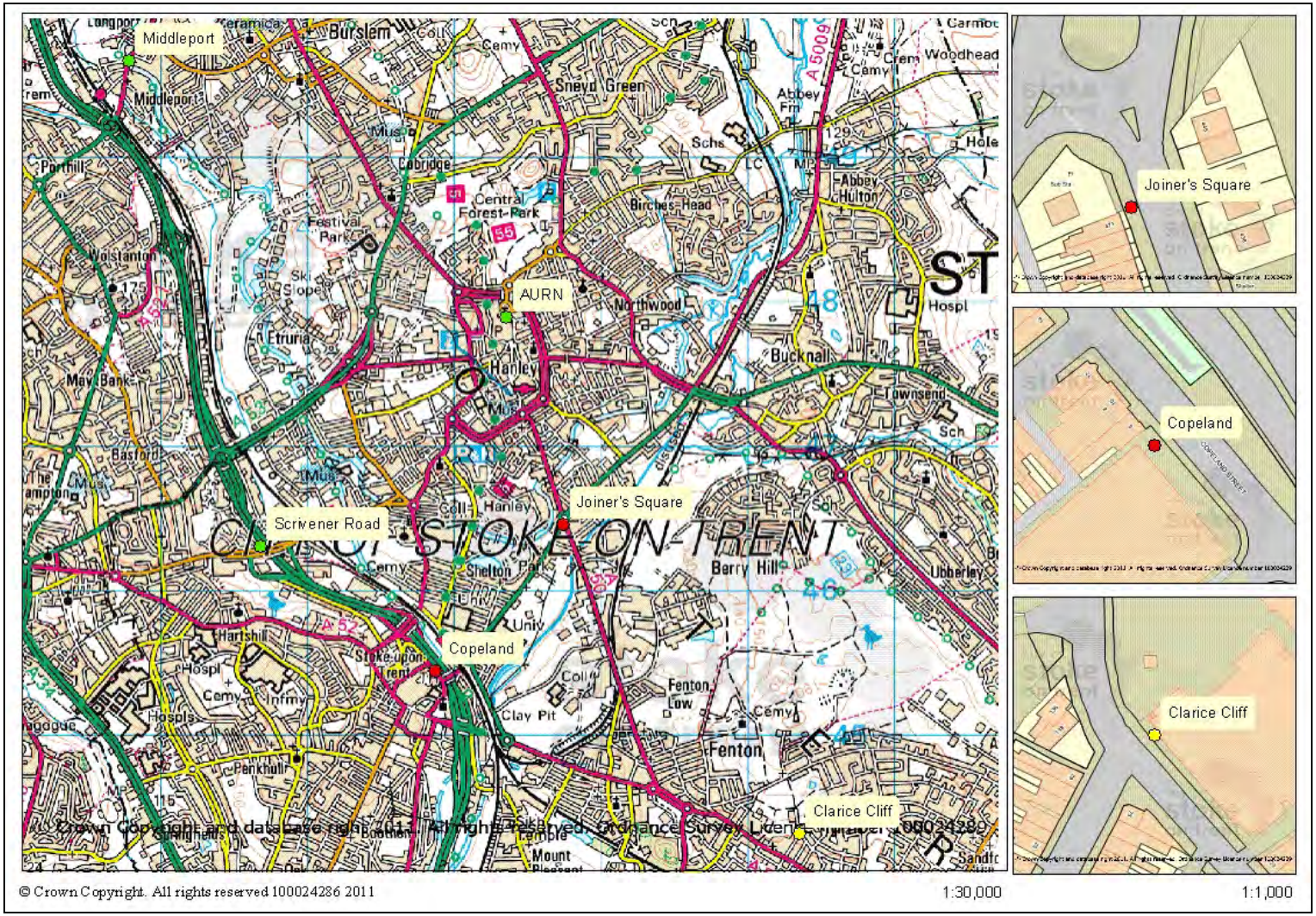


Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	Monitoring Technique	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
AURN	Urban background	X 388358	Y347891	NO_2 O_3 PM_{10} $PM_{2.5}$	Chemilumin-escence UV fluorescence FDMS FDMS	Y N Y N	Y (3m)	10m	
Joiner's Square	Roadside	X388743	Y346457	NO_2	Chemilumine scence	Y	Y (0.4m)	4.4m	Y
Scrivener	Other (A500T)	X386677	Y346307	NO_2	Chemilumine scence	Y	N (5.5m)	9m	Y
Middleport	Roadside	X385780	Y349673	NO_2 PM_{10}	Chemilumine scence	Y	N (16.6m)	4m	Y
Copeland	Roadside	X387873	Y345445	NO_2	Chemilumine scence	Y	N (4.4m)	4.1m	Y
Clarice Cliff	Industrial	X390353	Y344314	PM_{10}	TEOM + VCM	Y	N (15m)	N/A	Y

2.1.2 Non-Automatic Monitoring Sites

Stoke-on-Trent City Council operated 60 nitrogen dioxide diffusion tube sites during 2010. Diffusion tubes were supplied and analysed by Staffordshire Scientific Services Laboratory using the 20% triethanolamine (TEA) in water method and following procedures set out in the Practical Guidance document. [1]

Diffusion tubes were triple collocated with automatic analysers at the AURN Stoke-on-Trent Centre, Middleport and Copeland sites. The collocation data was submitted for inclusion in the overall bias correction factor for Staffordshire Scientific Services laboratory. The bias adjustment factor for Staffordshire Scientific Services of 0.85 was obtained from the Review and Assessment Helpdesk and applied to all diffusion tubes. Details of the bias factor and is included in Appendix A.

Results of the laboratory precision for Staffordshire Scientific Services for 2010 was 'good'. A table of laboratory precision is included in Appendix A. Results for the Workplace Analysis Scheme for Proficiency (WASP) scheme for the period April 2009 to April 2010 was good.

Diffusion tube site details are shown in Table 2.2a. The location of diffusion tubes are shown in Figures 2.2 and in detail in Appendix B. Concentrations below the nitrogen dioxide annual mean objective are displayed in green and those above the objective in red.

Eight sites have been closed down and eight new sites commissioned since the previous report. Details of the sites are shown in Table 2.2b together with the reason for closure/commissioning.

[1] http://laqm.defra.gov.uk/diffusion-tubes/practical-guidance.html

Figure 2.2 Map of Non-Automatic Monitoring Sites

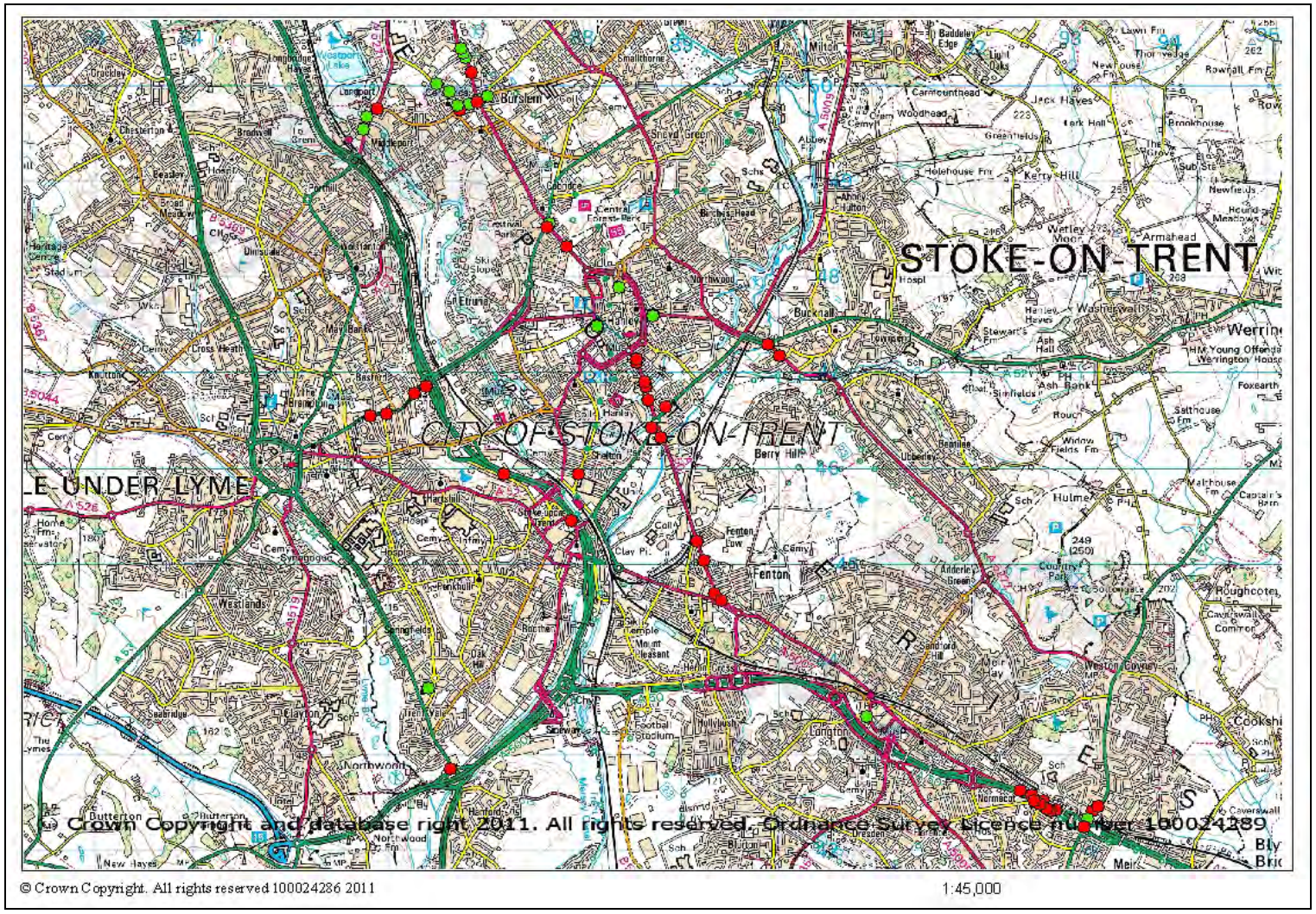


Table 2.2a Details of Non- Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	In AQMA ?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location?
1994/01	Urban background	X386394	Y343716	NO_2	Y	Y (10m)	NA	N
1994/02	Other	X387643	Y348557	NO_2	Y	Y (0m)	20m	Y
1999/01	Roadside	X389884	Y347289	NO_2	Y	Y (0m)	2.2m	Y
1999/02	Urban background	X390619	Y350782	NO_2	Y	Y (6.5m)	112m	N
2001/04	Roadside	X392705	Y342518	NO_2	Y	Y (0m)	19.5m	Y
2001/13	Roadside	X387180	Y345937	NO_2	Y	Y (2m)	11.3m	Y
2002/01	Roadside	X385740	Y349543	NO_2	Y	Y (0.3)	3m	Y
2003/02	Other (A500T)	X388356	Y347892	NO_2	Y	Y (0)	10.5m	Y
2005/01	Other (A500T)	X387625	Y348516	NO_2	Y	Y (0m)	4.8m	Y
2005/02	Roadside	X386927	Y349854	NO_2	Y	Y (0m)	3.8m	Y
2005/03	Roadside	X386822	Y349811	NO_2	Y	Y (0m)	4.4m	Y
2005/04	Other (A500T)	X385886	Y349757	NO_2	Y	Y (0m)	5.5m	Y
2005/07	Other (A50T)	X392471	Y342631	NO_2	Y	Y (3.1m)	10m	Y
2005/08	Roadside	X392589	Y342576	NO_2	Y	Y (1.5)	13m	Y
2005/11	Roadside	X389335	Y344693	NO_2	Y	Y (0.2m)	2.5m	Y
2005/13	Roadside	X385974	Y346574	NO_2	Y	Y (0)	2.6m	Y
2005/14	Other (A500T)	X386270	Y346782	NO_2	Y	Y (0.5m)	2.1m	Y
2005/15	Roadside	X386630	Y342853	NO_2	Y	N (1.5m)	3m	Y
2005/16	Roadside	X388791	Y346320	NO_2	Y	Y (1.8m)	3.5m	Y
2005/17	Roadside	X388841	Y346641	NO_2	Y	Y (0.2m)	2.5m	Y
2005/19	Roadside	X389998	Y347181	NO_2	Y	Y (0m)	2.3 m	Y
2005/20	Roadside	X386729	Y349749	NO_2	Y	Y (1.8m)	2.4m	Y

2005/22	Other (A50T)	X388676	Y347611	NO_2	Y	Y (0m)	4m	Y
2005/23	Other (A50T)	X393201	Y342409	NO_2	Y	Y (0)	1.6m	Y
2005/28	Roadside	X386848	Y350135	NO_2	Y	Y (0m)	1.8m	Y
2005/29	Roadside	X386787	Y350289	NO_2	Y	Y (0m)	2.1m	Y
2005/30	Roadside	X386766	Y350336	NO_2	Y	Y (0m)	2.0m	Y
2005/31	Roadside	X386739	Y350393	NO_2	Y	Y (3.3m)	2.8m	Y
2005/33	Roadside	X386704	Y349789	NO_2	Y	Y (0.5m)	2.4m	Y
2005/34	Roadside	X386904	Y349828	NO_2	Y	Y (0m)	2.9m	Y
2005/36	Roadside	X387015	Y349894	NO_2	Y	Y (0.5m)	3.4m	Y
2005/39	Roadside	X387823	Y348317	NO_2	Y	Y (0m)	1.7m	Y
2005/41	Roadside	X388698	Y346421	NO_2	Y	Y (2.6)	3.4m	Y
2005/44	Roadside	X389153	Y345234	NO_2	Y	N (4.5)	2m	Y
2005/45	Roadside	X389228	Y345035	NO_2	Y	Y (0.2m)	2m	Y
2005/47	Roadside	X389409	Y344619	NO_2	Y	Y (3.5m)	2.9m	Y
2005/48	Roadside	X392837	Y342428	NO_2	Y	Y (5.3m)	11.3m	Y
2005/50	Kerbside	X393260	Y342460	NO_2	Y	Y (0)	5m	Y
2005/51	Roadside	X393151	Y342331	NO_2	Y	Y (0)	3m	Y
2005/53	Roadside	X393310	Y342213	NO_2	Y	N (17m) but equal distance to road source	17.3m	Y
2005/54	Roadside	X393122	Y342248	NO_2	Y	Y (0m)	4.3m	Y
2005/56	Roadside	X392777	Y342409	NO_2	Y	N (5.6)	15.2m	Y
2005/57	Roadside	X392741	Y342435	NO_2	Y	N (4.0)	12.9m	Y
2005/58	Roadside	X392670	Y342481	NO_2	Y	N (16.4) but equal distance to road source (14.5)	14.5m	Y
2005/59	Roadside	X392611	Y342521	NO_2	Y	N (19.5) but equal distance from road source (11m)	10.4m	Y

2005/62	Roadside	X388704	Y347587	NO_2	Y	Y (0m)	11.6m	Y
2008/02	Roadside	X387873	Y345445	NO_2	Y	N (4.4m) but equal distance from road source	4.1m	Y
2008/05	Roadside	X385780	Y349673	NO_2	Y	N (16.6m)	4m	Y
2008/08	Roadside	X390893	Y343404	NO_2	Y	N	3.8m	Y
2008/09	Roadside	X388662	Y346707	NO_2	Y	N	2.1m	Y
2008/10	Roadside	X388632	Y346850	NO_2	Y	N	1.8m	Y
2008/11	Roadside	X388618	Y346903	NO_2	Y	N	2.0m	Y
2008/12	Roadside	X388538	Y347100	NO_2	Y	N	1.7m	Y
2008/13	Roadside	X388536	Y347143	NO_2	Y	N	2.0m	Y
2009/01	Roadside	X386493	Y350020	NO_2	Y	Y (0m)	3.6m	Y
2009/02	Roadside	X386621	Y349931	NO_2	Y	Y (0m)	2.9m	Y
2009/04	Roadside	X386380	Y346859	NO_2	Y	Y (2.4m)	18m	Y
2009/05	Roadside	X385811	Y346545	NO_2	Y	Y (2.1m)	2.4m	Y
2010/01	Roadside	X387938	Y345939	NO_2	Y	Y (0m)	2.4m	Y
2010/02	Roadside	X388135	Y347495	NO_2	Y	Y (0m)	2.8m	Y
2010/03	Roadside	X388128	Y347487	NO_2	Y	Y (0m)	4m	Y

Table 2.2b Details of Non- Automatic Decommission/New Monitoring Sites

Sites decommissioned in 2010				Reason
1998/01	53 St Michaels Road	386673	352388	Consistanly low results since the Tunstall Northern By-pass opened
2001/01	Trinity Street Traffic Lights	388091	347611	Traffic through junction signifcanly decreased since the Broad Street to Etruria Road section of ring-road opened.
2003/05	Meir Station collocation	392992	342332	Meir automatic site closed as not representative of receptors
2005/05	Drainpipe between 113 & 115 St Michael's Road, Tunstall	386737	352528	Consistanly low results since the Tunstall Northern By-pass opened
2005/53	Lamppost , Car park adj 863 Uttoxeter Rd, Meir	393310	342213	No access to site since new health centre development started
2006/06	Lamppost adj 106-108 Bucknall New Road	388949	347571	No access to site due to building demolition
2006/07	No waiting sign adj Alias Quiff & Combs	389114	347555	No access to site due to building demolition
2006/08	No waiting sign adj former HSS	389215	347548	No access to site due to building demolition
Sites commissioned in 2010				**Reason**
2005/33	Lamppost adj Fountain Court Pack Horse Lane / Westport Road, Burslem	386704	349789	Possibility of traffic being re-routed along Westport Road - base data being collected
2009/01	Drainpipe 58 Westport Road, Burslem	386493	350020	Possibility of traffic being re-routed along Westport Road - base data being collected
2009/02	Lamppost adj Hallam Court, Greenhead Street, Burslem	386621	349931	Possibility of traffic being re-routed along Westport Road - base data being collected
2009/04	Lamppost 3 adj 445 Etruria Road, Basford	386380	346859	Additional monitoring data being gathered in hot-spot area
2009/05	Lamppost 11 adj 569 Etruria Road, Basford	385811	346545	Additional monitoring data being gathered in hot-spot area
2010/01	College Road	387938	345939	Area identified as narrow congested street
2010/02	Pall Mall drainpipe Majestic Building	388135	347495	Bus-route along road with residential area.
2010/03	Marsh Street South drainpipe Majestic Building	388128	347487	Bus-route along road with residential area.

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

There is a city-wide AQMA for the nitrogen dioxide annual mean objective.

Automatic Monitoring Data

Automatic monitoring data is shown in Tables 2.3a and 2.3b.

The Scrivener site was decommissioned at the end of August 2010, but due to a monitor fault, no data was available after 17 July. The data between 1 January and 17 July has been annualised in accordance with Defra Local Air Quality Management Technical Guidance (LAQM.TG(09)) Box 3.2. [2]

The nitrogen dioxide annual mean objective was exceeded at two sites, Joiners Square and Copeland. Both sites are representative of relevant exposure and are within the city-wide Air Quality Management Area (AQMA). The annual mean objective was not exceeded at the AURN, Scrivener or Middleport sites.

The Park Hall monitor is a background site. No monitoring data is available for 2010 as the monitor was decommissioned, following persistent faults.

Trend analysis in Figure 2.3 shows that while the AURN Urban Centre site indicates an overall downward trend, the Joiners Square site shows an upward trend in nitrogen dioxide annual mean concentration between 2002 and 2010.

There has been an increase in the annual mean concentration recorded at four of the five monitoring sites compared to the previous two years. This may be due to extreme weather conditions during November and December 2010 which led to high barometric pressure extremely low temperatures and low wind speed hindering dispersion and 'trapping' pollutants.

The 1-hour mean objective was not exceeded at any site. As the Scrivener site had low data capture, the 99.8th percentile was calculated to indicate whether the number of exceedances of the hourly mean was likely to have breached the nitrogen dioxide 1-hour mean objective. The 1-hour objective was unlikely to have been exceeded at the Scrivener site, as the 99.8th percentile did not exceed 200 µg/m^3.

[2] http://www.defra.gov.uk/environment/quality/air/air-quality/laqm/guidance/policy/

Table 2.3a Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective

Site ID	Location	Within AQMA?	Relevant public exposure? Y/N	Data Capture for monitoring period [a] %	Data Capture for full calendar year 2010 [b] %	Annual mean concentrations (μg/m^3)		
						2008 [c, d]	2009 [c,d]	2010 [c]
AURN	City Centre	Y	Y	97	97	26	26	35
Joiner's Square	Victoria Rd/Leek Rd Junction	Y	Y	80	80	39	**48**	**46**
Scrivener	Scrivener Road, Cilffe Vale	Y	Y	81	54	**43**	38	35 annualised result
Middleport	Newcastle Street, Middleport	Y	Y	99	99	38	31	35
Copeland	Copeland Street, Stoke	Y	Y	100	100	27	39	**41**

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)
[c] Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.
[d] Annual mean concentrations for previous years are optional.

Figure 2.3 Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Automatic Monitoring Sites.

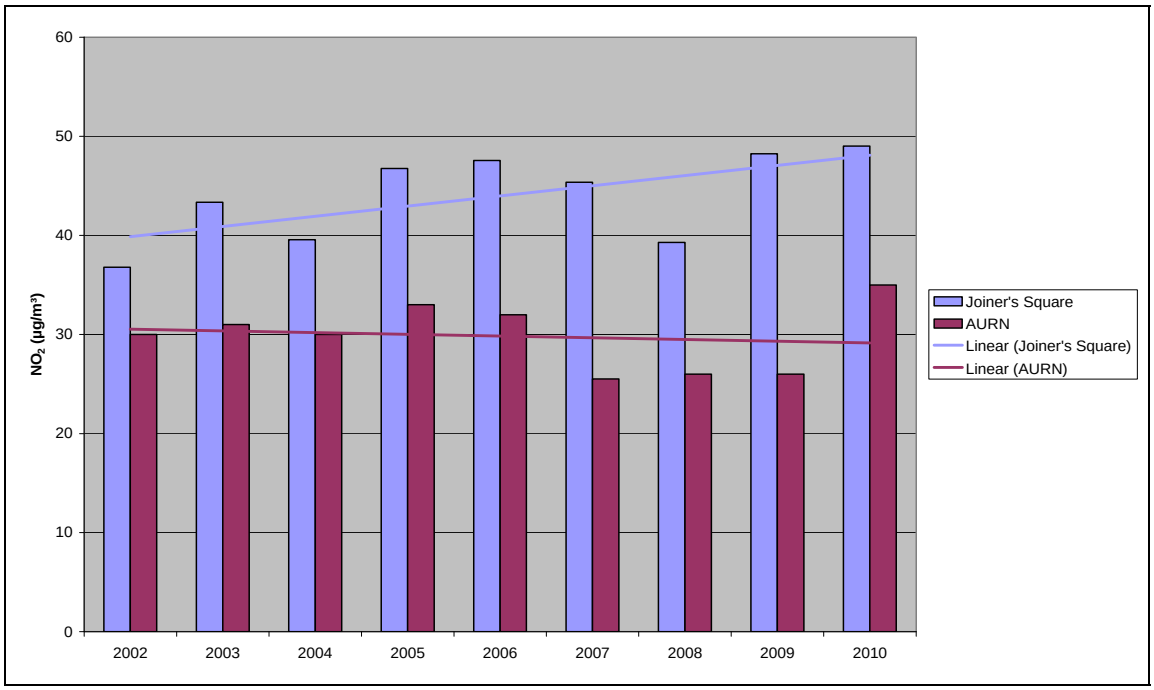


Table 2.3b Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour Mean Objective

Site ID	Location	Within AQMA?	Relevant public exposure? Y/N	Data Capture for monitoring period [a] %	Data Capture for full calendar year 2010 [b] %	Number of Exceedences of hourly mean (200 μg/m^3) If the period of valid data is less than 90% of a full year, include the 99.8th percentile of hourly means in brackets.		
						2008 [c]	2009 [c]	2010
AURN	City Centre	N	Y	94	94	3	0	0
Joiner's Square	Victoria Rd/Leek Rd Junction	N	Y	80	80	5	7	2 (173)
Scrivener	Scrivener Road, Cilffe Vale	N	Y	54	54	6	0	0 (137)
Middleport	Newcastle Street, Middleport	N	Y	99	99	0 (143)	0	4
Copeland	Copeland Street, Stoke	N	Y	100	100	1	0	0

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)
[c] Numbers of exceedences for previous years are optional.

Diffusion Tube Monitoring Data

Diffusion tube monitoring results are shown in Table 2.4.

Exceedances of the nitrogen dioxide annual mean objective are shown in **bold** text and those that are borderline have a * next to the result. Concentrations greater than 60 µg/m³ are shown on bold **red.**

Table 2.4 Results of Nitrogen Dioxide Diffusion Tubes

Site ID	Location	Within AQMA?	Relevant public exposure? Y/N	Data Capture for monitoring period[a] %	Data Capture for full calendar year 2010[b] %	Annual mean concentrations (µg/m³)		
						2008 [c,d]	2009 [c,d]	2010 [c]
1994/01	6 Robertson Square	Y	Y (10m)	100%	100%	21.7	20.9	**25.7**
1994/02	2 Douglas Street	Y	Y (0m)	100%	100%	30.5	30.1	30.5
1999/01	Lamppost 6/8 Dividy Road	Y	Y (0m)	83%	83%	**51.8**	**49.2**	**49.2**
1999/02	31Trentfields Road	Y	Y (6.5m)	100%	100%	19.7	19.8	21.8
2001/04	633 Uttoxeter Road, Meir	Y	Y (0m)	100%	100%	**46.5**	37.8	**40.9**
2001/13	140 North Street	Y	Y (2m)	100%	100%	39.1	38.3	**41.3**
2002/01	11 Station Street	Y	Y (0.3)	100%	100%	37.9	34.7	38.8*
2003/02	Triple co-location with AURN	Y	Y (0)	97%	97%	28.4	28.9	31.9
2005/01	Drainpipe 344 Waterloo Road, Cobridge	Y	Y (0m)	100%	100%	**53.7**	**48.3**	**48.8**
2005/02	Red Lion Pub, Burslem Drainpipe on far left	Y	Y (0m)	100%	100%	**42.6**	35.5	40.1*
2005/03	Drainpipe near pub,Market Place, Burslem	Y	Y (0m)	83%	83%	39.1	36.9	39.8*
2005/04	Lamppost 5 adj 315 Newcastle Street, Middleport	Y	Y (0m)	100%	100%	**55.9**	**42.7**	**46.3**
2005/07	Lamppost ST90 adj 513 Uttoxeter Road, Meir	Y	Y (3.1m)	100%	100%	**45.7**	**44.2**	**44.9**

2005/08	Lamppost ST94 adj 571 Uttoxeter Road, Meir	Y	Y (1.5)	100%	100%	**51.3**	**42.9**	**45.7**
2005/11	Lamppost between 20 - 22 Victoria Place	Y	Y (0.2m)	92%	92%	**45.6**	**43.8**	**46.5**
2005/13	Drainpipe Beauty Shop (525) Etruria Road, Basford	Y	Y (0)	100%	100%	**64.3**	**52.0**	**57.1**
2005/14	Lamppost adj 481 Etruria Road, Basford	Y	Y (0.5m)	100%	100%	**85.5**	**71.1**	**81.3**
2005/15	Lamppost adj White House Hotel, Stone Road, Hanford	Y	N (1.5m)	100%	100%	39.3	**41.9**	**44.5**
2005/16	Lamppost 6 adj 401 Victoria Road	Y	Y (1.8m)	100%	100%	**47.1**	38.8	**44.3**
2005/17	Lamppost 122 adj Village Tavern, Leek Road	Y	Y (0.2m)	100%	100%	**41.5**	36.8	**43.2**
2005/19	Drainpipe 50 Dividy Road, Bucknall	Y	Y (0m)	92%	92%	**42.7**	39.9	**42.9**
2005/20	Duke William, Newcastle Street, Burslem	Y	Y (1.8m)	100%	100%	**44.3**	40.1	**42.8**
2005/22	17/19 Bucknall New Road, Hanley	Y	Y (0m)	100%	100%	**45.2**	**43.6**	**46.5**
2005/23	64 Weston Road, Meir	Y	Y (0)	100%	100%	**46.7**	**44.5**	**51.4**
2005/28	Lamppost 4 adj 2 Scotia Road, Burslem	Y	Y (0m)	92%	92%	**43.4**	38.6	**45.7**
2005/29	Lamppost 165 adj 72 Scotia Road / Wain St, Burslem	Y	Y (0m)	83%	83%	36.1	33.1	37.2
2005/30	Lamppost 8 adj 88 Scotia Road / Barber St, Burslem	Y	Y (0m)	100%	100%	38.2	31.5	34.6
2005/31	Lamppost 10 adj 104 Scotia Road, Burslem	Y	Y (3.3m)	100%	100%	34.7	31.8	34.5

2005/33	Lamppost adj Fountain Court Pack Horse Lane / Westport Road, Burslem	Y		100%	100%			32.5
2005/34	Drainpipe Post Office Vaults, Burslem	Y	Y (0m)	100%	100%	**47.4**	**41.7**	**44.9**
2005/36	Lamppost 7 adj 17 Moorland Road, Burslem	Y	Y (0.5m)	92%	92%	36.1	36.0	40.2*
2005/39	Lamppost 119 adj 421 Waterloo Road, Cobridge	Y	Y (0m)	100%	100%	39.2	37.1	**43.4**
2005/41	Telegraph pole DP1161 adj 388/390 Leek Rd, Joiner's Square	Y	Y (2.6)	100%	100%	**47.5**	**42.8**	**46.7**
2005/44	Lamppost 48 adj 192 Manor Street, Fenton	Y	N (4.5)	100%	100%	**43.9**	38.8	**41.7**
2005/45	Lamppost 56 adj 101/103 Victoria Road, Fenton	Y	Y (0.2m)	67%	67%	**54.3**	**52.2**	**56.3**
2005/47	Telegraph pole DP996 Adj 7 Victoria Place	Y	Y (3.5m)	92%	92%	**45.7**	**42.9**	**48.2**
2005/48	Lamppost ST121 adj 675 Uttoxeter Road, Meir	Y	Y (5.3m)	100%	100%	**42.6**	**43.1**	**44.3**
2005/50	Lamppost 10, adj Wrights pie shop, Weston Rd, Meir	Y	Y (0)	100%	100%	**51.9**	**48.3**	**52.5**
2005/51	Lamppost 3 adj Harveys travel agent, Meir	Y	Y (0)	92%	92%	**44.0**	36.5	39.9*
2005/54	Lamppost 16R04 adj Pizza Hut, Meir	Y	Y (0m)	100%	100%	**41.7**	**42.3**	**46.1**
2005/56	Telegraph pole 249 adj Kenilworth Grove. Meir	Y	N (5.6)	100%	100%	**46.3**	40.2	**46.9**

2005/57	Telegraph pole 2512 adj Warwick Ave, Meir	Y	N (4.0)	75%	75%	35.5	39.7	**46.2**
2005/58	Lamppost ST14 Meir Rd / Grosvenor Rd, Meir	Y	N (16.4) but equal distance to road source (14.5)	92%	92%	36.2	36.9	**41.2**
2005/59	Lamppost 26 adj Royal British Legion, Meir	Y	N (19.5) but equal distance from road source (11m)	92%	92%	36.1	39.9	**47**
2005/62	Dainpipe 60 / 62 Bucknall New Road, Hanley	Y	Y (0m)	92%	92%	34.2	33.8	35.3
2008/02	Triple co-location with Copeland St Monitor	Y	N (4.4m) but equal distance from road source	97%	97%	39.3	38.1	**43**
2008/05	Triple co-location with Middleport Monitor	Y	N (16.6m)	100%	100%	36.5	33.8	39.4*
2008/08	Drainpipe, 44 The Strand, Longton	Y	N	100%	100%		32.7	35.9
2008/09	Lamppost 29 Lichfield St (by Hansons)	Y	N	83%	83%		**42.8**	**47.3**
2008/10	Lamppost 25 Lichfield St (by Bridgewater factory)	Y	N	100%	100%		38.1	**45.6**
2008/11	Lamppost 23 Lichfield St (by Bridgewater factory)	Y	N	92%	92%		37.5	**42.1**
2008/12	Lamppost 17 Lichfiled St (by RNIB)	Y	N	92%	92%		**46.3**	**50.2**
2008/13	Lamppost 16 Lichfirled St/Drby St	Y	N	100%	100%		39.5	**44**
2009/01	Drainpipe 58 Westport Road, Burslem	Y	Y (0m)	92%	92%			25.6
2009/02	Lamppost adj Hallam Court, Greenhead Street, Burslem	Y	Y (0m)	100%	100%			27.7

2009/04	Lamppost 3 adj 445 Etruria Road, Basford	Y	Y (2.4m)	100%	100%			**43.8**
2009/05	Lamppost 11 adj 569 Etruria Road, Basford	Y	Y (2.1m)	100%	100%			**53.2**
2010/01	College Road	Y	Y (0m)	92%	92%			**43.1**
2010/02	Pall Mall drainpipe Majestic Building	Y	Y (0m)	92%	92%			37.9
2010/03	Marsh Street South drainpipe Majestic Building	Y	Y (0m)	92%	92%			35.1

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)
[c] Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.
[d] Annual mean concentrations for previous years are optional.

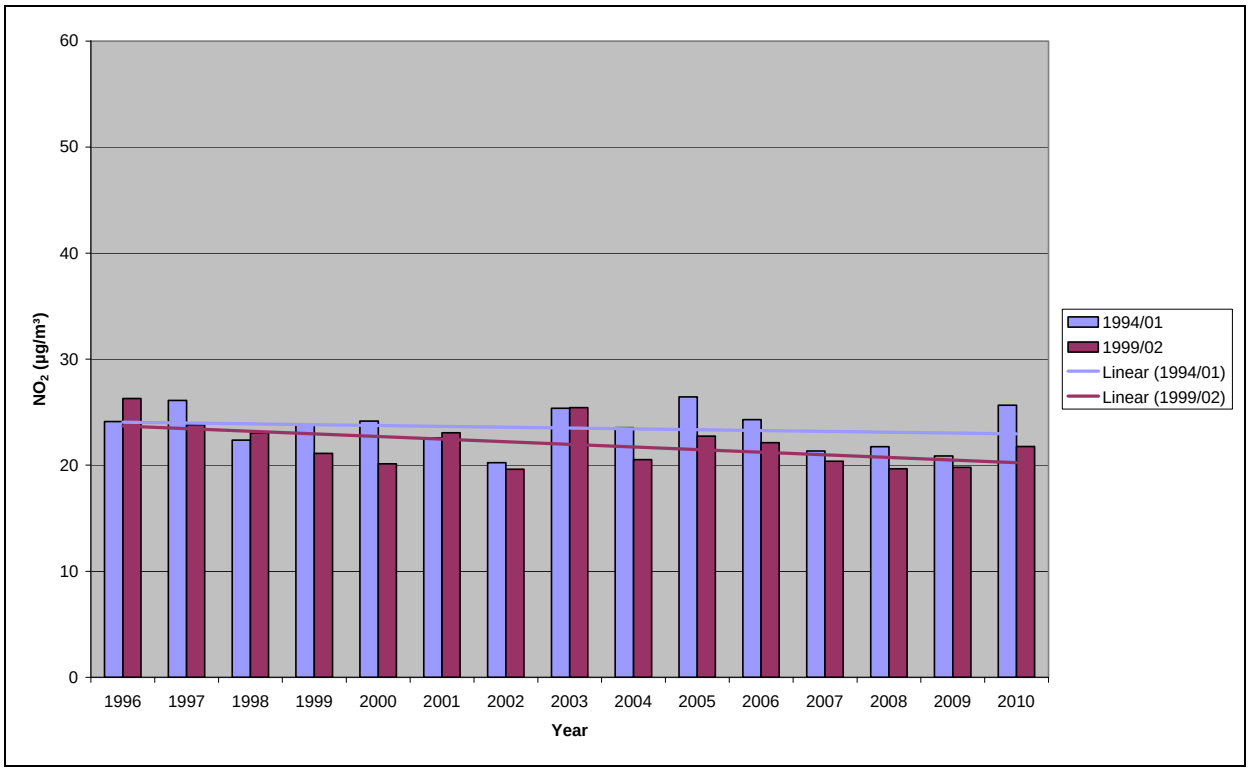
Bias adjustment factor 2008:1.03
Bias adjustment factor 2009:0.81
Bias adjustment factor 2010:0.85

Discussion of monitoring results and trend analysis

Background diffusion tube sites

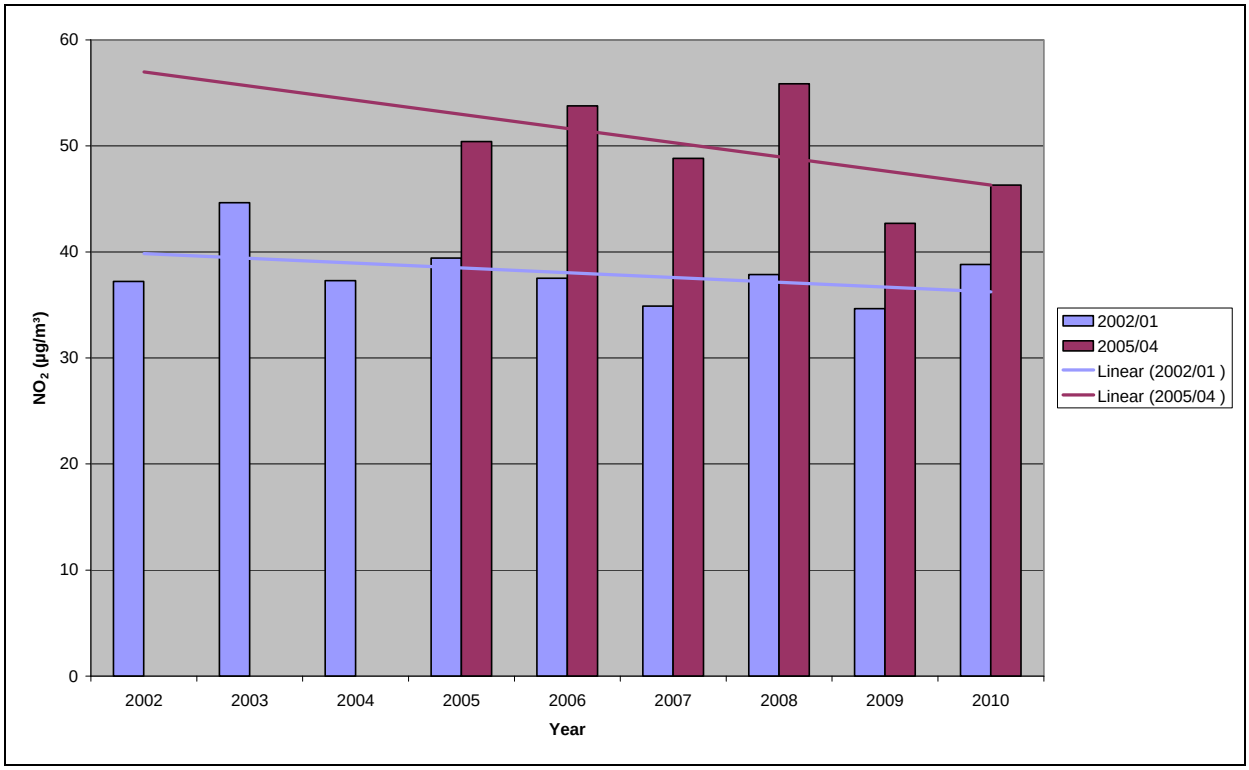
Figure 2.4a shows that background sites 1994/01 and 1999/02 exhibit a downward trend over the years 1996 to 2010.

Figure 2.4a Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Background Diffusion Tube Monitoring Sites



Middleport
Site 2005/04, representative of relevant receptors, is on the B5999 main route from the A500 trunk road to towns to the north of the city. It has consistently shown an exceedance of the nitrogen dioxide annual mean objective. Figure 2.4b shows a downward trend in concentrations since 2002.

Figure 2.4b Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Middleport Diffusion Tube Monitoring Sites



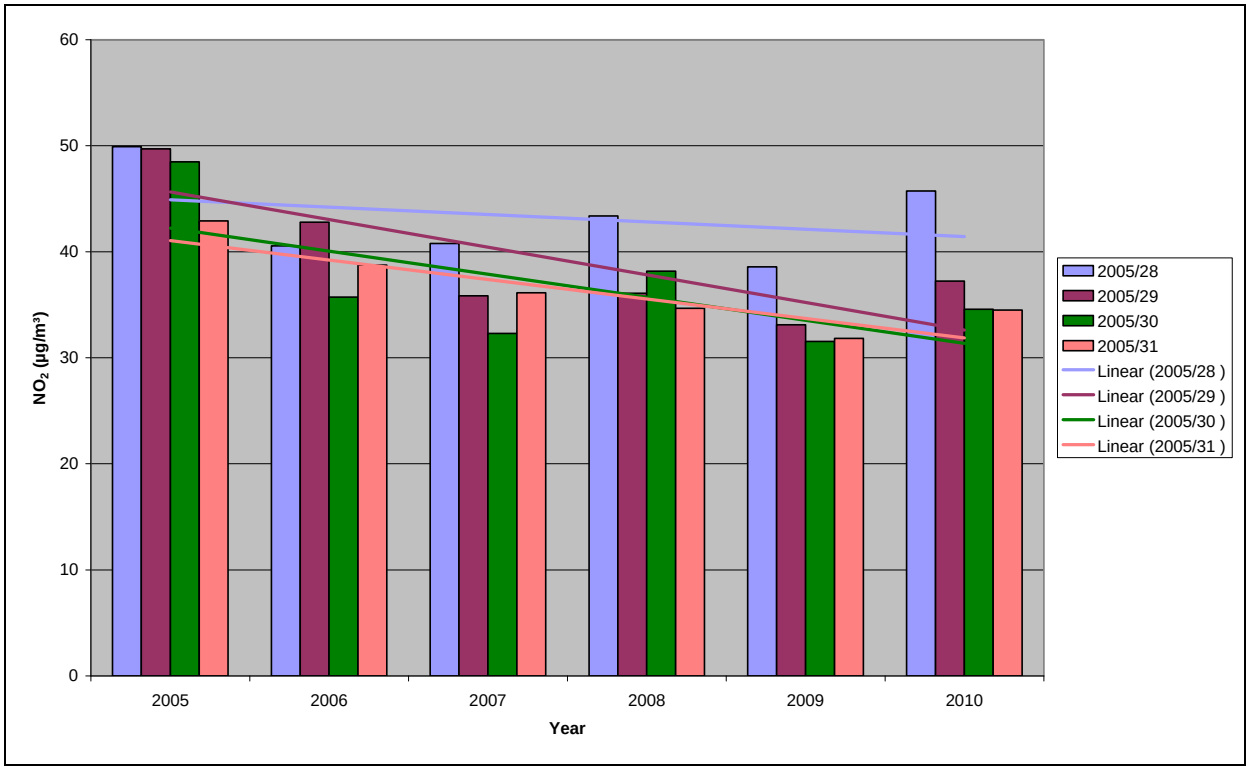
Burslem

Scotia Road is part of the main A50 route through the city from north to south. Site 2005/28, representative of relevant receptors, was border-line in 2009 but has shown a breach of the objective in previous years and in 2010.

Site 2005/31 is located closer to the road source than the nearest relevant exposure, therefore the calculation in Box 2.3 of TG (09) was used to estimate the concentration at the nearest relevant exposure. Predicted concentrations at the nearest relevant receptors are shown in Table 2.4b. The receptor closest to 2005/31 is not predicted to exceed the objective.

Figure 2.4c shows a downward trend in concentrations since 2005 at Scotia Road, Burslem.

Figure 2.4c Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Scotia Road, Burslem Diffusion Tube Monitoring Sites



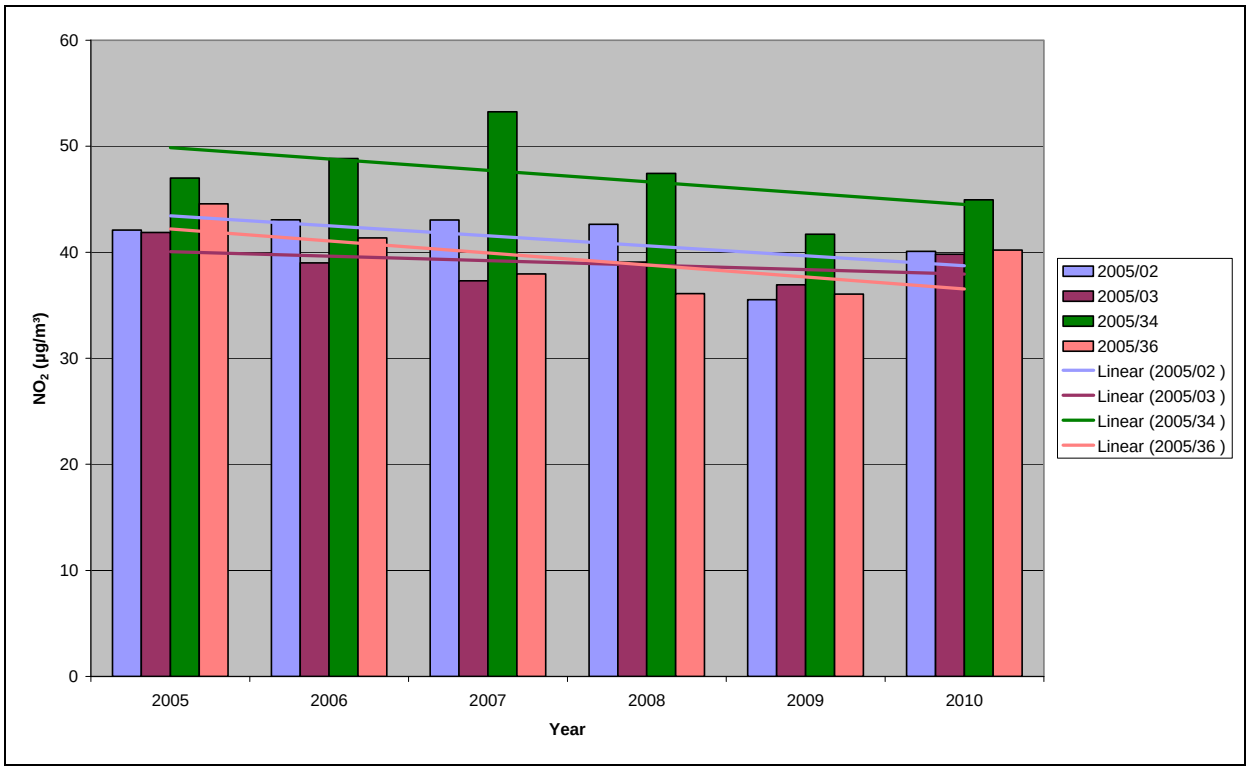
Site 2005/34 and 2005/02 situated on opposite side of the junction of the A50 and B5051, are both representative of relevant receptors. 2005/34 has consistently shown an exceedance of the objective, while 2005/02 is borderline.

2005/33 (not included in trend analysis) is located closer to the road source than the nearest relevant exposure, therefore the calculation in Box 2.3 of TG (09)[3] was used to estimate the concentration at the nearest relevant exposure. Predicted concentrations at the nearest relevant receptors are shown in Table 2.4b. The receptor closest to 2005/33 is not predicted to exceed the objective.

Figure 2.4d shows a downward trend in concentrations since 2005 at Market Place/Moorland Road, Burslem.

[3] http://archive.defra.gov.uk/environment/quality/air/airquality/local/guidance/documents/tech-guidance-laqm-tg-09.pdf

Figure 2.4d Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Market Place/Moorland Road, Burslem Diffusion Tube Monitoring Sites

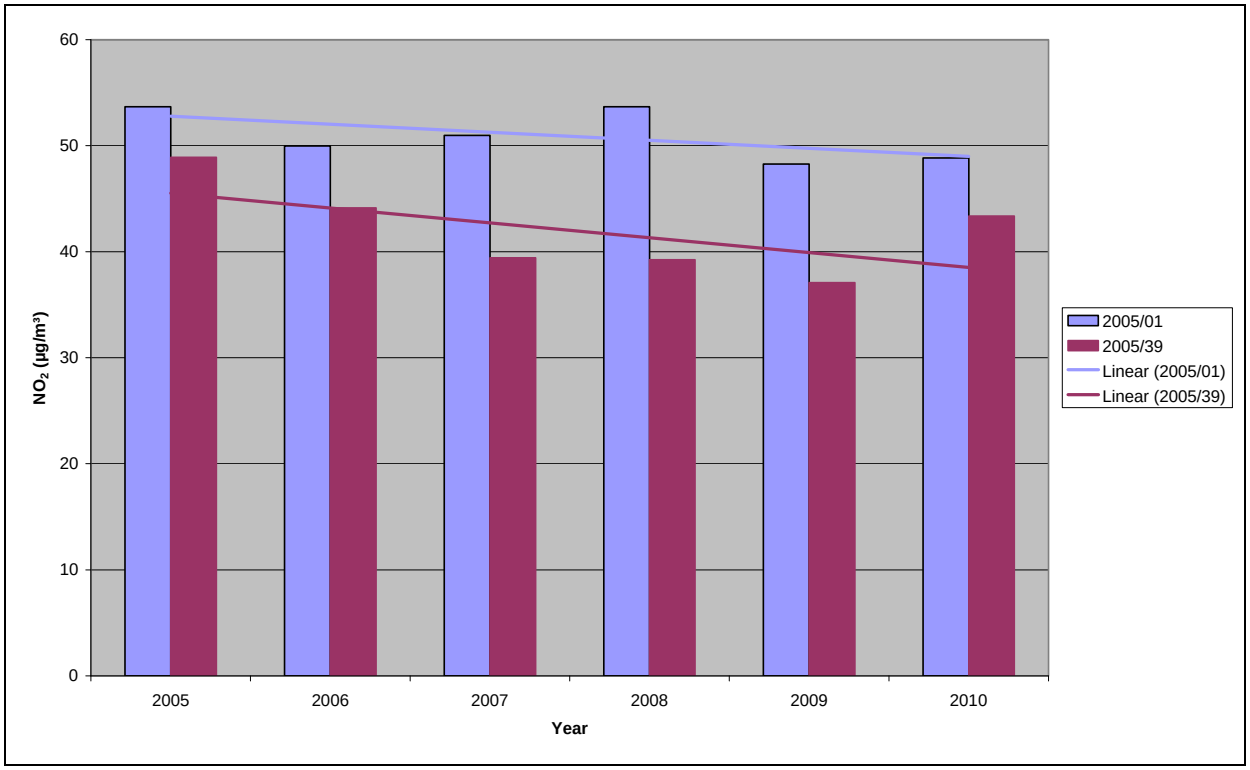


Cobridge

Site 2005/01, representative of relevant receptors, is situated at the junction of the A50 and A53. It has consistently shown an exceedance of the objective. 2005/39 has shown a breach of the objective for 2010.

Figure 2.4e shows a downward trend in concentrations since 2005 at Cobridge

Figure 2.4e Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Cobridge Diffusion Tube Monitoring Sites



Basford

Sites 2005/14 and 2005/15 are located on the A53 main route between Stoke-on-Trent and Newcastle-under-Lyme. Both sites have consistently shown an exceedance of the annual mean objective.

Two additional sites 2009/04 and 2009/05have been commissioned in the Basford area. Both show a breach of the annual mean objective.

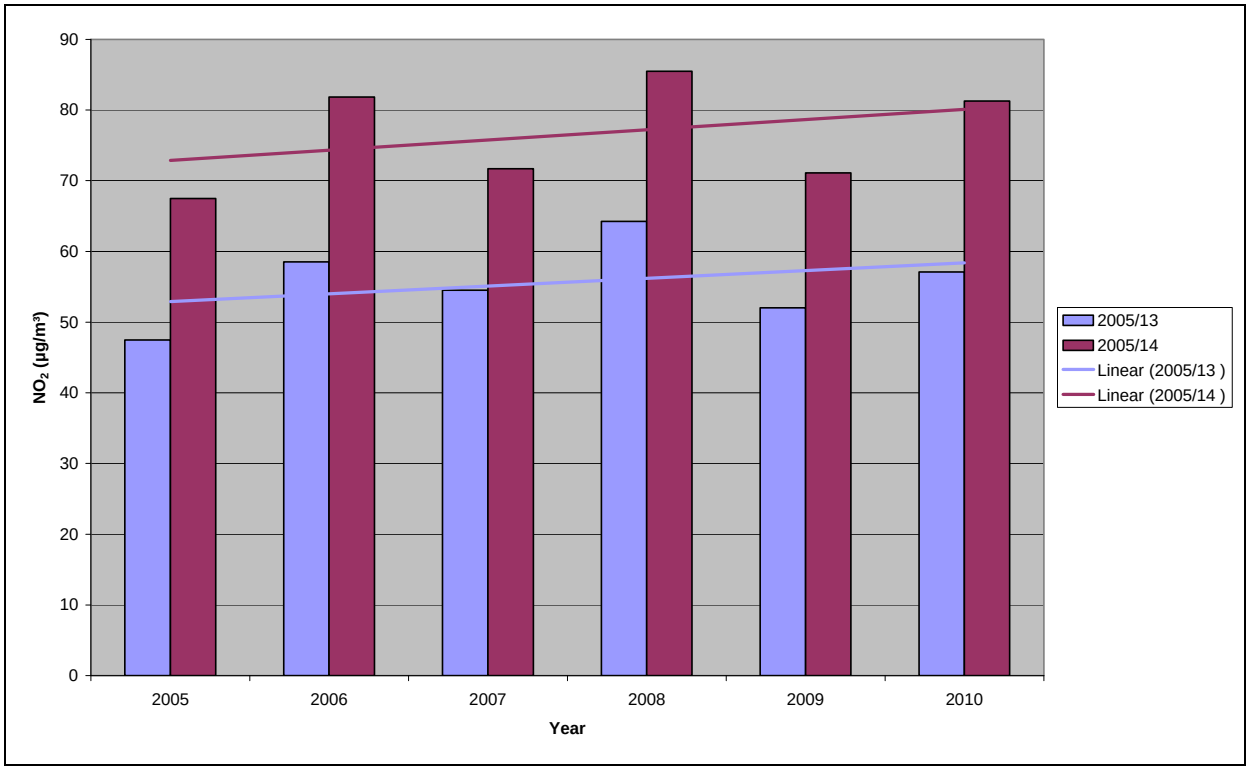
2005/14, 2009/04 and 2009/05 are located closer to the road source than the nearest relevant exposure, therefore the calculation in Box 2.3 of TG (09) was used to estimate the concentration at the nearest relevant exposure. Predicted concentrations at the nearest relevant receptors are shown in Table 2.4a. The receptors closest to 2005/14, 2009/04 and 2009/05 are predicted to exceed the objective.

Site 2005/14, located close to residential properties in a 'canyon' has consistently exceeded 60 µg/m³; indicating a possible breach of the 1- hour objective.

The local authority is in the process of amending the City-wide Air Quality Management Area (AQMA) to include the 1-hour objective. The new order will come into force on 09 May2011.

Figure 2.4f shows an increase in concentrations since 2005 at Basford.

Figure 2.4f Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Basford Diffusion Tube Monitoring Sites

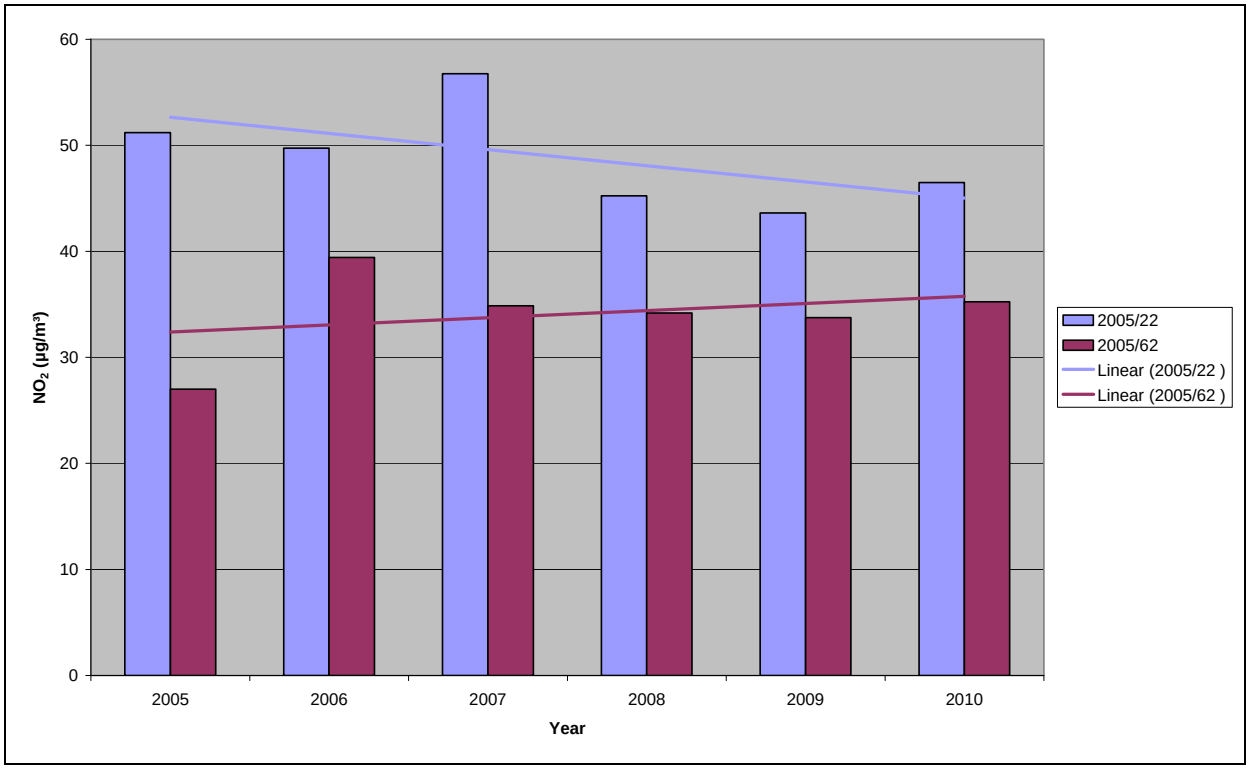


Hanley - Bucknall New Road

Sites 2005/22 and 2005/62 are located on the A5008 main routes from the east to the city-centre. 2005/22 has consistently shown an exceedance of the objective. Both sites are representative of relevant exposure.

Figure 2.4g shows a downward trend in concentrations at site 2005/22 since 2005, but site 2005/62 shows an upward trend. The two sites are on opposite sides of the carriageway with 2005/22 being to the north and 2005/62 is to the south of the carriageway.

Figure 2.4g Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Hanley Diffusion Tube Monitoring Sites



Hanley - Lichfield Street (A50 into city centre)

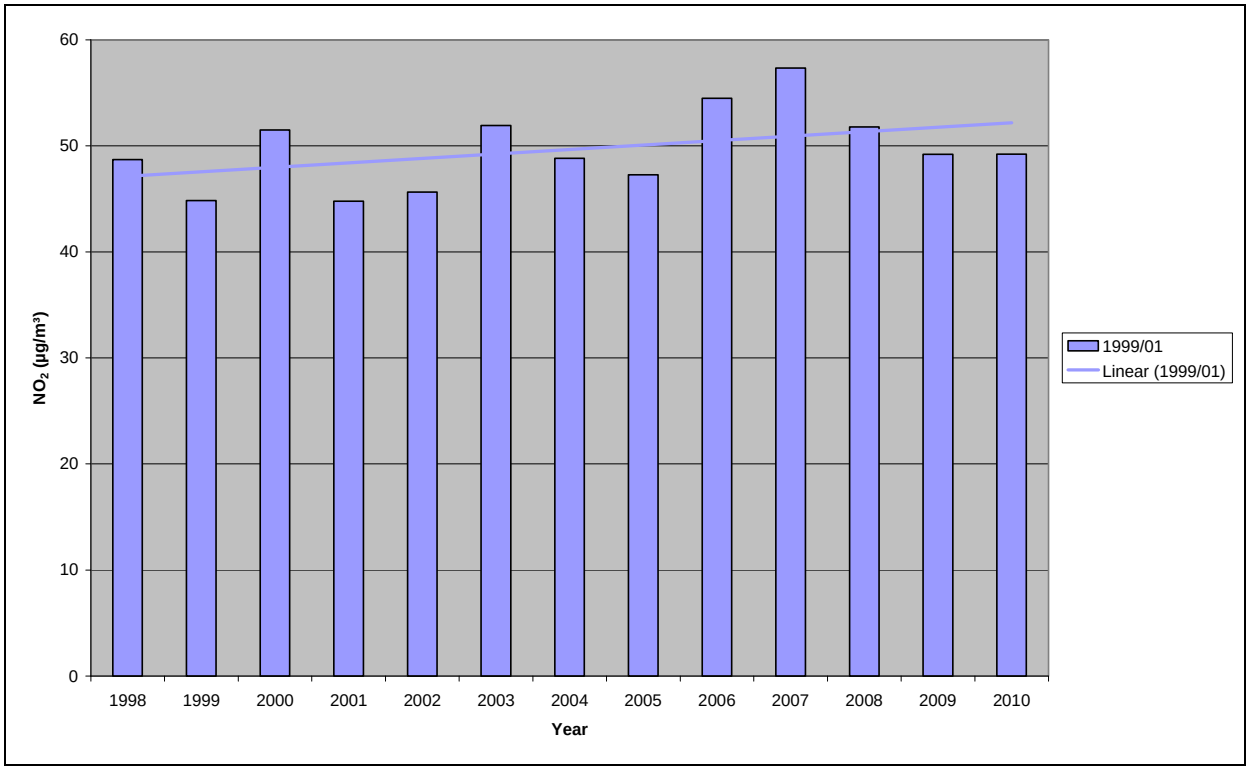
Sites 2008/09, 2008/10, 2008/11, 2008/12 and 2008/13 are not representative of relevant exposure, but planning application 49916/OUT for mixed commercial/residential use on the eastern side of the Lichfield Street has been approved by the council. Exceedance of the objective is indicated at all sites.

Bucknall

Dividy Road site1999/01 exceeded the objective in this and previous years. Site 2005/19 was borderline in 2009 but exceeded the objective in previous years and in 2010. Both sites are representative of relevant exposure.

Figure 2.4h shows an increase in concentrations since 1998 at Bucknall.

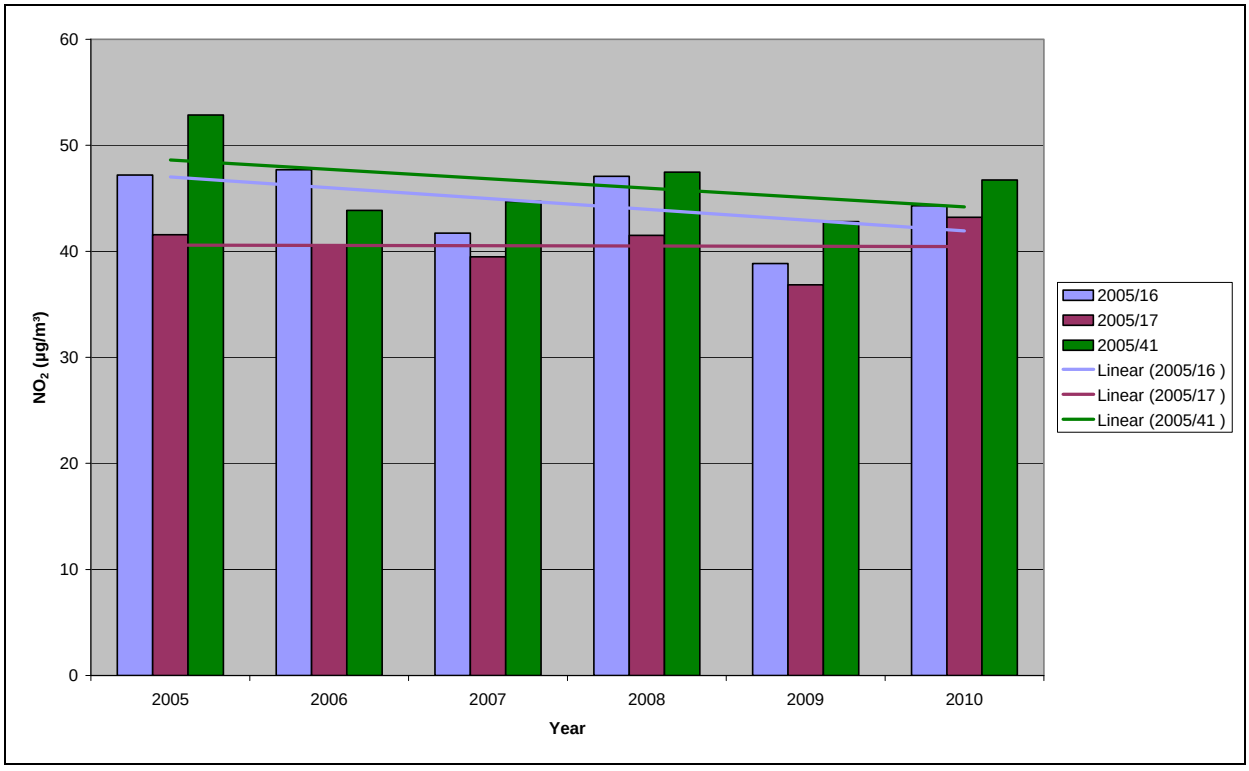
Figure 2.4h Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Bucknall Bridge Diffusion Tube Monitoring Sites



Joiners Square

All sites in the Joiners Square area show an exceedance of the objective for 2010. Sites 2005/16 and 2005/41 are located closer to the road source than the nearest relevant exposure, therefore the calculation in Box 2.3 of TG (09) was used to estimate the concentration at the nearest relevant exposure. Predicted concentrations at the nearest relevant receptors are shown in Table 2.4b. The receptor closest to 2005/16 and 2005/41 are both predicted to exceed the objective Figure 2.4i shows a downward trend in concentrations since 2005 at Joiners Square.

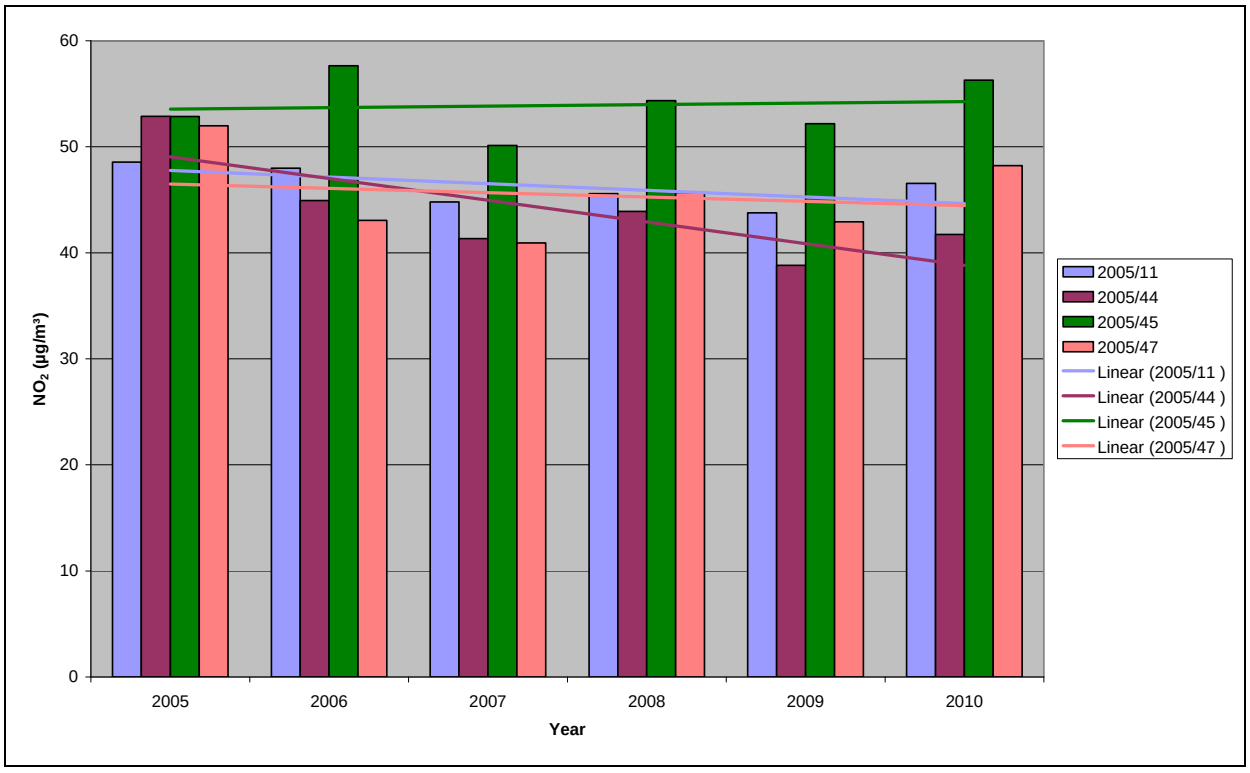
Figure 2.4i Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Joiners Square Diffusion Tube Monitoring Sites



Fenton

Victoria Place/Victoria Road sites 2005/11, 2005/44, 2005/45 and 2005/47 are located on the A50 main link between the A50 trunk road and the City Centre. Sites 2005/11, 2005/45 and 2005/47 have consistently shown an exceedance of the objective. 2005/44 is borderline, but has shown exceedances in the past. Sites 2005/44, 2005/45 and 2005/47 are located closer to the road source than the nearest relevant exposure, therefore the calculation in Box 2.3 of TG (09) was used to estimate the concentration at the nearest relevant exposure. Predicted concentrations at the nearest receptors, shown in Table 2.4b. The receptor nearest to 2005/44 is predicted to not exceed the objective, but receptors closest to 2005/45 and 2005/47 are predicted to exceed the objective. Figure 2.13 shows a downward trend in concentrations since 2005 at Fenton.

Figure 2.4j Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Fenton Diffusion Tube Monitoring Sites



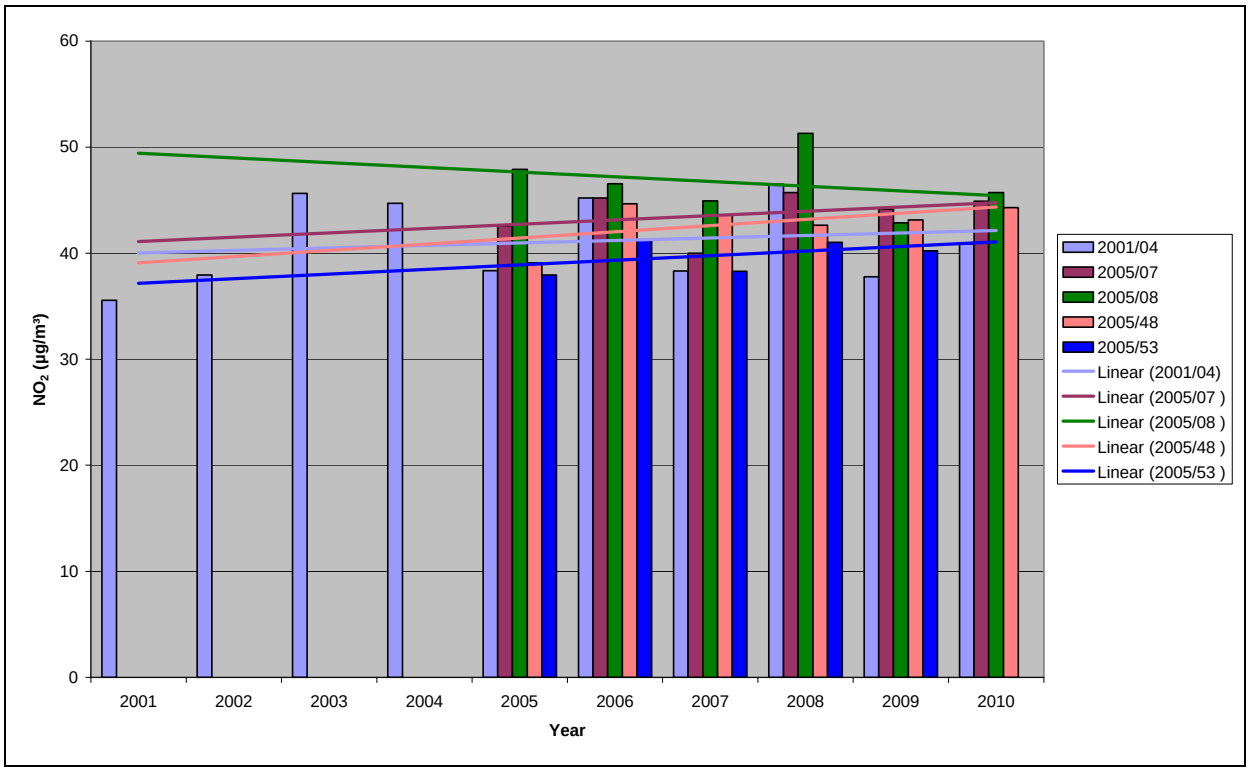
Meir - Sites adjacent to the A50 trunk road

Sites 2005/07, 2005/08, 2005/41, 2005/48 and 2005/53 are located on a road adjacent and to the north of the A50 trunk road at Meir.

2005/07 and 2005/08 are located closer to the road source than the nearest relevant exposure, therefore the calculation in Box 2.3 of TG (09) was used to estimate the concentration at the nearest relevant exposure. Predicted concentrations at the nearest relevant receptors to 2005/07 and 2005/08 exceed the objective. Predicted concentrations are shown in Table 2.4b.

Figure 2.4k shows an upward trend at four of the five sites to the north of the A50 trunk road.

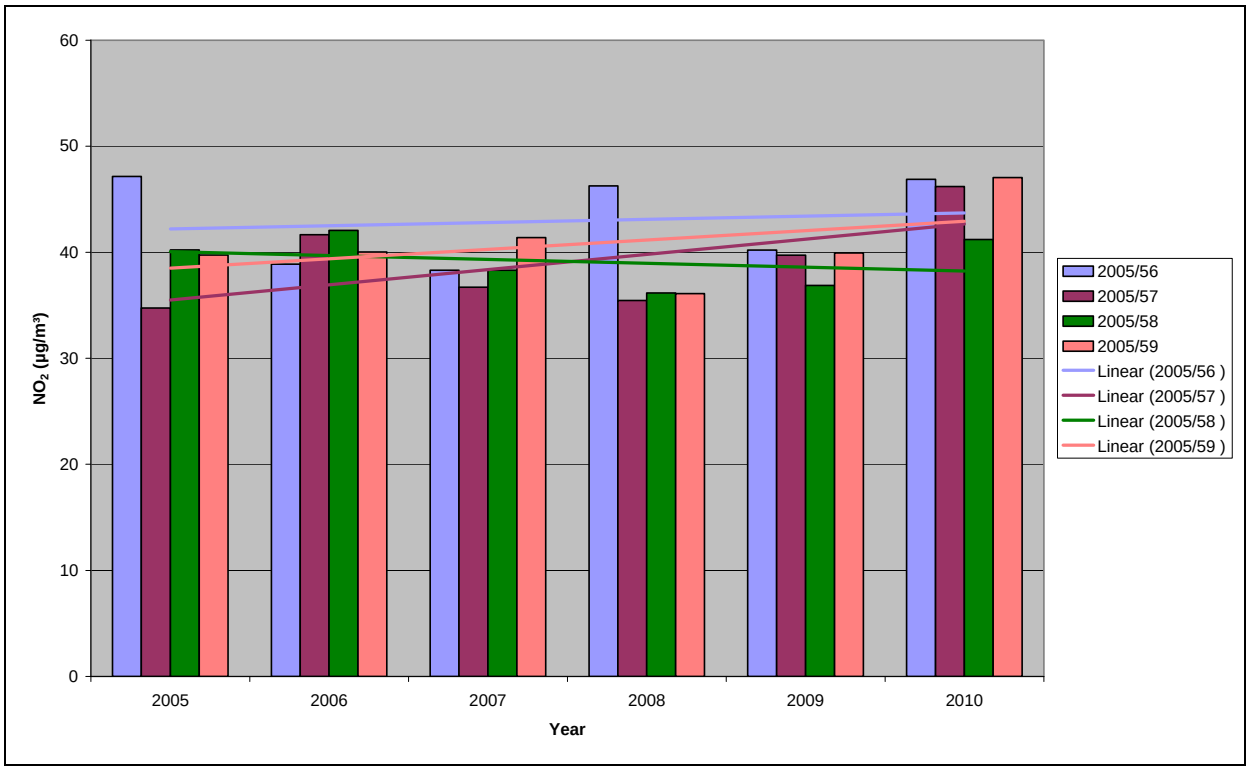
Figure 2.4k Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Meir (north of A50) Diffusion Tube Monitoring Sites



Sites 2005/56, 2005/57, 2005/58 and 2005/59 are located on properties adjacent and to the south of the A50 trunk road. All sites have breached the annual mean objective in 2010.

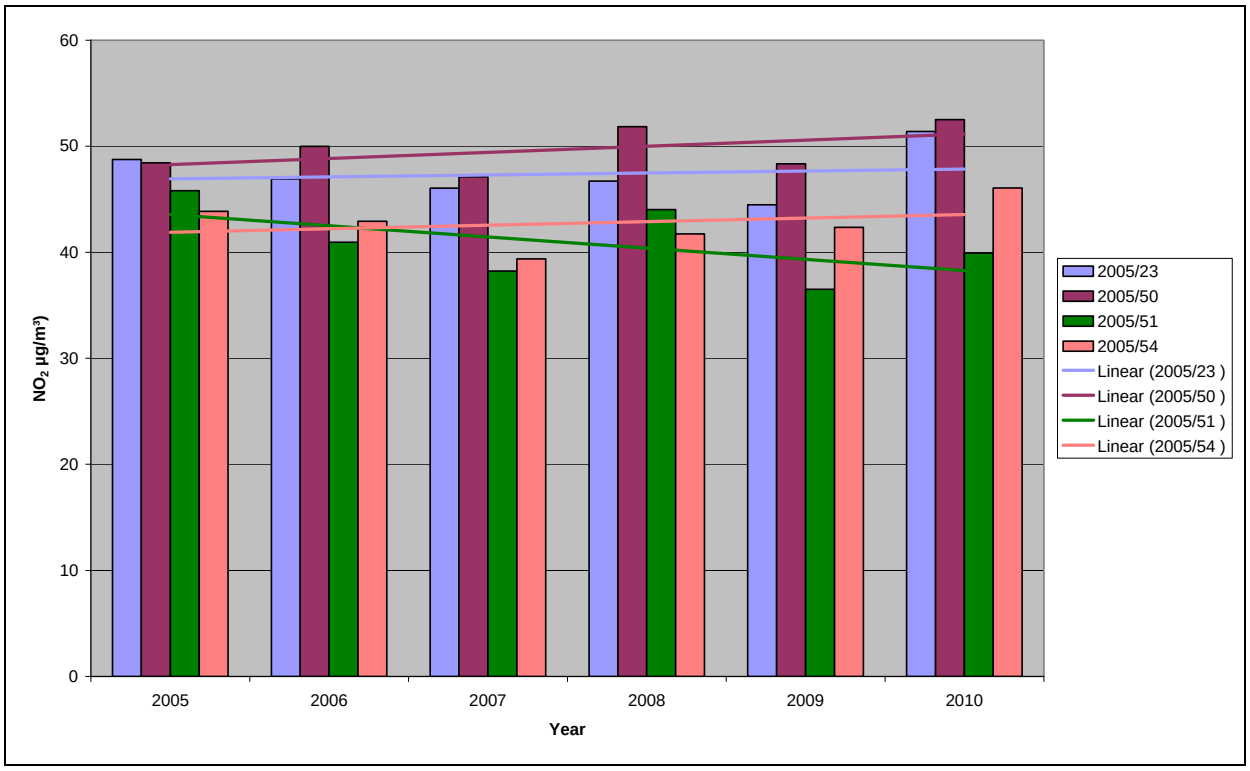
Figure 2.4l shows an upward trend in concentrations at three of the four sites to the south of the A50 trunk road.

Figure 2.4l Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Meir (south of A50) Diffusion Tube Monitoring Sites



Meir - Sites on Weston Road A520 near to the junction with the A50 trunk road
Sites 2005/23, 2005/50 and 2005/54 have consistently shown an exceedance of the objective.
2005/51 showed a borderline result for 2010.
Figure 2.4m shows an upward trend in concentrations at three of the four sites at Weston Road.

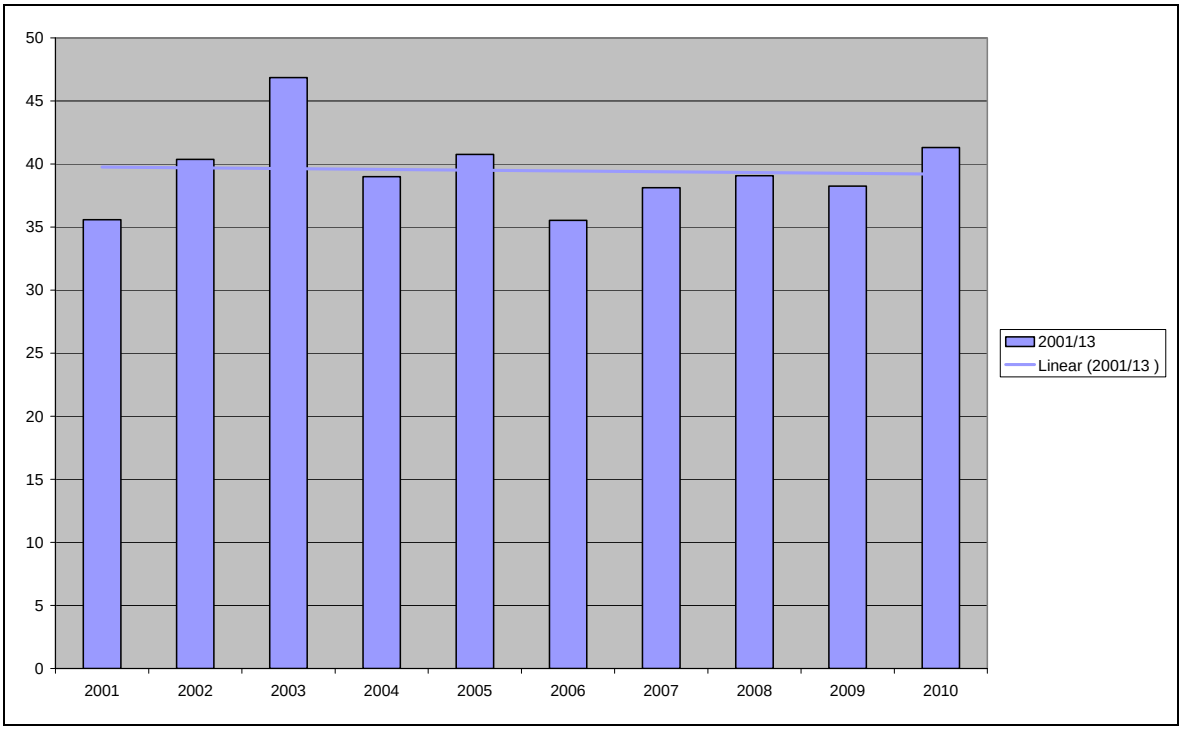
Figure 2.4m Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Meir (Weston Road) Diffusion Tube Monitoring Sites



North Street

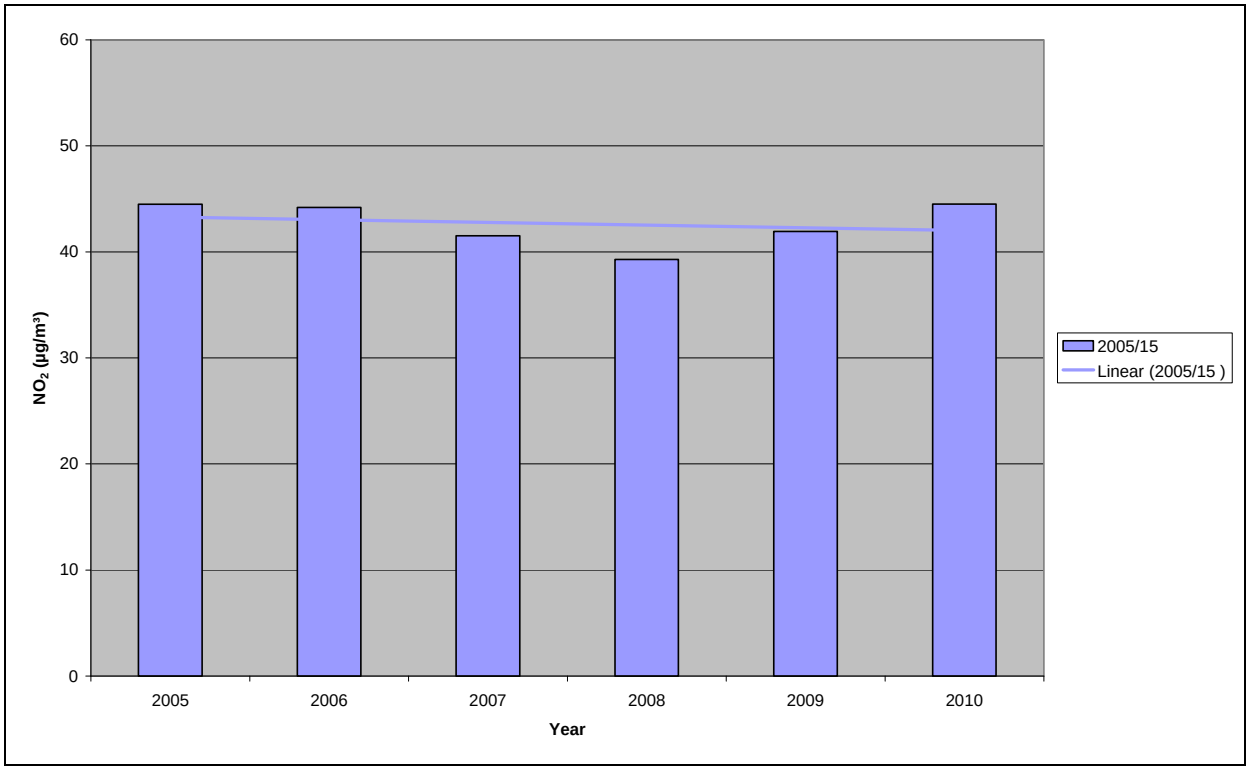
Site 2001/13 is located on North Street, which runs parelle to the A500 trunk road through Stoke. Trend analysis shows a slight downward. The diffusion tube is closer to the road source than the nearest relevant exposure, therefore the calculation in Box 2.3 of TG (09) was used to estimate the concentration at the nearest relevant exposure. Predicted concentrations are shown in Table 2.4b. The receptor closest to 2001/13 is predicted to be borderline regarding exceedance of the objective.

Figure 2.4n Trends in Annual Mean Nitrogen Dioxide Concentration Measured at North Street



Hanford
Site 2005/15 is situated on the A34 close to the junction with the A500 trunk road. The result for 2010 is above the objective and previous results have shown exceedances or been border-line.
Figure 2.4o shows a downward trend in concentrations at since 2005.

Figure 2.4o Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Hanford Diffusion Tube Monitoring Sites



Where the diffusion tube was located closer to the road than the receptor, Defra's NO_2 fall off with distance calculator was used to calculate the likely concentrations at the nearest receptor. [4] The predicted concentrations are shown in Table 2.4b.

Table 2.4b Predicted concentration of NO2 at nearest receptor

Site	DT distance from kerb (m)	Receptor distance from kerb (m)	Background annual mean NO_2 (µg/m³)	Measured NO_2 (µg/m³)	Predicted NO_2 at receptor (µg/m³)
2001/13	11.3	13.3	23.8	41.3	40.2
2005/07	10	13.1	23.8	44.9	**42.8**
2005/08	213	14.5	23.8	45.7	**44.7**
2005/14	2.1	2.6	23.8	81.3	**78.4**
2005/16	3.5	5.3	23.8	44.3	**42.0**
2005/31	2.8	6.1	23.8	34.5	32.4
2005/33	2.4	2.9	23.8	32.5	**32.1**
2005/41	3.4	6	23.8	46.7	**43.2**
2005/44	2	6.5	23.8	41.7	36.8
2005/45	2	2.2	23.8	56.3	**55.6**
2005/47	2.9	6.4	23.8	48.2	**43.2**
2009/04	18	20.4	23.8	43.8	**42.6**
2009/05	2.4	4.5	23.8	53.2	**48.7**

[4] http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html

2.2.2 PM_{10}

All automatic PM_{10} monitoring results have been adjusted to gravimetric equivalent using the King's College London Volatile Correction Model (VCM). [5]

The annual mean was not greater than 40 µg/m³ at any of the monitoring sites. The number of times that the 24-hour mean exceeded 50 µg/m³ was not more than 35 at any site.

The AURN site is an urban centre site located at the edge of the main city-centre shopping area and therefore, representative of public exposure.

The Clarice Cliff site is located on a former school site, close to a waste transfer station and as close to residential properties as is practicable. Since the closure of the school the monitor is not strictly representative of public exposure, however, it is indicative of likely exposure at residential properties.

The Middleport site is located equal distance from the road to residential properties on the B5999, main route from the A500 to areas in the north of the city.

Table 2.5a Results of PM_{10} Automatic Monitoring: Comparison with Annual Mean Objective

Site ID	Location	Within AQMA?	Data Capture for monitoring period [a] %	Data Capture for full calendar year 2010 [b] %	Annual mean concentrations (µg/m³)		
					2008 [c, d]	2009 [c,d]	2010 [c]
AURN	City Centre	N	94	94	19	19	22
Clarice Cliffe	Former school site Brocksford Street	Y	97	97	22	20	24
Middleport	Newcastle Street, Middleport	N	100	100	23	23	25

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)
[c] Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.
[d] Annual mean concentrations for previous years are optional.

[5] http://laqm.defra.gov.uk/review-and-assessment/tools/volatile-correction-model.html

Table 2.5b Results of PM_{10} Automatic Monitoring: Comparison with 24-hour Mean Objective

Site ID	Location	Within AQMA?	Data Capture for monitoring period [a] %	Data Capture 2010 [b] %	Number of Exceedences of daily mean objective (50 μg/m^3)		
					2008 [c]	2009 [c]	2010 [c]
AURN	City Centre	N	94	94	0	0	0
Clarice Cliffe	Former school site Brocksford Street	Y	97	97	6	5	8
Middleport	Newcastle Street, Middleport	N	100	100	13	15	13

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)
[c] Numbers of exceedences for previous years are optional.

2.2.3 Benzene

Benzene monitoring is undertaken at the Stoke-on-Trent Centre AURN site, as part of the Non-Automatic Hydrocarbon Network. [6] The annual maximum concentration for 2010 was 1.9 µg/m³.

The monitoring site has no nearby residential properties, schools, hospitals, care homes etc., therefore it is not relevant to public exposure for an annual mean.

2.2.4 Ozone

Ozone monitoring is undertaken at the Stoke-on-Trent Centre AURN site. There were six recorded exceedances of the Air Quality Standard (O_3) 8-hour running mean > 100 µgm-3 during 2010.

2.2.5 Black Smoke

At the time of writing, no 2010 data was available for the UK Air Quality Archive for the Stoke Centre monitoring site of the UK Black Carbon Network. [7]

[6] http://uk-air.defra.gov.uk/interactive-map#network=nahc
[7] http://uk-air.defra.gov.uk/interactive-map#network=ukbsn

Summary of Compliance with AQS Objectives

Stoke-on-Trent City Council has examined the results from monitoring in the city. Concentrations outside of the AQMA are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment.

3 New Local Developments

3.1 Road Traffic Sources

There are no newly identified narrow congested streets, busy streets, roads with a high flow of buses and/or HGVs, junctions, newly constructed roads, roads with significantly changed flows or bus/coach stations since the last Updating and Screening Assessment. However, planning permission has been granted for a new bus station as part of the East-West Development site. Details of the planning application are included in Section 5 Planning.

3.2 Other Transport Sources

There are no airports in the city or neighbouring authority areas
There are no locations where diesel trains are regularly stationary for 15 minutes or more, with potential for the relevant exposure within 15 m.
There are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30 m.

3.3 Industrial Sources

There have been no new or proposed installations for which an air quality assessment has been carried out.
There are no existing installations where emissions have increased substantially or new relevant exposure has been introduced.
There have been two new Industrial installations with no previous air quality assessment. They are detailed below.
There are no Major fuel storage depots storing petrol.
There are no new Petrol stations.
There are no Poultry farms within the city or in neighbouring boroughs close to the city boundary.

3.4 Commercial and Domestic Sources

There have been no new individual biomass combustion plant.
There are no areas where the combined impact of several biomass combustion sources may be relevant
There are no areas where domestic solid fuel burning may be relevant.

3.5 New Developments with Fugitive or Uncontrolled Sources

Planning Application (SOT/50481) has been granted for The Coalyard, Milton Road, Milton, Stoke-on-Trent for the "Erection of building for sorting waste associated with a waste recycling facility". [8]

Stoke-on-Trent City Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

Stoke-on-Trent City Council confirms that all the following have been considered –

- **Road traffic sources**
- **Other transport sources**
- **Commercial and domestic sources**

Stoke-on-Trent City Council has identified the following new or previously unidentified local developments which may impact on air quality in the Local Authority area.

- **Industrial sources**

Permit Reference Number 171 – Reiter Automotive (GB) Ltd – Di-isocyanate process
Permit Reference Number 172 – Recticel Insulation Products - Di-isocyanate process

- **New developments with fugitive or uncontrolled sources**

Planning Application SOT/50481 The Coalyard, Milton Road, Milton, Stoke-on-Trent for the "Erection of building for sorting waste associated with a waste recycling facility".

These will be taken into consideration in the next Updating and Screening Assessment, scheduled for 2012.

8 http://www.planning.stoke.gov.uk/dataonlineplanning/AcolNetCGI.exe?ACTION=UNWRAP&RIPSESSION=%7B%5B%2A%211D1A020B050304731D3C3D31617C041E28360020373B2D3A033A2131681B1102001216030D02040A06016F691120283F3A3606243629243A06176F7D727B737C77637777007F6D1D2A20212C2B20080A72606575777B717E79636A74%21%2A%5D%7D

4 Local / Regional Air Quality Strategy

The Stoke-on-Trent City Council Air Quality Strategy was published in December 2002. The document stated the council's commitment to

- adopting a 'corporate' approach;
- considering all the options available to improve air quality;
- using both 'regulatory' and 'non-regulatory' powers;
- considering the wider economic, social and environmental consequences of each option;
- requiring 'relative' contributions to a solution from industry, transport and individuals that are cost-effective and proportionate.

However, Staffordshire Local Transport Plan (LTP2) set out measures for transport planning for the areas North Staffordshire to include both the city of Stoke-on-Trent and the borough of Newcastle-under-Lyme. Chapter 8 of the document included The Air Quality Strategy for North Staffordshire and is available online at http://www.stoke.gov.uk/ccm/content/rc/LTP/provisional-north-staffordshire-ltp.en

The Stoke-on-Trent Local Transport Plan (LTP 3) is currently being prepared for publication, but will include transport measures for Stoke-on-Trent only. Therefore, the original Stoke-on-Trent Air Quality Strategy 2002 will be reviewed and amended during 2011/12. The updated report will be published following consultation.

5 Planning Applications

Stoke-on-Trent City Council has identified the following new or previously unidentified local developments which may impact on air quality in the Local Authority area.

Planning Permission has been granted for the East-West Development - Planning Application SOT/48935 for the redevelopment of a 6.8 hectare site in the city centre. This major development will comprise a hotel, restaurants, cinema, shops, multi-storey parking facilities and a new bus interchange. An Environmental Impact Assessment (EIA) [9] has been submitted in support of this application. The development is likely to result in changed traffic flows on the surrounding roads.

Summary of the EIA air quality assessment

- Dust during demolition and construction and associated traffic are considered to be minor, localised and temporarily adverse
- Plant operating on site is considered to be negligible
- The operational phase of plant and ventilation systems is considered to be negligible
- Detailed ADMS-Roads modelling at eight sensitive receptor locations resulted in:
  Minor adverse at three receptors in terms of NO_2
  Moderate adverse at 1 receptor in terms of NO_2
  Minor beneficial at 1 receptor in terms of NO_2 associated with the relocation of the bus station
  Negligible at all receptors in terms of PM_{10}
- The results of the ADMS assessment have indicated that the dispersion of cumulative emissions from the generation and redistribution of traffic flows on the adjacent road network, in addition to those originating from the proposed multi-storey car park and bus station will not give rise to any exceedance of the UK Air Quality Standards or Objectives for NO_2 and PM_{10}.

Bus or coach stations.

Planning Application SOT/51668RES has been granted permission in order that the first phase of the East-West Development, the bus interchange can be constructed. The current bus station is located in the centre of the redevelopment site. The new bus facility is needed before work on the remainder of the development can begin. Bus routes into the city-centre had not been finalised when the EIA was submitted in support of planning application SOT/48935. Bus routes from the south and west of the city remain unchanged from that included in the air quality assessment section of the EIA. However, the bus operator preferred routes for services from the north and east of the city differ from those considered in the EIA. An additional air quality assessment is currently being prepared to include an assessment of air quality impacts as a result of buses entering the city-centre from services to the north and east of the city.

[9] http://www.planning.stoke.gov.uk/dataonlineplanning/AcolNetCGI.exe?ACTION=UNWRAP&RIPNAME=Root.PgeDocs&TheSystemkey=54849

6 Air Quality Planning Policies

The Draft Local Validation List (LVL) has been published by the city council for consultation. The LVL clearly sets out the information requirements for different types of planning applications within the city of Stoke-on-Trent indicating:

a) when/why information is needed;
b) what sort of information is required; and,
c) where to get further guidance.

Matrix B – Local List Validation Criteria, Section 3 shows the types of development which are likely to require an air quality assessment and is shown in Table 6.1.

Table 6.1 Local Validation List - Air Quality

3	Air Quality Assessment	**If one or more of the criteria (below) is met, an AQA will be required:** ▪ **The works are a prescribed industrial process under PPC (Pollution, Prevention and Control) regulations;** ▪ **The proposal is a sensitive development (residential, school, healthcare, childcare);** ▪ **The development consists of 50 or more dwellings;** ▪ **B2 or B8 development of more than 5,000 m²;** ▪ **The scheme introduces 300 or more new parking spaces;** ▪ **The development requires a Transport Assessment;** ▪ **The development significantly changes traffic volume (5% Annual Average Daily Traffic (AADT) or peak flow);** ▪ **The development leads to a change in average speed of vehicles of 5kph or a significant increase in congestion;** ▪ **The development increases HGV movements by 200 per day (including buses);** ▪ **Large, long-term construction sites that would generate large HGV flows over a period of a year or more;** ▪ **The development interferes with the air quality actions stated in**	**The City of Stoke-on-Trent is designated as an Air Quality Management Area (AQMA) therefore Regulatory Services (01782 237788) should be contacted to agree upon the extent of the assessment required which should be commensurate with the potential significance of the impacts.**	**Core Spatial Strategy Policy CSP3** **PPS23: 'Planning and Pollution Control'**	**Additional information can also be found at Defra, UK - Environmental Protection - Air Quality** **Guidance is available from** Environmental Protection UK ***Development Control: Planning for Air Quality (2010 update)*** **http://www.environmental-protection.org.uk/air-quality-and-climate/**

		the Local Transport Plan or Air Quality Action Plan; ▪ **The development includes a Heat and Combined Power (HCP) or biomass plant.**			

7 Local Transport Plans and Strategies

Stoke-on-Trent Local Transport Plan (LTP3) 2011-2026 will provide strategy and direction to 2026 and also contain an investment plan for the period 2011/12 to 2013/14. The LTP3 will refresh the long term transport strategy and replace the implementation plan of the North Staffordshire LTP 2006/07-2010/11 (LTP2).

The LTP3 document sets three goals to provide links to national policies (and emerging themes), local planning objectives and transport policies and goals currently enshrined in 'Delivering a Sustainable Transport System'.

The three key goals are:

- Economy; improving the local economy through increasing productivity for existing businesses and encouraging new investment by making the area more attractive;
- Environment; improving the local environment through reducing the impact of traffic (air and noise) and moving towards more sustainable transport technology and modes, coupled with improving the appearance of local areas; and
- Health; caring for local health through improving access to transport, transport safety and encouraging walking and cycling.

Each of the goals has supporting policies which have the potential to impact air quality;

LTP3 Goal – Environment

- Policy 1 – Reduce Air Pollution
- Policy 2 - Reduce reliance on oil based transport; increase transport efficiency.
- Policy 4 - Improve internal environment through 'place' schemes which manage traffic and enhance pedestrian environments

LTP3 Goal – Health

- Policy 3 – Encourage use of sustainable modes (public transport, walking and cycling)

The Full LTP3 document will be published in April 2011.

The draft LTP3 strategy document can be found on the Stoke-on-Trent City Council website. [10]

[10] http://www2002.stoke.gov.uk/planning_uploads/LTP3%20Draft.pdf

8 Climate Change Strategies

The Carbon Reduction Delivery Plan (NI 186) was approved by the Council in July 2010. The Council has completed the Carbon Trust programme, and a Carbon Management Plan has been developed and is going before the Cabinet in June 2011.

A Sustainability Policy is being prepared for inclusion in the Policy Framework. The policy is expected to go before Cabinet in June 2011, after which the council will develop its Climate Change Strategy.

The Draft Supplementary Planning Document, Sustainability and Climate Change has been published for consultation. [11]

[11] http://www.stoke.gov.uk/ccm/cms-service/download/asset/?asset_id=2361830

9 Implementation of Action Plans

City-wide AQMA

Indicators for the city-wide AQAP for nitrogen dioxide show that progress is being made. Progress of the current action plan are summarised in Table 9.1.

The 2010 Progress Report stated that changes to the Action Plan for the city-wide nitrogen dioxide AQMA would be amended to ensure that actions were targeted to areas where the greatest number of receptors would benefit. However, cuts to local government funding means that the proposed changes to the AQAP must be reviewed again to ensure that proposals have adequate funding. The review will be carried out during 2011 and amendments to the Action Plan published in 2012.

Until a full review of the action plan is carried out and the amended action plan published, the following amendments have been made to the current AQAP:

- Items 1.1, 1.2, 2.4 and 3.5 of the Action Plan have been removed from the action planning list, as there is no funding is available for the proposed actions.
- Items 1.10, 1.11, 5.2 and 5.3 have been removed from the action planning list, as these actions are being continuously undertaken by the council.

The removed items, summarised in Table 9.2, will not appear in the amended Action Plan.

Fenton AQMA

Monitoring shows that the 24-hour PM_{10} objective has not been breached in the Fenton PM_{10} AQMA during 2010.

Following a review of the Fenton AQMA, the council made the decision to not revoke the AQMA order. There has been a significant reduction in the concentration of particulate matter monitored at the Clarice Cliff site. However, there is concern that reduced concentrations of particulate matter may, to some extent, be associated with the economic downturn and slow-down in redevelopment opportunities. The order will remain in place until such time that the council can be confident that the reduction in concentration of particulate matter is sustainable.

Progress of the Fenton action plan are summarised in Table 9.3.

Table 9.1 Action Plan Progress

Details of indicators and targets are included in Appendix C

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
1.3	Divert Traffic	Complete city-centre ring road.	SoTCC	2008-09	2010	Reduced congestion on routes into city-centre. Quantification beginning.	Unkown	Broad St to Etruria Rd section of ring-road complete. Etruria Rd to Waterloo Rd phase delayed, as land owner, Lear , taken into receivership	Broad St to Etruria Rd section of ring-road complete.	Etruria Rd to Waterloo Rd phase, unknown – dependant on developer funding.	Emission reduction unlikely to be seen in hot-spot areas. General reduction in congestion around city-centre likely.
1.4	Divert Traffic	Provide clear route signage on major routes through city	SoTCC	2010-11	201 1		Qualification under investigation for A50 Victoria Road	Signage Strategy currently being developed.	Signage Strategy currently being developed.	2012	Emission reduction unlikely to be seen in hot-spot areas. General reduction in congestion around city-centre likely.
1.12	Reduce road congestion at	Reduce emissions at	SoTCC	2009-10	2010	LTP L6	Qualification under			Ongoing	

No.	Measure	Focus	Lead authority	Planning phase	Implemen-tation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
	key traffic signal junctions using Remote Monitoring System (RMS) to improve fault response time.	major junctions				LTP M16 LTP M17 NI 167	investigation for air quality hot-spot areas	Long-term trend up Long-term trend down Long-term trend down	Short-term trend up Short-term trend down Short-term trend down		
1.13	Reduce congestion along key routes using ANPR to inform UTMC.	Reduce emissions along major routes				LTP L6 LTP M16 LTP M17 NI 167	Qualification under investigation for A50 Victoria Road	 Long-term trend up Long-term trend down Long-term trend down	 Short-term trend up Short-term trend down Short-term trend down	Ongoing	
1.14	Reduce congestion caused by roadworks using Highways Asset Management Plan (HAMP) to prioritise works.	Reduce emissions caused by congestion sue to roadworks	SoTCC		Current	LTP L6 LTP M16 LTP M17 NI 167	Qualification under investigation for air quality hot-spot areas	 Long-term trend up Long-term trend down Long-term trend down	 Short-term trend up Short-term trend down Short-term trend down	Ongoing	
2	**Transport Alternatives**										
2.1	Develop	Increase	SoTCC	Complete	2015	LTP L2		Long-term	Short-term		Emission

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
	priority bus route from Keele to Kidsgrove via Stoke rail station and city-centre (streetcar)	bus patronage						trend up	trend down Funding for this project has been cut. A funding bid to the Local Sustainable Transport Fund is being made.		reduction may not be measurable
2.2	Develop a bus priority route from Stoke Station to City Centre	Increase bus patronage	SoTCC	Complete	2013	LTP L2		Long-term trend up	Short-term trend down Funding for this project has been cut. A funding bid to the Local Sustainable Transport Fund is being made.		Emission reduction may not be measurable
2.3	Develop a bus priority route at Bucknall New Road	Increase bus patronage	SoTCC	Complete	2013	LTP L2		Long-term trend up	Short-term trend down Funding for this project has been cut. A funding bid will be made at a future date.		
2.5	Provide alternative transport	Encourage alternative transport	SoTCC	Complete	Ongoing	LTP L2		Long-term trend up	Short-term trend down	Ongoing	

No.	Measure	Focus	Lead authority	Planning phase	Implemen-tation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
	information through Traveline										
2.6	Reduce anti-social behaviour, crime and fear of crime on public transport by installing CCTV at specific bus shelters	Increase bus patronage	SoTCC	Complete	Ongoing	LTP M8		Long-term trend up	Short-term trend up	Ongoing	
2.7	Improve accessibility and personal security between main bus routes and residential areas by improving footpaths, lighting and pedestrian crossings.	Increase bus patronage	SoTCC	Complete	Ongoing	NI 175		Long-term trend up	Short-term trend up	Ongoing	
2.8	Provide subsidised bus route through purchase of one full size Cityrider bus	Increase bus patronage	SoTCC		Current	NI 175		Long-term trend up	Short-term trend up	Ongoing	

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
	(e.g. Plumline).										
2.9	Promote cycling through 'Cycling City' events	Increase cycle use	SoTCC		Current	LTP M13 LTP M14		Long-term trend up Long-term trend up	Short-term trend down Short-term trend up	Ongoing	
2.10	Improve cycle access to the canal system.	Increase cycle use	SoTCC		Current	LTP M13 LTP M14		Long-term trend up Long-term trend up	Short-term trend down Short-term trend up	Ongoing	
2.11a	Implement the Governments 'Cycle to Work' Scheme for council employees.	Increase cycle use	SoTCC		Current	LTP M13 LTP M14		Long-term trend up Long-term trend up	Short-term trend down Short-term trend up	Ongoing	
2.11b	Promote the the Governments 'Cylce to work' scheme through Green Travel Plans	Increase cycle use	SoTCC		Current	LTP M13 LTP M14		Long-term trend up Long-term trend up	Short-term trend down Short-term trend up	Ongoing	
2.12	Expand cycling proficiency schemes in schools	Increase cycle use	SoTCC		Current	LTP M13 LTP M14		Long-term trend up Long-term trend up	Short-term trend down Short-term trend up	Ongoing	
2.13	Expand cycling	Increase cycle use	SoTCC		Current	LTP M13		Long-term trend up	Short-term trend down	Ongoing	

No.	Measure	Focus	Lead authority	Planning phase	Implemen-tation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
	network					LTP M14		Long-term trend up	Short-term trend up		
2.14	Promote 'Cycling Journey Planner'	Increase cycle use	SoTCC		Current	LTP M13 LTP M14 Index of cycling level in City Centre		Long-term trend up Long-term trend up Long-term trend up	Short-term trend down Short-term trend up Short-term trend up	Ongoing	
2.15	Promote use and increase security of cycle routes close to new developments	Increase cycle use	SoTCC		Current	NI 175		Long-term trend up	Short-term trend up	Ongoing	
2.16	Promote walking by providing puffin crossings at strategic crossing points.	Increase walking	SoTCC		Current	NI 175		Long-term trend up	Short-term trend up	Ongoing	
2.17	Expand school walking bus schemes	Increase walking	SoTCC		Current	NI 198		Long-term trend up	Short-term trend up	Ongoing	
2.18	Support & promote NHS 'Walk This Way Project'	Increase walking	SoTCC		Current	NI 175		Long-term trend up	Short-term trend up	Ongoing	
2.19	Promote	Increase	SoTCC		Current	NI 175		Long-term	Short-term	Ongoing	

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
	walking through local road safety schemes at accident hot-spots	walking						trend up	trend up		
2.20	Develop Stoke Station Travel Plan & improve public transport access to station	Encourage alternative transport	SoTCC		Current	NI 175		Long-term trend up	Short-term trend up	Ongoing	
2.21	Encourage businesses to promote sustainable transport by providing cycle storage, lockers, shower facilities	Increase cycle use	SoTCC		Current	NI 175		Long-term trend up	Short-term trend up	Ongoing	
2.22	Promote green travel plans	Encourage alternative transport	SoTCC		Current	NI 175		Long-term trend up	Short-term trend up	Ongoing	
2.23	Promote safer routes to school	Increase walking and cycling	SoTCC		Current	NI 198		Long-term trend up	Short-term trend up	Ongoing	
2.24	Promote rail travel & publicise train	Encourage alternative transport	SoTCC		Current	NI 175		Long-term trend up	Short-term trend up	Ongoing	

No.	Measure	Focus	Lead authority	Planning phase	Implemen-tation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
	operating companies' services & information through sustainable travel plan										
3	**Reducing emissions**										
3.1	Enforce emissions limits from industrial (Part A2 and Part B) processes.	Reduce industrial emissions	SoTCC		Current	Defra Returns for emissions from processes compliant with permit				Ongoing	
3.2	Control smoky vehicles through 'smog-buster' campaign	Reduce emissions from poorly maintained vehicles	SoTCC		Current	No indicator				Ongoing	
3.3	Promote grants for transport operators to improve vehicles	Encourage retrofitting	SoTCC								
3.4	Limit the age of vehicles licensed as Taxis	Reduce emissions form taxis and private hire vehicles	SoTCC	Complete	Complete	No indicator				Complete	
3.6	Include Travel	Encourage	SoTCC		Current	No indicator		Travel plans	Travel plans		

No.	Measure	Focus	Lead authority	Planning phase	Implemen-tation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
	Plans as part of Section 106 agreements	alternative transport						required for inclusion of local developments	required for inclusion of local developments		
3.8	Improve council fleet	Reduce emissions from council fleet	SoTCC	2010-11	2012	Under consideration		Fleet replacement on hold due to funding cuts	Fleet replacement on hold due to funding cuts		
3.9	Develop quality bus partnership to include minimum Euro standard buses on all routes and use of alternative fuels.	Reduce emissions from buses	SoTCC			No indicator		Unlikely to get support for minimum EURO standard from service providers	Unlikely to get support for minimum EURO standard from service providers	Unkown	
4	**Education, Training & Publicity**										
4.1	Produce museum exhibit aimed at families and supported by school teaching pack.	Educate 7-11 year olds on pollution sources and encourage alternative transport	SoTCC	2009-10	2010	Number of competition entries and feedback forms		Initial project complete – booklets distributed to all year 4 pupils within city.	Defra funding obtained to enable further booklets to be distributed to schools. Currently reviewing feed-back from teachers to enable	April 2012	

No.	Measure	Focus	Lead authority	Planning phase	Implemen-tation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
									amendments to text before reprint.		
4.2	Ongoing high level marketing of sustainable travel under Travelwise branding (e.g. eco-driving, problems with short journeys, health benefits of walking/cycling etc.)	Encouraging alternative transport	SoTCC	Complete	Current	NI 175		Long-term trend up	Short-term trend up	Ongoing	
4.3	Promote Green Travel Plans for schools and businesses	Encouraging alternative transport	SoTCC	Complete	Current	NI175		Long-term trend up	Short-term trend up	Ongoing	
4.4	Monitor & publish air quality data throughout the city	Educate public on air quality issues	SoTCC	Complete	Current	Number of hits on web page		No data available	No data available	Ongoing	
4.5	Provide priority parking for car-sharing in employers car parks	Encourage car sharing	SoTCC	Complete	Current	Number of staff using scheme		No data available	No data available	Ongoing	
4.6	Provide	Encourage	SoTCC	Complete	Ongoing	No indicator		No data	No data	Ongoing	

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
	alternative transport information packs for new developments	alternative transport						available	available		
4.7	Encourage businesses to have flexible working hours. Stagger start times with neighbouring schools to allow walks between schools	Reduce congestion	SoTCC	Complete	Ongoing	No indicator		No data available	No data available		
5	**Land Use Planning**										
5.1	Provide supplementary planning documents with regard air quality	Provide information regarding when an air quality assessment is required	SoTCC	2009-10		No indicator			Local Validation List has been published for consultation	2011	

Table 9.2 Items removed from city-wide Action Plan

1.1	Divert Traffic	Divert traffic around Burslem town centre	SoTCC	2008-09	Unknown	NO_2 reduction in Burslem town centre	2%	Failure to secure funding	The project failed to secure funding.	Remove action from AQAP	
1.2	Divert Traffic	Divert traffic from Dividy Rd/Bucknall Rd junction	SoTCC	Complete	Unknown	NO_2 reduction on Dividy Rd	2%	Failure to secure funding until after 2013	The project failed to secure funding.	Remove action from AQAP	
1.10	Enforce 'school run' parking restrictions	Reduce emissions through idling vehicles close to schools.	SoTCC		Current	Not finalised					Emission reduction unlikely to be seen in hot-spot areas.
1.11	Increase number of no stopping zones outside schools	Reduce emissions through idling vehicles close to schools.	SoTCC	2010-11	2011	Not finalised					Emission reduction unlikely to be seen in hot-spot areas.
2.4	Improve efficiency and perceived unreliability of bus service using SPRITE (real time passenger information)	Increase bus patronage	SoTCC	Complete	Unknown - scheme put on hold – funding unavailable				Scheme put on hold – funding unavailable		
3.5	Introduce car fleet renewal initiatives for general public	Reduce emissions from vehicles	BIS		Complete	Local uptake of scheme				Feb 2010	
5.2	Ensure early	Ensure	SoTCC		Ongoing	No indicator				Ongoing	

	consultation between Master Planning, Highways and Planning Departments	relevant consulttion									
5.3	Demolish or change land-use for residential properties in areas of poor air quality.	Remove receptors from areas of poor air quality	SoTCC			No indicator					

Table 9.3 Fenton Action Plan

No.	Measure	Focus	Lead authority	Planning phase	Implemen-tation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
1.1.	Enforce Environmental Permit Conditions	Control and minimise emissions of particulate matter within the AQMA	City Council (PPC Permit for Crusher), Environment Agency (PPC Permit for Waste Site)	Ongoing				Regulation and inspection of permitted activities undertaken in line with standard risk assessment criteria. Possible breaches identified and remedial	Environment Agency (Waste Transfer) permit review now complete and issued. Action taken by Agency to enforce improved site management	Ongoing	Permit conditions requiring updated, detailed mud and dust management plans have been enforced by the Environment Agency

No.	Measure	Focus	Lead authority	Planning phase	Implemen-tation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
								actions agreed with company	and record keeping conditions		(awaiting response from Operator
1.1.1	Road sweeping of site roads and public highways	Control local emissions of particulates from vehicles associated with the Waste Transfer Station operation	City Council, Waste Transfer Station Operator, Environment Agency	Ongoing		Reduction in number of days of elevated (above 24hr air quality objective) particulate matter measured within AQMA		Sweeping has been more regular but sometimes ineffective at times due to time constraints	On-site conditions have remained steady although tracking of mud/dust has continued mostly due to adverse weather conditions.	Ongoing	Improvements have maintained the reduction of the number of days exceedance measured
1.1.2	On-site speed limitation	Control local emissions of particulates from vehicles associated with the Waste Transfer Station operation	City Council, Waste Transfer Station Operator, Environment Agency	Ongoing		Reduction in number of days of elevated (above 24hr air quality objective) particulate matter measured within AQMA		Limit of 10mph for site vehicles enforced by operator and complied with		Ongoing	Reduces on-site generation of dust capable of dispersing onto neighbouring premises.
1.1.3	Sheeting of	Control	Environment	Ongoing		Reduction		Operator's	Complaints	Ongoing	Emission

No.	Measure	Focus	Lead authority	Planning phase	Implemen-tation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
	vehicles	local emissions of particulates from vehicles associated with the Waste Transfer Station operation	Agency, Waste Transfer Station Operator, City Council			in number of days of elevated (above 24hr air quality objective) particulate matter measured within AQMA		vehicle fleet now almost entirely "automatic sheeting vehicles". Still no control over visiting drivers and vehicles	from residents of unsheeted vehicles continue but attributed to visiting operators		reductions continued and minimal but perceived by local residents as important
1.1.4	Hard surface site roads and operational areas	Control local emissions of particulates from vehicles associated with the Waste Transfer Station operation	City Council, Waste Transfer Station Operator, Environment Agency	Ongoing		Reduction in number of days of elevated (above 24hr air quality objective) particulate matter measured within AQMA		All areas accessed by vehicles now hard surfaced with the exception of vehicles delivering incoming demolition arisings	Crusher still sited on un-surfaced yard but agreed revision to operations has resulted in limited number of vehicles accessing un-surfaced area	Ongoing	Agreement between Council and operator to prevent out-going vehicles being loaded with material on un-surfaced area.
1.1.5	Provision of wheel-wash facilities	Control local emissions of particulates from vehicles	City Council, Waste Transfer Station Operator, Environment Agency	Ongoing		Reduction in number of days of elevated (above 24hr air quality		No wheel wash provided. Requirement for wheel wash included in EPA 1990	Reviewed Environment Agency permit includes stricter controls on		Dust and mud tracking off site remains a major environmental issue. Proposed

No.	Measure	Focus	Lead authority	Planning phase	Implemen-tation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
		associated with the Waste Transfer Station operation				objective) particulate matter measured within AQMA		Section 80 Abatement Notice (served August 2007) was successfully appealed by operator	condition of vehicles leaving site – power washing of vehicles has occurred infrequently		relocation of metal recycling site associated with Operator will reduce traffic and tracking further.
1.1.6	Materials handling	Control local emissions of particulates at source	Environment Agency, Waste Transfer Station Operator, City Council	Ongoing		Reduction in number of days of elevated (above 24hr air quality objective) particulate matter measured within AQMA		Reinforcement of good general environmental management has minimised emissions from this source	On-site storage of material has increased in the last 12 months. Large stockpile of material not processed	Ongoing	Compliance with PPC crushing permit conditions minimises generation of mineral based particulate matter.
1.1.8	Water sprays	Control local emissions of particulates at source	City Council	Ongoing				Seven spray points to control dust from roads, yards and stockpiles in vicinity of crushing operation	Crushing operation s sporadic during last 12 months due to economic downturn – sprays still operational	Ongoing	Sprays can be used to control emissions from crushing operation also but need to be used sparingly to avoid mud generation

No.	Measure	Focus	Lead authority	Planning phase	Implemen-tation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
4	Liaise with internal and external regulatory bodies	Unify all regulatory functions into a single “authority” message	City Council, Environment Agency	Ongoing				Group consisting of Councillors, Environmental Health, Planning, Highways, Regeneration Dept and Environment Agency established	Regular meetings held between all bodies involved.	Ongoing	Unified regulatory body has maintained impetus in assessing the issues affecting local residents and continues to improve “customer” satisfaction

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

Monitoring throughout the city has resulted in higher than expected concentrations of nitrogen dioxide (NO_2) during 2010. The extreme weather conditions during November and December 2010 led to high barometric pressure extremely low temperatures and low wind speed hindering dispersion and 'trapping' pollutants.

Monitoring has shown that several areas of the city continue to exceed the NO_2 annual mean objective. However, all areas are within the city-wide AQMA. Therefore there is no need to progress to a detailed assessment.

A downward trend in concentrations of NO_2 is evident many areas of the city. However, an upward trend was evident at Basford, Bucknall Bridge and Meir. Monitoring in the Joiners Square area showed an upward trend on the Victoria Road (A50), but downward trend on Leek Road (A52).

Diffusion tube monitoring indicates a possible exceedance of the NO_2 1-hour mean objective at Basford. The city-wide AQMA amendment, to include an exceedance of the 1-hour mean objective, will come into force on 9 May 2011. Defra funding has been granted to enable the relocation of the Copeland monitor to Basford. Automatic monitoring will confirm whether the 1-hour mean is being breached and help to inform the action plan.

10.2 Conclusions relating to New Local Developments

Two newly permitted industrial permits have been issued:

- Permit Reference Number 171 – Reiter Automotive (GB) Ltd – Di-isocyanate process and
- Permit Reference Number 172 – Recticel Insulation Products - Di-isocyanate process

These processes will be considered in more detail in the next Updating and Screening Assessment (USA). Neither process is likely to give rise to the need for a Detailed Assessment.

10.3 Other Conclusions

Indicators for the city-wide AQAP for nitrogen dioxide show that progress is being made.

The amendment to city-wide AQMA to include the nitrogen dioxide 1-hour objective will be published and come into force on 9 May 2011. A copy of the amended order is included in Appendix D.

The city-wide AQAP will be reviewed and amended target specific areas where objectives are breached and will include actions for the area of Basford.

The Fenton AQMA will not be revoked until there is sufficient evidence to show that low concentrations are sustainable.

An air quality assessment in support of planning application SOT/50481 will be discussed in the next USA.

The LTP3 draft document sets out goals and policies which have the potential to improve air quality

Goal - Environment

- Policy 1 – Reduce Air Pollution.
- Policy 2 - Reduce reliance on oil based transport; increase transport efficiency.
- Policy 4 - Improve internal environment through 'place' schemes which manage traffic and enhance pedestrian environments.

Goal - Health

- Policy 3 – Encourage use of sustainable modes (public transport, walking and cycling).

The Draft Local Validation List has been published for consultation. The document sets out the information requirements for different types of planning applications within the city of Stoke-on-Trent and lists the type of developments that are likely to need an air quality assessment.

10.4 Proposed Actions

Monitoring has shown that there is no need to proceed to a detailed assessment for any pollutant.

An automatic monitor will be located at Basford to confirm whether the 1-hour mean objective is being breached and to inform the action plan.

The amended city-wide AQMA will come into force on 9 May 2011. The amendment will include exceedance of the nitrogen dioxide 1-hour mean objective.

The city-wide nitrogen dioxide AQAP and the Fenton particulates AQAP will be reviewed and amended as appropriate during 2011.

Monitoring of nitrogen dioxide and particulates will continue and will be reported in the Updating and Screening Assessment (USA) 2012.

Appendices

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

The National Diffusion Tube Bias Adjustment Factor for Staffordshire Scientific Services supplied by the R&A Helpdesk is shown in Table A.1.

Table A.1Bias adjustment factor

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 04/11

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated in late June 2011 on the

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List. If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List. If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List. If a year is not shown, we have no data[2]

Step 4: Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.

If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953

Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year[5] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (μg/m³)	Automatic Monitor Mean Conc. (Cm) (μg/m³)	Bias (B)	Tube Precision[6]	Bias Adjustment Factor (A) (Cm/Dm)
Staffordshire Scientific Services	20% TEA in Water	2010	O	South Staffordshire DC	11	41	35	18.5%	G	0.84
Staffordshire Scientific Services	20% TEA in Water	2010	UB	Stoke-on-Trent City Council	12	38	37	1.5%	G	0.99
Staffordshire Scientific Services	20% TEA in Water	2010	R	Cannock Chase Council	11	53	44	20.9%	G	0.83
Staffordshire Scientific Services	20% TEA in Water	2010	UC	Manchester CC	12	48	45	7.2%	G	0.93
Staffordshire Scientific Services	20% TEA in Water	2010	S	Manchester CC	12	32	28	13.0%	G	0.89
Staffordshire Scientific Services	20% TEA in Water	2010	K	Marylebone Road Intercomparison	12	119	93	27.4%	G	0.79
Staffordshire Scientific Services	20% TEA in Water	2010		Overall Factor[3] (6 studies)				Use		0.87

[1] For Casella Stanger/Bureau Veritas (NOT Bureau Veritas Labs) use Gradko 50% TEA in Acetone.
For Casella Seal/GMSS/Casella CRE/Bureau Veritas Labs/Eurofins use Environmental Scientific Groups.
For Staffordshire CC SS/Staffordshire County Analyst use Staffordshire Scientific Services.
For Bodycote Health Sciences and Clyde Analytical Laboratories use Exova.
For Rotherham MBC use South Yorkshire Labs.
For Dundee CC use Tayside SS.
For Leicester Scientific Services use Staffordshire Scientific Services. For South Yorkshire Air Quality Samplers use South Yorkshire Labs.

[2] In this situation it would be reasonable to use data from the nearest year.

[3] Overall factors have been calculated using orthogonal regression to allow for uncertainty in both the automatic monitor and diffusion tube. The uncertainty of the diffusion tube has been assumed to be double that of the automatic monitor.

[4] If you have your own co-location study, please send your data to us, so that it can be included here. If this is not possible, but you wish to combine these factors with your own, select and copy the relevant data from this spreadsheet and paste them into a new one (otherwise your calculations will include hidden data). Then add your own data and calculate the bias. To obtain a new correction factor that includes your data, average the bias (B) values, expressed as a factor, i.e. -16% is -0.16. Next add 1 to this value, e.g. -0.16 + 1.00 = 0.84 in this example, then take the inverse to give the bias adjustment factor 1/0.84 = 1.19. (This will not be exactly the same as the correction factor calculated using orthogonal regression as used in this spreadsheet, but will be reasonably close).

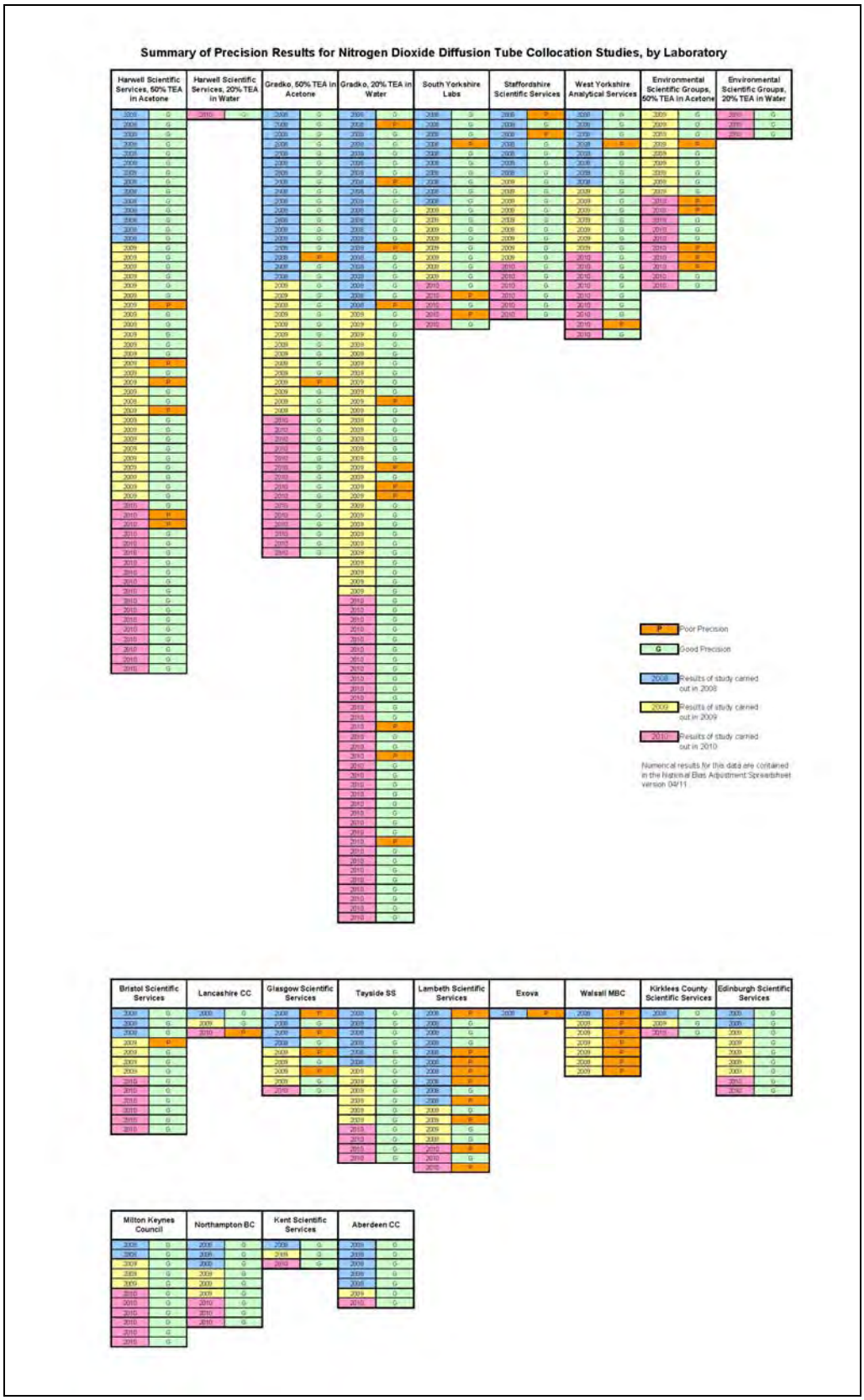
To add data download a questionnaire

[5] Where an annual dataset falls into two years it has been ascribed to the year in which most of the data has fallen.

[6] Tube precision is determined as follows: G = Good precision - coefficient of variation (CV) of diffusion tube replicates is considered good when the CV of eight or more periods is less than 20%, and the average CV of all monitoring periods is less than 10%; P = Poor precision - CV of four or more periods >20% and/or average CV>10%; S = Single tube, therefore not applicable; na - not available.

Details of laboratory precision are shown in Table A.2.

Table A.2Laboratory Precision



Factor from Local Co-location Studies (if available)

Three local collocation studies (Table A.3 to A.5) were submitted to the R&A Helpdesk for inclusion in the National Diffusion Tube Bias Adjustment Factor for Staffordshire Scientific Services.

Table A.3 AURN Bias factor

Diffusion Tube Collocation Data Questionnaire For Local Authorities 2011

Please Read the "Notes" sheet and then fill in the white boxes of this questionnaire
Should you require assistance, email kiribrown@aqconsultants.co.uk or phone 0117 974 1086

	Date form filled in	Name of Local Authority	Your name	Phone number	Contact email
Your Details	25/01/2011	Stoke-on-Trent City Council	Ann Beeston	01782 236575	ann.beeston@stoke.gov.uk

	Distance from kerb (m)	Site type (e.g. roadside, background). Definitions of site types are given on the "Notes" sheet	Distance from diffusion tube(s) to continuous analyser inlet (m)	Location (site name or a brief description)	Grid Reference of Site (if available)
Site Details	**9 m**	Urban background	0 m	Stoke-on-Trent Centre AURN	**E**388358 **N**347891

	Prepared by (if known; e.g. Harwell Scientific Services)	Analysed by (e.g. Kent Scientific Services)	Preparation method (e.g. 50% TEA in acetone; 50% TEA in water)	How are diffusion tubes deployed? (e.g. with a clip, spacer, shelter box, just tape)
Diffusion Tube Details	Staffordshire County Council Scientific Services	Staffordshire County Council Scientific Services	20% TEA in water	Spacer

	Analyser type	QA/QC (e.g. local or network)
Continuous Analyser Details	Thermo Electron 42I	AURN QA/QC

Data from the Automatic Analyser (Matching Individual Diffusion Tube Periods)

Period	Start Date (dd/mm/yy)	End Date (dd/mm/yy)	% Data Capture	Ratified / Provisional	NOx (if available) (ug/m^3)	Nitrogen Dioxide (ug/m^3)
1	06/01/2010	03/02/2010	93.01%	Ratified	78.6	42.1
2	03/02/2010	04/03/2010	99.14%	Ratified	78.5	43.6
3	04/03/2010	31/03/2010	89.34%	Ratified	60.5	35.9
4	31/03/2010	29/04/2010	99.71%	Ratified	53.6	31.7
5	29/04/2010	02/06/2010	99.14%	Ratified	50.0	29.2
6	02/06/2010	30/06/2010	99.55%	Ratified	44.7	26.7
7	30/06/2010	05/08/2010	96.18%	Ratified	44.8	22.2
8	05/08/2010	01/09/2010	99.69%	Ratified	47.3	24.4
9	01/09/2010	30/09/2010	99.57%	Ratified	54.9	27.7
10	30/09/2010	03/11/2010	99.26%	Provisional	59.3	31.8
11	03/11/2010	08/12/2010	99.40%	Provisional	109.0	45.4
12	08/12/2010	06/01/2011	98.56%	Provisional	115.7	82.7
13						

Please express NOx as NO_2 (e.g. ppb x 1.913) or alternatively note the approach / units here:

When you are identifying the automatic monitoring periods that match your diffusion tube exposure periods, please be as precise as possible. It is not, however, necessary to match start times to the exact hour that you put out your tubes.

Individual Period (monthly) Mean Nitrogen Dioxide Data from the Diffusion Tubes (ug/m^3)

Period		Tube 1	Tube 2 (if available)	Tube 3 (if available)	Tube 4 (if available)
1		46.2	44.4	47.7	
2		46.1	44.4	46.3	
3			33.8	39	
4		28.3	25	25.8	
5		29.4	28.2	27.9	
6		32.6	32.5	33.8	
7		28.8	30	30.4	
8		30.8	30.5	31.1	
9		33.9	33.2	34.6	
10		40.2	39.4	40.8	
11		44.7	48.2	45.3	
12		52.3	54.2	53.8	
13					

	Are the concentrations stated in ug/m^3?	Did the diffusion tube supply or analysis method change during the monitoring period? When, from what, to what?	Were there any significant problems with the continuous analyser during the monitoring period?	Are there any other relevant issues with your data?
Other Information	Yes	No	No	

Please Return Completed Questionnaires to: kiribrown@aqconsultants.co.uk
This questionaire has been compiled and distributed by Air Quality Consultants Ltd on behalf of Defra and the DAs

Table A.4Copeland Bias factor

Diffusion Tube Collocation Data Questionnaire For Local Authorities 2010

Please Read the "Notes" sheet and then fill in the white boxes of this questionnaire
Should you require assistance, email kiribrown@aqconsultants.co.uk or phone 0117 974 1086

	Date form filled in	Name of Local Authority	Your name	Phone number	Contact email
Your Details	26/01/2011	Stoke-on-Trent City Council	Ann Beeston	01782 236575	ann.beeston@stoke.gov.uk

	Distance from kerb (m)	Site type (e.g. roadside, background). Definitions of site types are given on the "Notes" sheet	Distance from diffusion tube(s) to continuous analyser inlet (m)	Location (site name or a brief description)	Grid Reference of Site (if available)
Site Details	**4.1 m**	Roadside	0 m	Copeland	**E**387873 **N**345445

	Prepared by (if known; e.g. Harwell Scientific Services)	Analysed by (e.g. Kent Scientific Services)	Preparation method (e.g. 50% TEA in acetone; 50% TEA in water)	How are diffusion tubes deployed? (e.g. with a clip, spacer, shelter box, just tape)
Diffusion Tube Details	Staffordshire County Council Scientific Services	Staffordshire County Council Scientific Services	20% TEA in water	Spacer

	Analyser type	QA/QC (e.g. local or network)
Continuous Analyser Details	ML98xx	Local QA/QC

Data from the Automatic Analyser (Matching Individual Diffusion Tube Periods)

Period	Start Date (dd/mm/yy)	End Date (dd/mm/yy)	% Data Capture	Ratified / Provisional	NOx (if available) (ug/m^3)	Nitrogen Dioxide (ug/m^3)
1	06/01/2010	03/02/2010	99.70	Ratified	158.7	54.4
2	03/02/2010	03/03/2010	99.85	Ratified	164.3	58.6
3	03/03/2010	31/03/2010	100.00	Ratified	105.8	38.1
4	31/03/2010	28/04/2010	99.69	Ratified	96.4	37.1
5	28/04/2010	02/06/2010	99.76	Ratified	84.6	35.4
6	02/06/2010	30/06/2010	100.00	Ratified	82.5	33.2
7	30/06/2010	04/08/2010	100.00	Ratified	57.6	19.3
8	04/08/2010	01/09/2010	99.70	Ratified	73.5	26.1
9	01/09/2010	29/09/2010	99.85	Ratified	84.5	32.8
10	29/09/2010	03/11/2010	99.76	Ratified	112.7	39.5
11	03/11/2010	09/12/2010	98.15	Ratified	203.8	59.5
12	09/12/2010	05/01/2011	99.07	Ratified	222.3	63.3
13						

Please express NOx as NO_2 (e.g. ppb x 1.913) or alternatively note the approach / units here:

When you are identifying the automatic monitoring periods that match your diffusion tube exposure periods, please be as precise as possible. It is not, however, necessary to match start times to the exact hour that you put out your tubes.

Individual Period (monthly) Mean Nitrogen Dioxide Data from the Diffusion Tubes (ug/m^3)

Period		Tube 1	Tube 2 (if available)	Tube 3 (if available)	Tube 4 (if available)
1		56.8	54.9	57.8	
2		60.6	60.8	61.6	
3			50.4	48.7	
4		39.7	39.3	43	
5		38.6	40.1	37.9	
6		49.3	49.7	50.8	
7		36.4	38.6	36.7	
8		43.8	43.6	43.8	
9		46.6	45.7	46.5	
10		50.2	52	48.4	
11		63	68.7	64.9	
12		63.3	74.5	64.7	
13					

	Are the concentrations stated in ug/m^3?	Did the diffusion tube supply or analysis method change during the monitoring period? When, from what, to what?	Were there any significant problems with the continuous analyser during the monitoring period?	Are there any other relevant issues with your data?
Other Information	Yes	No	No	No

Please Return Completed Questionnaires to: kiribrown@aqconsultants.co.uk

This questionaire has been compiled and distributed by Air Quality Consultants Ltd on behalf of Defra and the DAs

Table A.5Middleport Bias factor

Diffusion Tube Collocation Data Questionnaire For Local Authorities 2010

Please Read the "Notes" sheet and then fill in the white boxes of this questionnaire
Should you require assistance, email kiribrown@aqconsultants.co.uk or phone 0117 974 1086

	Date form filled in	Name of Local Authority	Your name	Phone number	Contact email
Your Details	26/01/2011	Stoke-on-Trent City Council	Ann Beeston	01782 236575	ann.beeston@stoke.gov.uk

	Distance from kerb (m)	Site type (e.g. roadside, background). Definitions of site types are given on the "Notes" sheet	Distance from diffusion tube(s) to continuous analyser inlet (m)	Location (site name or a brief description)	Grid Reference of Site (if available)
Site Details	**4 m**	Roadside	0 m	Middleport	**E**385780 **N**349673

	Prepared by (if known; e.g. Harwell Scientific Services)	Analysed by (e.g. Kent Scientific Services)	Preparation method (e.g. 50% TEA in acetone; 50% TEA in water)	How are diffusion tubes deployed? (e.g. with a clip, spacer, shelter box, just tape)
Diffusion Tube Details	Staffordshire County Council Scientific Services	Staffordshire County Council Scientific Services	20% TEA in water	Spacer

	Analyser type	QA/QC (e.g. local or network)
Continuous Analyser Details	ML98xx	Local QA/QC

Data from the Automatic Analyser (Matching Individual Diffusion Tube Periods)

Period	Start Date (dd/mm/yy)	End Date (dd/mm/yy)	% Data Capture	Ratified / Provisional	NOx (if available) (ug/m^3)	Nitrogen Dioxide (ug/m^3)
1	06/01/2010	03/02/2010	99.70	Ratified	105.2	43.1
2	03/02/2010	03/03/2010	95.68	Ratified	125.3	48.7
3	03/03/2010	31/03/2010	99.43	Ratified	89.6	38.9
4	31/03/2010	28/04/2010	99.69	Ratified	86.4	31.8
5	28/04/2010	02/06/2010	99.88	Ratified	68.2	28.6
6	02/06/2010	30/06/2010	99.40	Ratified	68.8	29.0
7	30/06/2010	04/08/2010	99.29	Ratified	61.0	20.4
8	04/08/2010	01/09/2010	99.85	Ratified	70.0	22.7
9	01/09/2010	29/09/2010	99.85	Ratified	67.1	23.2
10	29/09/2010	03/11/2010	99.52	Ratified	90.8	31.8
11	03/11/2010	09/12/2010	99.88	Ratified	158.9	49.0
12	09/12/2010	05/01/2011	100.00	Ratified	152.7	50.0
13						

Please express NOx as NO_2 (e.g. ppb x 1.913) or alternatively note the approach / units here:

When you are identifying the automatic monitoring periods that match your diffusion tube exposure periods, please be as precise as possible. It is not, however, necessary to match start times to the exact hour that you put out your tubes.

Individual Period (monthly) Mean Nitrogen Dioxide Data from the Diffusion Tubes (ug/m^3)

Period		Tube 1	Tube 2 (if available)	Tube 3 (if available)	Tube 4 (if available)
1		53.4	52.2	54.8	
2		60.4	59	56.7	
3		42.1	40.5	44.4	
4		32.9	35.3	34.5	
5		38.7	37.2	35.3	
6		39.3	40.9	43.7	
7		38.5	36.1	37	
8		38.1	39.9	40.7	
9		41	40.6	41.3	
10		49.6	50.1	46.2	
11		59.7	61.3	61.6	
12		61.5	64.8	57.3	
13					

	Are the concentrations stated in ug/m^3?	Did the diffusion tube supply or analysis method change during the monitoring period? When, from what, to what?	Were there any significant problems with the continuous analyser during the monitoring period?	Are there any other relevant issues with your data?
Other Information	Yes	No	No	No

Please Return Completed Questionnaires to: kiribrown@aqconsultants.co.uk

This questionaire has been compiled and distributed by Air Quality Consultants Ltd on behalf of Defra and the DAs

Discussion of Choice of Factor to Use

It was not possible to calculate the orthogonal regression for direct comparison with the National figure for the laboratory; however the arithmetic mean of the three studies was calculated to be 0.85 which is the same as the National figure for Staffordshire Scientific Services. Therefore, the council is justified in using the National factor of 0.85 to correct all diffusion tube results.

Details of bias corrected, monthly concentrations for diffusion tubes sites are shown in Table A.6

Table A.6 Diffusion tube monthly data

Site Name	Address	Easting	Northing	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	AVERAGE	Missing	%DC
1994/01	6 Robertson Square	386394	343716	36.5	36.5	25.3	19.5	16.3	19.3	15.6	16.5	18.7	25.2	37.2	41.3	**25.7**	**0**	**100%**
1994/02	2 Douglas Street	387643	348557	38.8	39.2	31.7	23.7	22.1	2.4	29.3	28.9	31.8	31.8	42.9	42.8	**30.5**	**0**	**100%**
1999/01	Lamppost 6/8 Dividy Road	389884	347289	75.1	48.3	48.5	38.4	38.6	43.7	42.2		50.7	52.4	54.4		**49.2**	**2**	**83%**
1999/02	31Trentfields Road	390612	350793	32.3	31.7	18.2	11.6	10.8	14.8	14.1	14.5	18.2	24.1	33.8	37.1	**21.8**	**0**	**100%**
2001/04	633 Uttoxeter Road, Meir	392705	342518	41.9	43.9	42.3	34.7	32.0	38.4	38.9	39.2	44.3	45.3	43.3	46.2	**40.9**	**0**	**100%**
2001/13	140 North Street	387180	345937	49.6	49.2	44.1	32.7	31.7	38.4	32.7	30.0	38.8	44.9	51.8	51.9	**41.3**	**0**	**100%**
2002/01	11 Station Street	385740	349543	51.7	49.5	36.1	28.1	29.2	38.7	30.9	29.8	31.8	40.5	51.3	48.5	**38.8**	**0**	**100%**

2003/02	AUN colocation	388356	347892	39.3	39.2		24.1	25.0	27.7	24.5	26.2	28.8	34.2	38.0	44.5	**31.9**	**1**	**97%**
2003/03	AUN colocation	388356	347892	37.7	37.7	28.7	21.3	24.0	27.6	25.5	25.9	28.2	33.5	41.0	46.1			**100%**
2003/04	AUN colocation	388356	347892	40.5	39.4	33.2	21.9	23.7	28.7	25.8	26.4	29.4	34.7	38.5	45.7			**100%**
2005/01	Drainpipe 344 Waterloo Road, Cobridge	387625	348516	47.5	51.2	47.9	40.8	37.7	49.6	47.9	49.7	53.3	52.8	49.2	58.6	**48.8**	**0**	**100%**
2005/02	Red Lion Pub, Burslem Drainpipe on far left	386927	349854	36.5	45.8	37.1	43.1	39.0	40.6	35.5	40.0	33.7	37.5	43.1	49.1	**40.1**	**0**	**100%**
2005/03	Drainpipe near pub,Market Place, Burslem	386822	349811	41.2	45.2	40.5		28.0	34.9	34.3		38.3	40.3	47.7	47.7	**39.8**	**2**	**83%**
2005/04	Lamppost 5 adj 315 Newcastle Street, Middleport	385886	349757	47.3	51.5	53.5	35.4	33.8	41.6	44.6	41.5	50.4	47.8	55.2	53.2	**46.3**	**0**	**100%**
2005/07	Lamppost ST90 adj 513 Uttoxeter Road, Meir	392471	342631	51.2	53.0	44.5	34.0	31.6	38.5	38.1	39.2	49.3	46.8	54.1	58.5	**44.9**	**0**	**100%**

2005/08	Lamppost ST94 adj 571 Uttoxeter Road, Meir	392589	342576	49.2	52.5	44.8	33.8	36.0	46.2	36.8	40.0	49.4	46.6	54.8	58.5	**45.7**	**0**	**100%**
2005/11	Lamppost between 20 - 22 Victoria Place	389335	344693	50.1	45.0	44.3	38.5	34.9	45.2		40.4	48.5	48.4	57.4	59.5	**46.5**	**1**	**92%**
2005/13	Drainpipe Beauty Shop (525) Etruria Road, Basford	385974	346574	61.4	63.7	60.3	48.6	43.9	52.5	49.6	52.3	55.9	62.1	65.5	69.3	**57.1**	**0**	**100%**
2005/14	Lamppost adj 481 Etruria Road, Basford	386270	346782	77.2	79.4	80.7	62.6	63.7	90.2	88.6	77.9	85.6	91.4	95.0	82.9	**81.3**	**0**	**100%**
2005/15	Lamppost adj White House Hotel, Stone Road, Hanford	386630	342853	54.7	55.2	45.9	37.8	34.8	43.9	33.5	30.7	45.0	41.7	53.2	57.9	**44.5**	**0**	**100%**
2005/16	Lamppost 6 adj 401 Victoria Road	388791	346320	63.4	48.4	40.9	35.3	32.8	37.0	35.1	34.7	54.2	43.5	53.6	52.7	**44.3**	**0**	**100%**
2005/17	Lamppost 122 adj Village Tavern, Leek Road	388841	346641	52.0	53.9	41.0	36.7	34.6	40.4	34.9	34.8	44.5	41.6	53.5	50.7	**43.2**	**0**	**100%**
2005/19	Drainpipe 50 Dividy Road, Bucknall	389998	347181	52.6	49.4	46.2	37.8	33.1	40.2	36.7	36.5	45.6	43.3		51.0	**42.9**	**1**	**92%**

2005/20	Duke William, Newcastle Street, Burslem	386729	349749	46.7	49.3	43.8	32.1	33.0	38.0	35.6	35.4	45.6	46.4	55.5	51.9	**42.8**	**0**	**100%**
2005/22	17/19 Bucknall New Road, Hanley	388704	347607	54.3	52.3	41.6	36.4	40.0	48.2	29.3	45.3	46.1	45.7	57.9	60.8	**46.5**	**0**	**100%**
2005/23	64 Weston Road, Meir	393201	342409	51.6	55.7	47.6	49.6	47.1	56.6	40.6	47.9	50.2	50.0	61.2	58.6	**51.4**	**0**	**100%**
2005/28	Lamppost 4 adj 2 Scotia Road, Burslem	386848	350135	50.7	59.6	39.4	40.2	37.6		30.2	35.4	41.6	47.3	56.6	64.6	**45.7**	**1**	**92%**
2005/29	Lamppost 165 adj 72 Scotia Road / Wain St, Burslem	386787	350289	43.6	43.9	36.6	29.8	28.9		29.4	33.0	38.3	41.2		47.7	**37.2**	**2**	**83%**
2005/30	Lamppost 8 adj 88 Scotia Road / Barber St, Burslem	386766	350336	44.6	40.2	33.8	25.8	24.3	30.5	24.1	27.1	33.9	38.0	45.1	47.3	**34.6**	**0**	**100%**
2005/31	Lamppost 10 adj 104 Scotia Road, Burslem	386739	350393	38.0	41.4	32.0	26.9	26.9	33.3	23.6	26.1	33.8	39.0	42.8	50.2	**34.5**	**0**	**100%**
2005/33	Lamppost adj Fountain Court Pack Horse Lane / Westport Road, Burslem	386704	349789	48.2	45.3	33.7	14.9	23.7	26.6	23.1	22.4	28.6	40.2	40.3	43.0	**32.5**	**0**	**100%**

2005/34	Drainpipe Post Office Vaults, Burslem	386904	349828	48.4	41.8	50.4	40.3	37.5	42.7	38.8	40.5	46.0	49.0	50.9	53.0	**44.9**	**0**	**100%**
2005/36	Lamppost 7 adj 17 Moorland Road, Burslem	387015	349894	46.1	43.5	41.1		32.3	34.3	32.6	32.0	37.1	42.2	50.7	50.2	**40.2**	**1**	**92%**
2005/39	Lamppost 119 adj 421 Waterloo Road, Cobridge	387823	348317	54.6	46.1	38.1	32.9	33.9	41.3	32.5	35.7	40.6	46.5	59.3	58.9	**43.4**	**0**	**100%**
2005/41	Telegraph pole DP1161 adj 388/390 Leek Rd, Joiner's Square	388698	346421	50.8	55.0	48.7	35.5	37.9	46.6	37.6	36.1	47.1	52.8	55.6	57.0	**46.7**	**0**	**100%**
2005/44	Lamppost 48 adj 192 Manor Street, Fenton	389153	345234	49.3	51.7	38.8	32.1	30.9	39.5	31.5	35.3	38.3	43.7	51.9	57.7	**41.7**	**0**	**100%**
2005/45	Lamppost 56 adj 101/103 Victoria Road, Fenton	389228	345035	47.5	71.5	54.7				47.9	51.9	40.0	65.4		71.5	**56.3**	**4**	**67%**
2005/47	Telegraph pole DP996 Adj 7 Victoria Place	389409	344619	54.8	55.0	40.4	30.9	32.2		37.7	73.7	48.2	49.6	48.5	59.6	**48.2**	**1**	**92%**
2005/48	Lamppost ST121 adj 675 Uttoxeter Road, Meir	392837	342428	49.1	40.4	41.7	32.9	36.4	43.3	42.1	44.3	45.8	47.5	53.9	54.4	**44.3**	**0**	**100%**

2005/50	Lamppost 10, adj Wrights pie shop, Weston Rd, Meir	393260	342460	53.1	62.6	51.1	41.1	46.2	54.4	40.7	43.9	53.8	57.0	63.8	62.5	**52.5**	**0**	**100%**
2005/51	Lamppost 3 adj Harveys travel agent, Meir	393151	342331	44.7	46.8	40.0	33.5		29.3	29.2	34.8	37.1	41.6	50.1	52.0	**39.9**	**1**	**92%**
2005/54	Lamppost 16R04 adj Pizza Hut, Meir	393122	342248	50.3	49.6	48.7	36.0	39.4	49.0	38.3	38.3	50.5	46.6	51.8	54.3	**46.1**	**0**	**100%**
2005/56	Telegraph pole 249 adj Kenilworth Grove. Meir	392777	342409	57.0	65.9	49.3	39.7	42.2	43.9	30.2	32.0	44.4	44.5	54.9	58.4	**46.9**	**0**	**100%**
2005/57	Telegraph pole 2512 adj Warwick Ave, Meir	392741	342435	55.8	64.5	43.9	36.6	36.5	45.2				26.7	53.0	53.6	**46.2**	**3**	**75%**
2005/58	Lamppost ST14 Meir Rd / Grosvenor Rd, Meir	392670	342481	53.1	45.0		37.0	36.7	47.2	25.8	32.5	34.3	31.4	53.6	56.7	**41.2**	**1**	**92%**
2005/59	Lamppost 26 adj Royal British Legion, Meir	392611	342521	57.1	53.3	48.3		39.0	49.2	31.6	35.5	41.4	37.9	60.4	63.7	**47.0**	**1**	**92%**
2005/62	Dainpipe 60 / 62 Bucknall New Road, Hanley	388704	347587	40.6	37.5	36.2	27.3	25.4		29.2	29.3	36.3	38.9	42.9	44.0	**35.3**	**1**	**92%**

2008/02	Co-location with Copeland St Monitor	387873	345445	48.3	51.5		33.7	32.8	41.9	30.9	37.2	39.6	42.7	53.6	53.8	**43.0**	**1**	**97%**
2008/03	Co-location with Copeland St Monitor	387873	345445	46.7	51.7	42.8	33.4	34.1	42.2	32.8	37.1	38.8	44.2	58.4	63.3			
2008/04	Co-location with Copeland St Monitor	387873	345445	49.1	52.4	41.4	36.6	32.2	43.2	31.2	37.2	39.5	41.1	55.2	55.0			
2008/05	Co-location with Middleport Monitor	385780	349673	45.4	51.3	35.8	28.0	32.9	33.4	32.7	32.4	34.9	42.2	50.7	52.3	**39.4**	**0**	**100%**
2008/06	Co-location with Middleport Monitor	385780	349673	44.4	50.2	34.4	30.0	31.6	34.8	30.7	33.9	34.5	42.6	52.1	55.1			
2008/07	Co-location with Middleport Monitor	385780	349673	46.6	48.2	37.7	29.3	30.0	37.1	31.5	34.6	35.1	39.3	52.4	48.7			
2008/08	Drainpipe, 44 The Strand, Longton	390893	343404	42.7	41.7	34.2	30.9	26.5	28.4	28.0	32.2	33.0	36.0	47.5	49.8	**35.9**	**0**	**100%**
2008/09	Lamppost 29 Lichfield St (by Hansons)	388662	346707	56.0	52.1	49.3	35.5	36.4			32.2	42.7	49.0	57.5	61.8	**47.3**	**2**	**83%**

2008/10	Lamppost 25 Lichfield St (by Bridgewater factory)	388632	346850	53.2	59.5	39.4	36.3	37.4	44.0	30.3	34.5	42.2	45.0	59.3	66.3	**45.6**	**0**	**100%**
2008/11	Lamppost 23 Lichfield St (by Bridgewater factory)	388624	346903	48.9	52.4	41.0	35.6		38.8	29.3	31.0	38.5	39.1	50.7	57.8	**42.1**	**1**	**92%**
2008/12	Lamppost 17 Lichfiled St (by RNIB)	388538	347100	56.1	51.1	49.0	43.3	41.5	47.9	46.6	47.3	50.0	49.5		70.4	**50.2**	**1**	**92%**
2008/13	Lamppost 16 Lichfirled St/Drby St	388536	347143	47.3	49.2	37.7	30.0	31.5	37.9	41.1	41.9	44.5	48.6	56.3	61.9	**44.0**	**0**	**100%**
2009/01	Drainpipe 58 Westport Road, Burslem	386493	350020	33.7	32.2		21.5	19.4	18.9	16.6	17.5	20.1	26.2	36.2	39.5	**25.6**	**1**	**92%**
2009/02	Lamppost adj Hallam Court, Greenhead Street, Burslem	386621	349931	37.5	34.9	28.0	19.9	18.8	22.6	18.3	19.8	23.2	29.7	39.0	41.1	**27.7**	**0**	**100%**
2009/04	Lamppost 3 adj 445 Etruria Road, Basford	386380	346859	48.7	57.1	44.0	33.7	36.0	42.3	30.6	38.3	38.9	56.0	51.8	48.5	**43.8**	**0**	**100%**
2009/05	Lamppost 11 adj 569 Etruria Road, Basford	385811	346545	61.4	62.9	58.8	38.0	40.8	53.0	45.6	49.4	57.0	30.1	68.9	72.3	**53.2**	**0**	**100%**

2010/01	College Road	387938	345939	47.3	51.6	41.4	35.0	32.0		34.6	36.8	40.5	46.5	52.0	56.4	**43.1**	**1**	**92%**
2010/02	Pall Mall drainpipe Majestic Building	388135	347495		50.0	41.6	30.3	27.9	33.7	29.8	31.8	36.2	31.6	49.6	54.0	**37.9**	**1**	**92%**
2010/03	Marsh Street South drainpipe Majestic Building	388128	347487		44.1	41.0	30.5	27.0	31.6	24.6	24.7	33.4	40.4	43.9	45.2	**35.1**	**1**	**92%**

PM Monitoring Adjustment

The Volatile Correction Model (VCM) for TEOM PM_{10} data for the Clarice Cliff and Middleport sites are shown in Table A.7 and A.8 respectively.

Table A.7Clarice Cliff VCM Summary

Summary	Text	Value
Site Name	Fenton	
Organisation	Stoke-on-Trent	
Start Date	01/01/2010	
End Date	01/01/2011	
TEOM data already corrected with 1.3 factor	No	
EPA Constant A		3
EPA Constant B		1.03
Instrument Temperature		25
Instrument Pressure		1013
Instrument reports to local ambient readings	No	
Timescale	Hourly	
Pressure Site	Local	
Pressure Site Warning		
Temperature Site	Local	
Temperature Site Warning		
FDMS Site 1	Stoke-on-Trent Centre (SR0)	
FDMS Site 1 Warning	FDMS1 Correction includes unratified data.	
FDMS Site 2	Birmingham Tyburn Roadside - AURN (HX9)	
FDMS Site 2 Warning	FDMS2 Correction includes unratified data.	
FDMS Site 3	Average of remaining sites within range	
FDMS Site 3 Warning	FDMS3 Correction includes unratified data.	

Table A.8Middleport VCM Summary

Summary	Text	Value
Site Name	Middleport	
Organisation	Stoke-on-Trent City Council	
Start Date	01/01/2010	
End Date	01/01/2011	
TEOM data already corrected with 1.3 factor	No	
EPA Constant A		3
EPA Constant B		1.03
Instrument Temperature		25
Instrument Pressure		1013
Instrument reports to local ambient readings	No	
Timescale	Hourly	
Pressure Site	Local	
Pressure Site Warning		

Temperature Site	Local	
Temperature Site Warning		
FDMS Site 1	Stoke-on-Trent Centre (SR0)	
FDMS Site 1 Warning	FDMS1 Correction includes unratified data.	
FDMS Site 2	Salford Eccles - AURN (SS0)	
FDMS Site 2 Warning	FDMS2 Correction includes unratified data.	
FDMS Site 3	Average of remaining sites within range	
FDMS Site 3 Warning	FDMS3 Correction includes unratified data.	

QA/QC of automatic monitoring

Short-term to Long-term Data adjustment

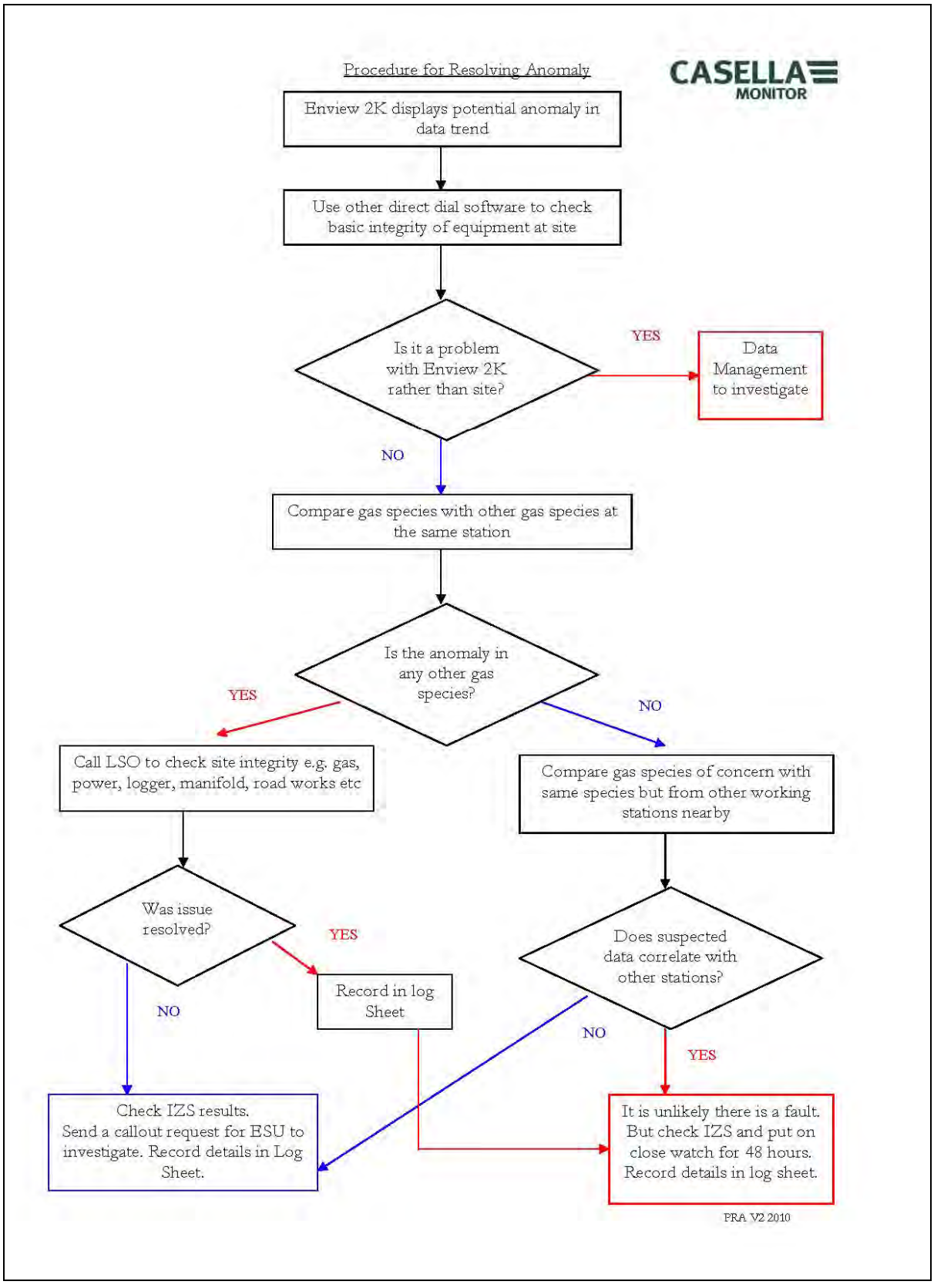
The short-term to long-term calculation for NO_2 at the Scrivener monitor is shown in Table A.8

Table A.8 Short-term to long-term calculation

Site	Site Type	Annual Mean	Period Mean	Ratio
Aston Hill	Rural background	6.078	5.957	1.020
Chesterfield	Urban background	19.501	19.993	0.975
Glasebury	Rural Background	19.355	16.524	1.171
Ladybower	Rural background	9.88	10.837	0.912
			Average	1.020

Data management for automatic sites has been carried out by Casella. Their QA/QC procedure is included Figure A.1.

Figure A.1 Casella Data Management Procedure



Rescaling NOx data using Enview 2000.

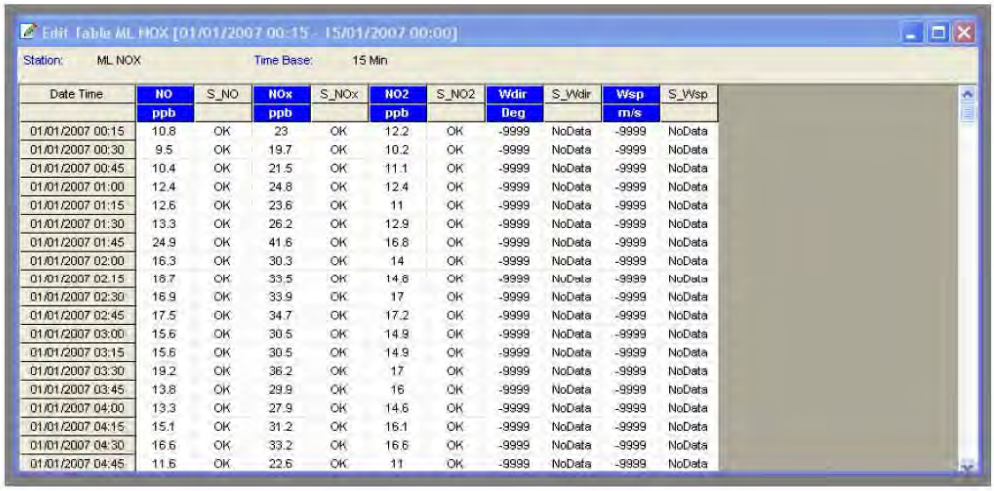
1. **Identify database structure.**

Prior to being able to rescale the data the database structure must be understood to enable a simple calculation of NO_2 from NOx – NO = NO_2.

Select **Edit**, **Edit Table** from the menu at the top of the Enview screen.

If you are prompted for a Username/Password then simply select OK. The following screen appears:

Select the Station for which you are rescaling the NOx data and any time period that contains data. Select OK. The following screen (or similar) appears:



Edit Table ML NOX [01/01/2007 00:15 - 15/01/2007 00:00]

Station: ML NOX Time Base: 15 Min

Date Time	NO	S_NO	NOx	S_NOx	NO2	S_NO2	Wdir	S_Wdir	Wsp	S_Wsp
	ppb		ppb		ppb		Deg		m/s	
01/01/2007 00:15	10.8	OK	23	OK	12.2	OK	-9999	NoData	-9999	NoData
01/01/2007 00:30	9.5	OK	19.7	OK	10.2	OK	-9999	NoData	-9999	NoData
01/01/2007 00:45	10.4	OK	21.5	OK	11.1	OK	-9999	NoData	-9999	NoData
01/01/2007 01:00	12.4	OK	24.8	OK	12.4	OK	-9999	NoData	-9999	NoData
01/01/2007 01:15	12.6	OK	23.6	OK	11	OK	-9999	NoData	-9999	NoData
01/01/2007 01:30	13.3	OK	26.2	OK	12.9	OK	-9999	NoData	-9999	NoData
01/01/2007 01:45	24.9	OK	41.6	OK	16.8	OK	-9999	NoData	-9999	NoData
01/01/2007 02:00	16.3	OK	30.3	OK	14	OK	-9999	NoData	-9999	NoData
01/01/2007 02:15	16.7	OK	33.5	OK	14.8	OK	-9999	NoData	-9999	NoData
01/01/2007 02:30	16.9	OK	33.9	OK	17	OK	-9999	NoData	-9999	NoData
01/01/2007 02:45	17.5	OK	34.7	OK	17.2	OK	-9999	NoData	-9999	NoData
01/01/2007 03:00	15.6	OK	30.5	OK	14.9	OK	-9999	NoData	-9999	NoData
01/01/2007 03:15	15.6	OK	30.5	OK	14.9	OK	-9999	NoData	-9999	NoData
01/01/2007 03:30	19.2	OK	36.2	OK	17	OK	-9999	NoData	-9999	NoData
01/01/2007 03:45	13.8	OK	29.9	OK	16	OK	-9999	NoData	-9999	NoData
01/01/2007 04:00	13.3	OK	27.9	OK	14.6	OK	-9999	NoData	-9999	NoData
01/01/2007 04:15	15.1	OK	31.2	OK	16.1	OK	-9999	NoData	-9999	NoData
01/01/2007 04:30	16.6	OK	33.2	OK	16.6	OK	-9999	NoData	-9999	NoData
01/01/2007 04:45	11.6	OK	22.6	OK	11	OK	-9999	NoData	-9999	NoData

Note the column order for the NO and NOx components, in this case the columns are:

NO – column 1 (identified as column M01 by Enview)
NOx – column 2 (identified as column M02 by Enview)

Please note that the Status columns S_NO and S_NOx can be considered as being the same column as the numerical NO and NOx columns.

Once you have noted the column numbers this procedure will not need to be repeated for this monitoring station as the column identities do not change. The column identity may differ for different monitoring stations and should be checked and noted using the above procedure.

Close the window down in the usual manner and select **Yes** when prompted to **Run Calc.Avg** (No can also be selected as operations have not yet taken place on the data).

CASELLA MONITOR

2. Rescaling NO values

To rescale the NOx, NO and NO_2 data it is assumed that fortnightly calibration checks have been performed at the relevant air quality monitoring station and the following data is known:

- Date of calibration check
- Cylinder calibration gas **actual** concentration (normally in ppb), the nominal value can be ignored for this procedure.
- NOx and NO values noted following the span calibration check.
- Zero offset values noted following the NOx and NO calibration checks.

Select **Edit**, **Edit Block** from the menu at the top of the Enview screen.

If you are prompted for a Username/Password then simply select OK. The following screen appears:

Select/input the following parameters:

- Station
- Check the **NO** monitor only
- Ensure timebase is set to **15 Min**.
- Choose the **start** and **stop** dates and times that correspond to the period you are rescaling the data for
- Check the **Calc Value**, button – this is where the rescaling values are input.
- The **a** value is calculated using the following:

$$a = \frac{\text{actual NO cylinder concentration}}{\text{NO value noted during span check- measured zero offset}}$$

- The **b** value is the ppb value required to return the analyser to zero e.g. if the zero offset was noted to be -5 ppb at the analyser (following a calibration / zero check) then the b value entered should be +5.
- The Enview software insists that a description is entered prior to any rescaling being performed, anything can be entered here however it is good practise to make a note of the **a** and **b** values entered, see above.
- Select **OK**, and select **Yes** when prompted to **Run Calc.Avg**
- The NO data has now been rescaled.

Worked example:

In this example, the actual NO cylinder concentration taken from the certificate on the NO cylinder is 451 ppb. The NO reading noted following the on-site calibration check was 454ppb. The zero offset noted at the analyser following the NO calibration checks was 3ppb.

Therefore **a = 451/(454-(-3)) = 451/457= 0.9869**
b = -3

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3. **Rescaling NOx values**

Repeat the above procedure for rescaling the NOx data but substituting the relevant values obtained from the calibration checks obtained at the monitoring site.

Worked example:

In this example, the actual NO cylinder concentration taken from the certificate on the NO cylinder is 451 ppb (the same as the previous example as the same NO cylinder is used to perform the NOx calibration check). The NOx reading noted following the on-site calibration check was 455ppb. The zero offset noted at the analyser following the NO calibration checks was 2ppb.

Therefore **a = 451/(455-2) = 0.9956**

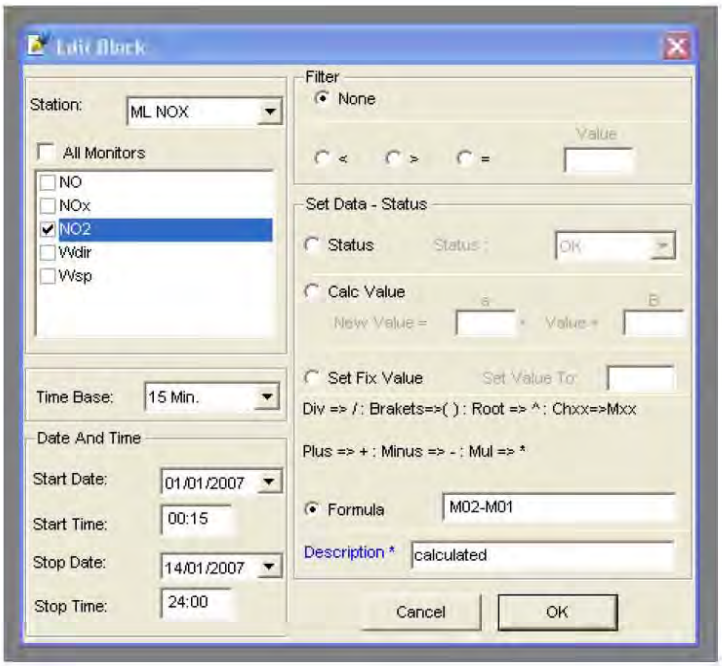
b = -2

4. **Rescaling NO_2 values**

Select **Edit**, **Edit Block** from the menu at the top of the Enview screen.

In this procedure you will instruct Enview to perform the following calculation: NOx – NO. This results in a calculated value of NO_2 which is based on the newly rescaled NOx and NO values.

If you are prompted for a Username/Password then simply select OK. The following screen appears:



Select/input the following parameters:

- Station
- Check the **NO2** monitor only
- Ensure timebase is set to **15 Min**.
- Choose the **start** and **stop** dates and times that correspond to the period you are rescaling the data for

- Check the **Formula**, button – this is where the column identities are input.
- Type the following code into the Formula box:

  M02-M01

  Please note that "**0**" is a zero and the "**2**" and "**1**" correspond to the column identities found in Section 1. These column identities may differ from your set-up. To confirm; M02-M01 is equivalent to NOx- NO.

- The Enview software insists that a description is entered prior to any calculation being performed, anything can be entered here.
- Select **OK**, and select **Yes** when prompted to **Run Calc.Avg**
- The NO_2 data has now been recalculated using the rescaled NOx and NO values previously entered into the system.

Appendix B Diffusion tube locations

Figure B2.1 Map of Non-Automatic Monitoring Sites

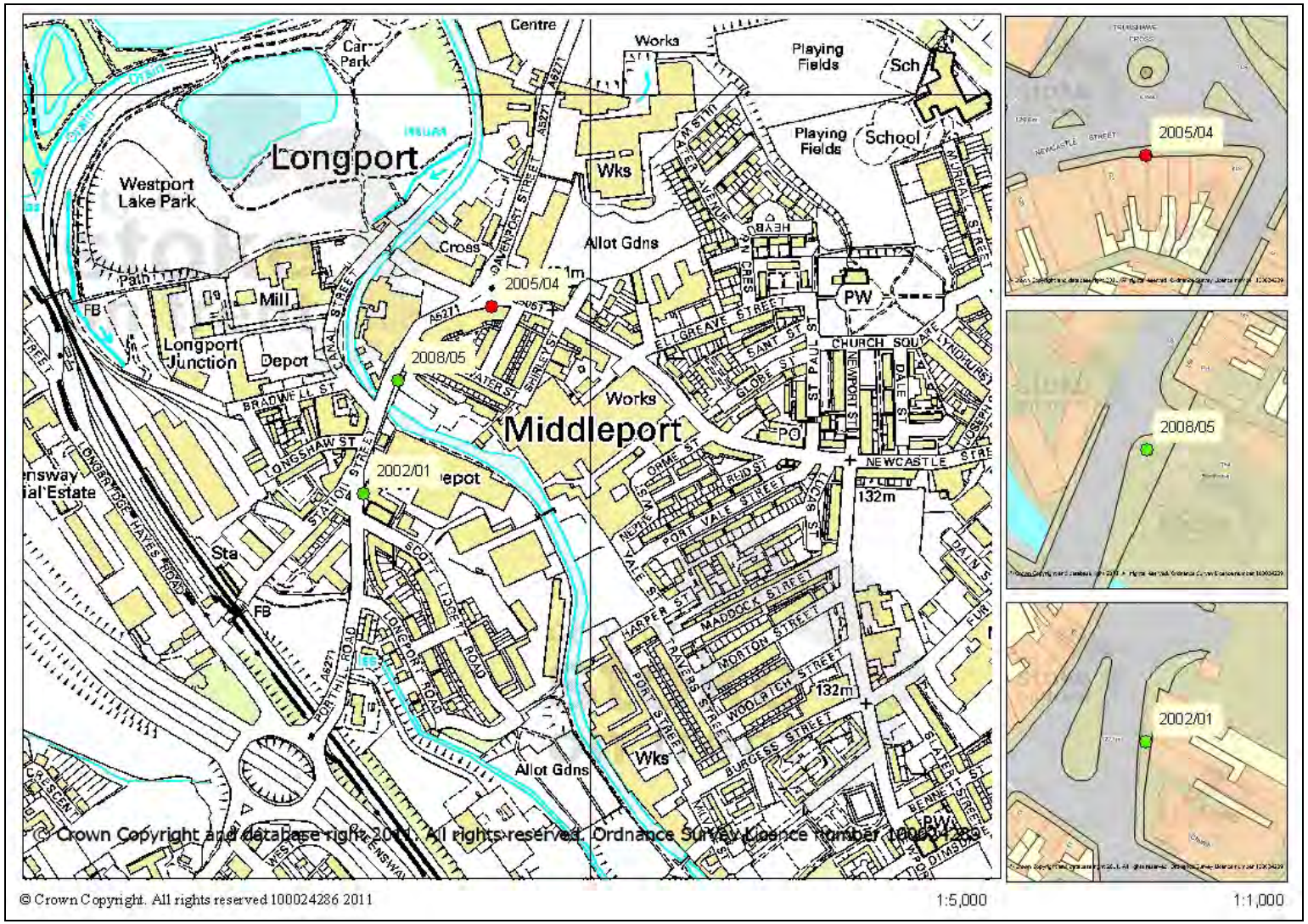


Figure B2.2 Map of Non-Automatic Monitoring Sites

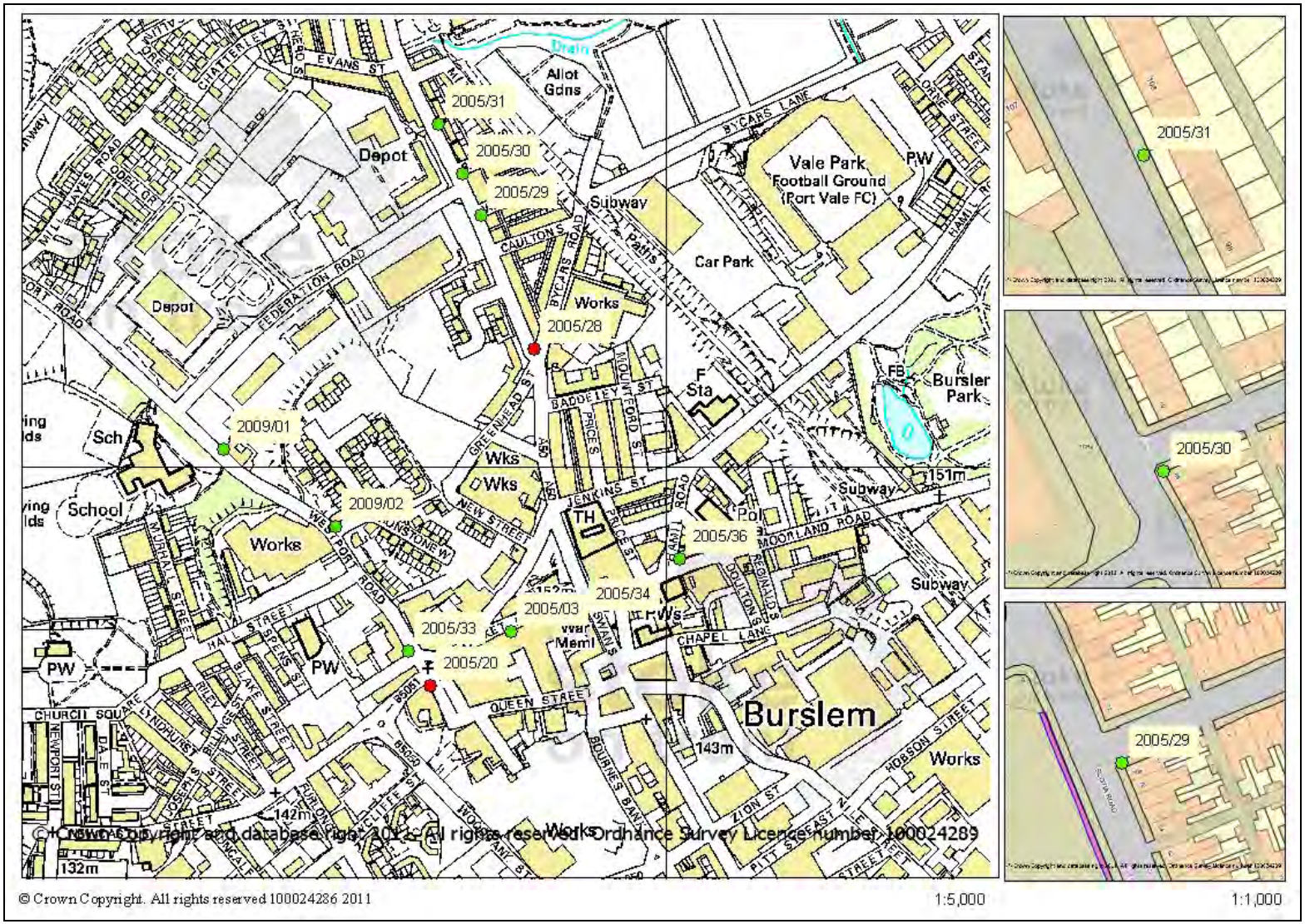


Figure B2.3 Map of Non-Automatic Monitoring Sites

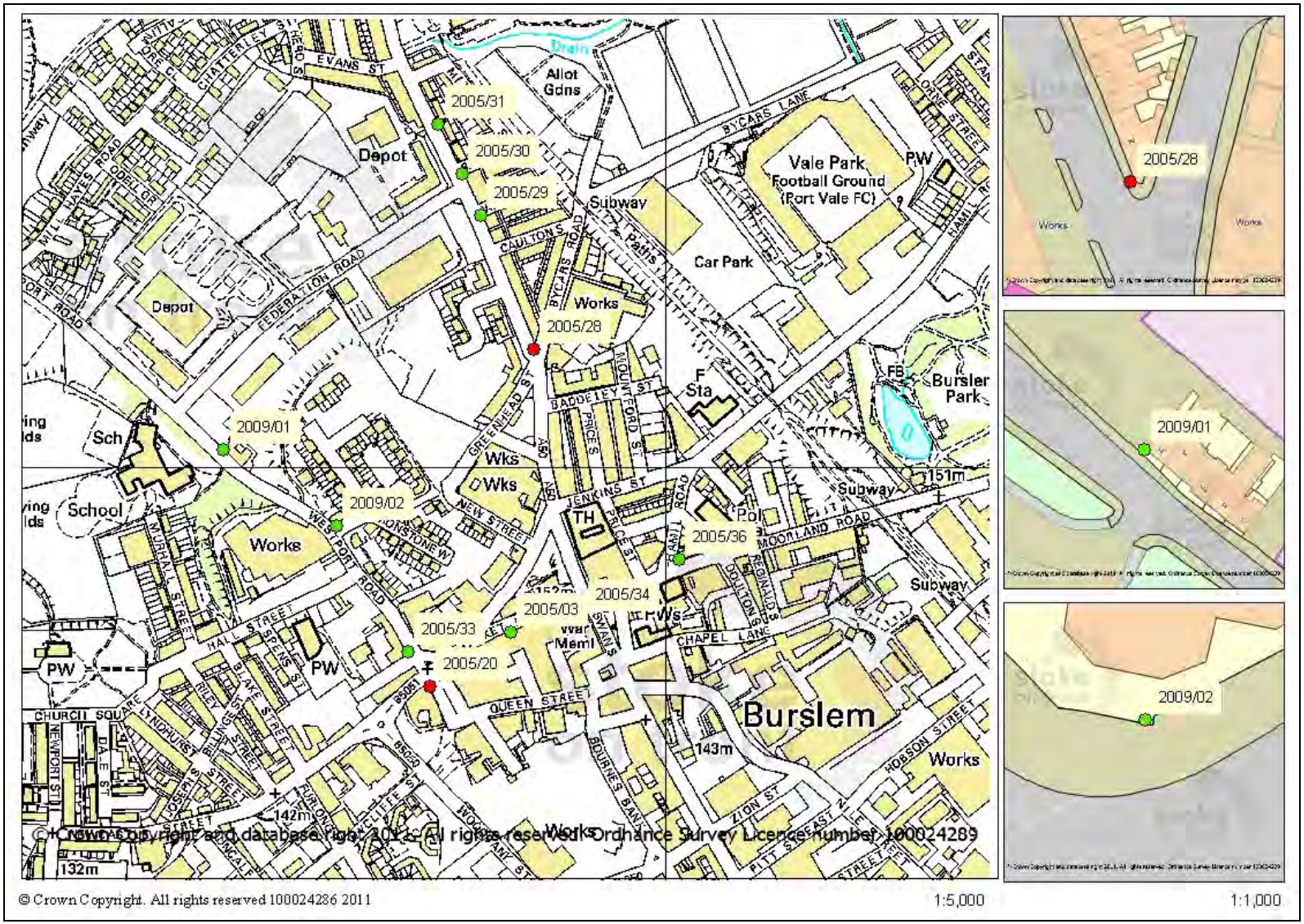


Figure B2.4 Map of Non-Automatic Monitoring Sites

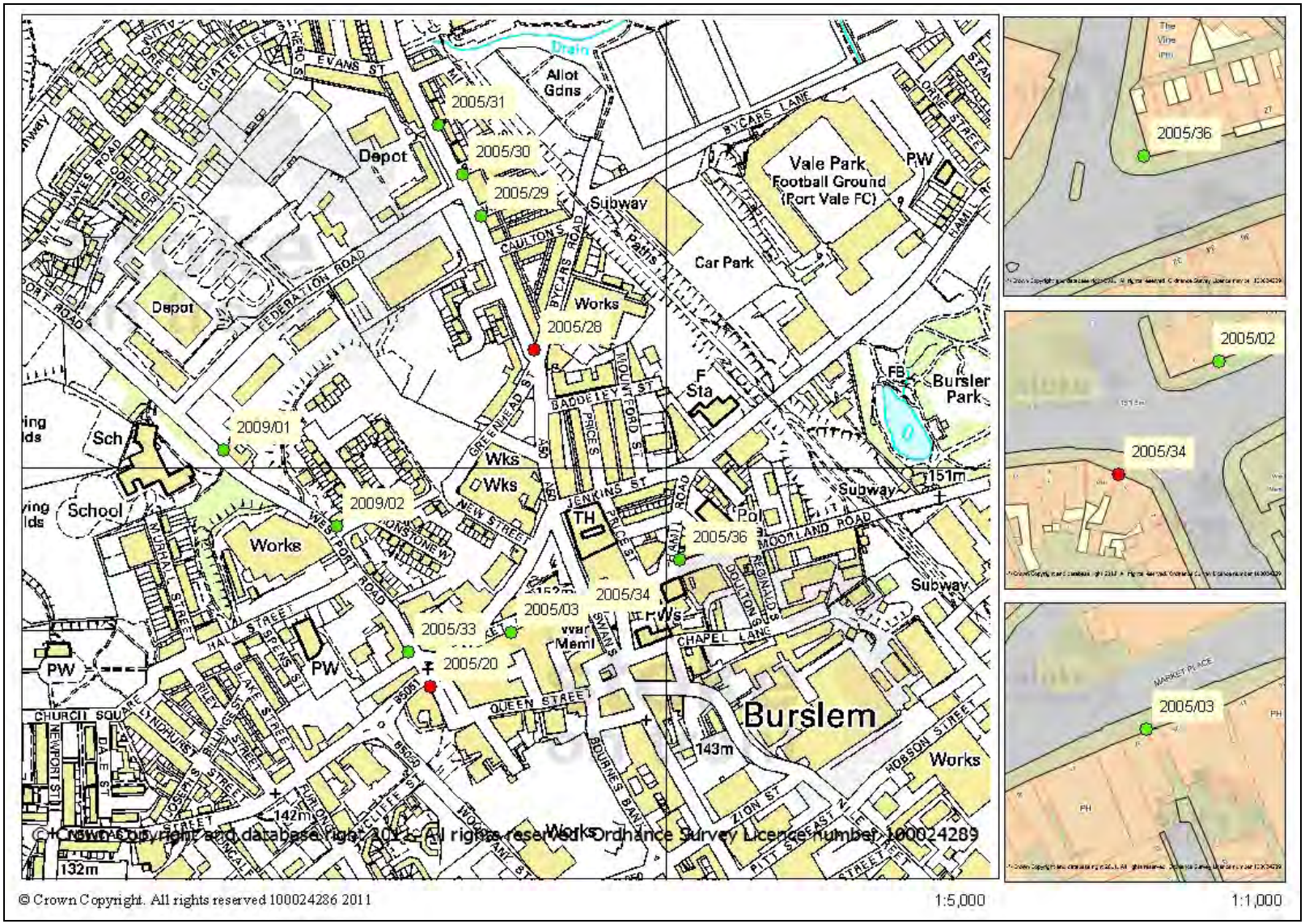


Figure B2.5 Map of Non-Automatic Monitoring Sites

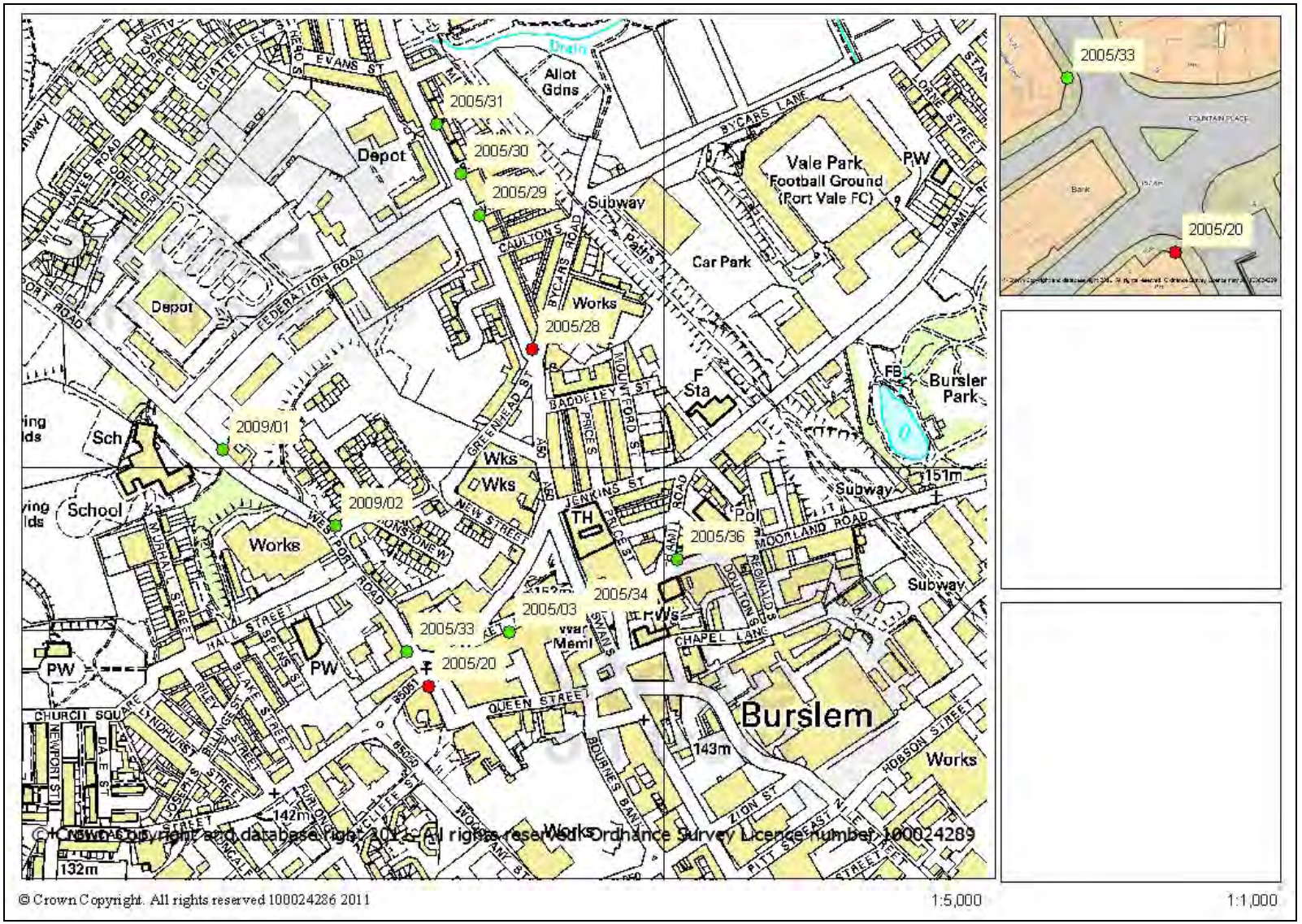


Figure B2.6 Map of Non-Automatic Monitoring Sites

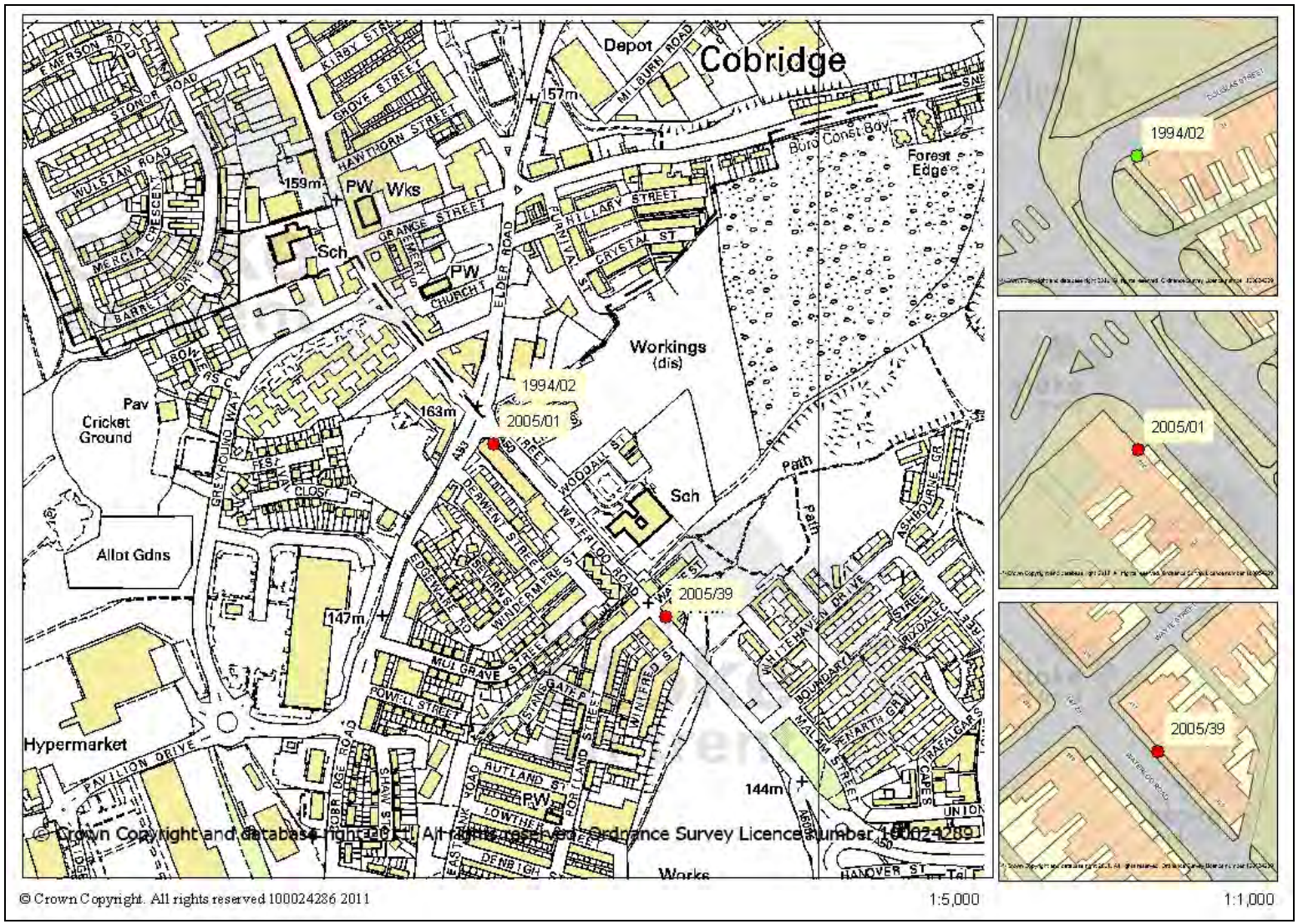


Figure B2.7 Map of Non-Automatic Monitoring Sites

Figure B2.8 Map of Non-Automatic Monitoring Sites

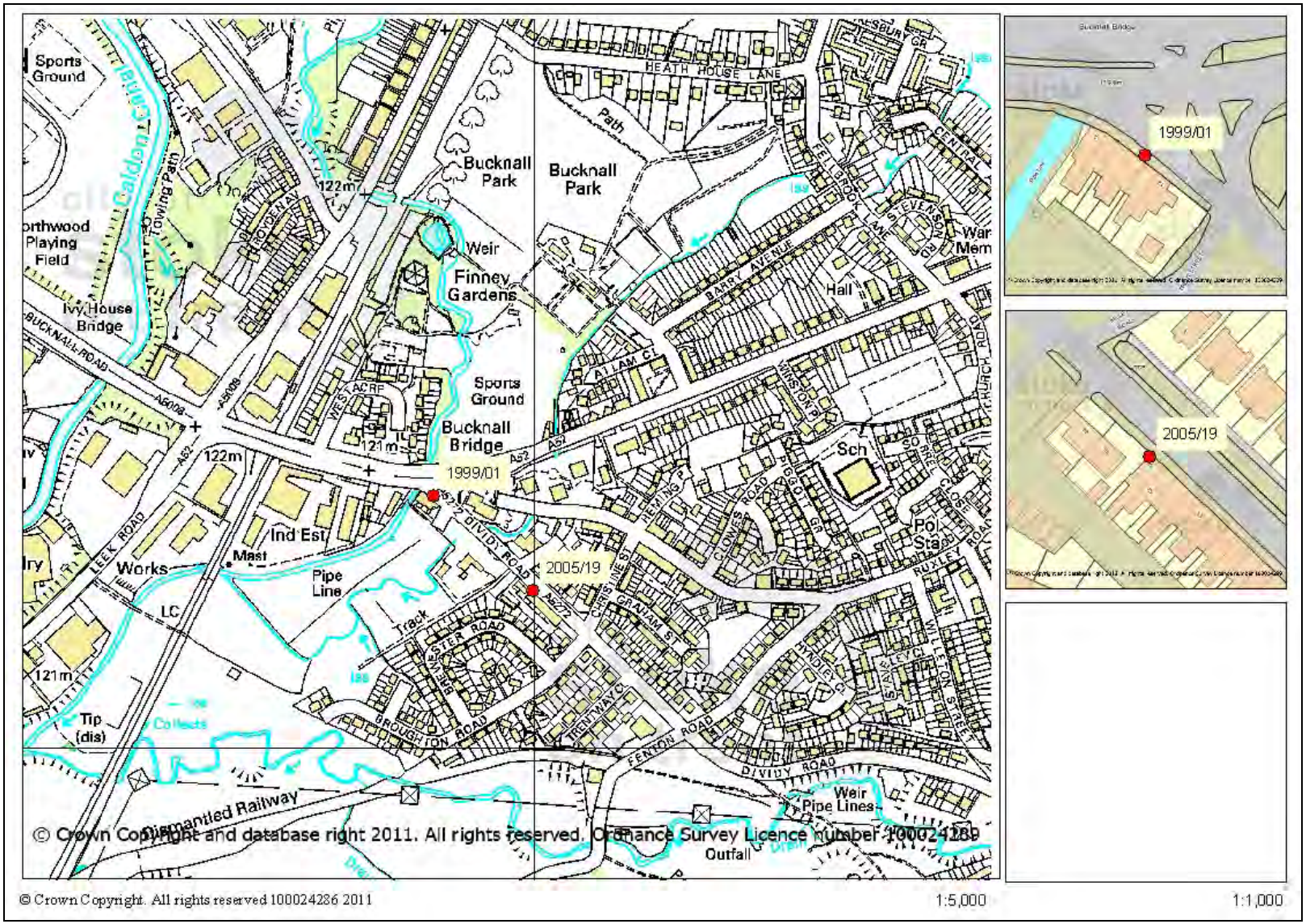


Figure B2.9 Map of Non-Automatic Monitoring Sites

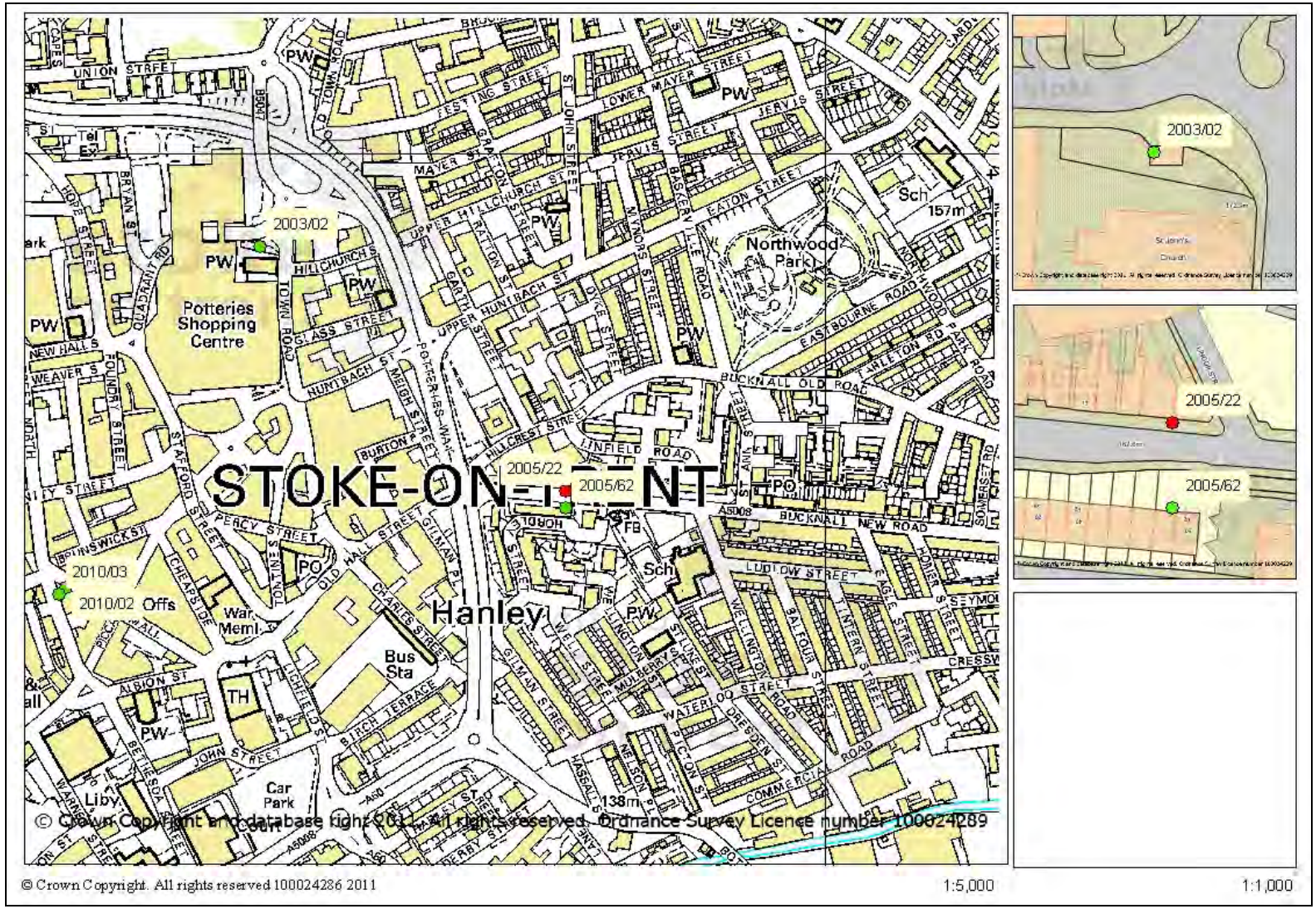


Figure B2.10 Map of Non-Automatic Monitoring Sites

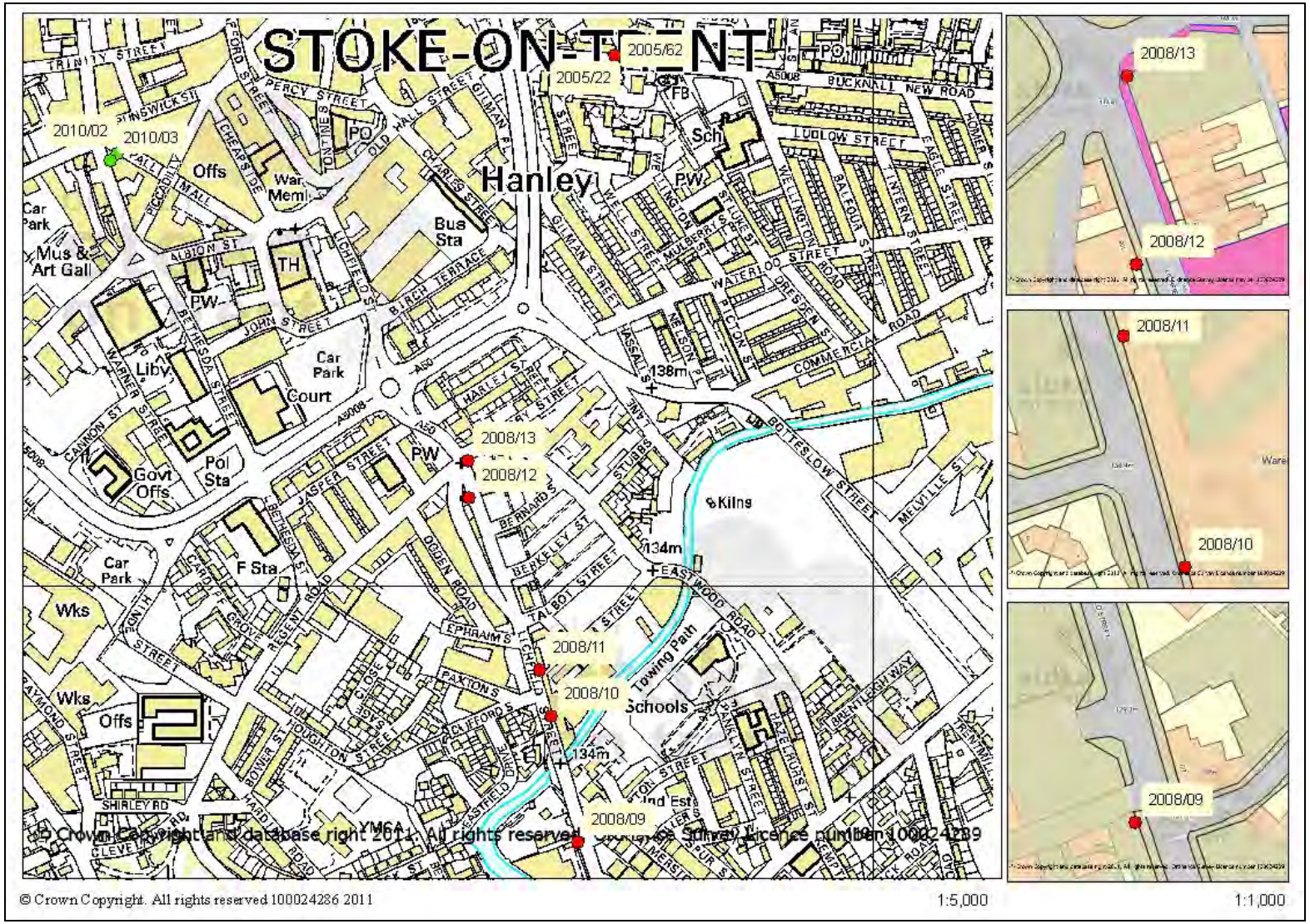


Figure B2.11 Map of Non-Automatic Monitoring Sites

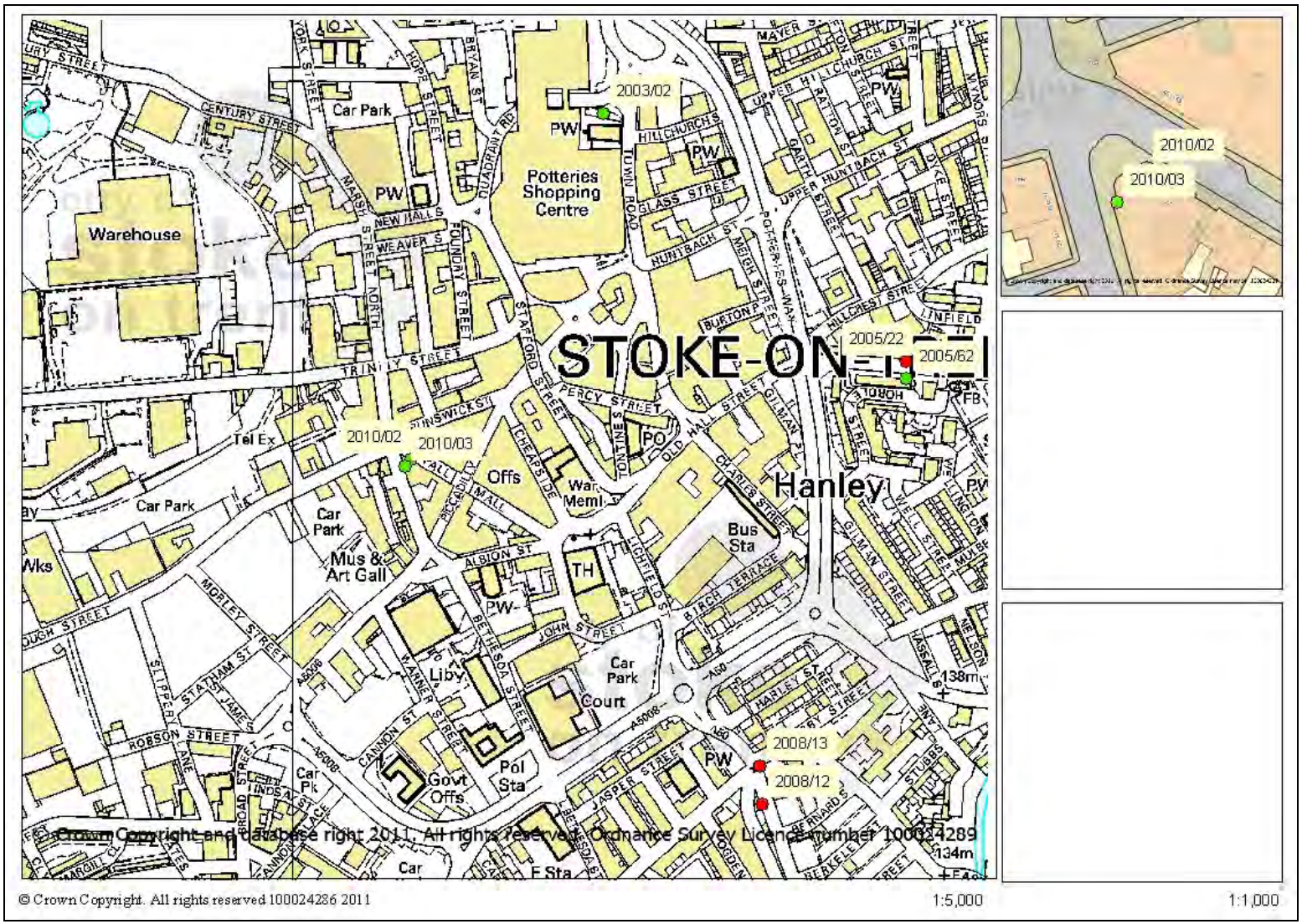


Figure B2.12 Map of Non-Automatic Monitoring Sites

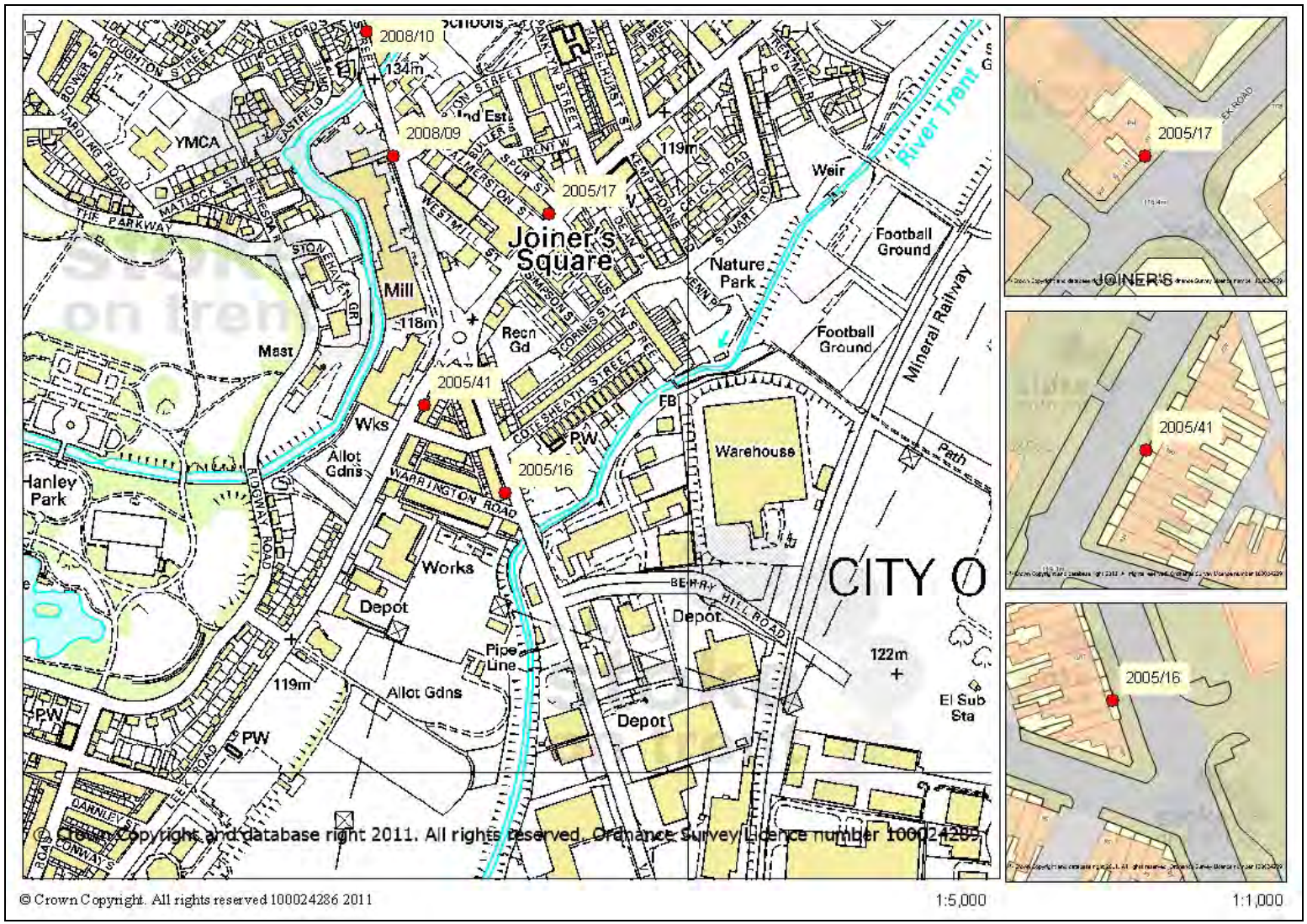


Figure B2.13 Map of Non-Automatic Monitoring Sites

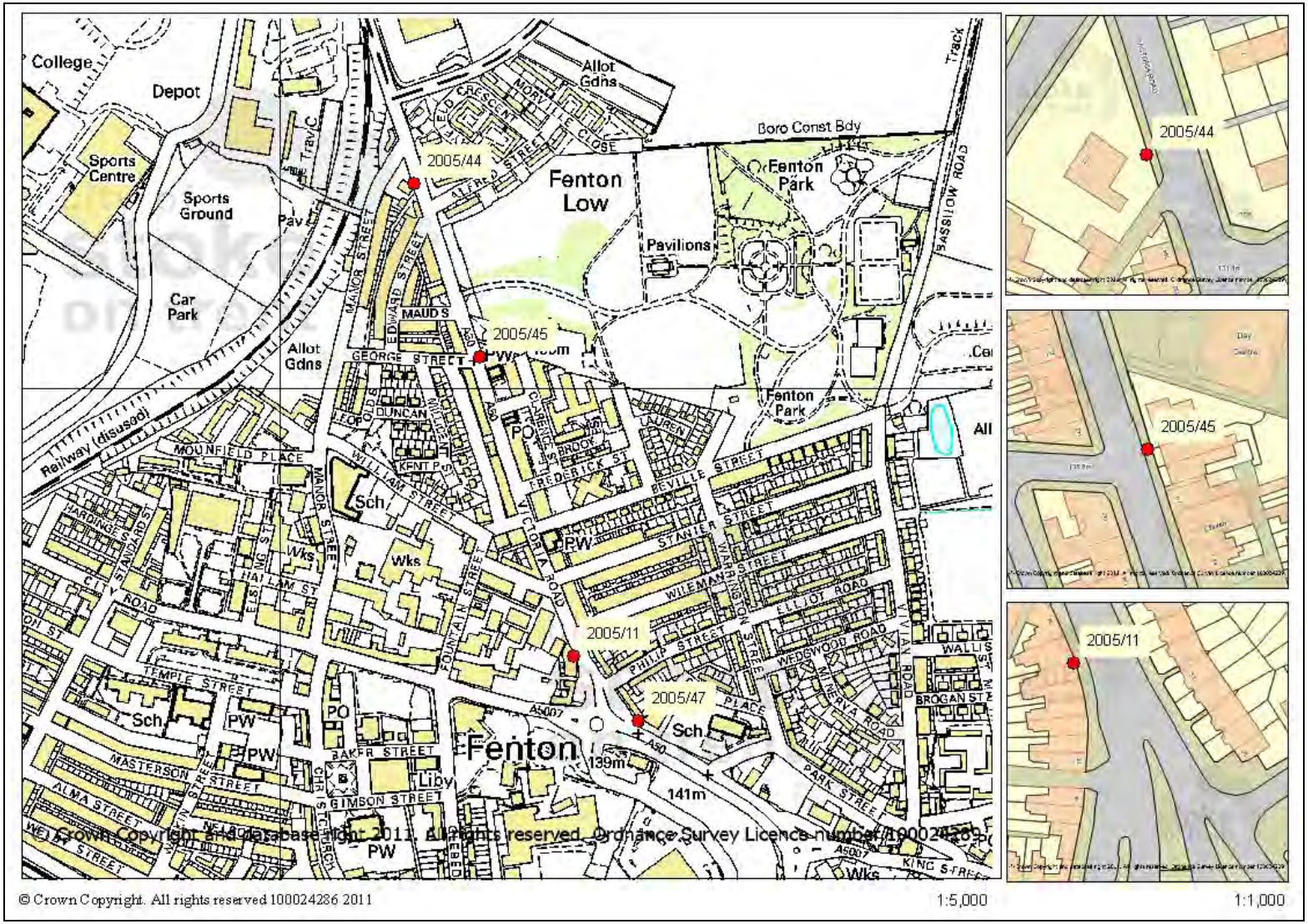


Figure B2.14 Map of Non-Automatic Monitoring Sites

Figure B2.15 Map of Non-Automatic Monitoring Sites

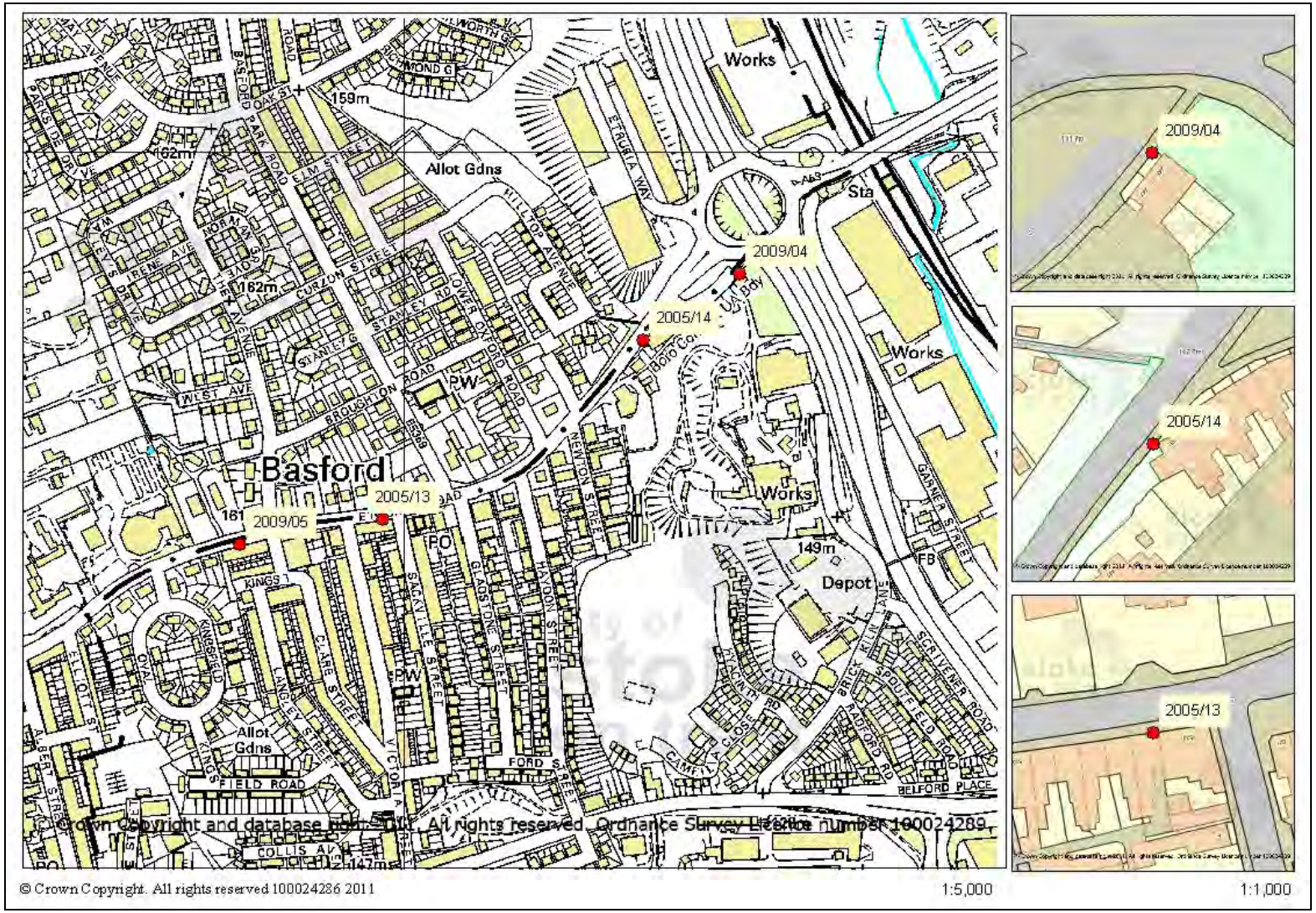


Figure B2.16 Map of Non-Automatic Monitoring Sites

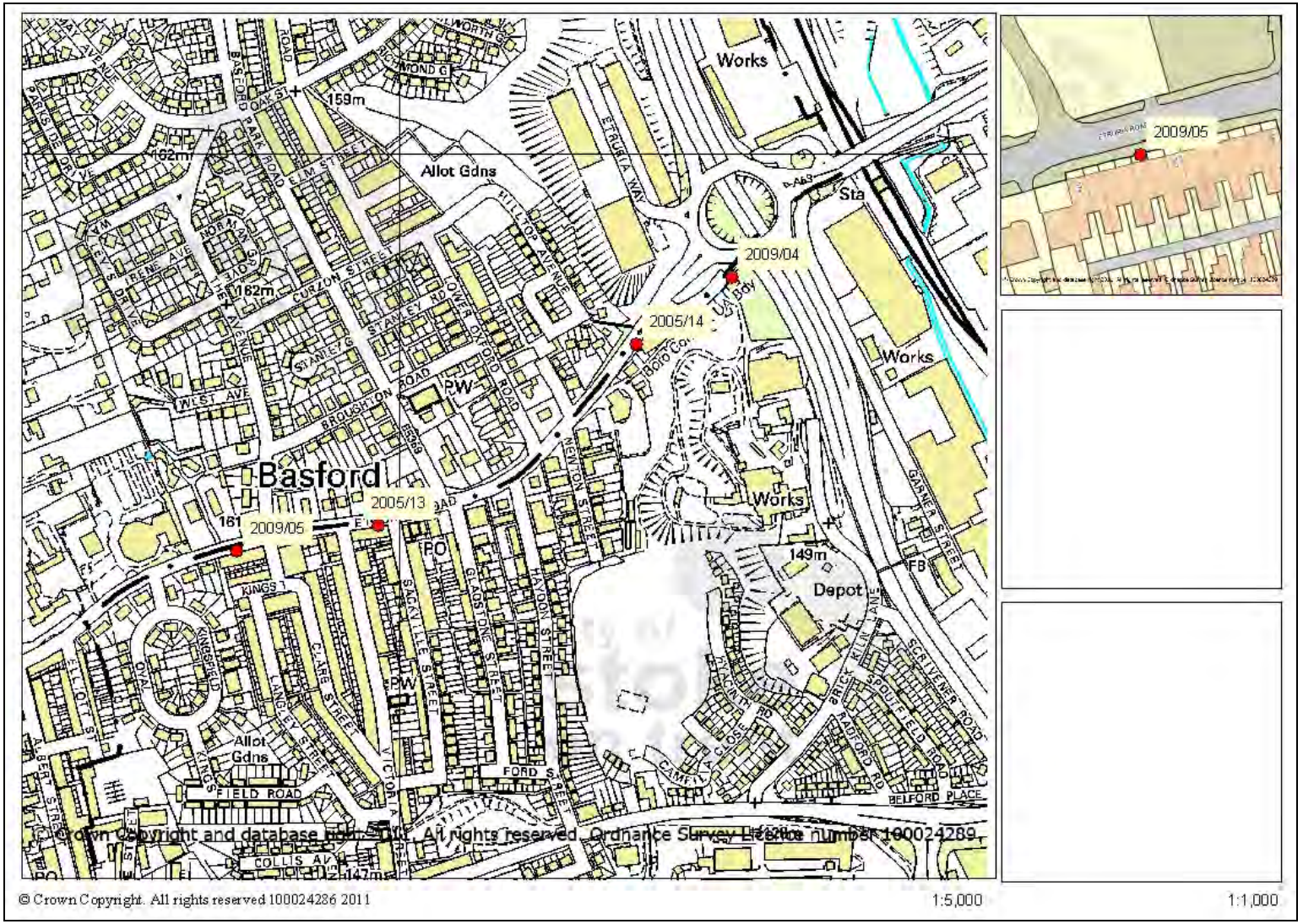


Figure B2.17 Map of Non-Automatic Monitoring Sites

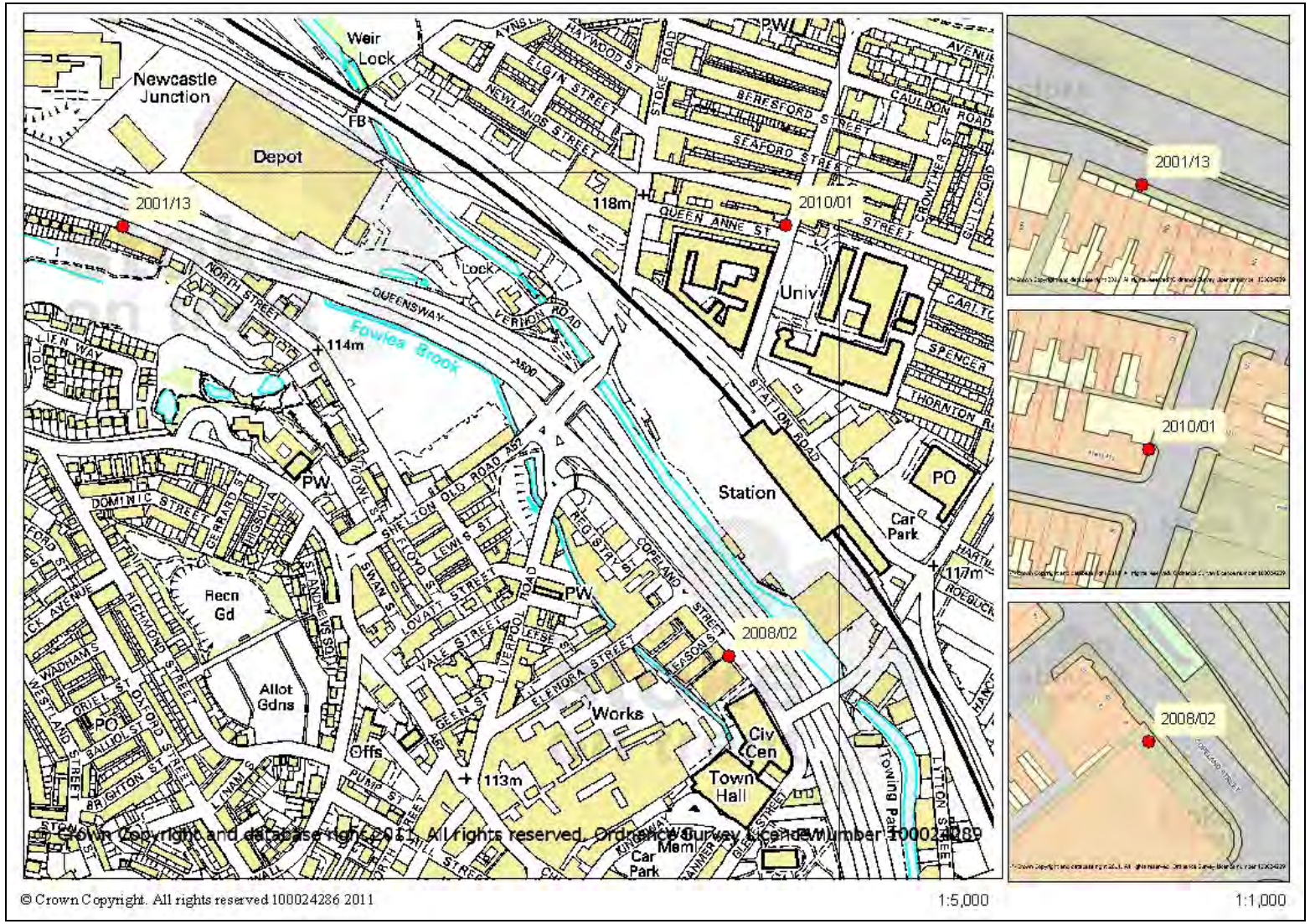


Figure B2.18 Map of Non-Automatic Monitoring Sites

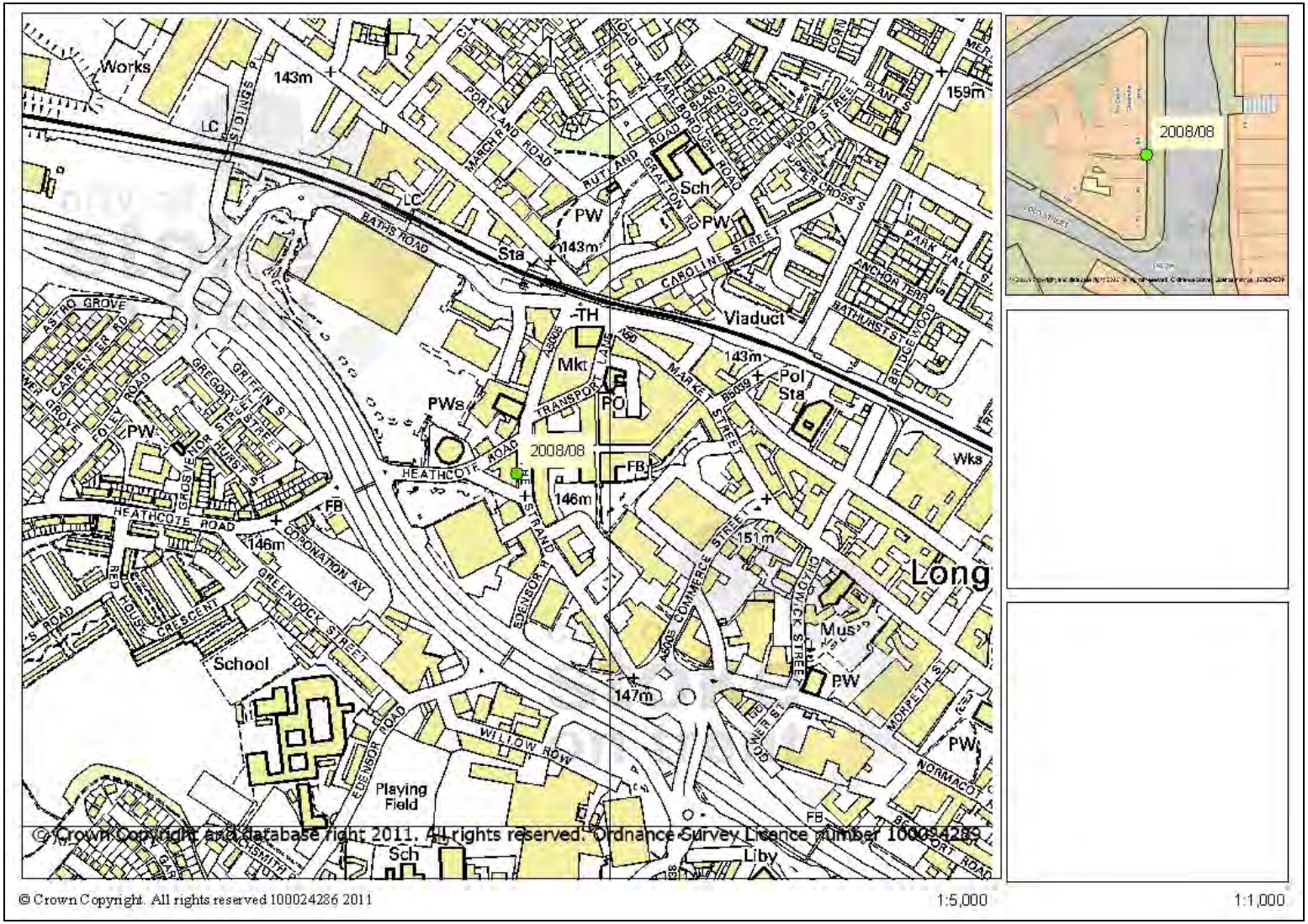


Figure B2.19 Map of Non-Automatic Monitoring Sites

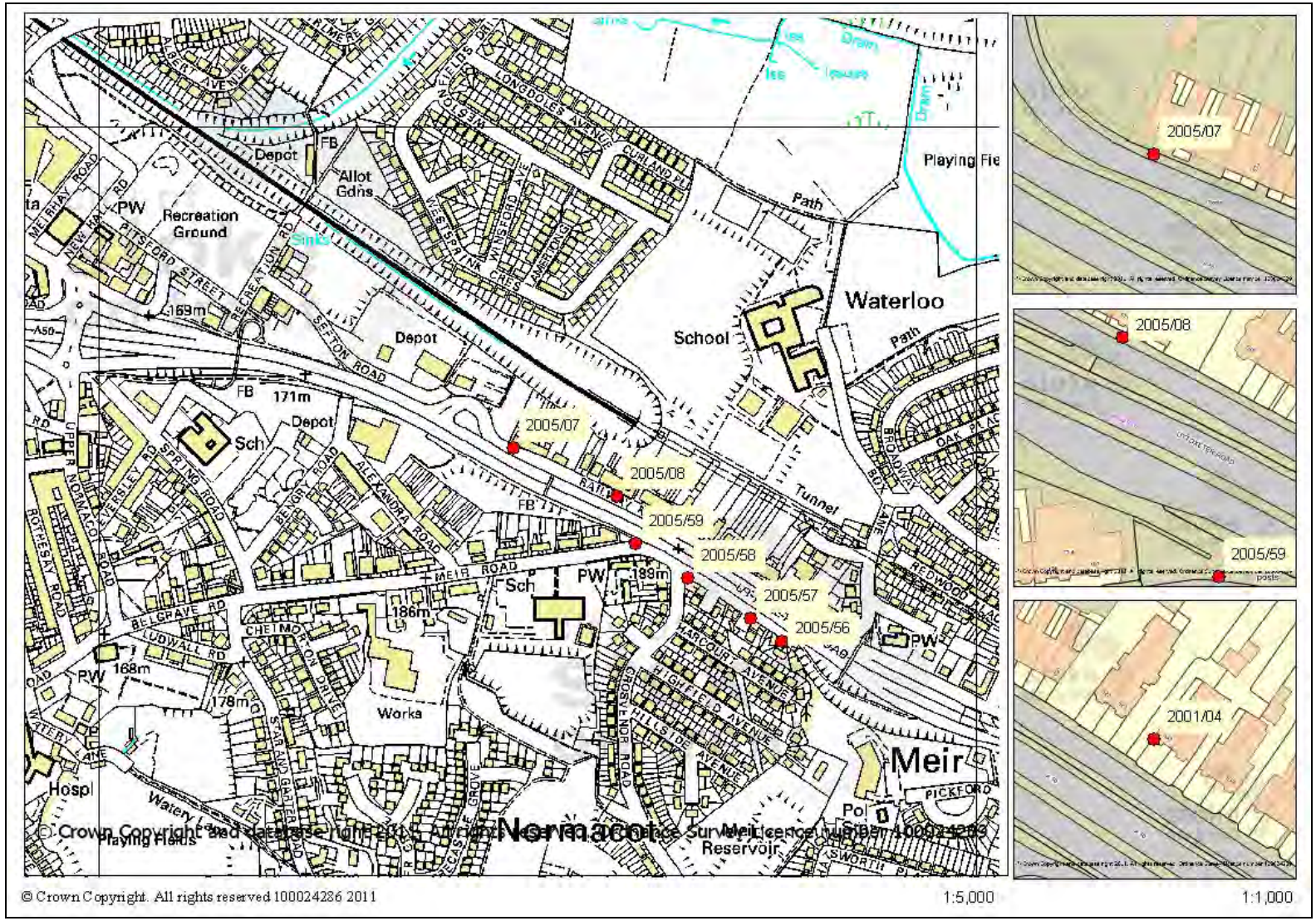


Figure B2.20 Map of Non-Automatic Monitoring Sites

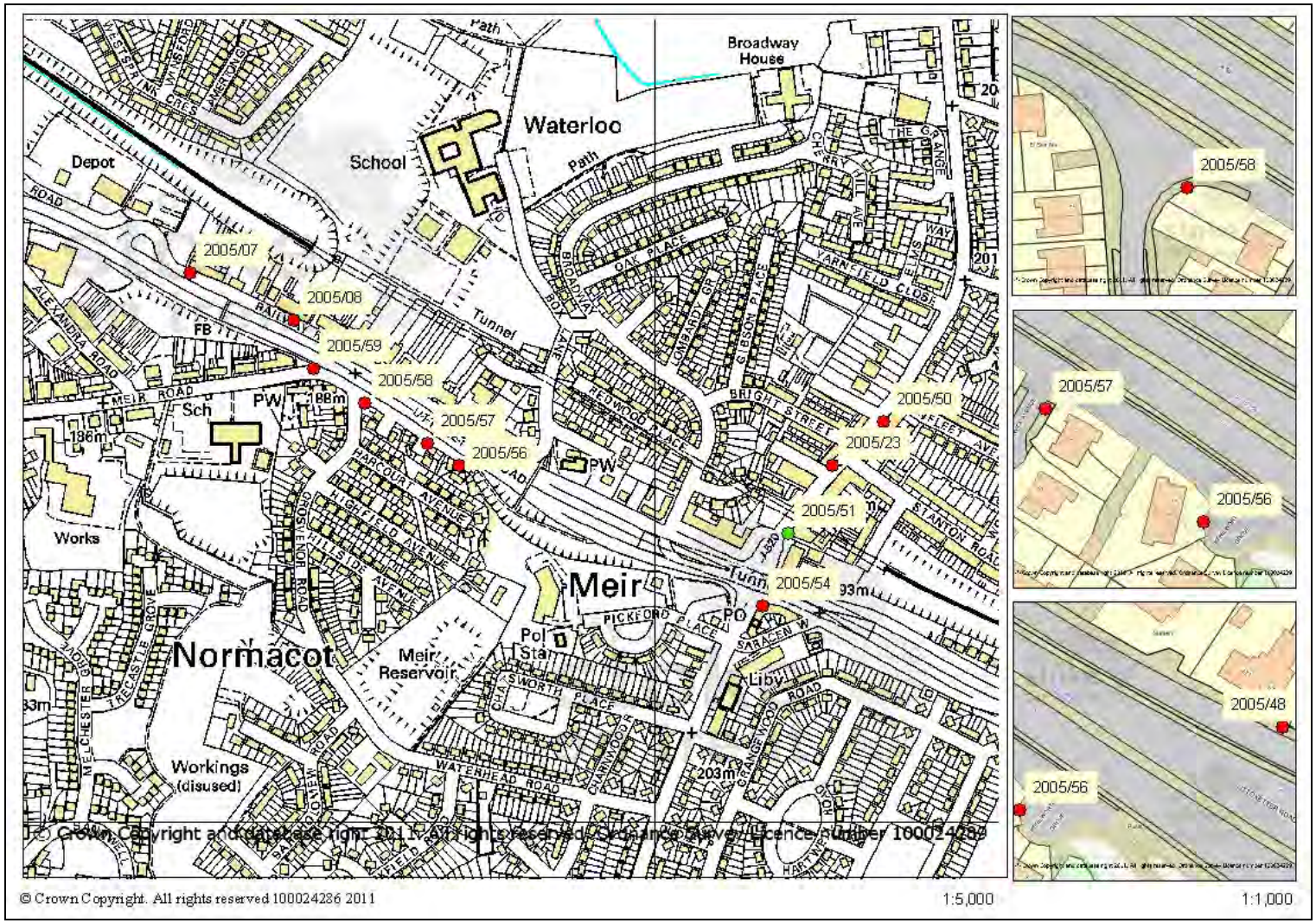
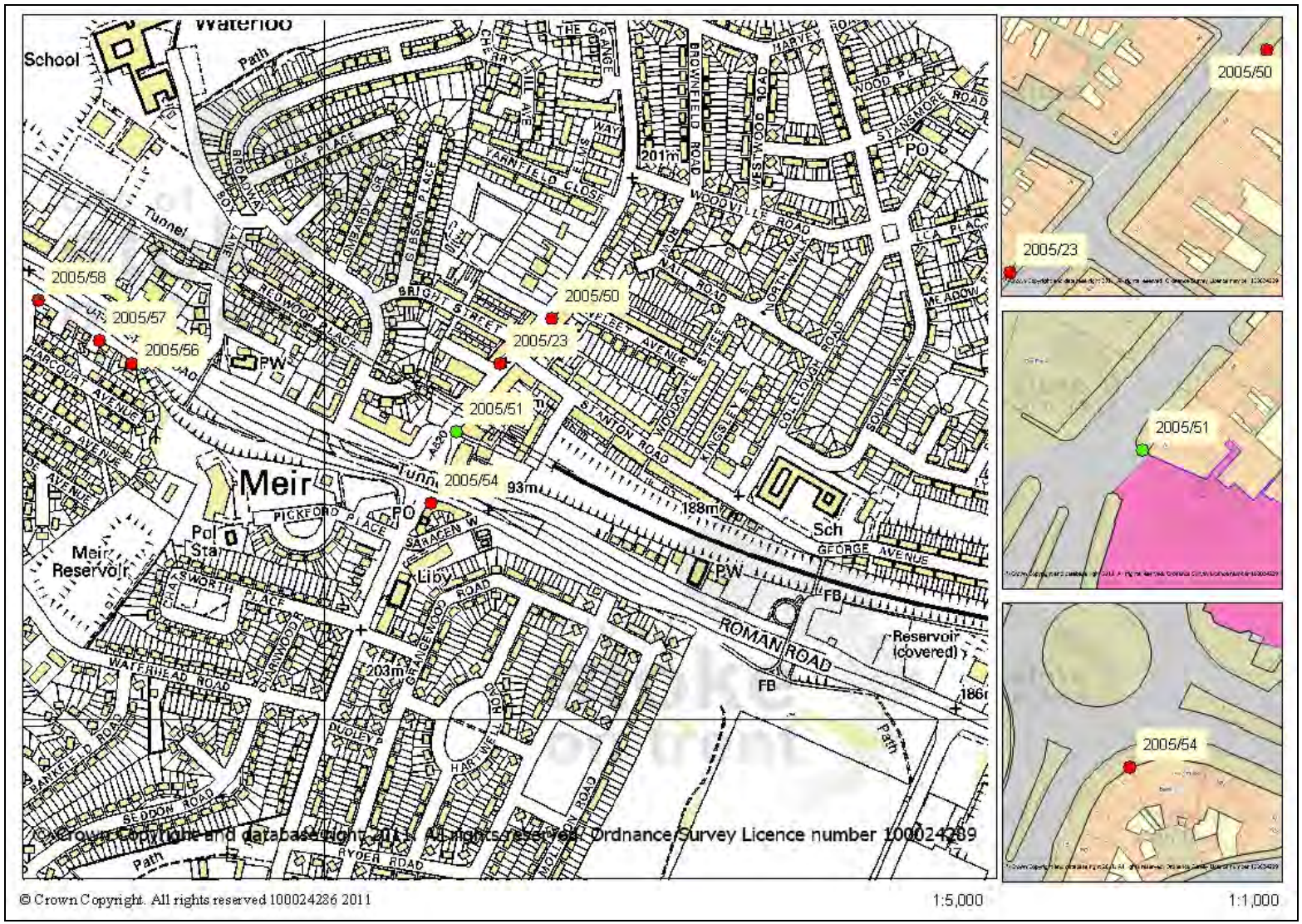


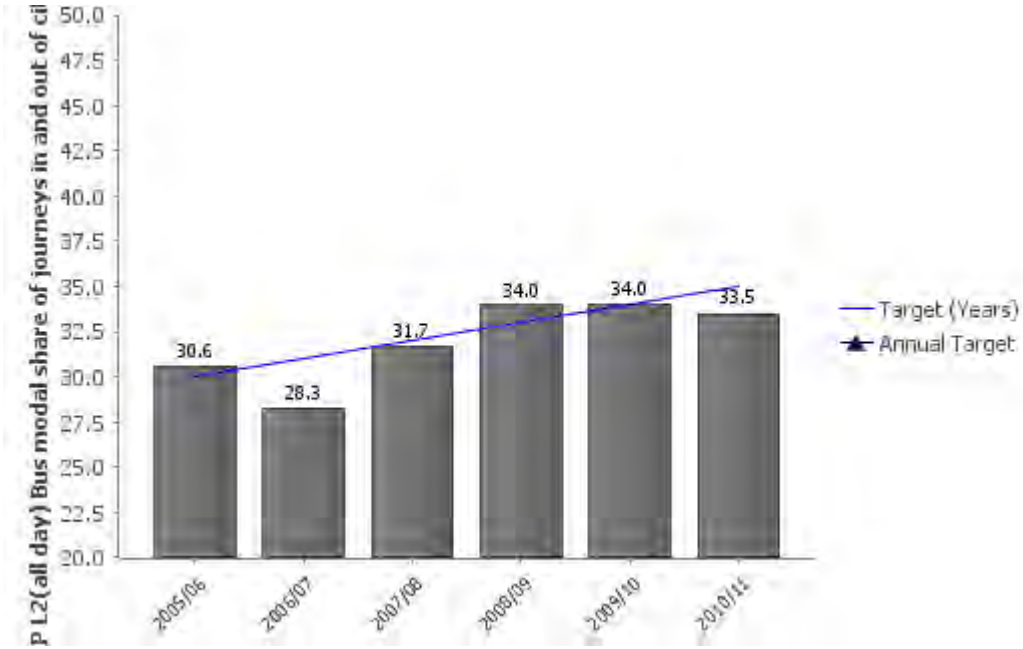
Figure B2.21 Map of Non-Automatic Monitoring Sites



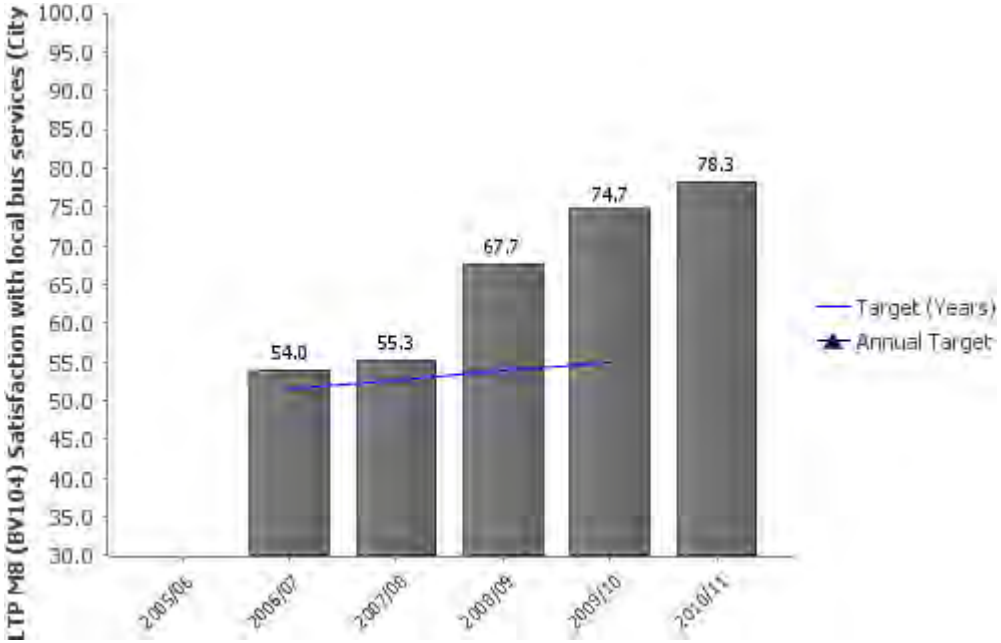
Appendix C

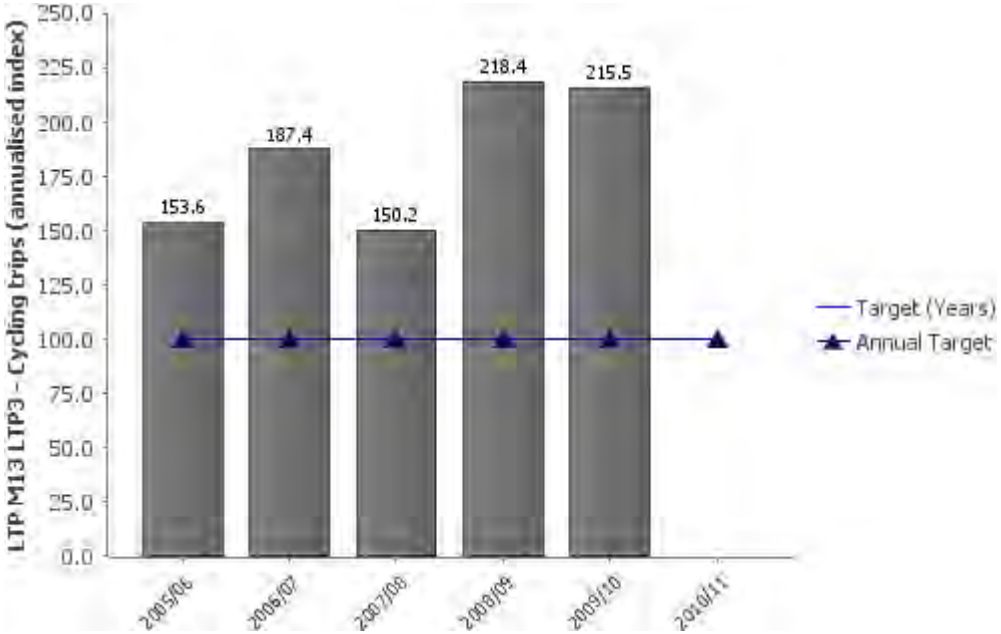
Figure C.1 Air Quality Action Plan Indicators

PI Code & Short Name	LTP L2(all day) Bus modal share of journeys in and out of city centre	**Managed By**	Carol Birchall; Matt Oxby; Pete Price
Description	Proportion of journeys across the city centre cordon by bus between 0700 and 1900 hours. (target from LTP1)	**Last Update**	2010/11
		Traffic Light Icon	
		Short Term Trend Arrow	
		Long Term Trend Arrow	
		Current Value	33.5
		Current Target	35.0
		Gauge Format Type	Aim to Maximise

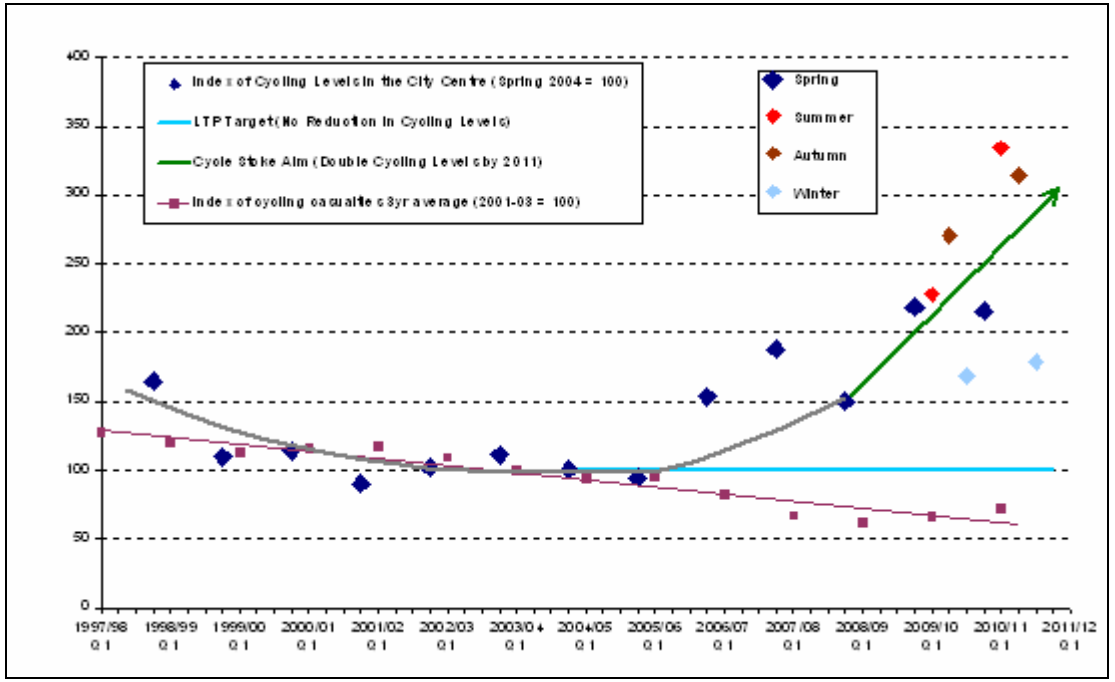


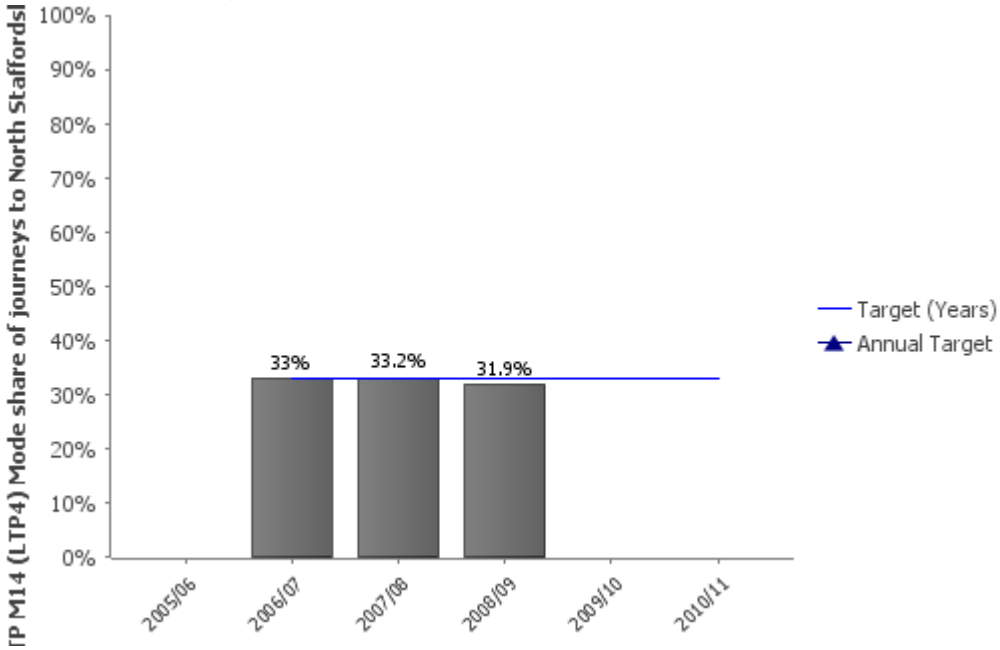
PI Code & Short Name	LTP M8 (BV104) Satisfaction with local bus services (City Wide).	**Managed By**	Carol Birchall; Matt Oxby; Pete Price
Description	Percentage customer satisfaction with bus services across the North Staffordshire LTP area	**Last Update**	2010/11
		Traffic Light Icon	
		Short Term Trend Arrow	
		Long Term Trend Arrow	
		Current Value	78.3
		Current Target	
		Gauge Format Type	Aim to Maximise

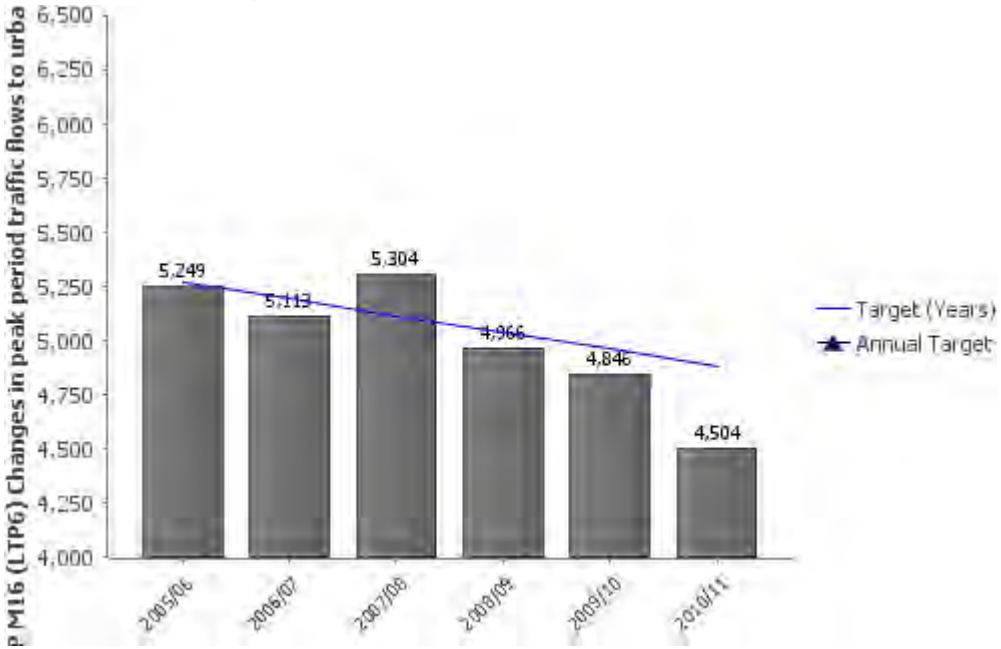


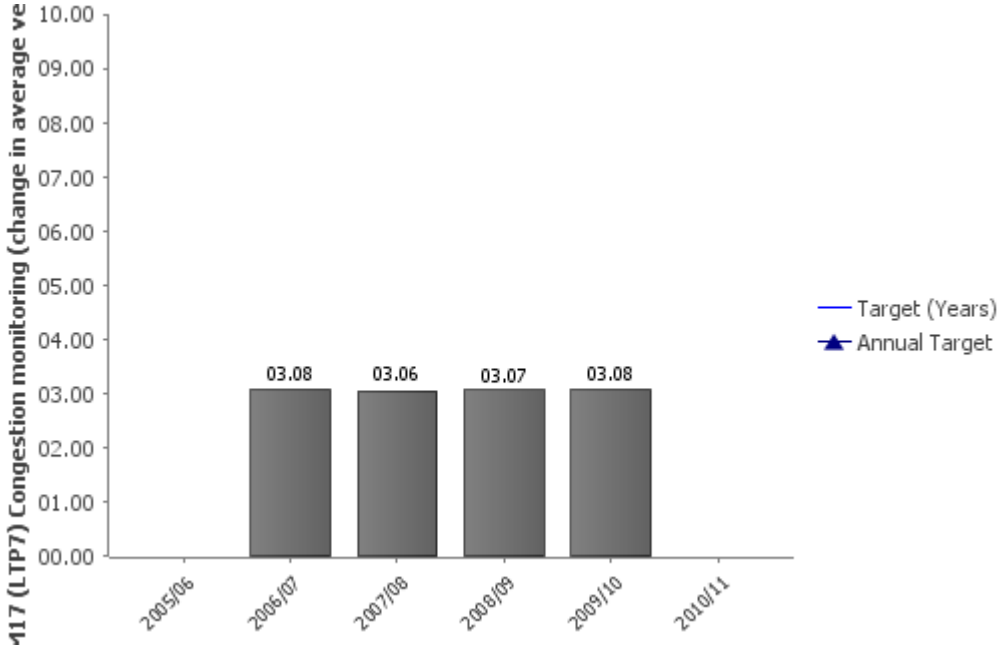
PI Code & Short Name	LTP M13 LTP3 - Cycling trips (annualised index)	**Managed By**	John Nichol; Pete Price
Description	Index of number of cyling trips (2003/04 level = 100)	**Last Update**	2009/10
		**Traffic Light Icon**	
		Short Term Trend Arrow	
		Long Term Trend Arrow	
		Current Value	215.5
		Current Target	100.0
		Gauge Format Type	Aim to Maximise

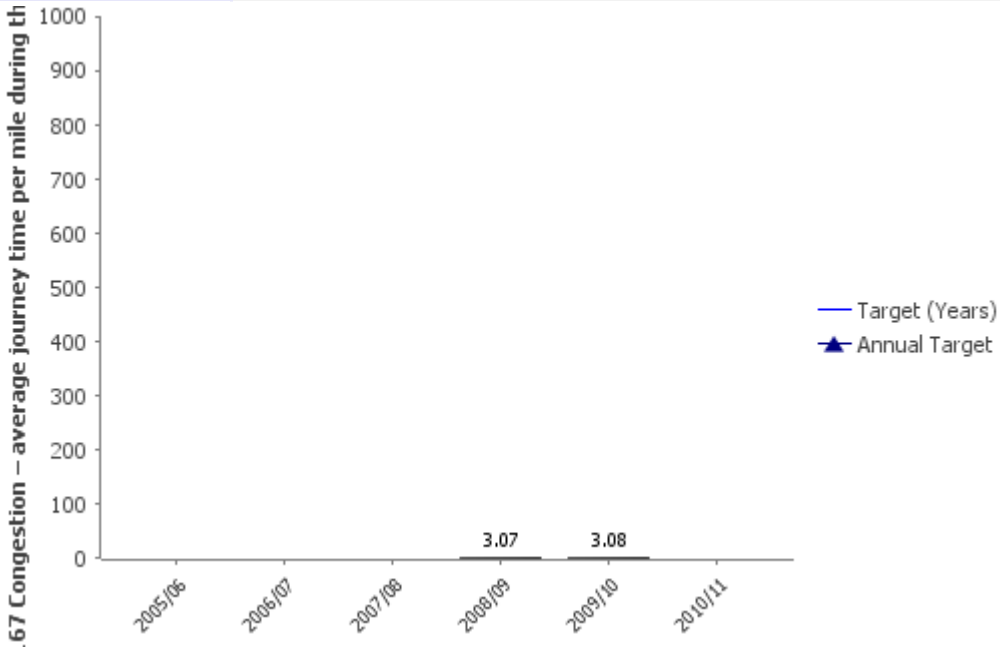
Index of cycling level in City Centre



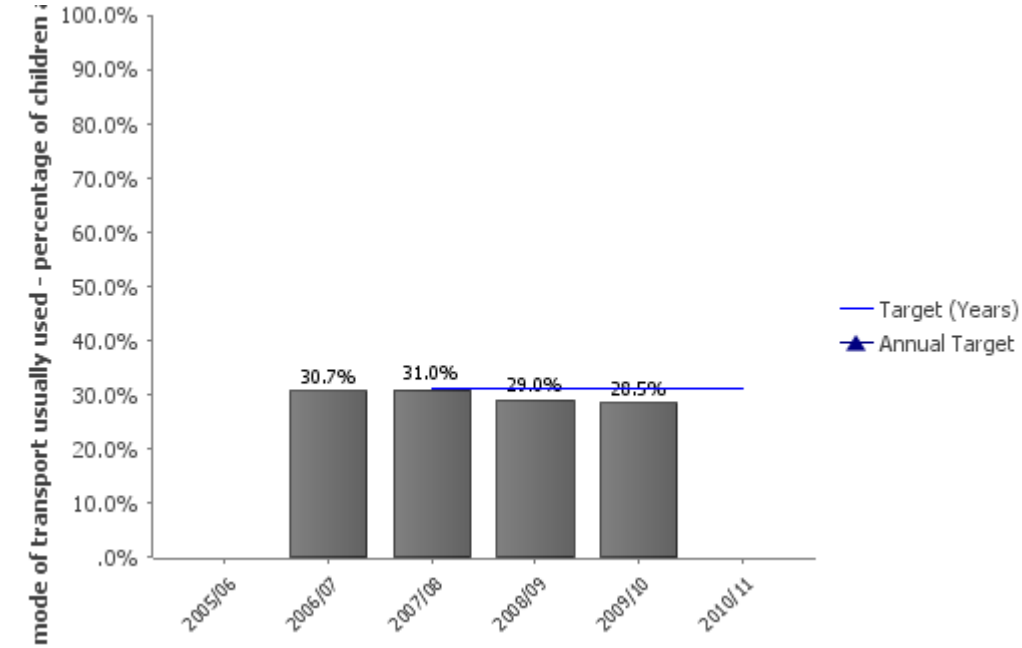
PI Code & Short Name	NS LTP M14 (LTP4) Mode share of journeys to North Staffordshire schools	**Managed By**	Carol Birchall; Matt Oxby; Pete Price
Description	Share of journeys by car (including vans and taxis), excluding car share journeys (pupils from more than one household) to schools in North Staffordshire LTP area	**Last Update**	2008/09
		**Traffic Light Icon**	
		Short Term Trend Arrow	
		Long Term Trend Arrow	
		Current Value	31.9%
		Current Target	33%
		Gauge Format Type	Aim to Minimise

PI Code & Short Name	LTP M16 (LTP6) Changes in peak period traffic flows to urban centres	**Managed By**	Carol Birchall; Matt Oxby; Pete Price
Description	Number of vehicles (excluding cycles and motorcycles) travelling into the city centre between 0700 and 1000 hours.	**Last Update**	2010/11
		**Traffic Light Icon**	
		Short Term Trend Arrow	
		Long Term Trend Arrow	
		Current Value	4,504
		Current Target	4,883
		Gauge Format Type	Aim to Minimise

PI Code & Short Name	LTP M17 (LTP7) Congestion monitoring (change in average vehicle delay)	**Managed By**	Carol Birchall; John Nichol; Matt Oxby; Pete Price
Description	Congestion monitoring (change in average vehicle delay).	**Last Update**	2009/10
		**Traffic Light Icon**	
		Short Term Trend Arrow	
		Long Term Trend Arrow	
		Current Value	03.08
		Current Target	
		Gauge Format Type	Aim to Minimise

PI Code & Short Name	NSRP NI 167 Congestion – average journey time per mile during the morning peak	**Managed By**	Pete Price
Description	To monitor the level of congestion during morning peak times.	**Last Update**	2009/10
		**Traffic Light Icon**	
		Short Term Trend Arrow	
		Long Term Trend Arrow	
		Current Value	3.08
		Current Target	
		Gauge Format Type	Aim to Minimise

PI Code & Short Name	NSRP NI 175 Access to services and facilities by public transport, walking and cycling	**Managed By**	Phil Crossland; Austin Knott; Pete Price
Description	This indicator monitors the fostering of social inclusion through access to core services and facilities via non-private modes of transport, which may include, but is not limited to: public transport; demand responsive transport; walking; and cycling. It is a key social inclusion and quality of life outcome. The indicator cuts across a number of service areas and can assist how they are planned and delivered.	**Last Update**	2010/11
		**Traffic Light Icon**	
		Short Term Trend Arrow	
		Long Term Trend Arrow	
		Current Value	87.7%
		Current Target	90.0%
		Gauge Format Type	Aim to Maximise

PI Code & Short Name	NI 198 Children travelling to school – mode of transport usually used - percentage of children aged 5-16 years who travel to school by car.	**Managed By**	John Nichol
Description	Provides information to help local authorities monitor and manage road traffic associated with the school run with a view to reducing the proportion of children travelling by car and increasing the proportion walking, cycling or using public transport. There is already evidence that children who walk or cycle to school are fitter and more ready to learn when they arrive at school and this indicator will further enable local authorities and central government to identify the extent of the correlation between the way children travel to school and levels of obesity, their health, fitness and level of academic attainment.	**Last Update**	2009/10
	**Traffic Light Icon**	
		Short Term Trend Arrow	
		Long Term Trend Arrow	
		Current Value	28.5%
		Current Target	31.0%
		Gauge Format Type	Aim to Minimise
			Forecast based on provisional results from raw data on Stoke Data and Research (SDR) website - not validated by DfT. Validated result expected Aug 2010.

Appendix D

Figure D.1 Amended City-wide AQMA Order

Environment Act 1995 Part IV Section 83(1)

Stoke-on-Trent City Council

AIR QUALITY MANAGEMENT ORDER 2011

The Council of the City of Stoke-on-Trent in exercise of the powers conferred upon it by Section 83(1) of the Environment Act 1995 hereby makes the following Order.

This Order may be cited/referred to as the City of Stoke-on-Trent, Stoke-on-Trent Air Quality Management Order 2011 and shall come into force on 09 May 2011.

The area shown shaded green on the attached plan ("the Plan") is to be designated as an Air Quality Management Area ("the Area"). The Area designated includes the districts of Burslem, Fenton, Hanley, Longton, Meir, Stoke and Tunstall, which are collectively known as the City of Stoke-on-Trent.

The Plan may be viewed at Stoke-on-Trent City Council, People – Adult and Neighbourhood Services Directorate, Public Protection Division, Town Hall, Albion Street, Hanley, Stoke-on-Trent ST1 1XP during usual business hours.

The Area is designated in relation to a likely breach of the nitrogen dioxide (annual mean and hourly mean) objective as specified in the Air Quality (England) Regulations 2000 (as amended).

This Order shall remain in force until it is varied or revoked by a subsequent Order.

Dated the 18th day of April 2011.

The Common Seal of the Council of the)
City of Stoke-on-Trent was hereunto)
affixed in the presence of :-)

Authorised Signatory

Authorised Signatory

JT/ LIT035204/ 168647

Page 1