Air Quality and Air Quality Action Plan Progress Report

Bedford Borough Council

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

April 2009/2010

PRIDE IN BEDFORD

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Executive Summary

This is the Air Quality and Action Plan Progress Report for 2009 and 2010 for Bedford Borough Council. The report fulfils this part of the Council's commitment to the continuing Local Air Quality Management (LAQM) process. This report provides an annual update for both 2009 and 2010 of recent air quality issues in Bedford, including an update on recent air quality in the Borough, obtained from its monitoring results. It also discusses the timescales in revising the Council's Action Plan in light of the declaration of AQMA 5.

The Council's earlier Review and Assessments of air quality confirmed that there were locations within the Borough with relevant public exposure where the Government's air quality objectives might be exceeded.

The more up to date monitoring of nitrogen dioxide in this report confirms that the Government's air quality objectives for NO_2 are still being exceeded widely at locations within the Town Centre AQMA. The Council will therefore maintain AQMA 5 for this pollutant.

No other areas out of the AQMA were found to exceed Government objectives and therefore the Council will produce a Progress Report in 2010.

Following the declaration of AQMA 5, the Council is in the process of producing a Further Assessment to be submitted to DEFRA in November 2010. Following this, the Air Quality Action Plan will be revised and submitted to DEFRA in May 2010.

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1 Introduction

1.1 Description of Local Authority Area

Bedford Borough Council was vested as a unitary authority on 1st April 2009. Bedford Borough Council includes the main town of Bedford, plus Kempston and 44 rural parishes. Bedford is a modern town, with an historic past, plus excellent rail links to London and the Midlands. 60% of the Borough's 6,359 hectares are Green Belt. The Borough has a population of approximately 154,900 (mid 2007). The town of Bedford has a population about 80,000, with Kempston about 20,000.

The busy A1 and A6 run through the Borough, with the M1 in easy reach. The main sources of air pollutants are busy and congested roads, with the main access to the Bedford town centre from the south constrained by the river Great Ouse and the three bridges that cross it near the town centre. Previously, the brickworks in Stewartby were a major source of air pollution, until brick making at the site ceased in November 2008. There are about 55 other minor industrial processes that are regulated by the Council, plus other processes regulated by the Environment Agency.

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 exceedence 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 microgrammes per cubic metre $\mu g/m^3$ (for carbon monoxide the units used are milligrammes per cubic metre, mg/m^3). Table 1.1. Includes the number of permitted exceedences 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 $\mu g/m^3$	Running 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	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

Air Quality Review & Assessment (2004-2005)

Two Detailed Assessments carried out as part of the second round of Review and Assessment confirmed that emissions of Nitrogen Dioxide from the traffic within three locations in Bedford (High Street, Prebend Street and the A421 running through the village of Great Barford) were such that the annual mean National Standard for Nitrogen Dioxide was likely to be exceeded by the objective date of 31st December 2005. In addition, it was concluded that the emissions from the Stewartby Brickworks were such that all three National Standards for Sulphur Dioxide were likely to be exceeded by their respective objective dates, the earliest being 31st of December 2004.

In 2005 the Borough Council declared four AQMA's and commenced two Further Assessments with which to inform the two Action Plans that will be needed to bring about the improvements in air quality necessary to ensure the National Standards are met. A Progress Report in 2005 provided further confirmation of the highlighted exceedances and also identified a need to expand the Nitrogen Dioxide passive air quality monitoring resources, particularly for those sites in London Road and Dame Alice Street. A commitment was also made to install new, more accurate, real time air quality monitoring stations in key locations to monitor both Sulphur Dioxide and Nitrogen Dioxide.

Air Quality Update and Screening Assessment (2006)

As part of it's continuing obligations under the Environment Act 1995, Bedford Borough Council commenced the third round of Review and Assessment in 2006 with an Update and Screening Assessment. The purpose being to re-examine the local air quality within the whole Borough to establish if there had been any changes since the second round of Review and Assessment which could threaten air quality elsewhere in the Borough other than those areas where AQMA's had been previously declared. This report incorporated the results of the newly expanded passive air quality monitoring resources for Nitrogen Dioxide. It concluded that, as a consequence of emissions from traffic, there may be a need to expand the existing

AQMA's on the High Street and Prebend Street, Bedford. In addition, concerns were raised over the air quality on part of Goldington Road and Ampthill Road Bedford where again, emissions from traffic could threaten achievement of the annual mean National Standard for Nitrogen Dioxide.

Air Quality Further Assessment (2006)

Bedford Borough Council completed two Further Assessments in respect of the air quality situation in the previously declared AQMA's. These in depth studies have been conducted to characterise the sources of pollution so as to enable effective targeting within the Action Plans. The Further Assessment for Nitrogen Dioxide has supplemented information the Borough already had on the need to either designate further AQMA's or expand those already existing. The Further Assessment has outlined areas outside of the AQMA's where the National Standards are being exceeded. Following completion of the Detailed Assessments, Bedford Borough Council will identify if an AQMA needs to be declared for the whole town Centre, or if expansion of the existing areas is adequate to encompass the areas where exceedances are identified. The Further Assessment for Sulphur Dioxide has shown that the National Standards are still being exceeded in and around the Stewartby area. The existing AQMA incorporates the area of exceedance which the Action Plan will work towards improving in the future.

Air Quality Action Plan (2007)

The AQAP drawn up by Bedford Borough Council details the measures that the Borough and its partners are taking to help improve the Air Quality of Bedford. The AQAP reflects the results of previously declared AQMA's by introducing schemes and measures to reduce the pollution emitted from vehicles and Stewartby Brickworks. The AQAP is a working document and will be continually reviewed and updated in order to achieve each new target set. The AQAP details the need of a multidisciplinary approach, involving all partners in order to improve Bedford Air Quality.

Air Quality Detailed Assessment 2007

Bedford Borough Council completed a Detailed Assessment as part of the next step of the Local Air Quality Management process. The Detailed Assessment was also

required as a result of the findings of the Council's 2006 Updating and Screening Assessment. The earlier screening assessment identified other parts of the Council which may exceed the government's annual mean. The purpose of this report was therefore to provide an accurate assessment of the likelihood of the objective being exceeded at locations with relevant exposure. The Detailed Assessment has identified that further AQMA's for London Road, Goldington Road and Newnham Avenue need to be declared. The report also identified the need to continue monitoring on Ampthill Road.

Air Quality Progress Report 2008

The Air Quality Progress Report provides an annual update of recent air quality issues in Bedford as well as a focus on the Council's progress on reducing air pollution through its Air Quality Action Plan. The more up to date monitoring of nitrogen dioxide confirmed that the Government's air quality objectives were still being exceeded widely at locations near the Bedford town centre with relevant public exposure. The Council therefore maintained its AQMA's for this pollutant. As reported by the Council previously, the Stewartby Brickworks was the main source of emissions leading to the AQMA declaration, the Brickworks closed at the end of February 2008.

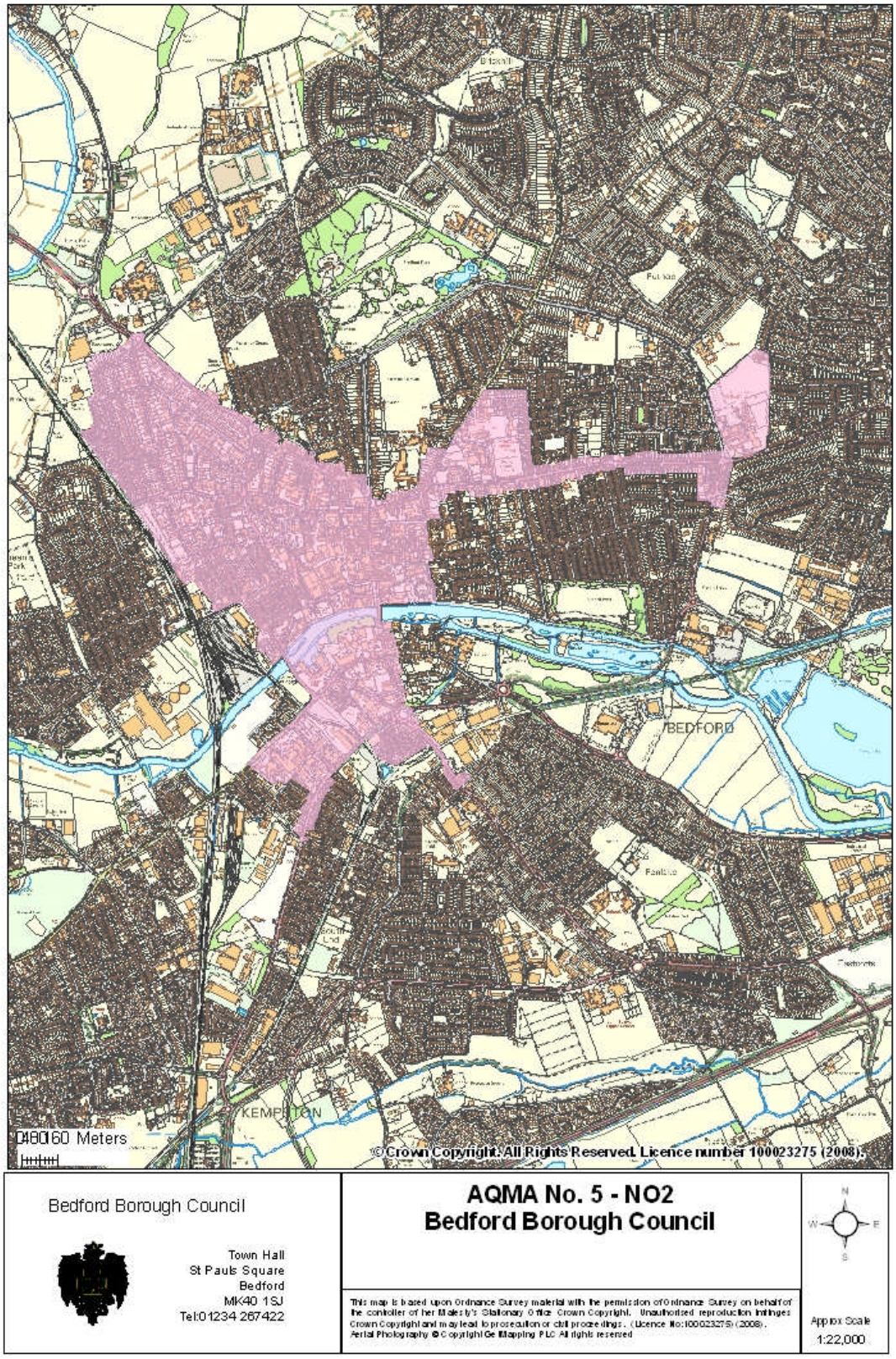
Updating and Screening Assessment 2009

The report re-examined pollution sources in the Borough to identify any relevant areas where it is considered that the Government's Air Quality objectives for the eight pollutants were being exceeded. The report identified that for the pollutants: carbon monoxide, benzene, 1,3 -butadiene, lead, sulphur dioxide and particulates PM10 there is not a significant risk of the objectives being exceeded in the Borough. For Nitrogen Dioxide the Council recently designated a town centre AQMA 5, the finding from the report confirmed that the annual mean nitrogen dioxide objective was widely exceeded within the new AQMA. The Council therefore continued to monitor within the AQMA. The report also provided data which enabled the Council to revoke AQMA 1 for sulphur dioxide (Stewartby) and AQMA 4 for Nitrogen Dioxide (Great Barford).

Moving Forward - Improving Local Air Quality

With the declaration of AQMA 5 in November 2009, a Further Assessment is in the process of being produced to cover the whole of the AQMA, this will be then used to revise our Air Quality Action Plan which will detail measures and actions the Council and its stakeholders will introduce to improve the air quality within the town centre.

Figure 1.1 Map of AQMA 5 Boundaries



2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

The Council undertakes continuous monitoring of NO_2 at two locations within the town centre of Bedford.

- Prebend Street, Bedford (BF1) – a site located on one of the busiest streets within Bedford (operating since December 2008).
- Lurke Street, Bedford (BF2) – Located just of High Street within the town centre of Bedford (Very new site, commissioned April 2010).

The above sites are representative of relevant exposure. Both sites are part of the Hertfordshire & Bedfordshire Air Pollution Monitoring Network and therefore the standards of QA/QC are similar to those of the government's AURN sites. Regular calibrations are carried out, with subsequent data ratification undertaken by the ERG at King's College London. In all cases the data are fully ratified unless reported otherwise. Details of the sites can be found at http://www.hertsbedsair.org.uk/hertsbeds/asp/Home.asp

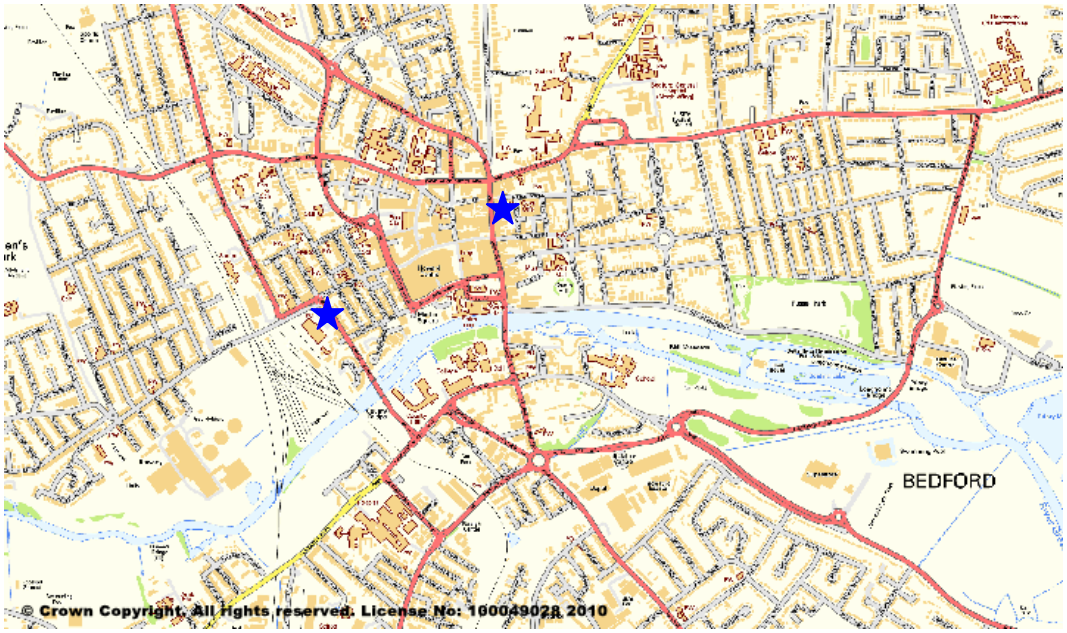


Figure 2.1 Map of Automatic Monitoring Sites for Nitrogen Dioxide

Two continuous monitoring stations for SO2 at two fixed long-term site have now closed due to the closure of Stewartby Brickworks and the subsequent revocation of the AQMA for SO2

The Council also undertakes non-continuous monitoring across its area.

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?
Prebend Street	Roadside	504494	249625	NO_2	HBAPMN Standard	Y	Y(1m)	2m	Y
Lurke Street	Roadside	505026	250012	NO_2	HBAPMN Standard	Y	N(10m)	4m	Y

2.1.2 Non-Automatic Monitoring

The Council monitor using diffusion tubes at sites across the Borough. The diffusion tubes are currently exposed at 64 locations. The sites include roadside, background and rural sites. The locations include sites within the new AQMA, as well outside of the AQMA including some villages. Twenty monitoring sites were started in 2004 and a further three were added in 2006. The three further sites were located close to the town centre. A further 19 sites were added in the newly revised AQMA 5. Most of the sites added since 2004 are located close to the façade of existing properties representing relevant exposure. The details of the nitrogen dioxide (NO2) monitoring sites are provided in Table 2.3.

The diffusion tubes used are analysed by Gradko International using a preparation method of 50% TEA in acetone. In the most recent round of Annual Performance Criteria for NO_2 Diffusion Tubes used in LAQM the laboratory demonstrated good performance in a QA/QC scheme for analysis of NO2 diffusion tubes. Gradko International participates in the Workplace Analysis Scheme for Proficiency (WASP), which is an independent analytical performance testing scheme. The scheme is an important QA/QC exercise for laboratories supplying diffusion tubes to Local Authorities for use in the context of Local Air Quality Management (LAQM). The Health and Safety Laboratory (HSL) operate the WASP scheme independently and the cost of operation is borne by the laboratories, which pay an annual fee to HSL.

The 2009 unbiased results for of the diffusion tube monitoring in the Borough are given in Appendix A.

Monitoring using diffusion tubes has advantages over continuous monitoring in that it is far cheaper and therefore more sites can be established and assessed. The main disadvantage is that the method is less precise and accurate than continuous monitoring. The recommended methods to reduce these errors include the use of good QA/QC practices and bias adjustment factors that are derived from co-location studies between continuous analysers and diffusion tubes.

The bias adjustment factors are specific to each year, analysing laboratory, method of analysis and location. The factors are therefore also limited to the data supplied. The Review and Assessment website advises that "in many cases, using an overall correction factor derived from as many co-location studies as possible will provide the 'best estimate' of the 'true' annual mean concentration, it is important to recognise that there will still be uncertainty associated with this bias adjusted annual mean. One analysis has shown that the uncertainty for tubes bias adjusted in this way is ± 20% (at 95% confidence level). This compares with a typical value of ± 10% for chemiluminescence monitors subject to appropriate QA/QC procedures."

A local co–location study has been completed this year for 2009 with the monitoring station at Prebend Street (Appendix B). The bias adjustment factor for each of the other years reported has been obtained from the default bias adjustment factors (based on the March 2009 spreadsheet derived from the Government's Review and Assessment website). The default factors are based on statistical analyses of reported data provided by other local authorities. For the final year 2009 the Council have used a local bias adjustment factor calculated from the UWE website tool.

For 2009, 15 studies were available and the 2009 factor reported is the most recently available factor (0.99). This factor was very similar to the Council's local bias adjustment factor of 0.98.

The default spreadsheet for calculating the local bias adjustment factor gave the overall survey good precision. The term "precision" indicates how well the diffusion tubes produce similar results from the duplicate and triplicate studies undertaken. The criterion is somewhat arbitrary and it reflects both the laboratory's performance in preparing and analysing the tubes, plus the handling of the tubes in the field.

YEAR	BIAS ADJUSTMENT FACTOR
2007	0.99
2008	0.94
2009	0.98

Table 2.2 Bias Adjustment Factor

The factors (Table 2.2) indicate the diffusion tube measurements are under reading for all years compared to continuous measurements. The results presented in Table 2.3 are the bias adjusted results. It should be noted those in red exceed the AQS objective. The locations in italics are those that are sited within the AQMA.

Table 2.3 Details of Non- Automatic Monitoring Sites NO2- Diffusion tube results for sites in Bedford (2009)

SITE CODE	CLASS	OS REF X	OS REF Y	ADDRESS	BIAS AD Ug/m^3	Pollutants Monitored	Worse case location
1	R	505030	249870	20 High St , Bedford	36	NO_2	Y
2	UB	506170	250190	135 George St, Bedford	25	NO_2	N
3	S	506660	251660	Arrowleys, Bedford	18	NO_2	N
4	S	503530	247380	61 The Links, Kempston	22	NO_2	N
5	R	503830	250070	Bromham Road, Bedford	31	NO_2	N
6	R	506720	250260	Goldington Road, Bedford	33	NO_2	N
7	R/UB	503160	247690	Bunyan Road, Kempston	30	NO_2	N
8	UB	505362	248345	Churchville Road	26	NO_2	N
9	UB	507530	249740	Riverfield Drive, Bedford	27	NO_2	N
10	R/UB	505968	248300	Kirkstall Close	26	NO_2	N
11	S	512770	252410	Great Barford	24	NO_2	N
12	S	516320	256640	The Lane, Wyboston	24	NO_2	N
13	S	504790	248790	Gt Nth Road, Wyboston (A1)	25	NO_2	N
14	R	505606	248632	River Street	35	NO_2	N
15	R/UB	505840	249870	Woburn Road , Kempston	30	NO_2	N
16	R	505590	250620	Kempston Road , Bedford	30	NO_2	N
17	R	504570	249510	Ampthill Road , Bedford	40	NO_2	N
18	UB	505907	248632	Castle Road , Bedford	31	NO_2	N
19	R	505795	248855	Kimbolton Road , Bedford	31	NO_2	N
20	K	505395	248613	Prebend Street , Bedford	60	NO_2	Y
21	R	516450	256630	Gt Nth Road, Wyboston (A1)	44	NO_2	Y
22	R	503020	247150	Gt Nth Road, Wyboston (A1)	61	NO_2	Y
23	R	504590	248980	Gt Nth Road, Wyboston (A1)	53	NO_2	Y
24	K	505852	248563	Great Barford no. 10	24	NO_2	N
25	R	505567	248723	London Road crossroad	47	NO_2	Y
26	R	505882	248559	Great Barford opp restaurant	29	NO_2	N
27	R	505476	248768	High St ladbrooks	58	NO_2	Y
28	R	503776	249930	Prebend St corner of com rd	43	NO_2	Y
29	R	506630	250281	Goldington Road opp uni	43	NO_2	N
30	K	505643	248748	High St collins jewlers	51	NO_2	Y
31	R	505490	248792	High St luddingtons	53	NO_2	Y
32	R	503740	249990	Prebend St opp no. 8	54	NO_2	Y
33	R	505380	248435	Shakespear Road	49	NO_2	Y
34	R	505537	248445	High St kings arms PH	52	NO_2	Y
35	R	503794	249853	Prebend St new residential	45	NO_2	Y
36	R	505362	248485	Ashburnham Road	42	NO_2	Y
37	R	504780	248702	Ampthill Road	36	NO_2	N
38	R	503719	250010	Prebend St opp no. 35	56	NO_2	Y
39	K	505750	248380	Great Barford no. 37	29	NO_2	N
40	R	505679	248776	Tavistock St	31	NO_2	N
41	R	505549	248739	Great Barford 6-10 roxton rd	20	NO_2	N
42	R	505569	248329	High St opp old BT building	47	NO_2	Y
43	R	505547	248743	Dame Alice St	45	NO_2	Y
44	R	505437	248644	Midland Road- No. 137,139A	41	NO_2	Y
45	R	505480	248652	End of Prebend St	48	NO_2	Y
46	K	505651	248729	Midland Rd-outside Beegees	43	NO_2	Y
47	K	505514	248739	On corner Harpur St opp 51A	33	NO_2	N

48	K	505541	248898	Sound Vision Tavistock St	48	NO_2	N
49	R	505712	248737	Outside John BullSt Peters St	58	NO_2	Y
50	R	505771	248758	Outside SevenOak St PeterSt	51	NO_2	Y
51	R	505628	248737	Outside PortersDame Alice St	54	NO_2	Y
52	R	505598	248743	Outside 13/15 Dame Alice St	48	NO_2	Y
53	K	505539	248768	Outside Longstaff Harpur St	47	NO_2	Y
54	K	505376	248896	Outside 63 – Union St	42	NO_2	N
55	R	505344	248670	Opp urban RuralBromham Rd	42	NO_2	Y
56	K	505342	248565	Outside flats Bromham Rd	47	NO_2	Y
57	K	506664	250199	Outside 110 Newnham Av	37	NO_2	N
58	R	506671	250231	Sign outside 96 Newnham Av	30	NO_2	N
59	R	506683	250223	Sign 117 Newnham Av	41	NO_2	N
60	R	506681	250296	Post Office Newnham Av	44	NO_2	N
61	K	506542	250296	Outside 185 Goldington Rd	35	NO_2	N
62	R	506655	250302	Outside 139 Goldington Rd	35	NO_2	N
63	R	506626	250292	Outside BP Newnham	39	NO_2	N
64	R	505608	248658	Outside no. 15 London Rd	22	NO_2	N
65	R	505634	248634	Outside no. 43 London Rd	35	NO_2	N

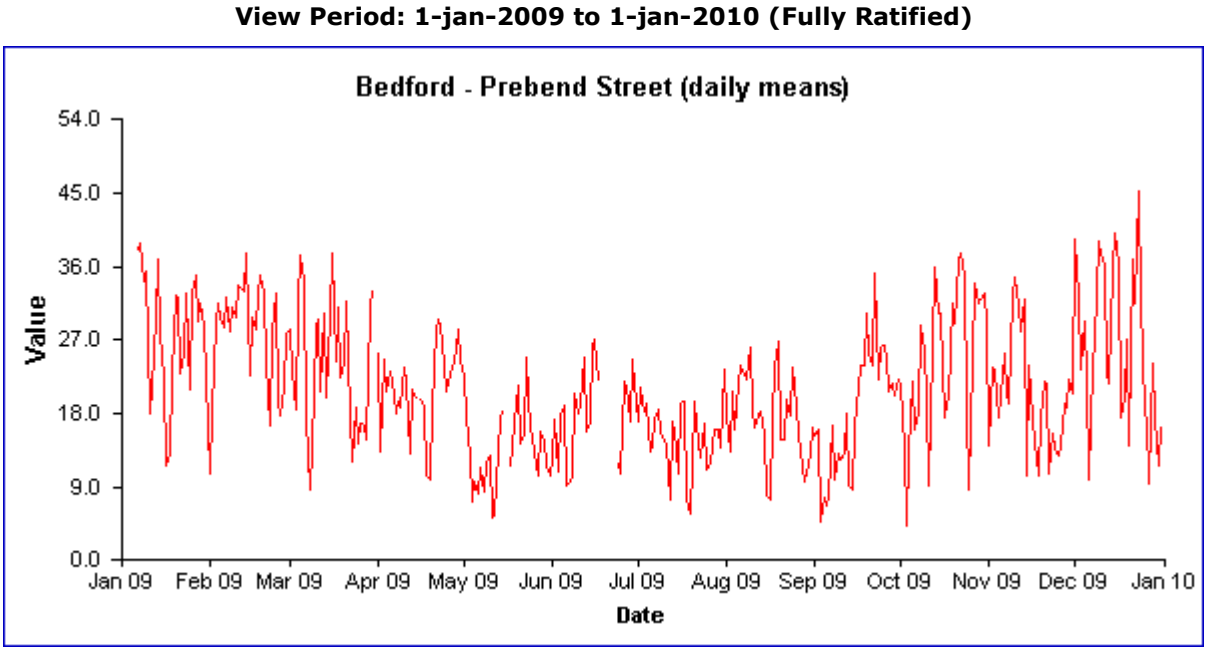
2.2 Comparison of Monitoring Results with Air Quality Objectives

Nitrogen Dioxide Automatic Monitoring Data

Table 2.4 Results of Automatic Monitoring for Nitrogen Dioxide

Site ID	Location	Within AQMA?	Data Capture 2009 %	Annual mean (µg/m^3) 2009
BF1	Prebend Street	Y	95	39.525

Figure 2.2 Trends in Nitrogen Dioxide Concentration Measured at Automatic Monitoring Site BF1.



Key: Nitrogen Dioxide (ppb)

Figure 2.3 Trends in Nitrogen Dioxide Concentration Measured at Diffusion Tube Monitoring Sites.

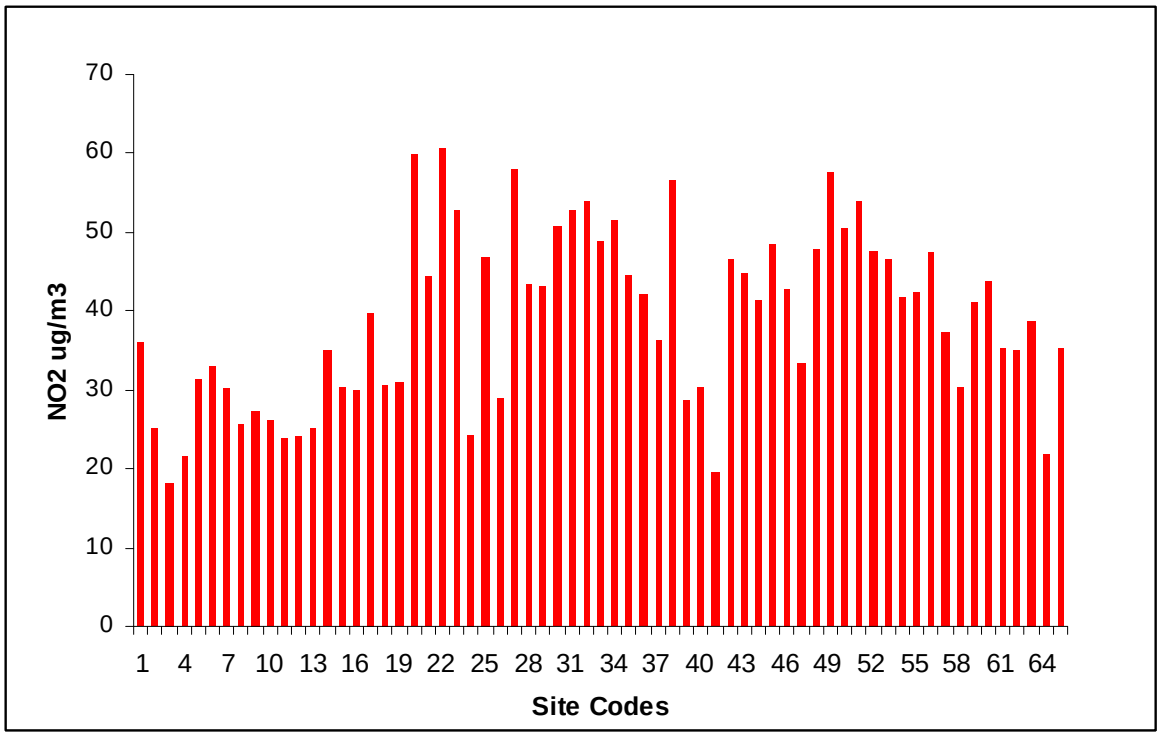


Table 2.4 shows the annual mean for the air quality monitoring station BF1 on Prebend Street was 39.52 ug/m2, just under the Government objective of 40ug/m2. The diffusion tube results, table 2.3 for 2009 show that all exceedances above the annual mean objective are located within the new AQMA 5. There are also locations within the AQMA that are close to the objective.

The highest annual means recorded are from High Street, Prebend Street and St Peters Street. The town centre wide AQMA has enabled all new areas of excceedance to be covered within the area. The areas on the A1 with annual means above the objective do not represent relevant exposure. From the annual mean diffusion tube results and automatic monitoring results there are no areas outside of AQMA 5 where Government objectives are exceeded. Therefore, a Detailed Assessment is not required.

2.3 Summary of Compliance with AQS Objectives

Bedford Borough Council has examined the results from monitoring in the borough. 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

This section outlines those local developments that may take place and may affect air quality. These are not for consideration now but are listed for a more thorough assessment during the next round of Review and Assessment. The guidance identifies the following developments that should be considered:

- New industrial processes included in the list of Appendix 2 of LAQM. TG 09.
- New developments with an impact on air quality, especially those that will significantly change traffic flows. Only include those developments with planning permission granted.
- New landfill sites, quarries, etc with planning permission granted and nearby relevant exposure.

3.1 Road Traffic Sources

The Council consolidated the previous smaller town centre AQMA's into the enlarged AQMA 5, which now encompasses the main routes through the town centre, as well as other busy streets where measured concentrations were found to exceed the annual mean objective for nitrogen dioxide.

Junctions

The Council's amended AQMA 5 includes relevant junctions within Bedford. There is no other change to the previously reported situation concerning junctions and no new or newly identified junctions with relevant exposure within 10m.

New roads constructed or proposed since the last round of review and assessment

Bedford's Western bypass opened in December 2009 linking the A412 to the A428. The second phase of the bypass linking the A421 to the A6 is still waiting funding. The purpose of the bypass will to ease traffic through the centre of

Bedford. Further improvements have continued in the work to widen the A412 this is hoped to be completed in October 2010. There have been no other new or proposed roads in the Borough where an air quality assessment was required.

3.2 Other Transport Sources

The Council confirms that there are no changes since the last Updating and Screening Assessment 2009.

3.3 Industrial Sources

The Council confirms there are no new or proposed industrial processes for which planning approval has been granted.

3.4 Commercial and Domestic Sources

The Council confirms that there are no commercial or domestics sources of pollution for which planning permission has been granted.

3.5 New Developments with Fugitive or Uncontrolled Sources

The Council confirms that there are no relevant potential sources of fugitive particulate matter emissions in the Borough.

4 Local / Regional Air Quality Strategy

Bedford Borough Council currently has an Air Quality Strategy produced in 1998. Is had been agreed by member that this will be revised to bring it up to date. Following this progress will be made toward its implementation. Once revised it will be placed on the Council's website.

5 Planning Applications

The Council can confirm that there have been no planning applications approved that will have an impact on the air quality of the borough.

6 Air Quality Planning Policies

An Air Quality Planning Document has recently been developed. The Council are currently consulting on this document to provide more of a health element to the report.

The main aims of the document are to continue to improve air quality in the AQMA and to ensure further expose of the public does not arise in are exceeding the Government's objectives.

7 Local Transport Plans and Strategies

The Council's Local Transport Plan 3 is currently being developed for completion in March 2011. This document will have strong links to the Council's Air Quality Action Plan detailing measures Bedford Borough Council will take to improve air quality within the Borough.

8 Implementation of Action Plans

Progress Report for the Air Quality Action Plan 2009 and 2010

Bedford Borough Councils Air Quality Action Plan was adopted in November 2007 covering the 4 AQMA's that were in place at that time. The Action Plan focussed on the measures to reduce emissions from the brickworks industry, traffic flow and vehicles that are consistent with other Council wide polices, principally in relation to both transport and planning. The main aim was to reduce NOx and SO_2 emissions. Other actions include reducing emissions from buildings and industry, measures to raise public awareness of air pollution and greener travel. The Council through its Action Plan, and other polices, also supports other initiatives proposed and undertaken by other authorities to reduce emissions in the Borough.

Since this time Stewartby Brickworks closed in November 2008. The Council continued to monitor the pollution levels for 12 months following the closure of the brickworks to show the immediate drop in SO_2 levels. After this time the results were presented in Bedford Borough Council's 2009 Updating and Screening Assessment and AQMA 1 was revoked in November 2009.

The Great Barford Bypass that bypassed the village of Great Barford just outside Bedford, opened in August 2006. After continuing to monitor levels of NO_2 within the village of Great Barford, the reduced levels of NO_2 recorded were again presented within the 2009 USA and AQMA 4 was revoked in the same order in November 2009.

The two town centre AQMA's (2 and 3) were subsequently encompassed into the new AQMA 5, covering the whole of the Town Centre, again declared in the one order in November 2009. All these changes have meant that the Action Plan is now out of date. A Further Assessment is in the process of being produced and once completed in November 2010, the Action Plan will be revised and produced in May 2011 to present the measures the Council and its stakeholders will take to improve air quality within the one town centre AQMA.

As such this progress report for the Action Plan is limited, but the successful progress made within the Borough has meant that AQMA 1 and 4 have been able to be revoked and hence the Action Plan for these areas are no longer applicable. Therefore, the summary below details progress that has been made with the relevant part of the Action Plan (for the old AQMA2 and 3) that will be carried forward into the new revised Action Plan for AQMA 5. It is also important to note that the Action Plan refers to Bedfordshire Country Council as the document was produced before Bedford Borough Council became a unitary authority in April 2008. This will be updated when the Action Plan is revised in May 2010.

Achievement of the Objectives

Bedford Borough's Action Plan at present applies to the Air Quality Management Areas that were previously in place and this is in the process of being revised to cover the whole of Bedford's town centre. The Action Plan will recognise that, although not everyone in the Borough will be exposed to concentrations that exceeded the air quality objectives, it is the intention of the Action Plan to reduce pollution levels, wherever possible, in pursuit of the achievement of the objectives.

Monitoring Air Quality

The Council has maintained its commitment over the last two years to monitoring air quality in the Borough and reporting to other bodies, including DEFRA since the release of the Action Plan. As reported earlier, in December 2008 one NOx continuous analyser station was installed on Prebend Street, and in April 2010 another NOx continuous analyser was installed in Lurke Street, to measure levels of NOx on the High Street. The passive diffusion tubes have also continued to provide data at 65 locations around the Borough. All of the data is linked into the Hertfordshire and Bedfordshire Air Pollution Monitoring Network which can be viewed on www.hertbsandbedsair.org.uk.

Planning Policy and Control

The Council is using the planning system to bring air quality benefits, through imposing planning conditions and through using section 106 agreements for new developments for car free developments.

Table 8.1 Action Plan Progress

AQMA 5 (Previously AQMA 2 (Prebend Street) and 3 (High Street) for NO_2)

	Action	Who	When	Cost	AQ Impact	Effectiveness	Wider Impacts	Progress
1	Bedford Borough Council will increase its air quality monitoring in and around AQMA's 2 and 3.	BBC	Ongoing (Short -term)	2	2	4	May lead to additional AQMA(s)	AQ Monitoring stations have now been installed at Prebend St and Lurke St and are linked to the Herts and Beds Air Quality Monitoring Network.
2	Bedfordshire County Council will further encourage the use of County Hall car parking at weekends by shoppers/visitors, including improved signing of this facility.	BCC	2007 (Short -term) Ongoing	1	1	3	May encourage car reliant access to central Bedford	Car park is open at the weekends
3	Bedfordshire County Council will update urban traffic control in central Bedford by modernising the Scoot System, including a review of signalising junctions in order to (a) reduce standing/slow moving traffic and (b) support increased bus travel by assisting the introduction of bus priority where practicable.	BCC	Ongoing (Short -term)	2	2	4	Reduce congestion	Replaced hardware, running new software, implementing SCOOT – initial findings are less vehicles in queues
4	The Borough Council will continue to consider air quality as capable of	BBC/ BCC	Ongoing (Short -term)	1	3	9		BCC have submitted technical

	being a material consideration and will attach the appropriate weight to the issue of air quality as determined by the facts of each individual application especially relating to developments which will impact upon AQMA's 2 and 3.							guidance to BBC and will be incorporated into general D.C. guidance for BBC.
5	The Borough Council will consider the imposition of conditions to mitigate the impact of poor air quality on new residential development within AQMA's 2 and 3, subject to such conditional requirements being relevant, necessary, viable and proportionate.	BBC	Ongoing (Short -term)	1	3	9		Air Quality Assessments being asked for developments in the AQMA's leading to conditions of fixed windows and mechanical ventilation.
6	Bedfordshire County Council, as statutory highway/transport consultee to Bedford Borough Council in its role as Planning Authority, will advise on how best to ensure that new development can assist bus travel, smarter choices, walking/cycling etc in accordance with national/local policies.	BCC/ BBC	Ongoing (Short -term)	1	1	6		Already in place
7	Bedfordshire County Council/Bedford Borough Council will continue to collaborate in seeking to implement the Bedford Western Bypass.	BCC/ BBC	Ongoing (Short -term)	3	3	3	Provision of route alternatives	Work on Phase 1 Started Completion 2009/2010 BBC/BCC collaborating with Government, landowners and developers to facilitate phase 2 as soon as possible
8	Bedford Borough Council, as Building Control Authority, will provide guidance to developers who have	BBC	Ongoing (Short -term)	1	1	3	Reduce CO_2 emissions	Each application is examined to determine if targets,

	submitted building regulation applications to Bedford Borough Building Control on how best to meet technical standards which relate to conservation of fuel and power as set out in the Building Regulations 2000 (as amended).							set by the Government for fuel and energy, are met. The Building Control Unit ensures that in each case there is 100% compliance.
9	BCC/BBC will continue to collaborate in detrafficking the High Street, Bedford and St Paul's Square (north), Bedford.	BCC/ BBC	Ongoing (Medium – term)	1	3	9	Reduce NO_2 emissions in High Street/increased traffic on other parts of the road network	Included as an option in the Town Centre Study, will be worked up in detail following the opening of the Western bypass in its entirety.
10	Steering Group members will collaborate in a joint scheme promoting public awareness of air quality.	ALL	Ongoing (Short -term)	1	1	3	Sets example of good practice.	To be actioned following the approval of a revised action plan in May 2011 followed by annual update
11	Bedford Borough Council will work to encourage improvement in domestic energy efficiency through promotion and engagement.	BBC	Ongoing (Short -term)	1	1	3	Reduce CO_2 emissions and fuel poverty	The ESS Team continue to undertake promotions to raise awareness of energy efficiency and encourage take up of grants.
12	Bedford Borough Council will implement taxi licences which require new vehicles to comply with the Euro IV emission standard.	BBC	(Medium -term)	1	1	3	Reduce other pollutants, newer cars quieter	The Council is consulting on the number of additional hackney carriages to licence. This will determine the number that will be added to the

								fleet to comply with the Euro IV standard.
13	Police/Bedford Borough Council/Vehicle and Operator Services Agency will collaborate and carry out periodic checks on vehicle emissions from taxis.	Police/ BBC/ VOSA	(Medium -term)	1	1	3	Reduce other pollutants	The checks are being undertaken at broadly six monthly intervals. At the last check in November 2007 no vehicles failed the emissions tests.
14	Bedfordshire County Council trialling pilot scheme for private hire vehicles to use bus lanes.	BCC	2007 Ongoing				Reduce congestion	Still under consideration
15	Bedfordshire County Council will seek to implement bus and freight quality partnerships.	BCC	(Medium -term)	1	1	3	Reduces congestion	Strategic development in progress by BCC has been put on hold due to Local Government restructuring.
16	Bedfordshire County Council will stimulate bus travel by the introduction of further Park & Ride schemes in addition to the Elstow facility.	BCC	(Medium -term)	3	3	3	Reduces congestion	Dependent on development coming forward
17	Bedfordshire County Council will stimulate bus travel by the introduction of real time information systems at bus station/railway station/bus stops.	BCC	(Medium -term)	2	1	2	Improves uptake of public transport	Locations identified
18	Bedfordshire County Council will stimulate bus travel by the introduction of through ticketing and better access to key facilities (eg railway station).	BCC	(Medium -term)	1	1	3	Improves uptake of public transport	Bedford Plusbus in operation
19	Bedfordshire County Council/Bedford Borough Council will collaborate via	BCC/ BBC	(Medium -term)	1	1	3	Reduce congestion	Work with planning applicants ongoing.

	planning agreements and other liaison with businesses to promote Green Travel Plans. The Borough Council will normally require major new developments to adopt a Green Travel Plan as a condition of planning permission.							Development work on Council arrangements on hold pending the establishment of Unitary Authorities.
20	Bedford Borough Council will continue to discourage long stay parking within central Bedford by management of parking tariffs.	BBC	(Medium -term)	1	1	3	Reduce congestion at peak times	Long stay tariffs have been increased in the past but further review is required.
21	Bedfordshire County Council will undertake additional vehicle counts to increase and maintain information on traffic volumes, which will help Bedford Borough Council in respect of further modelling and monitoring of air quality.	BCC/ HA	(Medium -term)	1	1	3		Counts to continue with diffusion tube monitoring of NOx at the locations.
22	Bedfordshire County Council, in collaboration with English Partnerships, the Highways Agency and Bedford Borough Council, will pursue a major LTP bid for Bedford Borough aimed at achieving a step change improvement in the highway/transport networks and notably the implementation of a third river bridge in central Bedford: this package will disperse traffic by offering greater route choice and increase the opportunities for establishing bus priority routes/networks.	BCC/ BBC/ HA	(Medium -term)	3	3	3	Reduce congestion, noise in AQMA's, although may increase pollution elsewhere	Under consideration through stage 2 of the Bedford Town Centre Transport Study.
23	Bedfordshire County Council will stimulate bus travel by the introduction of bus network loops and bus priority lanes in the following: Bedford/Kempston urban area	BCC	(Medium -term)	2	1	4		No progress but linked to the replacement and upgrading of the SCOOT system

	Highway routes in other parts of Bedford Borough.							
24	Bedfordshire County Council will consider the introduction of traffic demand restraint measures to reduce traffic volumes in central Bedford.	BCC	(Long -term)	3	3	3	Reduce congestion, noise	Under consideration through Stage 2 of the Bedford Town Centre Transport Study.
25	Bedfordshire County Council will consider expansion of the Blue Solos scheme.	BCC	(Long -term)	2	1	4	Reduce car reliance	Delayed pending Unitary
26	Consider the promotion/organisation of car sharing clubs.	ALL	(Long -term)	1	2	6	Reduce car reliance	Ongoing through Travel Plans. Travel plans linked to specific development are considered when relevant.

9 Conclusions and Proposed Actions

This Air Quality and Action Plan Progress Report for 2009 and 2010 fulfils the requirements of the DEFRA TG 09 guidance and has updated monitoring results in the Borough and noted new relevant local developments and other initiatives. It also advises on the Council's progress in implementing its Action Plan, the final version of which will be published later next year following the completion of the Further Assessment. The revised Action Plan will cover the whole of the new AQMA 5.

9.1 Conclusions from New Monitoring Data

Monitoring results have revealed the mean for Nitrogen Dioxide is widely exceeded within the new AQMA; a progress report will therefore be required the following year (2011). The Council will continue its air quality management programme as part of its continuing local air quality management regime.

9.2 Proposed Actions

The Progress Report has identified that the annual mean for Nitrogen Dioxide is widely exceeded within the AQMA. There are no areas outside of the AQMA which represent relevant exposure where the Government objectives are exceeded; therefore, Borough Council will submit a Progress Report in 2011.

The Borough Council will also submit a Further Assessment following the declaration of AQMA 5 in November 2010 and a revised Air Quality Action Plan in May 2011.

Appendices

Appendix A

Non Adjustment Diffusion Tube Results 2008 - 2010

SITE CODE	CLASS	OS REF X	OS REF Y	ADDRESS	2008	2009	2010
1	R	505030	249870	20 High St , Bedford	41	35	47
2	UB	506170	250190	135 George St, Bedford	25	24	32
3	S	506660	251660	Arrowleys, Bedford	19	17	24
4	S	503530	247380	61 The Links, Kempston	19	21	29
5	R	503830	250070	Bromham Road, Bedford	30	31	36
6	R	506720	250260	Goldington Road, Bedford	36	32	40
7	R/UB	503160	247690	Bunyan Road, Kempston	30	30	33
8	UB	505362	248345	Churchville Road	25	25	33
9	UB	507530	249740	Riverfield Drive, Bedford	26	27	34
10	R/UB	505968	248300	Kirkstall Close	27	26	32
11	S	512770	252410	Great Barford	24	23	28
12	S	516320	256640	The Lane, Wyboston	24	24	32
13	S	504790	248790	Gt Nth Road, Wyboston (A1)	25	25	24
14	R	505606	248632	River Street	34	35	39
15	R/UB	505840	249870	Woburn Road , Kempston	31	30	33
16	R	505590	250620	Kempston Road , Bedford	31	29	39
17	R	504570	249510	Ampthill Road , Bedford	39	39	50
18	UB	505907	248632	Castle Road , Bedford	32	30	36
19	R	505795	248855	Kimbolton Road , Bedford	34	30	37
20	K	505395	248613	Prebend Street , Bedford	62	61	55
21	R	516450	256630	Gt Nth Road, Wyboston (A1)	43	44	53
22	R	503020	247150	Gt Nth Road, Wyboston (A1)	45	61	
23	R	504590	248980	Gt Nth Road, Wyboston (A1)	42	53	
24	K	505852	248563	Great Barford no. 10	24	24	31
25	R	505567	248723	London Road crossroad	48	47	49
26	R	505882	248559	Great Barford opp restaurant	26	28	31
27	R	505476	248768	High St ladbrooks	58	58	52
28	R	503776	249930	Prebend St corner of com rd	42	44	49
29	R	506630	250281	Goldington Road opp uni	44	43	46
30	K	505643	248748	High St collins jewlers	53	51	48
31	R	505490	248792	High St luddingtons	50	53	57
32	R	503740	249990	Prebend St opp no. 8	55	54	65
33	R	505380	248435	Shakespear Road	46	49	75
34	R	505537	248445	High St kings arms PH	49	52	59
35	R	503794	249853	Prebend St new residential	45	44	46
36	R	505362	248485	Ashburnham Road	43	42	48
37	R	504780	248702	Ampthill Road	46	36	42
38	R	503719	250010	Prebend St opp no. 35	57	56	68
39	K	505750	248380	Great Barford no. 37	31	29	33
40	R	505679	248776	Tavistock St	29	30	35
41	R	505549	248739	Great Barford 6-10 roxton rd	18	19	24
42	R	505569	248329	High St opp old BT building	49	47	54
43	R	505547	248743	Dame Alice St	46	45	54
44	R	505437	248644	Midland Road- No. 137,139A	41	41	48
45	R	505480	248652	End of Prebend St	46	48	51
46	K	505651	248729	Midland Rd-outside Beegees	42	42	46

47	K	505514	248739	On corner Harpur St opp 51A	33	33	43
48	K	505541	248898	Sound Vision Tavistock St	48	47	53
49	R	505712	248737	Outside John BullSt Peters St	56	58	61
50	R	505771	248758	Outside SevenOak St PeterSt	50	51	
51	R	505628	248737	Outside PortersDame Alice St	50	54	54
52	R	505598	248743	Outside 13/15 Dame Alice St	42	47	50
53	K	505539	248768	Outside Longstaff Harpur St	42	47	49
54	K	505376	248896	Outside 63 – Union St	42	42	44
55	R	505344	248670	Opp urban RuralBromham Rd	43	42	50
56	K	505342	248565	Outside flats Bromham Rd	45	48	49
57	K	506664	250199	Outside 110 Newnham Av	37	37	40
58	R	506671	250231	Sign outside 96 Newnham Av	33	31	40
59	R	506683	250223	Sign 117 Newnham Av	42	41	47
60	R	506681	250296	Post Office Newnham Av	44	44	
61	K	506542	250296	Outside 185 Goldington Rd	34	35	40
62	R	506655	250302	Outside 139 Goldington Rd	33	34	45
63	R	506626	250292	Outside BP Newnham	39	38	44
64	R	505608	248658	Outside no. 15 London Rd	47	22	
65	R	505634	248634	Outside no. 43 London Rd	35	35	45

Appendix B

Local Bias Adjustment Factor

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	Nitrogen Dioxide (ug/m^3)
1	01/01/2009	01/02/2009	81	Ratified	53.4
2	01/02/2009	01/03/2009	99	Ratified	55.5
3	01/03/2009	01/04/2009	97	Ratified	45.4
4	01/04/2009	01/05/2009	96	Ratified	39.8
5	01/05/2009	01/06/2009	95	Ratified	26.3
6	01/06/2009	01/07/2009	83	Ratified	32.1
7	01/07/2009	01/08/2009	99	Ratified	28.2
8	01/08/2009	01/09/2009	99	Ratified	31.1
9	01/09/2009	01/10/2009	99	Ratified	29.4
10	01/10/2009	01/11/2009	99	Ratified	46.3
11	01/11/2009	01/12/2009	99	Ratified	37.6
12	01/12/2009	01/01/2010	99	Ratified	49.2

Diffusion Tubes Measurements									
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	01/01/2009	01/02/2009	45.53	44.99		45	0.4	1	3.4
2	01/02/2009	01/03/2009	48.73	40.62	49.98	46	5.1	11	12.6
3	01/03/2009	01/04/2009	47.26	53.03	44.58	48	4.3	9	10.7
4	01/04/2009	01/05/2009	43.46	27.52	42.98	38	9.1	24	22.5
5	01/05/2009	01/06/2009	24.45	34.61		30	7.2	24	64.5
6	01/06/2009	01/07/2009	40.1	34.8		37	3.7	10	33.7
7	01/07/2009	01/08/2009	38.58	38.47	36.06	38	1.4	4	3.5
8	01/08/2009	01/09/2009	38.02	37.83	37.85	38	0.1	0	0.3
9	01/09/2009	01/10/2009	30.57	36.57		34	4.2	13	38.1
10	01/10/2009	01/11/2009	43.91	42.27		43	1.2	3	10.4
11	01/11/2009	01/12/2009	42.14	40.36	41.5	41	0.9	2	2.2
12	01/12/2009	01/01/2010	45.27	47.95	45.95	46	1.4	3	3.5

Automatic Method		Data Quality Check	
Period Mean	**Data Capture (% DC)**	**Tubes Precision Check**	**Automatic Monitor Data Capture Check**
53.4	81	**Good**	**Good**
55.5	99	**Good**	**Good**
45.4	97	**Good**	**Good**
39.8	96	**Poor Precision**	**Good**
26.3	95	**Poor Precision**	**Good**
32.1	83	**Good**	**Good**
28.2	99	**Good**	**Good**
31.1	99	**Good**	**Good**
29.4	99	**Good**	**Good**
46.3	99	**Good**	**Good**
37.6	99	**Good**	**Good**
49.2	99	**Good**	**Good**
		Good precision	**Good Overall DC**

Accuracy			**(with 95% confidence interval)**
without periods with CV larger than 20%			
Bias calculated using 10 periods of data			
Bias factor A		**0.98 (0.88 - 1.11)**	
Bias B		**2% (-10% - 14%)**	
Diffusion Tubes Mean:	**42**	**µgm^{-3}**	
Mean CV (**Precision**):	**6**		
Automatic Mean:	**41**	**µgm^{-3}**	
	Data Capture for periods used:	**95%**	
Adjusted Tubes Mean:	**41 (37 - 46)**		**µgm^{-3}**

Accuracy			**(with 95% confidence interval)**
WITH ALL DATA			
Bias calculated using 12 periods of data			
Bias factor A		**0.98 (0.89 - 1.08)**	
Bias B		**2% (-8% - 12%)**	
Diffusion Tubes Mean:	**40**	**µgm^{-3}**	
Mean CV (**Precision**):	**9**		
Automatic Mean:	**40**	**µgm^{-3}**	
	Data Capture for periods used:	**95%**	
Adjusted Tubes Mean:	**40 (36 - 44)**		**µgm^{-3}**