

AIR QUALITY PROGRESS REPORT

2008

Bassetlaw District Council



Air Quality Progress Report 2008

This report has been produced following the Progress Report Guidance LAQM.PRG(03) published by Defra to fulfil the requirements of Part IV of the Environment Act 1995 - Local Air Quality Management. The report provides an update to the Updating and Screening Assessment carried out in April 2006 and the Progress Report in 2007.

**Bassetlaw District Council
Environment and Health Services**

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Report Author

**John Rhoades
Scientific Officer**

Executive Summary

Part IV of the Environment Act 1995 establishes a national framework for air quality management, requiring all local authorities in England, Scotland and Wales to conduct local air quality reviews. Where the reviews indicate that the objectives set out in the National Air Quality Strategy will not be met, the relevant authority is required to designate an Air Quality Management Area.

In 2006 Bassetlaw District Council carried out an Updating and Screening assessment that considered the sources, effect and level of local air pollution in the district and compared against the associated air quality objectives. The 2006 review and assessment concluded that no areas with the Bassetlaw District with relevant public exposure would be likely to exceed an air quality objective.

This review builds on the 2006 Updating and Screening Assessment and the Progress Report of 2007 by providing an update on progress in meeting the air quality objectives and consideration to potential new sources of air pollution, housing and commercial development, road and traffic changes and monitoring since the previous review.

The review has identified that the Local Air Quality of the Bassetlaw District, with the possible exception of one area, meets the relevant air quality objectives for the key pollutants at locations with a relevant receptor. However the report has identified the need for further monitoring and assessment of nitrogen dioxide levels in congested areas of Worksop town centre.

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1 New Local Developments

This section summarises the changes that have taken place that could impact on the air quality of the district.

1.1 New Industrial Processes

There have been no new Part A1 or A2 activities commissioned in the Bassetlaw District within the last year.

Changes to A1 Permitted Activities

EDF Energy was granted Section 36 consent under the Electricity Act 1989 by the Department of Business, Enterprise and Regulatory reform in October 2007 to construct and operate a new gas fired power station at West Burton. The site will be covered by an A2 PPC Permit; the permit application is being determined by the Environment Agency. The natural gas-fired power station will be adjacent to the existing 2000MW coal-fired West Burton Power Station in the northeast of the district. Initial site works have commenced in early 2008; construction of the station is expected to be complete by 2011. When operational the site would generate 1,270MWe using the inherently clean natural gas as the primary fuel, with low sulphur distillate fuel oil (DFO) as a back up supply. Emissions of nitrogen oxides (NO_x) will be controlled by the use of dry low NO_x burners with exhaust gases being discharged through three 80m tall stacks.

The Permit application includes detailed modeling outputs that indicate that the plant design and stack height will ensure that the combined emissions from the proposed plant and the existing plant will not infringe upon the achievement of the UK Air Quality Strategy standards and objectives.

Changes to A2 Permitted activities

Notification has been given of the closure in September 2008 of the Ardagh Glass site in Worksop. The site is located in an industrial area to the north west of Worksop Town centre; historically the site will have been a significant emitter of NO_x and particulate matter.

Changes to Part B Permitted activities

There have been no new Part B activities commissioned with in the previous year. Indeed, one of the larger Part B sites in the district, a refractory brick manufacturer closed in 2007. The site was adjacent to the above mentioned glass works, it is

anticipated the two sites will be redeveloped in to mixed use commercial / residential developments.

1.2 New Retail Developments

In the previous report it was reported that Planning permission had recently been granted for a major development to the north of Worksop town centre for a retail and leisure development split across two nearby sites. The scheme involves the relocation of the Tesco supermarket from its current location on Gateford Road, Worksop to a new store to be constructed on a former landfill site off Carlton Road. Associated with this is the leisure development including a cinema, bingo, bowling and two restaurant units, again redeveloping a former landfill area off Turner Road.

Construction work has yet to begin on these developments, no other significant retail developments have been proposed in the previous year.

1.3 New road schemes

A1 Roadworks

The A1 dual carriageway runs roughly north-south through the middle of the Bassetlaw district; previously there were three roundabout controlled junctions along this section, Blyth in the north, Appleyhead (Clumber) in the centre and Markham Moor to the south. Historically these have been the cause of considerable congestion and delays due to traffic volumes and have been the site of a number of accidents.

An ongoing programme of works to replace the roundabouts with two level 'motorway style' junctions has been agreed over recent years and works on the Blyth and Appleyhead junctions commenced in September 2006 and are now largely complete. Works on the Markham Moor junction commence in summer 2007 and are anticipated to be completed in late 2008.

1.4 North Nottinghamshire Local Transport Plans

In its second Local Transport Plan 2006/07-2010/11 (LTP2), Nottinghamshire County Council is committed to building on the success of its achievements in the first Plan (LTP). Over the first Plan period the Council was consistently highly rated for its achievements against its targets (as reported in the Annual Progress Reports) and was awarded Centre of Excellence and Beacon Status for its work

in the fields of Access and Mobility, Integrated Transport Planning and Local Transport Delivery. As a result of its involvement in these initiatives and its willingness to learn from the work of other highly-rated authorities, the Council has been able to take on board best practice advice as well as disseminating best practice to other local authorities. Of particular value in the development of the LTP2, has been a close examination of the impact of strategies and measures in the first Plan.

The Local Transport plan is linked to the Nottinghamshire Air Quality Strategy, this document has recently been reviewed and rewritten by representatives of all the Nottinghamshire Local Authorities and key stakeholders, including the Environment Agency and the Health Protection Agency.

1.5 New Waste, Landfill or Mineral Developments

There are no proposals for new waste or landfill developments within the Bassetlaw district.

2 Pollutants

2.1 Progress on Carbon Monoxide Emissions

National Air Quality Objective

10.0 mg/m³ measured as a maximum daily running 8 hour mean

Bassetlaw District Council does not undertake any monitoring for carbon monoxide, therefore for the purposes of this progress report data obtained from nationally estimated background concentrations has been used.

Estimated background concentrations are expected to be considerably lower than the objective levels. The maximum estimated concentration for 2001, the most recent published figure, was 0.36 mg/m³. Using a year adjustment correction predicted background concentrations for 2008 and 2010 have been calculated:

- 2008 estimated maximum concentration = 0.20 mg/m³
- 2010 estimated maximum concentration = 0.17 mg/m³

Previous Updating and Screening Assessments have not identified any areas of the district in which the air quality objective for carbon monoxide is likely to be exceeded. It is anticipated that improvements in vehicle engine design and stricter emission standards in the MOT test will continue to reduce carbon monoxide emissions from road transport, the major source of emissions.

Where background concentrations are low exceedences of current and future air quality objectives are only likely to occur near to very busy roads or junctions in built up areas. It is not expected that any location within the Bassetlaw District will meet the criteria used to define a very busy road or junction:

- Single carriageway roads with daily average traffic flows which exceed 80,000 vehicles per day.
- Dual carriageway (2 or 3 lane-) roads with daily average traffic flows which exceed 120,000 vehicles per day
- Motorways with daily average traffic flows which exceed 140,000 vehicles per day.

Based on a review of all available information it is considered highly unlikely that the air quality objective for carbon monoxide will be exceeded in the Bassetlaw district.

2.2 Progress on Benzene Emissions

National Air Quality Objective

16.25 $\mu\text{g}/\text{m}^3$ as a running annual mean concentration

5 $\mu\text{g}/\text{m}^3$ as an annual mean is to be achieved by 31st December 2010

Bassetlaw District Council does not undertake any monitoring for benzene, therefore for the purposes of this progress report data obtained from nationally estimated background concentrations has been used.

Estimated background concentrations are expected to be considerably lower than the objective levels. The maximum estimated concentration for 2003, the most recent published figure, was 0.52 $\mu\text{g}/\text{m}^3$. Using a year adjustment correction predicted background concentrations for 2008 and 2010 have been calculated:

- 2008 estimated maximum concentration = 0.43 $\mu\text{g}/\text{m}^3$
- 2010 estimated maximum concentration = 0.39 $\mu\text{g}/\text{m}^3$

Previous Updating and Screening Assessments have not identified any areas of the district in which the air quality objective for benzene is likely to be exceeded and it is anticipated that national policies would continue to be the major influence on future benzene levels.

Where background concentrations are low exceedences of current and future air quality objectives are only likely to occur near to localised emissions sources. Such sources include major industrial processes handling benzene; oil refining, major petrol stations near to busy roads, fuel storage depots and very busy roads. There are no such sites existing or planned within the Bassetlaw District.

Based on a review of all available information it is considered highly unlikely that the air quality objective for benzene will be exceeded in the Bassetlaw district.

2.3 Progress on 1,3-Butadiene Emissions

National Air Quality Objective

2.25 $\mu\text{g}/\text{m}^3$ as a running annual mean to be achieved by 31st December 2003

Bassetlaw District Council does not undertake any monitoring for 1,3-butadiene, therefore for the purposes of this progress report data obtained from nationally estimated background concentrations has been used.

Estimated background concentrations are expected to be considerably lower than the objective levels. The maximum estimated concentration for 2003, the most recent published figure, was $0.2 \mu\text{g}/\text{m}^3$. Using a year adjustment correction predicted background concentrations for 2008 and 2010 have been calculated:

- 2008 estimated maximum concentration = $0.13 \mu\text{g}/\text{m}^3$
- 2010 estimated maximum concentration = $0.12 \mu\text{g}/\text{m}^3$

Previous Updating and Screening Assessments have not identified any areas of the district in which the air quality objective for 1,3-butadiene is likely to be exceeded and it is anticipated that national policies would continue to be the major influence on future levels.

Where background concentrations are low exceedences of current and future air quality objectives are only likely to occur near to localised emissions sources. There are no such sites existing or planned within the Bassetlaw District.

Based on a review of all available information it is considered highly unlikely that the air quality objective for 1,3-butadiene will be exceeded in the Bassetlaw district.

2.4 Progress on Lead Emissions

Air Quality Objective

0.5 $\mu\text{g}/\text{m}^3$ as an annual mean

0.25 $\mu\text{g}/\text{m}^3$ as an annual mean to be achieved by 31st December 2008

The ban on the sale of leaded petrol atmospheric emission of lead are greatly reduced are is now restricted to a variety industrial sources, such as battery manufacture, pigment and paint manufacture and some metal and alloy processing.

There are no such sites existing or planned within the Bassetlaw District.

Based on a review of all available information it is considered highly unlikely that the air quality objective for lead will be exceeded in the Bassetlaw district.

2.5 Progress on Sulphur Dioxide Emissions

National Air Quality Objectives

350 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 24 times a year measured as a 1-hour mean

125 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 3 times a year measured as a 24-hour mean

266 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 35 times a year measured as a 15-minute mean

Bassetlaw District Council no longer carries out direct monitoring for sulphur dioxide within the district. Previous assessments and progress reports have identified that the background levels within the district are low. The maximum estimated background concentration for 2001 was 15.1 $\mu\text{g}/\text{m}^3$, with an average of 5.1 $\mu\text{g}/\text{m}^3$.

Historically, the most significant industrial sources of sulphur dioxide within Bassetlaw have been the coal powered power stations alongside the River Trent. However emissions from these sources has been significantly reduced following the installation of flue gas desulphurisation (FGD) plant at the two remaining stations.

No new industrial sources that are likely to emit significant amounts of sulphur dioxide have been developed or proposed in the Bassetlaw District since the previous updating and screening assessment.

Based on a review of all available information it is considered highly unlikely that the air quality objective for sulphur dioxide will be exceeded.

2.6 Progress on Nitrogen Dioxide Emissions

National Air Quality Objectives

40 ug/m³ as an annual mean

200 ug/m³ measured as a 1-hour mean concentration not to be exceeded more than 18 times per year

New monitoring results

Bassetlaw District Council carries out monitoring of nitrogen dioxide levels in the district using diffusion tubes. A network of 24 diffusion tube monitoring locations has been maintained within the district for several years, reduced to 23 locations in the previous year. The actual locations have been subject to change as a result of new developments and previous review periods. Figure 1 shows the monitoring locations used in recent years. Details of the locations and monitoring results are given in Appendix 1.

Following the completion of the Updating and Screening Assessment submitted in April 2006, a major review of the monitoring locations was carried out. Several tubes were relocated to target potential problem areas or to better represent the effect on potential receptors. The tubes at the three roundabouts along the A1 dual-carriageway were removed due to the anticipated access problems associated with the major roadwork schemes underway at these locations. The new locations were chosen to more closely represent and assess the impact on receptors close to busy roads and junctions in Retford town centre and to assess the levels of NO₂ at potential receptors close to A1 carriageway, away from the previously monitored roundabouts. The 2007 Progress report included results from the new locations, however the monitoring period was not sufficient to draw adequate conclusions, this report considers at least 12 months of monitoring data for most of the location monitored.

The results have been assessed using a bias adjustment figure from the spreadsheet downloaded from www.uwe.ac.uk/aqm/review/, the same source has also been used to correct previous years data sets for comparison.

(Diffusion tubes are supplied by Gradko. Preparation is 20% TEA in water. Exposure period is 4 or 5 weeks approximating to a calendar month.)

Figure 1: Location of diffusion tube monitoring locations

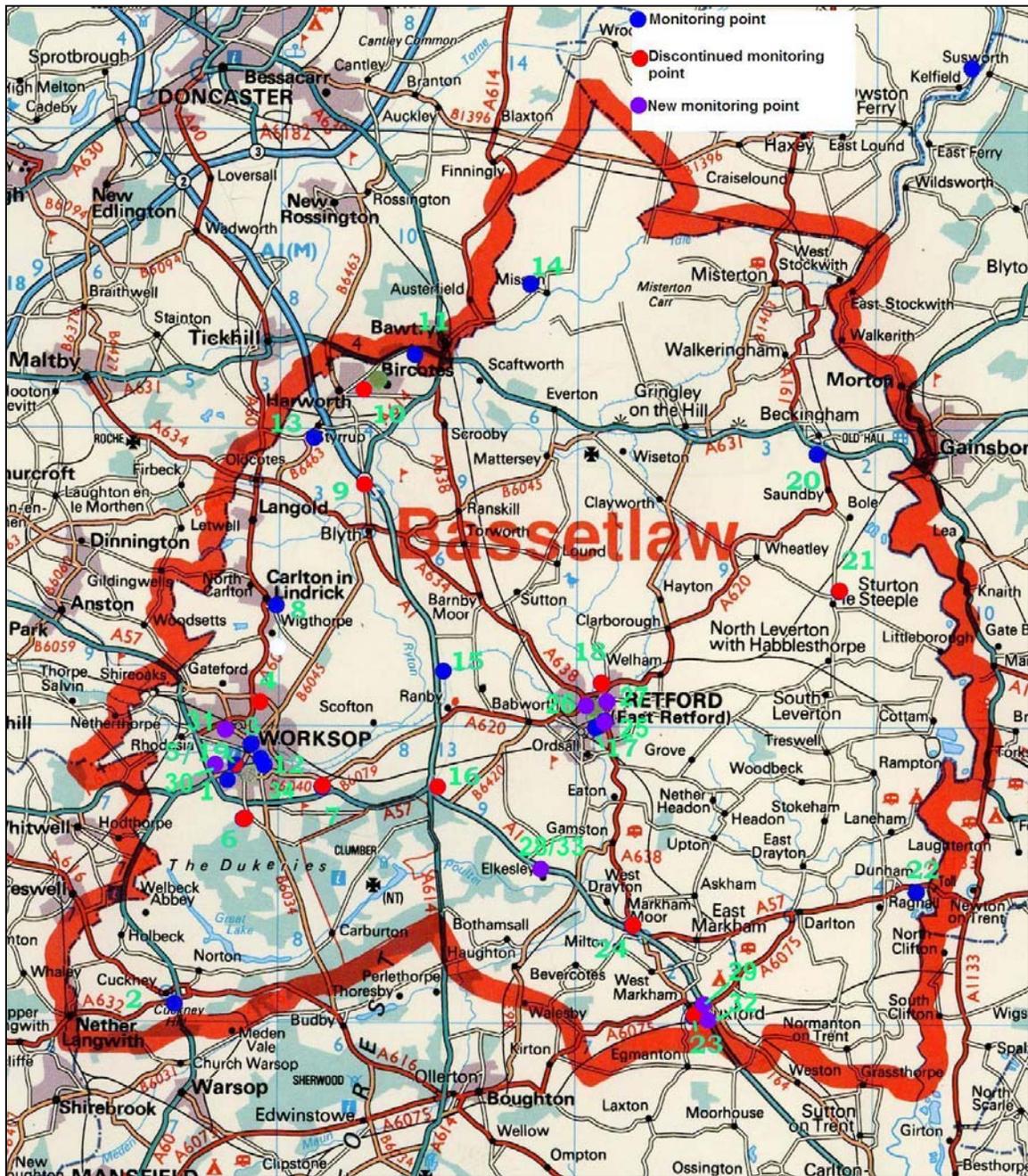


Table 3: Diffusion tube monitoring locations corrected annual averages ($\mu\text{g}/\text{m}^3 \text{NO}_2$)

Location Reference	2004 annual average	2005 annual average	2006 annual average	2007 annual average	Long term average
1 Saxon Close Worksop	24.4	26.5	23.9	25.2	25.0
2 Cuckney	23.5	27.7	25.1	24.8	25.3
3 Kings Head Carlton Road Worksop	36.0	38.7	36.0	34.9	36.4
4 Chatsworth Road Worksop	22.7	27.5	30.4	-	26.9
5 Newcastle Avenue, Worksop	38.0	40.4	38.1	37.4	38.5
6 Sparken Hill, Worksop	20.5	21.7	22.2	-	21.5
7 B6040 link to A57 Worksop	27.2	27.9	31.0	-	28.7
8 The Green, Carlton	25.4	27.1	27.0	26.4	26.5
9 A1 Roundabout, Blyth	51.4	56.3	60.5	Discontinued	
10 Scrooby Road, Harworth	29.2	30.6	29.7	Discontinued	
11 Plumtree Ind Est, Harworth	22.3	25.0	24.3	23.0	23.7
12 Watson Road (1), Worksop	39.9	44.3	45.1	42.3	42.9
13 Main Street, Styrrup	22.3	23.5	22.0	20.9	22.2
14 Misson	18.6	20.3	20.3	19.6	19.7
15 Blyth Road, Ranby	27.9	33.2	31.4	31.8	31.1
16 A1 Roundabout, Clumber	73.9	89.3	93.1	Discontinued	
17 Thomas Street, Retford	22.0	24.0	22.1	21.4	22.3
18 Moorgate, Retford	33.9	38.1	35.7	-	35.9
19 Newcastle Avenue, Worksop	26.5	33.2	32.3	Discontinued	
20 Bar Road South, Beckingham	18.7	21.3	22.2	19.1	20.3
21 Sturton Le Steeple	18.3	19.7	18.5	-	18.9
22 Dunham	34.3	36.0	37.4	35.0	35.7
23 Newark Road, Tuxford	25.5	28.8	26.1	Discontinued	
24 A1 Markham Moor Roundabout	53.5	64.9	67.8	Discontinued	
25 London Road junction, Retford	-	-	36.4	31.1	33.8
26 Hospital Road, Retford	-	-	39.8	39.5	39.7
27 Arlington Way / Grove Street, Retford	-	-	36.1	36.4	36.3
28 Elkesley A1 (lamp 93)	-	-	33.2	41.1	37.2
29 Tuxford, Lincoln Road A1 overpass	-	-	47.6	45.4	46.5
30 Beaufort Road, Worksop	-	-	30.0	29.8	29.9
31 Claylands Avenue, Worksop	-	-	37.3	33.8	35.6
32 Birch Court, Tuxford	-	-	25.8	32.0	28.9
33 Elkesley A1 (lamp 95)	-	-	23.8	30.1	26.9
34 Watson Road (2), Worksop	-	-	-	34.2	-

- NB.
- Locations 4, 6, 7, 9, 16, 18, 21, 23, 24 were discontinued during 2006 – results are not a full annual average.
 - 2006 Data for locations 25 – 33 only includes results from July 2006 – results are not a full annual average
 - Indicative month by month results for 2007 are given in Appendix 1.
 - 2007 Data for locations 34 only includes data from September 2007 – results are not a full annual average

The results from 2007 indicate that the air quality objective levels are being met at the majority of the monitoring locations, the two locations where the objective level is exceeded are discussed below.

Tuxford, Lincoln Road A1 overpass (29)

This is a relatively new monitoring location (from July 2006) aimed at determining the impact traffic using the A1. As shown in Figure 2 the diffusion tube is positioned on a lamppost near to the overpass of the A1 dual carriageway over Lincoln Road (the A6075, single carriageway). The tube is positioned approximately 8 metres from the A1 kerb and 2 metres from the kerb of the Lincoln Road, approximately 3m above groundlevel, but 3 metres below the level of the A1 road bridge (see photograph).

Figure 2 – Diffusion tube 29 location



The nearest receptors to this location are private houses. The nearest property is 23 metres from the tube location, the distance to the kerb from the receptor is 21 metres to the A1 and 15 metres to the A6075.

Daily traffic movements on the two roads, the A1 and A6075 are 32,000 and 4,600 respectively.

Initial results from the latter half of 2006 indicated elevated nitrogen dioxide levels, therefore an additional tube was been placed in the area (from November 2006) to provide further information (tube 32, Birch Court, Tuxford. The tube is positioned on a lamp post approximately 22 metres from the kerb of the A1. Daily traffic movements on the A1 are the same as above, traffic on the local road, a cul de sac, are not measured, but are considered negligible.

In addition two monitoring tubes are located adjacent to the A1 at Elkesley, a few miles to the north of the Tuxford tube. The tubes, numbers 29 and 33 are located 2 and 8 metres from the kerb respectively. Daily traffic movements at this location are recorded as 41,000 vehicles per day.

The exceedences at tube 29 (Lincoln Road, Tuxford) are considered to be an anomaly, possibly due to the location of the tube in relation to the A1 overpass. The location does not directly represent the nearest receptor, which is shown to be several metres further back from the kerb. Additionally results from tubes with a similar, and closer proximity to the A1 with comparable traffic flows are not showing an exceedence of the nitrogen dioxide objective. These results and the distance to the nearest receptor at the Lincoln Road site would suggest that the nitrogen dioxide objective is unlikely to be exceeded at the receptor.

In order to test this hypothesis it is proposed to site an additional tube to more accurately measure levels at the receptor.

Watson Road, Worksop (12)

Watson Road (B6040) is a busy, relatively narrow town centre street, in a short section of the road the two and three storey building are close to the carriageway, resulting in a street canyon effect. The monitored section of road carries some 10,300 daily vehicle movements.

A single tube (No 12) is located on a lamppost within this section of the road, very close to the façade of a commercial premises, approximately 2 metres from the kerb. The tube is located at the corner of the building, see Figure 3. The location represent the 'worst case' scenario, as this is the closest point of buildings to the kerb side, generally the buildings are set 2 or 3 metres further back.

Figure 3 – Watson Road, diffusion tube 12 location



The results from this location have indicated a potential exceedence of the air quality objective level for nitrogen dioxide in the previous two years, though it should be note that the levels for 2006 and 2007 are lower than that of 2005.

The area around diffusion tube 12 is characterised by commercial premises: shops, an undertaker and a dry cleaners, there is also a bus stop approximately 20 metres from the tube location. Traffic speeds are expected to be generally slow, less than 20mph average speeds.

In order to further investigate NO₂ levels in the area a further monitoring point has been established on Watson Road (Tube location 34) further to the south. This section of the street is characterised by residential properties, the properties are set back 4 metres from the kerb, however the monitoring point is a lamppost 2 metres from the kerb. Traffic speeds are expected to be slow, less than 20mph average speed and will frequently be affected by stationary traffic resulting from the nearby traffic light controlled junction. Initial results from this monitoring location would indicate that the air quality objective for nitrogen dioxide is being met at this location.

Average levels of NO₂ recorded at location 12 in 2007 were 42.3µg/m³, a downward trend from previous years. Initial results for location 34 were 34.2µg/m³. Traffic flows at the two locations are expected to be identical. Further diffusion tube monitoring at the two locations is proposed to assess whether the downward trend in NO₂ concentrations at location 12 continues.

2.7 Progress on PM₁₀ Emissions

National Air Quality Objective

50 ug/m³ as a 1-hour mean not to be exceeded more than 35 times a year

40 ug/m³ as an annual mean

Bassetlaw District Council does not undertake any monitoring for PM₁₀, therefore for the purposes of this progress report data obtained from nationally estimated background concentrations has been used.

The maximum estimated concentration for 2005, the most recent published figure, was 24.7 µg/m³. Using a year adjustment correction predicted background concentrations for 2008 and 2010 have been calculated:

- 2008 estimated maximum concentration = 23.15 µg/m³
- 2010 estimated maximum concentration = 22.19 µg/m³

Previous Updating and Screening Assessments have not identified any areas of the district in which the air quality objective for PM₁₀ is likely to be exceeded. For such an exceedence to occur in Bassetlaw there would have to be a significant local source. There have been no developments in the district that are likely to create a local source; no complaints have been received relating to dust emissions from existing industrial activities within the last year.

Based on a review of all available information it is considered highly unlikely that the air quality objective for PM₁₀ will be exceeded in the Bassetlaw district.

3 Conclusions

Bassetlaw District Council's Updating and Screening Assessment submitted in 2006 concluded that the air quality objectives were being met and there was a low likelihood of future exceedences.

This Progress Report has taken into account the major factors that may have an impact on local air quality. The conclusions for benzene, 1, 3-butadiene, carbon monoxide, PM10, sulphur dioxide and lead in the 2006 USA are still considered to be valid.

The conclusions for nitrogen dioxide have been reviewed following a correction of the 2005 monitoring results and the new data obtained in 2006 and 2007. In general the conclusions for NO₂ presented in the Updating and Screening Assessment remain valid – the air quality objective is being met at all locations within Bassetlaw, with the possible exception of an area of Worksop town centre that will require further monitoring and assessment.

4 Appendix

Appendix 1 – Diffusion tube locations

Tube No.	Site name	Grid reference
1	Saxton Close, Worksop	457831,378607
2	Cuckney	456490,371245
3	Carlton Road, Worksop	458564,379284
5	Newcastle Avenue, Worksop	458230,378909
8	The Green, Carton in Lindrick	459222,384834
11	Plumtree Industrial Estate, Harworth	463262,392582
12	Watson Road (1), Worksop	458569,379162
13	Main Street, Styrrup	460704,390538
14	Misson	468441,395148
15	Blyth Road, Ranby	464921,381197
17	Thomas Street, Retford	470555,380597
20	Beckingham	478336,389415
22	Dunham on Trent	481325,374504
25	London Road, Retford	470759,380698
26	Hospital Road, Retford	470095,381292
27	Arlington Way, Retford	470793,381106
28	Elkesley (1)	468518,375695
29	Tuxford, Lincoln Road	473779,371093
30	Beaufort Road, Worksop	457557,379081
31	Claylands Avenue, Worksop	457873,380581
32	Birch Court, Tuxford	473911,370840
33	Elkesley (2)	468509,375689
34	Watson Road (2), Worksop	458639,379009