



**Chesterfield Borough  
Council  
Air Quality Progress  
Report**

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## EXECUTIVE SUMMARY

Local air quality management was introduced in the Environment Act 1995 and subsequent regulations. It places a statutory duty on local authorities to review and assess the air quality in their area with respect to health-based Government objectives for seven major air pollutants.

The second phase of this review and assessment was initiated in 2003 with an Update & Screening report. The findings for Chesterfield were that two of the seven air pollutants, namely Nitrogen Dioxide and PM<sub>10</sub>, were at risk of exceeding these health-based objectives. This then led to a more detailed assessment of these pollutants being conducted in 2004. The results of this assessment revealed that although these pollutants should remain under close review, due to the marginality of the results and the large confidence error associated with the data, it was recommended that no immediate action be taken. Instead it was advised that improvements in air quality monitoring across the Borough should be implemented and to then review these pollutants in subsequent reports.

This report therefore constitutes the Air Quality Review and Assessment Progress Report for Chesterfield Borough Council for 2005. It details all new monitoring data across the Borough from both Nitrogen Dioxide diffusion tubes and the air quality automatic monitoring station and makes predictions for future levels of pollution in the Borough. It also considers any new major developments that may impact on air quality and evaluates the current and longer-term strategies for local air quality management at Chesterfield.

The results of the air quality monitoring show that the objectives for Sulphur Dioxide and PM<sub>10</sub> for 2004 and 2005 are unlikely to be exceeded. However it has been predicted that there may be a marginal breach of the PM<sub>10</sub> objective for 2010 at the automatic monitoring site. The majority of the monitoring locations within Chesterfield show that the objectives for 2005 and 2010 for Nitrogen Dioxide are unlikely to be exceeded. There is one location that may potentially marginally exceed the objective for Nitrogen Dioxide for 2005 and 2010 but the data capture at this location is not of sufficient accuracy for immediate action to be taken. It has been recommended that an automatic monitoring station be relocated from an urban background site to this area in order for a more thorough assessment of air quality to be made.

Since the closure of the coal pits and demise of the associated heavy industry within Chesterfield there has been a legacy of large areas of derelict land within the Borough. However recently there has been a growing interest in developing these areas. The potential development of these major sites has implications with regards air quality from new transport movements in the area and also the end-use of these sites. As a consequence a Major Development Sites Group has been appointed which meet on a regular basis and closely review these developments to assess their air quality impacts as well as a range of other issues. In addition the Local Plan contains policies to ensure that air quality is a material consideration in all planning applications.

As a consequence of this report a range of recommendations have been formulated which will be implemented over the course of 2005. These will ensure that data quality and QA/QC procedures are improved and current and longer-term strategies in air quality management in the Borough is reviewed and updated.

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## 1.0 Introduction

Local air quality management was introduced in the Environment Act 1995 and subsequent regulations. It requires a Local Authority to regularly review and assess the air quality in their area with respect to health-based air quality objectives for seven of the main air pollutants. Should any of these air quality objectives not be met by a required date, the Local Authority must declare an Air Quality Management Area and develop an action plan to address the air quality issues. The air quality objectives are listed below:

### 1.1 Air Quality Objectives

**Table 1: Summary of objectives in the Air Quality Regulations 2000 and (Amendment) Regulations 2002 applicable to Chesterfield Borough Council.**

| Pollutant                                 | Concentration   | Measured as                       | Date to be achieved by |
|---|---|-----------------------------------|------------------------|
| <b>Benzene</b>                            | 16.25µgm <sup>3</sup> (5ppb)  | Running annual mean               | 31/12/2003             |
|   | 5.0 µgm <sup>3</sup> (1.5ppb)   | Annual Mean                       | 21/12/2010             |
| <b>1,3-Butadiene</b>                      | 2.25µgm <sup>3</sup> (1ppb)   | Running annual mean               | 31/12/2003             |
| <b>Carbon Monoxide</b>                    | 10.0 mgm <sup>3</sup> (8.6ppm)  | Maximum daily running 8-hour mean | 31/12/2003             |
| <b>Lead</b>                               | 0.5 µgm <sup>3</sup>  | Annual mean                       | 31/12/2004             |
|   | 0.25µgm <sup>3</sup>  | Annual mean                       | 31/12/2008             |
| <b>Nitrogen Dioxide* (NO<sub>2</sub>)</b> | 200µgm <sup>3</sup> (105ppb), not to be exceeded more than 18 times a year  | 1 hour mean                       | 31/12/2005             |
|   | 40µgm <sup>3</sup> (21ppb)  | Annual mean                       | 31/12/2005             |
| <b>Particles (PM<sub>10</sub>)</b>        | 50µgm <sup>3</sup> not to be exceeded more than 35 times a year   | 24-hour mean                      | 31/12/2004             |
|   | 40µgm <sup>3</sup>  | Annual mean                       | 31/12/2004             |
| <b>Sulphur Dioxide (SO<sub>2</sub>)</b>   | 266µgm <sup>3</sup> (100ppb), not to be exceeded more than 35 times a year  | 15 minute mean                    | 31/12/2005             |
|   | 350µgm <sup>3</sup> (132ppb), not to be exceeded more than 24 times a year  | 1 hour mean                       | 31/12/2004             |
|   | 125µgm <sup>3</sup> (47ppb), not to be exceeded more than 3 times a year  | 24 hour mean                      | 31/12/2004             |
|   | ppm = parts per million; ppb = parts per billion; µg/m <sup>3</sup> = micrograms per cubic metre<br>*The objectives for nitrogen dioxide are provisional **Assuming NO <sub>x</sub> is taken as NO <sub>2</sub> |                                   |                        |

The first phase of the second round of review and assessment of air quality was completed in 2003. This involved an update and screening of all the air pollutants identified in the Air Quality Regulations and listed in Table 1 above. Where a Local Authority identified one or more of the objectives at risk of exceedence they then had to proceed to a Detailed Assessment in 2004, with a Progress Report required from all Local Authorities in 2005. In order to provide a little background to this annual Progress Report 2005, a summary of the findings of Chesterfields Update & Screening 2003 and Detailed Assessment in 2004 are summarised below:

## 1.2 Summary of Update and Screening Assessment 2003

A brief summary of Chesterfields Air Quality Update and Screening Assessment for the Borough in 2003 is as follows:

- **Carbon Dioxide:** Local data, national background data and traffic flow data all predict that the 2003 objective of  $10\mu\text{g}\text{m}^3$  will be met and a detailed review and assessment was not required.
- **Benzene:** Due to the lack of any local relevant industrial sources, and modest traffic flow, the 2010 and 2003 objectives were expected to be met.
- **1,3-Butadiene:** There are no new processes that give rise to emissions of 1,3-Butadiene which would give rise to a risk that the objective will be exceeded. Background data gives a level of  $0.28\mu\text{g}\text{m}^3$  as the maximum concentration in the district, set against the  $10\mu\text{g}\text{m}^3$  target. Additionally the DMRB model predicts the highest concentration which may be experienced to be  $0.73\mu\text{g}\text{m}^3$  at the busiest traffic location. There was no risk of the objective being exceeded.
- **Lead:** The previous stage 1,2 and 3 reviews concluded that there was no risk of the objective for lead being exceeded.
- **Nitrogen Dioxide (NO<sub>2</sub>):** *The updating and screening assessment of nitrogen dioxide included a more detailed assessment of traffic sources.* Nitrogen dioxide tube monitoring indicated that emission levels had not fallen as quickly as predicted. More detailed traffic data was also provided, allowing more comprehensive modelling with DMRB, and also from the modelling, 7 junctions

and 2 main roads were judged as being at *possible risk of exceeding the objective*.

- **Sulphur Dioxide (SO<sub>2</sub>):** The 2003 USA did not identify a risk of sulphur dioxide objectives being exceeded. Solid fuel burning can cause elevated levels but the density of solid fuel burning properties fall short of the need to undertake a detailed review and assessment. The Borough Council's aggressive smoke control policies of the 1980's (which resulted in the whole Borough being smoke controlled) may account for this achievement.
- **Particulate PM<sub>10</sub>:** The only risk of exceeding the Particulate PM<sub>10</sub> 2004 objective was identified as from traffic sources. *A detailed assessment was recommended, as being required to validate the modelling and further quantify the risk.*

### **1.3 Conclusions and Recommendations of Detailed Assessment 2004**

Following the 2003 Update and Screening Assessment, Chesterfield went on to conduct a Detailed Assessment in 2004 concentrating on the two pollutants which were at risk of breaching the air quality objectives, namely Nitrogen Dioxide and PM<sub>10</sub>. The results of this assessment are summarised below:

- **Nitrogen Dioxide (NO<sub>2</sub>)**

*From the measured and predicted nitrogen dioxide concentrations it is concluded that there is a risk of exceedences of the air quality objective being breached at several locations in the Borough.*

This conclusion is however reached using inadequate data with high level uncertainty. It is recommended that further monitoring is undertaken and reported in a subsequent report to clarify the position.

Detailed spatial modelling is also planned in the future.

Although indicative, it is not felt that this evidence is strong enough to determine with certainty that the 2004 objective will not be met, at these relevant locations. The information provided from future data sets supported by detailed modelling would provide stronger evidence on which to make a determination.

▪ **PM<sub>10</sub>**

The results of monitoring and the modelling again indicate that there is a risk of a possible exceedence of the objective.

Based on the information available, 11 days of exceedences of the 50µgm<sup>3</sup> objective were recorded during the monitoring period.

The modelled exposure is compared to the monitored data where the monitoring site is situated. The ratio between modelled and monitored data will then be applied to the location closest to the road.

Both the modelling and the monitoring show a potential breach of the PM<sub>10</sub> objective close to the residential bungalows at Whittington Moor.

DMRB predicts that there will be 61 days of pollution levels above 50µgm<sup>3</sup>, when the standard allows for 35 days. This indicates a possible breach of the objective at this location.

At the monitoring location the extrapolated annual average was 28.5µgm<sup>3</sup>. This is below the objective. There is a large discrepancy between the modelled prediction of 9 days above 50µgm<sup>3</sup> and the extrapolated monitored prediction of 39 days, above the 50µgm<sup>3</sup> standard. In this instance, the monitored results show a borderline breach of the standard.

Consequently, it has been concluded from the developments from these conclusions to determine that the declaration of an air quality management area (AQMA) should not be pursued at present because of:

- (i) The marginality of the results and the large confidence error would require further data.
- (ii) QC/QA analysis of the data.
- (iii) Consideration of whether unusual climatic conditions in 2003 were influential in the monitoring figures over this period.



It is therefore recommended that these factors be addressed further before coming to a definitive conclusion, and making a decision. This will be the subject of a more detailed report in the future.

The recommendations of the 2004 Detailed Assessment will be addressed over the course of 2005 and the associated actions are highlighted in Section 8 - Additional Information.

#### **1.4 Role of Progress Reports**

The role of the Progress Report is to encourage continuity of the local air quality management process in the years where a more Detailed Assessment of local air quality is not required. It provides an opportunity to report on progress implementing air quality action plans/strategies or recommendations from previous air quality assessments. It also presents a convenient means to formally evaluate new monitoring data, to identify new developments or new industrial processes that may impact on air quality and to evaluate current and longer-term strategies for local air quality management.

This report can then be used to communicate local air quality information to Members and the Public, assist other council departments such as Transport and Land-Use Planning in their policy and decision making processes, and can help external organisations such as Consultancies and Developers in producing Environmental Statements and related reports.

This document forms the Progress Report for Chesterfield Borough Council. In writing this report, the Council has had regard to the Governments published guidance in Progress Report Guidance LAQM.PRG(03). It details new monitoring data for 2004 and also makes predictions of future levels of Nitrogen Dioxide (NO<sub>2</sub>) and PM<sub>10</sub> in the Borough. It also reviews all new developments and industrial processes within the Borough that could impact on air quality and any new policies and strategies that have been developed since the 2003 Update and Screening Assessment.

Although this report should concentrate on progress in 2004, when reviewing new developments in the Borough, it was thought appropriate to discuss a major

development which received outline planning permission in early 2005, rather than waiting until the next round of Review and Assessment scheduled for 2006.

## **2.0 Air Quality Monitoring Sites**

Over the course of 2004, Chesterfield Borough Council monitored Nitrogen Dioxide (NO<sub>2</sub>), Sulphur Dioxide (SO<sub>2</sub>) and PM<sub>10</sub> across the Borough. These three pollutants were measured using automatic analysers housed in air quality monitoring stations and further NO<sub>2</sub> and SO<sub>2</sub> monitoring was achieved using passive diffusion tubes distributed across the Borough. Chesterfield Borough Council did not monitor the remaining pollutants detailed in Table 1 during 2004 as they were identified in the Update & Screening 2003 Assessment as pollutants at 'no risk of exceedence of their air quality objectives'.

### **2.1 Automatic Monitoring sites**

There are two mobile automatic monitoring stations in Chesterfield, both monitoring NO<sub>2</sub>, SO<sub>2</sub> and PM<sub>10</sub>. Nitrogen Dioxide is monitored using a Monitor Labs chemiluminescence analyser, Sulphur Dioxide using a Monitor Labs UV Fluorescence analyser and PM<sub>10</sub> using a R&P TEOM analyser. The analysers are all housed in secure air-conditioned cabins.

Both stations undergo a routine maintenance service every six months by Casella ETI and are also audited on a six monthly basis by Netcen. The stations are visited every two weeks by a Local Site Operator, who performs calibrations and equipment checks in accordance with the Site Operators Manual AEAT/ENV/R1595. The results are submitted to Netcen for verification after each calibration.

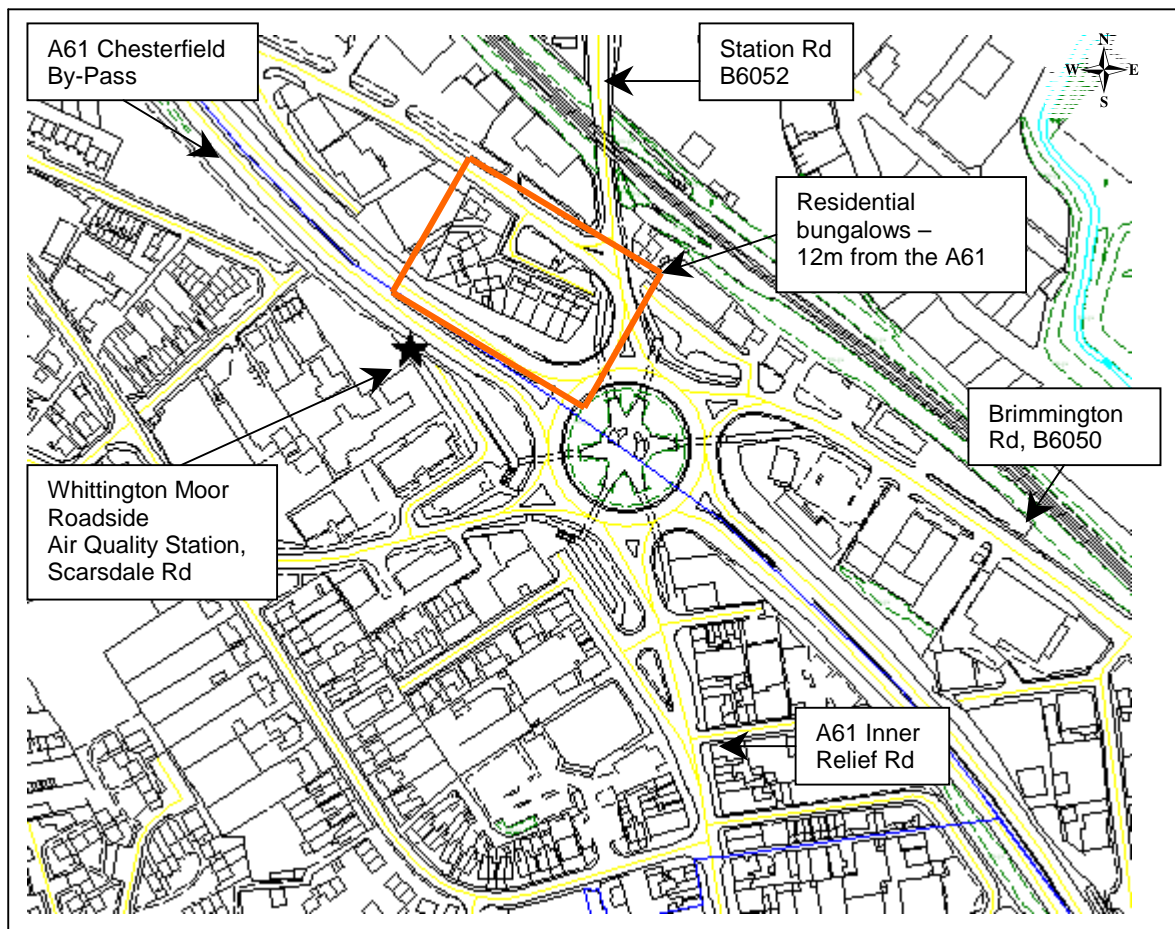
The data is downloaded by GSM modem from both stations every 24 hours directly to a standalone PC in the Environmental Health Department at Chesterfield Borough Council. The data is also downloaded on a daily basis by Netcen, who then validate and ratify the raw data and provide the ratified reports on a bi-annual basis to Chesterfield Borough Council.

### **Whittington Moor Roadside Air Quality Station**

One of the mobile air quality stations was positioned at a roadside location adjacent to St. Johns Road in Whittington, Northwest of Chesterfield, approximately 40m from the busy A61. The air quality was monitored at that location from 1<sup>st</sup> January 2004 to 26<sup>th</sup> February 2004.

It was then re-located to its current position and was commissioned on the 14<sup>th</sup> April 2004. This location is much closer to the A61, being within 1m of the kerb. This is therefore a kerbside site, Northwest of Chesterfield, adjacent to Scarsdale Road and opposite Gilbert-Heathcote Primary School. It is also within 50m of the busy roundabout linking the A61, B6050 and the B6057. The location of the Whittington Moor kerbside air quality station and the nearest sensitive receptors to the A61, namely residential bungalows highlighted in the orange box, can be found on Figure 1 below. The property which is nearest the A61 is approximately 12m from the kerb.

**Figure1: Location of Whittington Moor Roadside air quality monitoring station.**



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According to the Governments published Technical Guidance LAQM.TG(03), the minimum monitoring period for which data can be for Review and Assessment purposes is three consecutive months, therefore the data from its position at St.

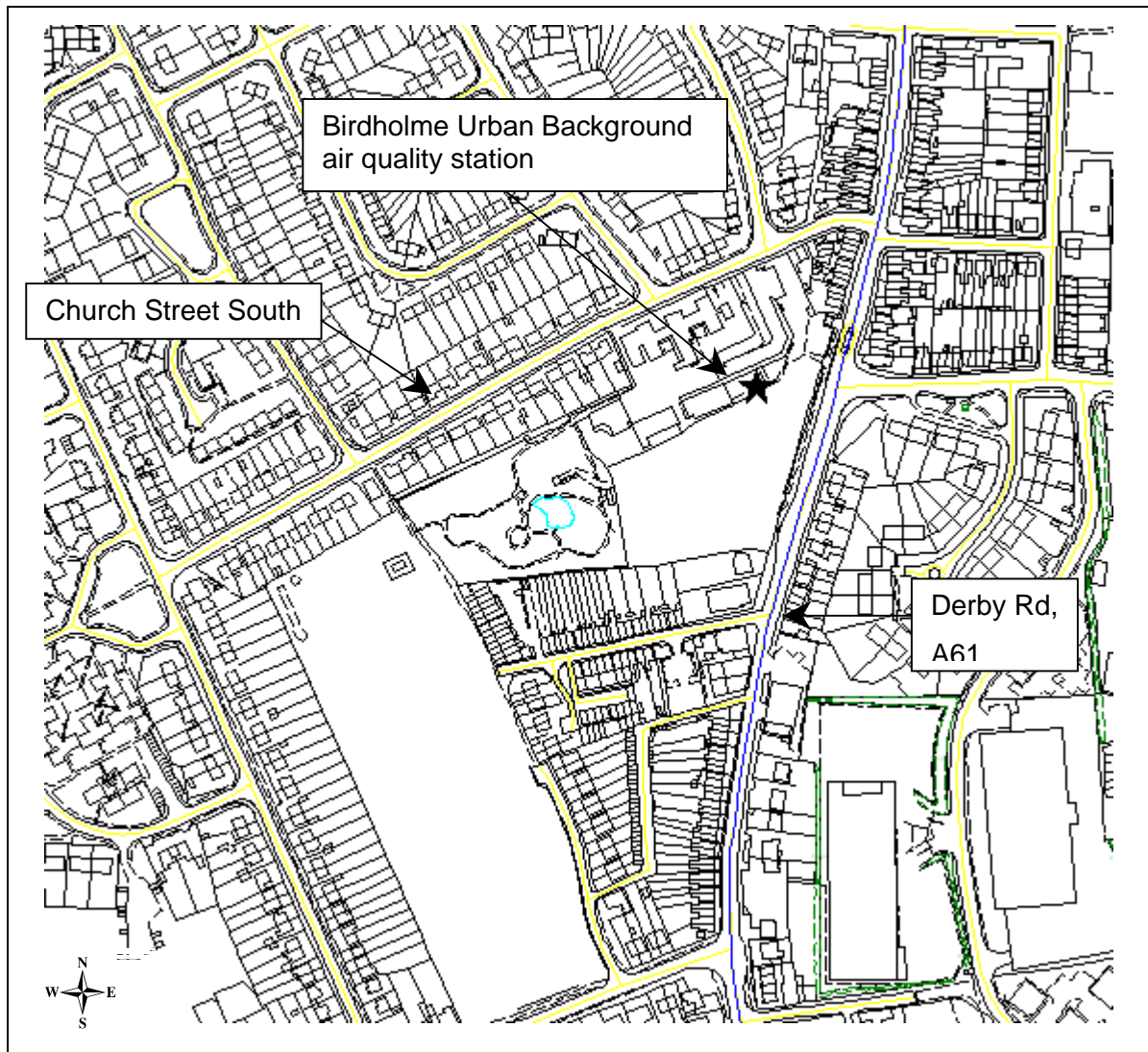
Johns Road during January and February 2004 cannot be used to extrapolate levels at that location for the whole of 2004. However the air quality station has been at its current location, adjacent to the A61, since April 2004. This data therefore can be used and can be extrapolated to give an annual average. This is discussed in more detail in the proceeding Section Three – New Monitoring Data.

### **Birdholme School Urban Background Air Quality Station**

The second mobile air quality station has recently been located at Birdholme Primary School and was commissioned in October 2004. This site monitored air quality over a two-month period from 30<sup>th</sup> October to 31<sup>st</sup> December 2004.

It is positioned 50m from the nearest busiest road, namely Derby Road (A61) to the south of Chesterfield and is an urban background site representative of residential properties set-back from busy roads but where the predominant source of pollutants in the area is generated by traffic. This school in particular was chosen due to an increasing number of complaints of asthma amongst the children that attended the school. A detailed map showing the location of the Birdholme air quality station can be found on Figure 2 below.

**Figure 2: Location of Birdholme Urban Background air quality monitoring station.**



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As discussed earlier, according to the Governments published Technical Guidance LAQM.TG(03) the minimum monitoring period for which the data can be used for Review and Assessment is three consecutive months therefore unfortunately the data from this site cannot be included in this report. However it will provide invaluable data, which will be included in the next round of Update and Screening scheduled for 2006.

## 2.2 Nitrogen Dioxide Diffusion Tubes

There are a total of 25 diffusion tubes distributed across the Borough, each being exposed for a four-week period. However, unfortunately over the course of 2004 a substantial number of diffusion tubes were lost, this has been attributed to theft. According to LAQM.TG(03), the minimum monitoring period using diffusion tubes should encompass at least three summer and three winter months consecutively where comparison with an annual mean objective for NO<sub>2</sub> is required. Of the 25 diffusion tubes distributed across the Borough, only 15 diffusion tubes fulfilled this criteria in 2004. A table listing the diffusion tube locations and the months successfully exposed and returned to the South Yorkshire Laboratories for analysis can be found in Appendix 1.

The diffusion tubes results that cannot be used for comparison with the annual mean are briefly discussed as follows. Three tubes were collocated at the Whittington Moor Roadside air quality station but due to tube-loss, culminated in only four results in nine months of tube exposure. Five diffusion tubes were newly located in the Borough in September 2004 but unfortunately only one location, namely the Hasland by-pass, has a complete four-month exposure result. At two locations, Derby Road; Lincoln St and Chesterfield Road; Brimington, although three consecutive winter months of diffusion tube data were collected, both locations suffered tube-loss during the summer months and so cannot be used for comparison with the annual mean objective for NO<sub>2</sub>.

The Table in Appendix 1 also details the monthly average bias adjusted NO<sub>2</sub> results for each tube over the course of 2004. Further details regarding the bias adjustment used and detailed discussion of the results can be found in the proceeding Section Three – New Monitoring Data.

The diffusion tubes are supplied and analysed by South Yorkshire Laboratories. They purchase the tubes uncoated from Gradko, treat with 50% acetone and 50% triethanolamine, allow to evaporate and then mount into tubes. Analysis of the tubes is by colourimetric determination. South Yorkshire laboratories are members of WASP, InterLaboratory Field Comparison and Standard Solution Checks associated with NO<sub>2</sub> monitoring with satisfactory results. It is also the intention of South Yorkshire laboratory to obtain UKAS accreditation for its NO<sub>2</sub> tube analysis in 2006.

Travel blanks are not used. They retain co-prepared samplers to determine the preparation and storage blank concentrations for each batch prepared and automatically correct results for this blank. This system was adopted due to elevated travel blanks consistently being associated with inappropriate handling of the diffusion tubes and therefore the elevated values were rarely used to correct their associated diffusion tube results. This new system of co-prepared samplers was therefore agreed with all the users of South Yorkshire Laboratories in February 2004.

### **2.3 Sulphur Dioxide (SO<sub>2</sub>) Diffusion Tubes**

In addition to the automatic monitoring station, Chesterfield Borough Council monitored SO<sub>2</sub> in 2004 using 10 diffusion tubes distributed across the Borough. However SO<sub>2</sub> diffusion tubes are unable to detect short-term increases in SO<sub>2</sub> concentration and according to LAQM.TG(03) are therefore not of sufficient accuracy to be used for Review and Assessment purposes. The results of these diffusion tubes therefore are not included in this report.



### 3.0 New Monitoring Data

The following section details the new monitoring data for 2004, including the results from the automatic monitoring station at Whittington Moor and the NO<sub>2</sub> diffusion tubes. It will also make projections of future concentrations of PM<sub>10</sub> and NO<sub>2</sub> in 2005 and 2010. Unfortunately trends in the data cannot be discussed in this report as this requires at least five years of consecutive data and this is not available for either the automatic monitoring station nor the NO<sub>2</sub> diffusion tubes. It is anticipated trends in local air pollution will be discussed in future reports, as the data becomes available.

#### 3.1 Nitrogen Dioxide

##### Diffusion Tubes

According to LAQM.TG(03) a recent report revealed that the results from diffusion tube collocation studies varied considerably between the different laboratories responsible for analysing the tubes. It is recommended therefore that this bias should be taken into account when using diffusion tube data.

Ideally each local authority should be able to calculate their own bias correction factor by collocating NO<sub>2</sub> diffusion tubes with a chemiluminescence analyser for a period of at least nine months. However, in the case of Chesterfield, since the collocation study occurred for nine months with only four months of diffusion tube data it was thought appropriate to use a correction factor provided by the Air Quality Consultants which is available via the Air Quality Review & Assessment website at <http://www.uwe.ac.uk/aqm/review>. According to the database provided, the correction factor to use for the laboratory that analyses Chesterfields NO<sub>2</sub> diffusion tubes is 0.77. Table 2 below shows the corrected annual mean for each diffusion tube location for 2004. Further details regarding the correction factor can be found in the calculation pages of Appendix 2.

The Table in Appendix 1 shows the corrected value per month for all the NO<sub>2</sub> diffusion tube locations. It also shows the period of data capture for each location and as discussed earlier in Section 2, there was considerable loss of diffusion tubes in 2004 attributed to theft. Therefore those sites that do not have sufficient data, less than three months of consecutive data in both summer and winter months, are highlighted in the table and cannot be used to compare with annual mean objective.

Those locations that do have the minimum period of data capture can be used but must be extrapolated to provide an annual mean. According the LAQM.TG(03) Box 6.5, this requires calculation of a correction factor based on data provided by two to four nearby long-term air quality stations, which are preferably part of the national network. The air quality stations which meet these criteria and which have been used to extrapolate Chesterfield's data is Sheffield Tinsley and Sheffield Centre AURN air quality stations. The extrapolated NO<sub>2</sub> annual means for those diffusion tube locations in Chesterfield which met the minimum monitoring criteria in 2004 can be found in Table 2 below.

**Table 2: Annual mean NO<sub>2</sub> diffusion tube results for all tube locations in Chesterfield.**

| Tube Location               | Site Type  | Annual Mean 2004 NO <sub>2</sub> (µgm <sup>3</sup> ) | Annual Mean 2005 NO <sub>2</sub> (µgm <sup>3</sup> ) | Annual Mean 2010 NO <sub>2</sub> (µgm <sup>3</sup> ) |
|-----------------------------|------------|--|--|--|
| Staveley High Street        | Roadside   | 21.4   | 20.9   | 17.1   |
| Travel Lodge                | Roadside   | 36.1   | 35.2   | 28.8   |
| St Augustines Rain Pipe     | Roadside   | 23.2   | 22.6   | 18.5   |
| Derby Rd; St Augustines     | Kerbside   | 38.1   | 37.1   | 30.4   |
| Station Road; Barrow Hill   | Kerbside   | 29.8   | 29.0   | 23.8   |
| Staveley Stables            | Background | 18.4   | 18.0   | 15.4   |
| Chesterfield Rd; Staveley   | Roadside   | 33.7   | 30.2   | 24.7   |
| Middlecroft Road            | Roadside   | 18.2   | 17.8   | 14.6   |
| Triple Exposure; Brimington | Roadside   | 23.3   | 22.7   | 18.6   |
|                             |            | 23.7   | 23.1   | 18.9   |
|                             |            | 22.5   | 21.9   | 18.0   |
| Jawbones Hill               | Kerbside   | 37.7   | 36.7   | 30.5   |
| St Augustines Rd            | Kerbside   | 25.3   | 24.6   | 21.1   |
| Bell House Lane             | Roadside   | 25.4   | 24.8   | 20.5   |
| St Augustines Church        | Roadside   | 19.4   | 18.9   | 15.6   |

Table 2 also gives the predicted annual means at each diffusion tube location for 2005 and 2010 using the technique detailed in LAQM.TG(03) and the adjustment

factors in boxes 6.6 and 6.7 of this Guidance. The calculations can be found in Appendix 2.

It can be seen from the table above that none of the above locations are at risk of breaching the annual mean objective for NO<sub>2</sub> for 2005 and 2010.

As discussed earlier, those sites that do not fit the minimum monitoring period criteria cannot be used to compare with annual mean objective for NO<sub>2</sub>. However the data that was collected can be used to give an indication of the levels of NO<sub>2</sub> at that location and would serve as a useful early warning sign of any potential areas of exceedence which may require careful monitoring in the future. The period means for each location were therefore calculated where possible and are listed in Table 3 below.

**Table 3: Period means for diffusion tubes that did not meet the minimum monitoring period criteria.**

| Tube Location                     | Site Type | Period Mean 2004 NO <sub>2</sub> (µg m <sup>3</sup> ) | Data Capture 2004 (4-week period) |
|-----------------------------------|-----------|---|-----------------------------------|
| Derby Rd; Lincoln St              | Kerbside  | 47.2  | 10.0                              |
| Chesterfield Rd; Brimmington      | Kerbside  | 33.5  | 10.0                              |
| Triple Exposure; Whittington Moor | Roadside  | 21.8  | 4.0                               |
|                                   |           | 22.4  | 4.0                               |
|                                   |           | 20.2  | 4.0                               |
| Hasland By-Pass                   | Roadside  | 23.5  | 4.0                               |
| Queen Mary Rd                     | Kerbside  | 21.6  | 3.0                               |
| Walton Rd                         | Roadside  | 14.4  | 3.0                               |

As can be seen in Table 3 there appears to be one site which may represent an area of potential exceedence namely Derby Road; Lincoln St showing a period mean 47.2µgm<sup>3</sup>. This diffusion tube is located on a lamp post within 1m of the kerb of the A61 towards the south of Chesterfield. The nearest sensitive receptors at this location are residential properties, which are distanced 6m from the road. Guidance provided by the Review and Assessment website give correction factors for kerbside mounted diffusion tubes so they represent the concentration at the relevant receptor façade. The correction factors are given in Table 4 below.

Since the nearest sensitive receptor is located 6m from the kerb, the annual mean should be multiplied by an adjustment factor of 0.9. The adjusted figure is therefore  $42.5\mu\text{gm}^3$  which shows a potential marginal exceedence. It must be noted however that this is only an indication of the levels at that location, it does not take into account seasonal variability, cannot be used to calculate predicted future concentrations and therefore cannot be compared to the annual mean objective. In light of the potential concentrations of  $\text{NO}_2$  at that location, the possibility of relocating an automatic monitoring site from an urban background site to a location near the Derby Road site, will be investigated. This would allow a more thorough assessment of the air quality in that area and would provide the necessary confidence for further action to be taken if deemed necessary.

**Table 4: Adjustment factors to calculate façade concentrations from kerbside tube results.**

| Distance from Kerb (m) | Adjustment Factor |
|------------------------|-------------------|
| 2-5                    | 0.95              |
| 5-10                   | 0.9               |
| 10-20                  | 0.75              |

There are a total of six other kerbside diffusion tube locations which should also be adjusted to reflect the concentration at the nearest building façade, using the factors detailed above. Table 5 below shows these adjusted annual means for these locations.

**Table 5: Annual mean  $\text{NO}_2$  diffusion tube results adjusted for kerbside locations.**

| Tube Location               | Site Type | Distance to Façade (m) | Adjusted Annual Mean 2004 $\text{NO}_2$ ( $\mu\text{gm}^3$ ) | Adjusted Annual Mean 2005 $\text{NO}_2$ ( $\mu\text{gm}^3$ ) | Adjusted Annual Mean 2010 $\text{NO}_2$ ( $\mu\text{gm}^3$ ) |
|-----------------------------|-----------|------------------------|--|--|--|
| Derby Road; St Augustines   | Kerbside  | 6                      | 34.3   | 33.4   | 27.4   |
| Station Road; Barrow Hill   | Kerbside  | 3                      | 28.3   | 27.6   | 22.6   |
| Jawbones Hill               | Kerbside  | 6                      | 33.9   | 33.0   | 27.5   |
| St Augustines Road          | Kerbside  | 6                      | 22.8   | 22.1   | 19.0   |
| Queen Mary Rd               | Kerbside  | 10                     | 19.4   | Null   | Null   |
| Chesterfield Rd; Brimington | Kerbside  | 10                     | 13.0   | Null   | Null   |

Having adjusted the results to represent the concentrations that would be present at the façade of the nearest sensitive receptors the NO<sub>2</sub> annual mean objective is not at risk of exceedence for any of these locations.

It is recommended that the diffusion tubes currently at kerbside locations be relocated to sites which are more representative of the levels that the public would sustain for the relevant exposure period as detailed in the air quality objectives. In addition care will be taken to select more secure locations for the diffusion tubes in order to reduce the risk of loss due to theft. These actions should allow for more reliable/indicative data to be produced in the future. Should the diffusion tube network be reviewed and relocated (Please refer to Section 8 – Conclusions and Recommendations) care will be taken to adhere to the guidance provided in LAQM.TG(03) Appendix1.

### Automatic Monitoring Data

The data provided by the Whittington Moor Roadside site is for a period of eight and a half months, from 14<sup>th</sup> April 2004 to 31<sup>st</sup> December 2004. The data capture during this monitoring period was 82%. Since this is less than a 12-month monitoring period and according to Progress Report Guidance LAQM.PRG(03), it is appropriate to report the average hourly NO<sub>2</sub> concentration as a percentile. The 99.8<sup>th</sup> percentile is appropriate for the 1-hour NO<sub>2</sub> air quality objective and the result is listed in Table 6 below. Guidance on calculating percentiles is available in LAQM.TG(03) page A1-39. Table 6 also provides the extrapolated annual mean for 2004 and the predicted concentrations for 2005 and 2010. The calculations can be found in Appendix 2.

**Table 6: Hourly and Annual mean NO<sub>2</sub> concentrations for Whittington Moor Roadside automatic air quality monitoring station.**

| Monitoring Period   | 99.8 <sup>th</sup> Percentile (µgm <sup>3</sup> ) | Period Mean 2004 NO <sub>2</sub> (µgm <sup>3</sup> ) | Annual Mean 2004 NO <sub>2</sub> (µgm <sup>3</sup> ) | Annual Mean 2005 NO <sub>2</sub> (µgm <sup>3</sup> ) | Annual Mean 2010 NO <sub>2</sub> (µgm <sup>3</sup> ) |
|---------------------|---|--|--|--|--|
| 14/04/04 – 31/12/04 | 111   | 26.8   | 27.5   | 26.8   | 35.6   |

The annual air quality objective for NO<sub>2</sub> for 2005 and 2010 is 40µgm<sup>3</sup>. The annual mean at Whittington Moor projected to 2005 and 2010 are 26.8µgm<sup>3</sup> and 35.6µgm<sup>3</sup> respectively.

Therefore **THE ANNUAL AIR QUALITY OBJECTIVE FOR NO<sub>2</sub> IS EXPECTED TO BE MET.**

The hourly air quality objective for NO<sub>2</sub> for 2005 and 2010 is 200µgm<sup>3</sup> with 18 exceedences. This equates to the 99.8th percentile, which for 2004 at Whittington Moor roadside site is 111µgm<sup>3</sup>, which is well below the objective. Therefore it is thought there is little risk of future NO<sub>2</sub> hourly air quality objectives being exceeded.

Therefore **THE HOURLY AIR QUALITY OBJECTIVE FOR NO<sub>2</sub> IS EXPECTED TO BE MET.**

### 3.2 Sulphur Dioxide

Sulphur Dioxide was monitored over the course of 2004 data using Monitor Labs UV Fluorescence analyser installed at the Whittington Moor Roadside site for a period of eight and a half months.

According to the Guidance LAQM.TG(03), ideally monitoring of SO<sub>2</sub> should be carried out for a period of one year, particularly for the assessment of the 15-min mean objective. However a shorter period may be sufficient to demonstrate that the risk of exceedence is unlikely. As discussed earlier and according to Progress Report Guidance LAQM.PRG(03), since there is less than 12 months monitoring data it is appropriate to present the results as percentiles. The 99.9<sup>th</sup> percentile for the 15-min SO<sub>2</sub>, the 99.7<sup>th</sup> percentile for the 1-hour SO<sub>2</sub> and the 99.2<sup>nd</sup> percentile for 24-hour SO<sub>2</sub> air quality objective. These results are listed in Table 7 below. Guidance on calculating percentiles is available in LAQM.TG(03) page A1-39.

**Table 7: 15-minute, 1-hour and 24-hour mean SO<sub>2</sub> concentrations at Whittington Moor Roadside air quality monitoring station.**

| Monitoring Period   | Data Capture | 99.9 <sup>th</sup> Percentile: SO <sub>2</sub> 15-min mean (µgm <sup>3</sup> ) | 99.7 <sup>th</sup> Percentile: SO <sub>2</sub> 1-hour mean (µgm <sup>3</sup> ) | 99.2 <sup>nd</sup> Percentile: SO <sub>2</sub> 24-hour mean (µgm <sup>3</sup> ) |
|---------------------|--------------|--|--|---|
| 14/04/04 – 31/12/04 | 81.8%        | 56   | 32   | 15  |

The 1-hour mean air quality objective for SO<sub>2</sub> for 2004 is 350µgm<sup>3</sup> with 24 exceedences, which equates to the 99.7th percentile. The result for the monitoring period at Whittington Moor is 32µgm<sup>3</sup>, which is well below this objective.

The 24-hour mean air quality objective for SO<sub>2</sub> for 2004 is 125µgm<sup>3</sup> with 3 exceedences, which equates to the 99.2nd percentile. The result for the monitoring period at Whittington Moor is 15µgm<sup>3</sup>, which again is well below the objective.

therefore **THE 1-HOUR AND 24-HOUR AIR QUALITY OBJECTIVES FOR SO<sub>2</sub> ARE EXPECTED TO BE MET.**

The 15-minute mean air quality objective for SO<sub>2</sub> for 2005 is 266µgm<sup>3</sup> with 35 exceedences, which equates to the 99.7th percentile. The result for the monitoring period at Whittington Moor in 2004 is 56µgm<sup>3</sup> which would suggest that the concentration of SO<sub>2</sub> at the Whittington Moor Roadside location is at little risk of breaching the 2005 objective.

According to LAQM.TG(03), there is no straightforward way to predict future exceedences of the short-term objectives for SO<sub>2</sub>. However since the 2003 Update and Screening Assessment did not identify a risk of the SO<sub>2</sub> objectives being exceeded and the results for 2004 support this projection it has been concluded that it is highly unlikely that the 2005 objective will be at risk of exceedence.

Therefore **THE 15-MINUTE AIR QUALITY OBJECTIVE FOR SO<sub>2</sub> IS EXPECTED TO BE MET.**

Nevertheless monitoring of SO<sub>2</sub> will continue over the course of 2005 and the results of this monitoring will be discussed in the next Update & Screening scheduled for 2006.

### **3.3 PM<sub>10</sub>**

The monitoring of PM<sub>10</sub> in 2004 was achieved using a R&P Teom analyser housed at the Whittington Moor Roadside automatic monitoring station. The monitoring period was for eight and a half months and the data capture during this period was 82.5%. The current EU Limits and UK objectives are based upon measurements carried out using the European Transfer Reference Sampler or equivalent and therefore the results from the Teom need to be adjusted so they can be compared with the UK objectives.

The reason for this is because the Teom instrument houses the filter at a temperature of 50°C in order to minimise errors associated with the evaporation and condensation of water vapour. This can lead to a loss of the more volatile particles (such as ammonium nitrate etc). Whilst there will also be some losses of volatile

species from the filter of the Transfer Reference Sampler, it will be less than that from the Teom. To compensate for this difference there is a default adjustment factor of 1.3 to estimate the gravimetric equivalent concentrations. This adjustment is discussed in more detail in LAQM.TG(03) Box 8.2.

Since there is less than 12 months of monitoring data and as discussed earlier according to Progress Report Guidance LAQM.PRG(03) it is appropriate to present the results as percentiles. The 90<sup>th</sup> percentile is appropriate for the PM<sub>10</sub> 24-hour mean objective. These results are listed in Table 8 below. Guidance on calculating percentiles is available in LAQM.TG(03) page A1-39.

Table 8 also provides the extrapolated annual mean for PM<sub>10</sub>. This was calculated using data provided by Sheffield Centre and Nottingham Centre AURN sites. The technique described in LAQM.TG(03) Box 8.5 was applied and the calculations can be found in Appendix 2. In addition, Table 8 details the predicted concentration for PM<sub>10</sub> at the Whittington Moor Roadside site in 2010 using the technique detailed in LAQM.TG(03) and the adjustment factors in boxes 8.6 and 8.7 of the Guidance. The calculations can also be found in Appendix 2.

**Table 8: 24-hour and annual mean PM<sub>10</sub> concentrations at Whittington Moor Roadside air quality monitoring station.**

| Monitoring Period   | Data Capture | 90 <sup>th</sup> Percentile: 24-hour mean ( $\mu\text{g}\text{m}^{-3}$ ) | Annual Mean 2004 PM <sub>10</sub> GRAV EQ ( $\mu\text{g}\text{m}^{-3}$ ) | Annual Mean 2010 PM <sub>10</sub> GRAV EQ ( $\mu\text{g}\text{m}^{-3}$ ) |
|---------------------|--------------|--|--|--|
| 14/04/04 – 31/12/04 | 82.5%        | 48.1   | 22.3   | 21.3   |

The 24-hour mean air quality objective for PM<sub>10</sub> for 2004 is  $50\mu\text{g}\text{m}^{-3}$  with 35 exceedences, which equates to the 99.0th percentile. The result for the monitoring period at Whittington Moor is  $48.1\mu\text{g}\text{m}^{-3}$  which is below this objective.

therefore **THE 24-HOUR AIR QUALITY OBJECTIVE FOR PM<sub>10</sub> IS EXPECTED TO BE MET.**

The annual mean air quality objective for PM<sub>10</sub> for 2004 is  $40\mu\text{g}\text{m}^{-3}$ . The result for the monitoring period at Whittington Moor is  $22.3\mu\text{g}\text{m}^{-3}$  which is well below the objective.

Therefore **THE ANNUAL AIR QUALITY OBJECTIVE FOR PM<sub>10</sub> IS EXPECTED TO BE MET.**



The provisional air quality objective for PM<sub>10</sub> in 2010 is 20.0µgm<sup>3</sup>. The projected result for the monitoring period at Whittington Moor in 2004 is 21.3 µgm<sup>3</sup> which is a potential marginal breach of the provisional 2010 objective.

Therefore **THE PROVISIONAL ANNUAL AIR QUALITY OBJECTIVE FOR PM<sub>10</sub> IN 2010 IS AT RISK OF EXCEEDENCE.**

Monitoring of PM<sub>10</sub> will continue over the course of 2005, the results of which will be discussed in the next Update & Screening scheduled for 2006. Further PM<sub>10</sub> monitoring data will also be available from the Birdholme Urban Background air quality station, which has been monitoring PM<sub>10</sub> over the course of 2005. The results from further monitoring and detailed spatial modelling to be conducted in the next assessment scheduled for 2006 should provide more conclusive evidence of any potential future exceedences. This would provide valuable information and would act as a useful tool to guide the longer-term air quality management strategy at Chesterfield; especially in the event the provisional 2010 objective becomes regulation.

## **4.0 Land Use Planning Policies**

Air quality should be integrated into land-use planning decisions at the earliest stage in order for potential air quality impacts of a development to be identified and the appropriate reduction or mitigation measures be agreed and implemented. This addresses the potential of a development to affect local air quality in the future and should form a key role in the long-term development strategy of an area. Obviously this requires the Land-Use Planning Department to liaise closely with Environmental Health in the consideration of relevant planning applications and to also work together to develop the appropriate policies and strategies to address air quality issues within the Local Development Plan.

### **4.1 Chesterfield Borough Local Plan**

Chesterfield Borough Council have incorporated air quality issues within the revised Chesterfield Borough Local Plan, the second deposit of which was published in March 2005, is expected to be subject to Public Local Enquiry in the autumn of 2005, with adoption of the Plan by July 2006. The policy which has been agreed with Environmental Health and which relates specifically to local air quality is as follows:

**Planning Policy V24: Pollution and Other Adverse Environmental Impacts:**

1) Planning permission will not be granted for developments which would materially increase existing levels of air, noise, water or light pollution or result in significant adverse environmental impacts unless these are outweighed by the social or economic benefits to the wider community or the wider environmental benefits. In such circumstances planning permission will only be granted provided a) no practicable alternative and better site readily available OR b) all reasonable mitigation measures are implemented

2) Planning permission will not be granted for development which would be adversely affected by existing sources of air, noise, water, light pollution or result in significant adverse environmental impacts unless it can be demonstrated that the adverse impacts can be reduced to an acceptable level by mitigation measures at the sources, or within the development site.

In addition to this specific air quality policy, the Borough Local Plan also details policies aimed at tackling the impact of traffic generated by a development which will influence transport generated air pollution in the area. These policies require developers to carry out traffic impact assessments when submitting their application and increasing emphasis is now being given to requiring the overall transportation impact of major new developments to be assessed. There are policies aimed at mitigating the effects of development proposals on highway safety and congestion and the revised plan also includes policies to increase sustainable transport choices by negotiating with developers to include in planning agreements:

- Development and monitoring of travel plans for the company's workforce
- Making of financial contributions to improve transport facilities generally
- Funding any improvements to the highways network which are required as a result of their proposal

Within the Transport Section of the replacement Borough Local Plan, policies TR5B – TR17 all relate to sustainable transport choices and encouraging initiatives such as park & ride, provision for buses, improving access to the railway station and provision for pedestrians and cyclists. A copy of the replacement Chesterfield Borough Local Plan can be downloaded from the Planning Department's WebPages on Chesterfield Borough Council's website. These policies should all provide mechanisms with which

Chesterfield Borough Council can ensure air quality is a material consideration in the land-use planning process.

#### **4.2 Major Development Sites Group**

Since the closure of the coal pits and the demise of the associated heavy industry there has been a legacy of large areas of derelict land within Chesterfield. However recently there has been a growing interest in developing these areas. The potential development of these major sites has air quality implications with regards both the end-use of these developments and new transport movements in the area.

As a result of this growing area of development a Major Development Sites Group has been established, which is attended by Forward Planning, Development Control, Economic Development, Legal Section and Environmental Health, in which these major developments are discussed in detail. This group has only recently formed, Spring 2005, but is indicative of the new partnership between the Land-use Planning and Environmental Health at Chesterfield and will allow the progress of these developments to be kept under close review.

Although this report should focus on issues arising during 2004, it was thought to be appropriate to highlight the formation of the Major Development Sites Group which formed in early 2005 and to also discuss a major development which received outline planning permission in the Spring of 2005 - The Derby Road Development. This and other local developments are discussed in more detail in the following Section 5 – New Local Developments.

In addition to this, an informal arrangement has been developed between Environmental Health and the Land-use Planning Department in that a list of planning applications is circulated on a weekly basis. This allows developments with potential air quality impacts to be highlighted at an early stage and appropriate comments made. A more formal arrangement regarding this weekly planning list shall be agreed between Land-Use Planning and Environmental Health and progress shall be detailed in future reports.

## **5.0 New Local Developments**

This section details all the developments within Chesterfield Borough Council that may have an impact on local air quality in the Borough.

### **5.1 Residential, commercial and public**

No new developments have been completed in 2004 that impact on air quality. However, as mentioned earlier, the MEGZ scheme received outline planning permission in late 2004 and the Derby Road Development received outline planning permission in early 2005 and these are both discussed in more detail below.

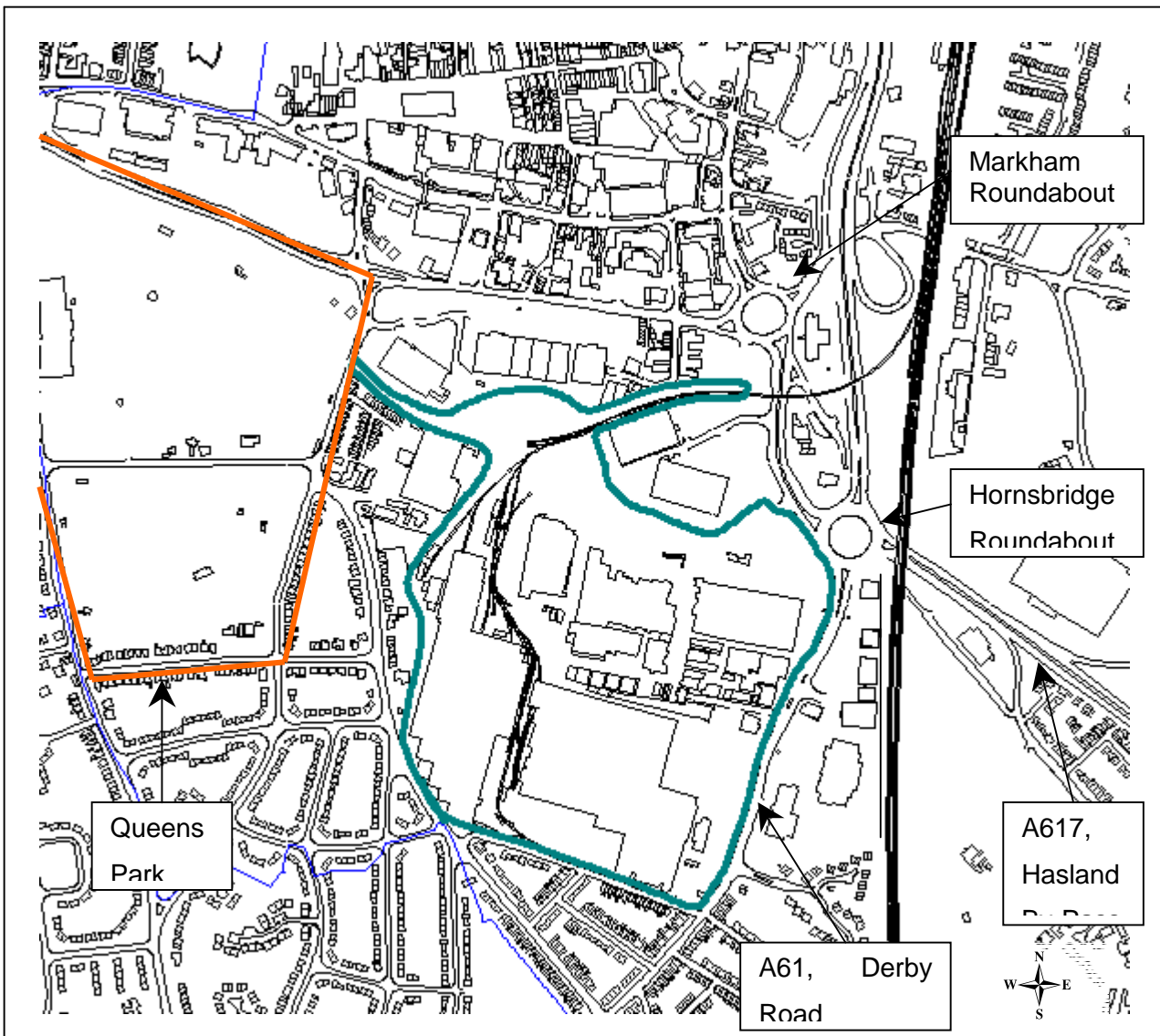
#### **The Derby Road Development**

This is a mixed-use development on previously developed land adjacent to Derby Road (A61), 600m south of Chesterfield near the Hornsbridge A61/A617 roundabout. The development comprises a non-food retail outlet, 8 new office buildings, an urban park, residential development of 280 units, provision of a health facility, community rooms and local shopping and associated car parking and landscaping. There will be 453 car-parking spaces assigned to short stay retail use and 594 for offices. Figure 3 below shows the approximate outline of the Derby Road Development and highlights the major landmarks and nearby busy roads in order to provide a context to the development area.

With respect to local air quality the greatest potential impact will be resulting from the additional traffic generated by the scheme. The roads leading onto the Derby Road site have recently been de-trunked so that responsibility now lies with Derbyshire County Council rather than the Highways Agency. As such the developers have been required to supply the following information to accompany transport assessments as governed by Derbyshire County Councils Development Control Policy:

- Propose measures that concentrate on reduction rather than mitigation of impacts from private cars.
- Consider the needs of the pedestrians and cyclists.
- Include an assessment of public transport provision illustrating how existing services would benefit the development and accommodate predicted trips.
- Provide a draft travel plan to accompany the transport assessment with the intention that it will become subject to a binding agreement.

**Figure 3: Outline of the Derby Road Development highlighting major landmarks and nearby busy roads/junctions.**



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The developer has fulfilled all the above requirements and proposed to improve existing pedestrian and cycle routes with signal controlled crossings as well as improving the existing route into the centre of Chesterfield over the River Hipper. A new pedestrian and cycle route will be created to connect up with an existing one in Queens Park to the East and the Lordsmill Retail Park to the north. A bus stop and passenger waiting area will be provided to the South of the development, near the

office element, which will also benefit people using the Alma Retail Park to the East. Secure cycle parking will also be provided.

In addition to this a travel plan will be formulated by the end-users of the developments office element and by the operator of the non-food retail outlet. Examples of the measures proposed are:

- The encouragement of shared use of cars by reward/benefit
- Providing a good standard of cyclists facilities including secure cycle parking and changing facilities
- Use of link bus service to transport employees to and from the town centre
- Availability of special ticketing products such as interest free loans for employees to purchase public transport season tickets
- Provision of good ticket and timetable information.

Derbyshire County Council's Development Control Policy also states that new road infrastructure should be designed to provide sufficient network capacity 5 years after the year of opening. The situation should be no worse with the development than without.

The developer, in response to the County Councils policy have provided the following access and infrastructure proposals as part of their application. The main Road network changes that will be:

1. Extension of dual carriageway on Derby Road (A61) between the Hornsbridge Roundabout and Byron Street.
2. Conversion of the Hornsbridge roundabout to traffic control
3. Three new access points onto Lordsmill Street/Derby Road; two for the commercial development and one for the residential
4. A secondary access onto Redvers Buller Road for the residential development
5. An internal road serving the internal land uses
6. Possible closure of Redvers Buller Road and Byron Street at Derby Road
7. Pedestrian and cycle connections onto existing networks.

An air quality assessment was also submitted with the application, which looked at the effects on air quality both with and without the development in place. The overall conclusion was that it is thought the development will result in only minor increases in pollutant concentrations with no exceedences of the Air Quality Objectives. The

operation of the Derby Road development is predicted to result in longer-term negligible to minor adverse impacts on local air quality.

The heating plant that may be associated with the development has also been considered in the application, but it was agreed at this stage it was not possible to predict emissions released from combustion plant. However during the schemes more detailed design, Chesterfield Borough Council will review and approve the combustion process that might be employed within the development.

In light of the information provided in the application, outline planning permission has been granted. Following this the applicant will prepare and submit more detailed applications for the proposed site, which will be closely reviewed by the Major Sites Development Group.

### **The Markham Employment Growth Zone**

The Megz scheme is located on what was previously the North Derbyshire and North Nottinghamshire coalfields which is now predominantly derelict land following a legacy of pit closures. It comprises the development of 11 coalfields with a total area of 85 hectares. The site is bounded by the A632 to the south, B6418 to the East, B6419 to the north and the M1 to the East. Access to the site is via Markham Lane and Erin Road. There is a wider 'vision' for the MEGZ scheme, which encompasses additional development sites comprising a total area of 230 hectares and 16 coalfields. Although these do not form part of the development which has received outline planning permission, the whole 'vision' has been taken into account when carrying out the Transport and Environmental Assessments for the scheme.

The scheme is to be a mixed-use development, including offices, industrial units, warehousing and a hotel/conferencing facility. It will also include a rail freight intermodal terminal, a new motorway junction 29A and associated local highway links and improvements as well as new pedestrian and cycle routes. This development is at the heart of the Derbyshire Local Transport Plan and further details regarding the development and its associated transport plans/impacts can be found at [www.derbyshire.gov.uk/transport/transport-planning](http://www.derbyshire.gov.uk/transport/transport-planning).

With respect to local air quality the greatest potential impact from this development will be resulting from the additional traffic generated by the scheme, although the

impacts of the industrial units will also need to be considered. A condition is included in the outline planning permission, which specifically relates to local air quality and is detailed below:

**Condition 45:** Prior to the commencement of development details of mitigation measures to be taken to ensure that there is no significant deleterious effect on current air quality, during construction period and as contained in the Environmental Statement (Section 6) shall be submitted for consideration and approval to the Local Planning Authority and implemented as so approved.

An air quality assessment was submitted with the application (Section 6), which focused on the effects of traffic associated with the development on local air quality. The results show that the forecast changes in concentrations with and without the proposals in 2005 and 2020 for Carbon monoxide, benzene, butadiene and particulates do not currently and will not exceed the air quality standards.

However the assessment identified two roadside receptor sites that could potentially fail the NO<sub>2</sub> annual mean in 2020. However the level of uncertainty associated with the modelled results could be responsible for the marginal exceedences and so more detailed modelling is required. In addition the assessment recommends that the exceedences could be mitigated by traffic management though no measures were proposed as part of the air quality assessment.

The assessment recommends that further information is required regarding the proposed end-use of the development and therefore more detailed applications and assessments for the site will be submitted and will be reviewed closely by the Major Sites Development Group.

The application also contains a comprehensive sustainable transport strategy which includes initiatives such as multi-user cycle trails, passenger rail, integrated regional bus network and park & ride schemes. Travel planning was also recommended and a condition has been included in the outline planning permission for a Corporate Travel Plan for the whole of the MEGZ development to be submitted and approved within 12 months of the start of the development. In addition the reserved matters submissions for each element of traffic generating development shall include a travel plan which will show its relationship to the Corporate Travel Plan. These actions will all help to reduce the impact on local air quality of the potential increased traffic levels in the



area, although further assessments are required in order to quantify any potential impacts.

Further applications from this scheme and any further major developments will be reviewed carefully by the Major Development Sites Group to ensure that local air quality is a material consideration in these and all future planning developments. Progress on these and any further major development sites which may receive outline planning permission will be detailed in future reports.

## 5.2 Industrial Processes

The following section details those developments that have been newly permitted or revoked in 2004 by either the Environment Agency or Chesterfield Borough Council.

### Chesterfield Borough Council Permitted Installations

The changes to Local Authority permitted installations in 2004 are listed in Table 9 below. There is one new permitted installation and two have been revoked. These will be taken into consideration in the next round of Update and Screening scheduled for 2006. There have been no new petrol stations authorised in 2004.

**Table 9: Chesterfield Borough Council Permitted Installations in 2004.**

| Installation Details  | Type of Installation     | Date Permitted                               | Date Revoked                              |
|---|--------------------------|--|---|
| <b>RAC AutoWindscreens</b><br>Britannia House<br>Storforth Lane<br>Hasland                | Waste Oil Burner         | Authorised 5 <sup>th</sup><br>February 2004. |   |
| <b>Alkane Energy UK Ltd</b><br>Markham Green<br>Energy Park<br>Markham Lane<br>Duckmanton | Odourisation             |  | Revoked<br>1 <sup>st</sup> November 2004  |
| <b>British Steel Forgings</b><br>Derby Road<br>Chesterfield                               | Other Surface<br>Coating |  | Revoked<br>12 <sup>th</sup> November 2004 |

## **Environment Agency**

There have been no new mineral or landfill developments permitted by the Environment Agency during 2004. One installation has been newly permitted in 2004, called Metapic LTD which is a metal finishing company. Again this new installation will be taken into consideration in the next round of Update and Screening scheduled for 2006.

## **6.0 Local Transport Plan and Policies**

Chesterfield Borough Council has continued to work with Derbyshire County Council and neighbouring Local Authorities on local transport issues including the implementation of a Local Transport Plan. The initiatives detailed in the Local Transport Plan for 2004/2005 and which are specifically intended to reduce congestion in Chesterfield are detailed below:

1. The signalisation of the A61 Lockford Lane/Tesco roundabout is underway.
2. A619 Markham Road widening is complete.
3. West Bars signalisation is complete.
4. Development of a new bus/coach station in the town centre is complete.
5. Discussions are ongoing with developers with regard to the A61/A617 Horns Bridge junction and one of the major schemes being investigated for LTP2 is alteration to the various junctions on the A61 Chesterfield Relief Road.
6. Review of on street parking provision and enforcement, Chesterfield is to be the first Borough for which we take on parking enforcement from the police.

In addition to this the Derbyshire Local Transport Plan 2 has now been drafted and will be put to consultation in autumn 2005. Copies of the Derbyshire LTP and associated Progress Reports and the draft LTP2 can be found at the Derbyshire County Council Transport website at [www.derbyshire.gov.uk/transport/transport-planning](http://www.derbyshire.gov.uk/transport/transport-planning).

## **7.0 Local Air Quality Strategy**

Since Chesterfield has not declared an Air Quality Management Area to date, a report on the implementation of any action plan is not possible. However an Air Quality Strategy was agreed with lead members in 2003 and some of the actions of that strategy have been fulfilled. Unfortunately since there hasn't been an air quality officer in post at Chesterfield moving the strategy forward since the spring of 2004, some of the actions have yet to be completed and some are now out of date.

It has therefore been agreed that the Air Quality Strategy will be reviewed and updated over the coming year. It is envisaged the existing strategy will be updated and developed further to incorporate more detail and where possible involve more interaction between the relevant Council departments such as Land-Use Planning, Transport, Energy Efficiency and Sustainability Departments. Progress on this will be updated in future reports. The original Strategy can be found in Appendix 4.

## 8.0 Conclusions and Recommendations

The conclusions drawn from this report and the recommended actions over the coming year are detailed as follows:

### Conclusions

- The hourly and annual mean NO<sub>2</sub> concentrations for 2005 and 2010 for Whittington Moor Roadside air quality station did not show any risk of exceedence of the air quality objectives.
- One diffusion tube location, Derby Road; Lincoln Street, may be at risk of potentially breaching the NO<sub>2</sub> objectives. However since this location did not meet the minimum monitoring period criteria, this result only provides an indication of a possible hotspot. In view of this however, relocation of one of the air quality sites to this area will be investigated so that more thorough monitoring can be conducted (see following section – Recommendations)
- The 1-hour, 24-hour and 15-minute mean air quality objectives for SO<sub>2</sub> do not show any risk of exceedence.
- The 24-hour and annual mean air quality objective for PM<sub>10</sub> for 2004 do not show any risk of exceedence. However the provisional 2010 annual mean objective shows a potential marginal exceedence.
- The Major Development Site Progress Group will continue to meet on a regular basis; the major developments which received outline planning permission in the spring 2005 will be kept under close review. Appropriate comments on more detailed application will be made regarding any air quality issues when those applications are received.
- There have been two new industrial process permitted in 2004. The Environment Agency have permitted a metal finishing installation and Chesterfield Borough Council have permitted a waste oil burner. Two installations have been revoked by Chesterfield Borough Council; one was an odourisation plant and the other a

surface coating installation. The air quality implications of these installations will be considered in more detail in the next round of Review and Assessment.

- The Local Transport Plan 2 will be put to consultation in autumn 2005 with a view to publishing the final version in 2006.

### **Recommendations**

- Since SO<sub>2</sub> diffusion tubes are unable to detect increases in short-term concentrations and according to LAQM.TG(03) are not of sufficient accuracy to be used for Review and Assessment purposes, the cessation of SO<sub>2</sub> diffusion tube network is therefore recommended.
- The current NO<sub>2</sub> diffusion tube network will be reviewed and extended to target likely problem areas. The majority of the diffusion tubes are located at roadside/kerbside sites but it may be more appropriate to locate the tubes at the façade of properties. In relocating the diffusion tubes, care will also be taken to select sites that should be at a lower risk of theft to provide better data capture over the coming year. The guidance provided by LAQM.TG(03) Annex 1 will be strictly adhered to in the design and selection of new diffusion tube locations.
- The possibility of conducting additional air quality monitoring in the Borough will be investigated and closer working relationships with neighbouring Local Authorities will be developed over the coming year.
- The possible relocation of the Birdholme Urban Background station to a suitable roadside location will be considered. Currently it is anticipated that the station will be relocated to a site on Derby Road, which is an area of concern with regards potential NO<sub>2</sub> air quality exceedences. The guidance provided by LAQM.TG(03) Annex 1 regarding the siting and operation of an air quality campaign will be strictly followed in the event of relocation of the air quality station.
- The air quality website will be reviewed and updated with a view to providing more relevant information and improve access to recent and historical air quality reports and data.

- The Local Air Quality Strategy and will be reviewed and updated. The aim is to liaise and where possible include other relevant council departments such as Land-Use Planning, Transport, Energy Efficiency and Sustainability Departments in the development of the Strategy.
  
- Since the appointment of the new air quality officer at Chesterfield Borough Council there will also be a review of in-house QA/QC procedures and improvements made where necessary. All QA/QC procedures will be documented and made available upon request.

## 9.0 References

- Chesterfield Borough Council. (2003) *Air Quality Updating & Screening Assessment*
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