

1 SUMMARY UPDATING AND SCREENING ASSESSMENT

The Environment Act 1995, Part IV, requires local authorities 'from time to time' to review and assess current and future air quality in their areas against air quality objectives given in the National Air Quality Strategy. The 'air quality objectives' are based on health based standards. Where it is unlikely that an air quality objective will be met in an area a local authority must declare the areas an 'Air Quality Management Area' (AQMA) and put in place an action plan setting out measures it intends to take in pursuit of the air quality objective.

The Council commenced its first review and assessment of air quality in 1999. It was completed in January 2003. It concluded that:

- The air quality objectives for carbon monoxide, 1,3-butadiene, lead and sulphur dioxide would be met across the City.
- The annual objective for nitrogen dioxide would not be met in the vicinity of the inner and outer ring roads. Nitrogen dioxide AQMA's were declared in August 2001 (and amended in 2003) for the inner and outer ring roads.
- The 24 hour objective for PM₁₀ would not be met close to a foundry operated by QDF Components Limited. A PM₁₀ AQMA was declared in August 2001 in the vicinity of the foundry on Victory Road.
- The air quality objectives for benzene would be met in the vicinity of Acordis Acetate. However, the Council recommended benzene monitoring continued close to this industrial site.

The second review and assessment of air quality commenced in 2003 and was completed earlier this year. It concluded that:

- The air quality objectives for carbon monoxide, 1,3-butadiene, lead and sulphur dioxide would be met across the City.

- There were continued exceedences of the 24 hour objective for PM₁₀ inside the PM₁₀ AQMA. However, the air quality objectives for PM₁₀ across the remainder of the City were being met.
- There were continued exceedences of the annual objective for NO₂ in the vicinity of the inner and outer ring roads. This included locations outside the NO₂ AQMAs. New boundaries for the AQMAs were proposed for consultation which joined together the existing inner and outer ring road AQMAs along Osmaston Road. A new AQMA was also proposed for dwellings adjacent to the A52 in Spondon.
- The 2010 annual objective concentration for benzene was being exceeded in the vicinity of Acordis Acetate. However, since it was likely that this objective concentration would be met by 2010, there was no need to declare an AQMA for benzene.

This Updating and Screening Assessment represents the start of the third review and assessment of air quality in Derby. It concludes that:

- The objectives for carbon monoxide, 1,3-butadiene, lead and sulphur dioxide will be met across the city and there is no need for a Detailed Assessment of these pollutants.
- There are continued exceedences of the annual objective for NO₂ in the vicinity of the inner and outer ring roads. However, as the objectives for nitrogen dioxide will be met across the City outside the proposed AQMA boundaries (2006), there is no need for a Detailed Assessment of this pollutant.
- The 2010 annual objective concentration for benzene is currently exceeded in some locations in the vicinity of Acordis Acetate. However, the 2006 Detailed Assessment of Benzene concluded that this objective was likely to be met by 2010 at all relevant locations so, there is no need for a Detailed Assessment of this pollutant.

- The objectives for PM₁₀ will be met across the City outside the Victory Road PM₁₀ AQMA. There is no need for a Detailed Assessment of this pollutant outside the boundaries of the AQMA.
- The 24 hour objective for PM₁₀ is likely to be met in 2006 at all relevant locations within the Victory Road PM₁₀ AQMA. This follows the closure the foundry operated by QDF Components Limited in the autumn of 2005. There will be a need to undertake a Detailed Assessment of PM₁₀ here to consider whether this AQMA can be revoked.

2 INTRODUCTION

2.1 Purpose of the Report

This report presents the findings of an Updating and Screening Assessment (USA) of air pollutants in Derby. It has been produced in accordance with the Council's Local Air Quality Management obligations under the Environment Act 1995.

2.2 The Local Air Quality Management Process

The Environment Act 1995, Part IV, requires local authorities 'from time to time' to review and assess current and future air quality in their areas against air quality objectives for the following pollutants: benzene, 1,3 butadiene, carbon monoxide, lead, nitrogen dioxide, sulphur dioxide and particulate matter (PM₁₀). The 'Air Quality Objectives', including target dates by which they should be achieved, are set out in the Air Quality Regulations 2000 (as amended) and are reproduced in Appendix 1. They are based on minimal/no risk health based standards and take account of the costs, benefits and technical feasibility of achieving the standards. If it is unlikely that an air quality objective will be met in an area, a local authority must declare an 'Air Quality Management Area' (AQMA) and put in place an action plan setting out measures it intends to take in pursuit of the air quality objective.

The structure of the Reviews and Assessments, including timescales for their completion, is set out in statutory guidance. It involves a staged approach so that the level of assessment relates to the risk of an air quality objective being exceeded. The latest statutory guidance issued by Defra, known as the Local Air Quality Management Technical Guidance LAQM. TG(03) (as amended) (*Reference 1*), involves 2 stages. There is an **Updating and Screening Assessment (USA)** and, where appropriate, subsequent **Detailed Assessments (DA)**.

The USA is based on a checklist to identify those matters that have changed since completion of the previous Review and Assessment which may now require DA. A DA must identify with 'reasonable certainty' whether or not an air quality objective will be met and so the need to declare an AQMA. If at any

time a local authority identifies a risk of an air quality objective being exceeded a DA must be completed for that pollutant without delay.

In those years when local authorities are not completing a USA or DA they are required to complete a **Progress Report** to ensure continuity in the local air quality management process. Progress reports must consider any new monitoring data and new local developments that might affect local air quality.

2.3 Previous Review and Assessment of Air Quality in Derby

A summary of previous reports on the review and assessment of air quality in Derby is given in Table 2.1 below with a brief summary of their findings.

<u>Table 2.1 – Derby City Council’s local air quality management reports</u>		
<u>Report</u>	<u>Date</u>	<u>Outcome</u>
Review and Assessment – First Round		
The Stage 1 and 2 Report for Derby (Reference 2)	Jul 1999	<u>Carbon monoxide, 1,3-butadiene, lead and sulphur dioxide</u> : Objectives likely to be met. <u>Benzene</u> : Objective likely to be met but further monitoring needed. <u>Nitrogen dioxide</u> : Objective unlikely to be met adjacent to some main roads. <u>PM₁₀</u> : Objective unlikely to be met near one industrial site.
The Stage 3 Report for Derby (Reference 3)	Dec 2000	<u>Benzene</u> : Objective likely to be met. <u>Nitrogen dioxide</u> : Annual objective unlikely to be met in some locations close to the inner and outer ring roads. One AQMA was subsequently declared for NO ₂ covering these locations in August 2001. <u>PM₁₀</u> : Modelling predicted the 24 hour objective was unlikely to be met near to QDF Components Ltd on Victory Road. An AQMA was subsequently declared for PM ₁₀ in this location in August 2001, see Appendix 2.

<u>Report</u>	<u>Date</u>	<u>Outcome</u>
Stage 4 Report on the PM₁₀ AQMA and Update for all Pollutants (Reference 4)	Aug 2002	<p><u>Carbon monoxide, 1,3-butadiene, lead and sulphur dioxide</u>: Objectives likely to be met.</p> <p><u>Benzene</u>: Objective likely to be met but monitoring should continue near to the Acordis Acetate industrial site.</p> <p><u>Nitrogen dioxide</u>: See stage 4 report below dated Jan 2003.</p> <p><u>PM₁₀</u>: Monitoring (TEOM) showed that in 2001 the 24 hour objective in the vicinity of QDF Components Ltd had been met. It was concluded that modelling predictions had not reflected the true air quality in this location and that further monitoring should be undertaken.</p>
Stage 4 Report on the Nitrogen Dioxide AQMA (Reference 5)	Jan 2003	<ul style="list-style-type: none"> Monitoring showed that the annual objective was likely to be met in some areas within the AQMA. The AQMA was subsequently reduced to exclude these locations resulting in the formation of 2 distinct AQMAs based on the inner and outer ring roads. It was predicted that a reduction of 7µg/m³ at the locations with the highest annual average NO₂ concentration would lead to the annual objective being met at all locations in Derby.
Supplementary Report on the PM₁₀ AQMA (Reference 6)	Jan 2003	Monitoring (TEOM) showed continued compliance with the 24 hour objective in the vicinity of QDF Components Ltd in 2002. There had also been a reduction of PM ₁₀ emissions from QDF. A draft PM ₁₀ Action Plan was deferred until further monitoring data was available.
Action Plan for the Nitrogen Dioxide AQMA (Reference 7)	Dec 2003	<ul style="list-style-type: none"> The main source of NO₂ in the AQMA was road traffic. A series of actions were detailed to improve air quality in the whole of Derby as well as targeting the NO₂ problem in the 2 AQMAs. Many of the actions related directly to road traffic.

<u>Report</u>	<u>Date</u>	<u>Outcome</u>
Review and Assessment – Second Round		
Updating and Screening Assessment for Derby (Reference 8)	Mar 2004	<p><u>Carbon monoxide, 1,3-butadiene, lead and sulphur dioxide:</u> Objectives likely to be met.</p> <p><u>Benzene:</u> There were monitored exceedences of the 2010 objective concentration in close proximity to Acordis Acetate.</p> <p><u>Nitrogen dioxide:</u></p> <ul style="list-style-type: none"> There were monitored exceedences of the annual objective in 3 locations outside (but very close to) the 2 existing AQMAs. There were 6 busy road junctions outside the 2 existing AQMAs that had predicted exceedences of the objective with relevant public exposure. <p><u>PM₁₀:</u></p> <ul style="list-style-type: none"> There were 12 busy road junctions that had predicted exceedences of the 24 hour objective with relevant public exposure. There were 5 locations in close proximity to the proposed Alvaston bypass with predicted exceedences of the 24 hour objective with relevant public exposure. Analysis of monitoring data (TEOM) for 2003 in the vicinity of QDF showed an exceedence of the PM₁₀ 24 hour objective. The need for an Action Plan to control PM₁₀ emissions in respect of the AQMA was highlighted and was subsequently implemented. The plan was never formally published in accordance with the flexibility given to Councils which achieved an 'excellent' Comprehensive Performance Assessment.
Progress Report (Reference 9)	Apr 2005	<p><u>Benzene Monitoring:</u></p> <ul style="list-style-type: none"> A pumped sampler adjacent to Acetate Products (previously Acordis Acetate) was commissioned in August 2004. At the same time the BTEX diffusion tube network was extended. There were monitored exceedences of the 2010 objective concentration at a number of locations in 2003 and 2004.

<u>Report</u>	<u>Date</u>	<u>Outcome</u>
Progress Report continued.... <i>(Reference 9)</i>	Apr 2005	<p><u>Nitrogen Dioxide Monitoring:</u></p> <ul style="list-style-type: none"> Two new high resolution continuous NO_x analysers were commissioned in the vicinity of the inner and outer Ring Roads in October 2004. Continuous high resolution monitoring also continued at the Council House. The NO₂ diffusion tube network was reviewed and extended. There were monitored exceedences of the annual objective at some locations in 2003 and 2004. <p><u>PM₁₀ Monitoring:</u></p> <ul style="list-style-type: none"> A gravimetric sampler was commissioned adjacent to QDF in October 2004. A TEOM analyser was commissioned adjacent to the outer Ring Road in October 2004. Monitoring (TEOM) at the Council House and adjacent to QDF continued. Monitoring (TEOM) by the outer ring road showed that there were 16 exceedences of the 24 hour objective concentration in the 6 months between October 2004 and March 2005, as compared to the 35 permitted per year. Monitoring (TEOM) showed that there were exceedences of the 24 hour objective close to QDF in 2004 with 40 exceedences compared to the 35 permitted per year. <p><u>Action Plans:</u> Progress on the formal NO₂ action plan and informal PM₁₀ action plan in respect of the AQMAs was reviewed.</p> <ul style="list-style-type: none"> An update was given of progress on the implementation of actions to target the NO₂ problem. QDF's IPPC permit had been varied to reduce PM₁₀ emissions from the foundry to try and ensure the 24 hour PM₁₀ objective was met in the vicinity of its site. <p><u>New Local Developments:</u> Industrial processes and other local developments including Connecting Derby, Riverlights and the extension of the Eagle Centre were reviewed.</p>

<u>Report</u>	<u>Date</u>	<u>Outcome</u>
Detailed Assessment for Benzene (Reference 10)	Feb 2006	<ul style="list-style-type: none"> ▪ There were monitored exceedences of the 2010 objective concentration at a number of locations in 2004 and 2005 in the vicinity of Acetate Products. ▪ Acetate products had made a commitment to ensure that the 2010 objective was met in the vicinity of their plant. The site permit from the Environment Agency was also varied to require this. ▪ It was concluded that there was no need to declare an AQMA for benzene, as it was likely that the 2010 objective would be met.
Detailed Assessment for Nitrogen Dioxide (Reference 11)	Mar 2006	<ul style="list-style-type: none"> ▪ There were monitored exceedences of the annual objective in some locations adjacent to the inner and outer ring roads and the A52 in Spondon, close to Brian Clough Way, in 2004 and 2005. Exceedences were typically observed up to 8m from the roadside but up to 14m from the roadside of some heavily congested roads. ▪ New AQMA boundaries were proposed based on the monitoring data. This included merging the Inner the Outer Ring Road AQMAs along Osmaston Road and creating a new AQMA in Spondon (Appendix 3).
Detailed Assessment for PM₁₀ (Reference 12)	Jul 2006	<ul style="list-style-type: none"> ▪ There were no monitored (TEOM) exceedences of the 24 hour objective adjacent to the inner and outer ring roads in 2005. ▪ Modelling predicted the 24 hour objective was likely to be met adjacent to the inner and outer ring roads in 2005. ▪ It was concluded that there was no need to declare an AQMA for PM₁₀ as it was likely that the 24 hour objective would be met.

2.4 General Methodology for the Updating and Screening Assessment

The assessment has been carried out in accordance with the Local Air Quality Guidance Note LAQM.TG (03) (as amended) (*Reference 1*). The new checklists issued by Defra for each air pollutant in January 2006 have been considered, to identify whether there is a risk that an air quality objective will be exceeded at a location with relevant public exposure. This is specifically with regard to any matters that have changed since the last USA, including: new monitoring data, new objectives, new sources and significant changes to existing sources. Where necessary, a further assessment has been undertaken for a pollutant in relation to a particular change, in accordance with the guidance. The air quality action plans for NO₂ and PM₁₀ have also been considered and an update on their implementation provided.

In undertaking this assessment it is important to note that due regard has been given to the matters detailed below.

Public Exposure

In carrying out the assessment regard has been given to "the quality of the air at locations which are situated outside of buildings or other natural or man-made structures, above or below ground, and where members of the public are regularly present" (*Reference 1*). As such, the detailed assessment has focussed on those locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective. It does not relate to occupational exposure.

The factors taken into account when considering relevant locations are:

- Where members of the public are regularly present. Relevant exposure to a short-term objective, which permits a number of exceedences of the standard, therefore means any location where a member of the public may be exposed to a single exceedence.
- Long-term objectives apply where members of the public are likely to be exposed over the averaging period of the objective. Again, this

does not require the same individual to be present for a full year at a particular location. Rather, the location must be one where people are likely to be regularly present for long periods. For example, for the 24-hour objectives, a relevant location is one where members of the public may be exposed for 8 hours or more in a day. For the annual mean objectives, it may be where people are exposed for a cumulative period of 6 months in a year.

- Since there is a link between pollutant concentrations measured both inside and outside of a building, measurements of relevant exposure are undertaken at the building façade.

Some examples of where the objectives should, and should not apply, are summarised in Table 2.2.

Uncertainty in the Data

In undertaking the assessment, there are inevitably uncertainties in relation to the estimation of pollutant concentrations for future years. Such uncertainties and the steps that have been taken to minimise them, are described in the report. In general a precautionary approach has been adopted in making any assumptions and judgements.

Table 2.2 - Relevant public exposure for short-term and long-term air quality objectives

Averaging Period	Objectives should apply at:	Objectives should generally not apply at:
Annual mean	<p>All locations where members of the public might be regularly exposed.</p> <p>Building facades of residential properties, schools, hospitals, libraries etc.</p>	<p>Building facades of offices or other places of work, where members of the public do not have regular access.</p> <p>Gardens of residential properties.</p> <p>Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.</p>
24-hour mean and 8-hour mean	<p>All locations where the annual mean objective would apply.</p> <p>Gardens of residential properties.</p>	<p>Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.</p>
1-hour mean	<p>All locations where the annual mean, 24-hour and 8-hour mean objectives apply.</p> <p>Kerbside sites e.g. pavements of busy shopping streets.</p> <p>Those parts of car parks, bus stations and railway stations etc, which are not fully enclosed, where the public might reasonably be expected to spend 1 hour or longer.</p>	<p>Kerbside sites where the public would not be expected to have regular access.</p>
15-min mean	<p>All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer.</p>	

3 CARBON MONOXIDE

3.1 Air Quality Objective

Carbon monoxide (CO) was assessed using the objective given in Table 3.1.

Table 3.1 - Objective for Carbon Monoxide

Objective	Measured as	To be achieved by
10 mg/m ³ (10 ppm)	Running 8-hour mean	31 December 2003

3.2 Consideration of the Checklist

The items given in Table 3.2 have been considered in accordance with Guidance note LAQM.TG(03). Where appropriate a further assessment of an item has been made below.

Table 3.2 – Checklist for Carbon Monoxide including the source, location or data that need to be assessed

Item	Consideration
A) Monitoring data	The Council does not currently monitor CO.
B) Very busy roads or junctions in built up areas	<p>This was examined in the 2004 USA. Very busy roads and junctions must be considered where the CO background is in excess of 1mg/m³ (annual mean).</p> <p>Low resolution annual mean background concentrations within 1km x 1km grid squares across Derby can be predicted for 2006 using the Local Air Quality Management Tools (<i>Reference 13</i>). The maximum annual mean concentration for Derby in 2001 was 0.47mg/m³ which provides a maximum projected value of 0.30mg/m³ in 2006. This is considerably below the level at which busy roads and junctions need to be considered in this report.</p> <p>In any case there are no new busy roads or junctions with more than 80,000 vehicles per day (single carriageway) or 120,000 vehicles per day (dual carriageway). There are no motorways within Derby City Council's area. No roads or junctions have experienced a significant increase (greater than 10%) in traffic flows.</p>

*** Further Assessment of this item required*

3.3 Changes Requiring Further Assessment

There are no changes which require further assessment as part of this USA.

3.4 Conclusion

The Council is not required to progress to a Detailed Assessment of CO at this time, as summarised in Table 3.3.

<u>Table 3.3 – Conclusions for Carbon Monoxide</u>	
Source, location or data that need to be assessed	Detailed Assessment Required?
A) Monitoring data	No
B) Very busy roads or junctions in built up areas	No

4 BENZENE

4.1 Air Quality Objective

Benzene was assessed using the objectives given in Table 4.1.

Table 4.1 - Objectives for Benzene

Objective	Measured as	To be achieved by
16.25 µg/m ³ (5 ppb)	Running annual mean	31 December 2003
5 µg/m ³	Annual mean	31 December 2010

4.2 Consideration of the Checklist

The items given in Table 4.2 have been considered in accordance with Guidance note LAQM.TG(03). Where appropriate a further assessment of an item has been made below.

Table 4.2 – Checklist for Benzene including the source, location or data that need to be assessed

Item	Consideration
A) Monitoring data outside an AQMA	<p>Monitoring is carried out at the Council House and in the vicinity of Acordis Acetate. A copy of the Council's QA procedures for air quality monitoring is given in Appendix 4.</p> <p>The annual mean benzene concentration at the Council House in 2003, 2004 and 2005 was 1.9µg/m³, 1.6µg/m³ and 1.6µg/m³ respectively, which are all below both of the objective concentrations.</p> <p>The monitored concentrations in the vicinity of Acordis Acetate have recently been reviewed and published in the 2006 DA for benzene. The DA concluded that whilst the 2003 objective concentration was currently being met there were monitored exceedences of the 2010 objective concentration. However, as the 2010 objective was likely to be met, there was no need to declare an AQMA for benzene in the vicinity of Acordis Acetate at this time. There is no new monitoring data that can be assessed in this report.</p>

Item	Consideration
B) Monitoring data within an AQMA	Not applicable as no AQMA for benzene.
C) Very busy roads or junctions in built up areas	<p>This was examined in the 2004 USA. Very busy roads and junctions must be considered where the benzene background is in excess of $2\mu\text{g}/\text{m}^3$ (annual mean).</p> <p>Low resolution annual mean background concentrations within 1km x 1km grid squares across Derby can be predicted for 2010 using the Local Air Quality Management Tools (<i>Reference 13</i>). The maximum annual mean concentration for Derby in 2010 is $0.60\mu\text{g}/\text{m}^3$. Further, the maximum projected annual mean concentration at the Council House, from monitoring results from 2003 to 2005, is $1.43\mu\text{g}/\text{m}^3$ in 2010. These values are considerably below the level at which busy roads and junctions must be considered in this report.</p> <p>In any case there are no new busy roads or junctions with more than 80,000 vehicles per day (single carriageway) or 120,000 vehicles per day (dual carriageway). There are no motorways within Derby City Council's area. No roads or junctions have experienced a significant increase (greater than 10%) in traffic flows.</p>
D) New industrial sources	A list of Part A and Part B industrial sources is given in Appendix 5. New processes since the last 2004 USA are highlighted in grey. Comparison with the checklist given in the guidance (p. A2-59 to A2-61) of potential significant sources of benzene indicates that none of these processes fall into this category. Further, there were no predicted exceedences of any air quality objectives in the air quality assessment submitted by Slipcatch Ltd to the Environment Agency, as part of their Permit application under the Integrated Pollution, Prevention and Control regime. Neighbouring local authorities have similarly confirmed that there are no new industrial sources in their area, which are likely to have a detrimental affect on air quality within Derby.
E) Industrial sources with substantially increased emissions, or new relevant exposure	<u>Substantially increased emissions:</u> A list of part A and Part B industrial sources is given in Appendix 5. None of the existing processes have experienced a substantial increase (greater than 30%) in emissions since the 2004 USA. Similarly neighbouring local authorities have confirmed that there has been no substantial increase in emissions from any existing processes in their areas, which are likely to have a detrimental affect on air quality within Derby.

Item	Consideration
E) Industrial sources with substantially increased emissions, or new relevant exposure continued...	<u>New relevant exposure:</u> The only process of concern in the 2004 USA was Acordis Acetate (Part A process). Whilst analysis of emissions data indicated that it was unlikely that the 2010 objective would be exceeded in the vicinity of this process, it was noted that monitoring data showed the need for a DA of benzene here. The DA was published in 2006 and considered potential relevant exposure. There is no new relevant exposure that can be assessed at this time.
F) Petrol Stations	This was examined in the 2004 USA. There are no new petrol stations with an annual throughput of more than 2 million litres petrol per annum.
G) Major fuel storage depots (petrol only)	There are no storage depots in Derby City Council's area

*** Further Assessment of this item required*

4.3 Changes Requiring Further Assessment

There are no changes which require further assessment as part of this USA.

4.4 Conclusion

The Council is not required to progress to a Detailed Assessment for benzene at this time, as summarised in Table 4.3.

Table 4.3 – Conclusions for Benzene	
Source, location or data that need to be assessed	Detailed Assessment Required?
A) Monitoring data outside an AQMA	No
B) Monitoring data within an AQMA	No
C) Very busy roads or junctions in built up areas	No
D) New industrial sources	No
E) Industrial sources with substantially increased emissions, or new relevant exposure	No
F) Petrol Stations	No
G) Major fuel storage depots (petrol only)	No

5 1,3-BUTADIENE

5.1 Air Quality Objective

1,3-butadiene was assessed using the objective given in Table 5.1.

Table 5.1 - Objective for 1,3-Butadiene

Objective	Measured as	To be achieved by
2.25 µg/m ³ (1 ppb)	Running annual mean	31 December 2003

5.2 Consideration of the Checklist

The items given in Table 5.2 have been considered in accordance with Guidance note LAQM.TG(03). Where appropriate a further assessment of an item has been made below.

Table 5.2 – Checklist for 1,3-Butadiene including the source, location or data that need to be assessed

Item	Consideration
A) Monitoring data	The Council does not currently monitor 1,3-butadiene.
B) New industrial sources	A list of Part A and Part B industrial sources is given in Appendix 5. New processes since the last 2004 USA are highlighted in grey. Comparison with the checklist given in the guidance (p. A2-59 to A2-61) of potential significant sources of 1,3-butadiene indicates that none of these processes fall into this category. Further, there were no predicted exceedences of any air quality objectives in the air quality assessment submitted by Slipcatch Ltd to the Environment Agency, as part of their Permit application under the Integrated Pollution, Prevention and Control regime. Neighbouring local authorities have similarly confirmed that there are no new industrial sources in their areas, which are likely to have a detrimental affect on air quality within Derby.

Item	Consideration
C) Industrial sources with substantially increased emissions, or new relevant exposure	<p><u>Substantially increased emissions:</u> A list of part A and Part B industrial sources is given in Appendix 5. None of the existing processes have experienced a substantial increase (greater than 30%) in emissions since the 2004 USA. Similarly neighbouring local authorities have confirmed that there has been no substantial increase in emissions from any existing processes in their areas, which are likely to have a detrimental affect on air quality within Derby.</p> <p><u>New relevant exposure:</u> Not applicable as no sources were identified as potential significant sources of 1,3-butadiene in the 2004 USA.</p>

*** Further Assessment of this item required*

5.3 Changes Requiring Further Assessment

There are no changes which require further assessment as part of this USA.

5.4 Conclusion

The Council is not required to progress to a Detailed Assessment of 1,3-butadiene at this time, as summarised in Table 5.3.

Table 5.3 – Conclusions for 1,3 Butadiene

Source, location or data that need to be assessed	Detailed Assessment Required?
A) Monitoring data	No
B) New industrial sources	No
C) Industrial sources with substantially increased emissions, or new relevant exposure	No

6 LEAD

6.1 Air Quality Objective

Lead was assessed using the objectives given in Table 6.1.

<u>Table 6.1 - Objectives for Lead</u>		
Objective	Measured as	To be achieved by
0.5 µg/m ³	Annual mean	31 December 2004
0.25 µg/m ³	Annual mean	31 December 2008

6.2 Consideration of the Checklist

The items given in Table 6.2 have been considered in accordance with Guidance note LAQM.TG(03). Where appropriate a further assessment of an item has been made below.

<u>Table 6.2 – Checklist for Lead including the source, location or data that need to be assessed</u>	
Item	Consideration
A) Monitoring data	The Council does not currently monitor lead.
B) New industrial sources	A list of Part A and Part B industrial sources is given in Appendix 5. New processes since the last 2004 USA are highlighted in grey. Comparison with the checklist given in the guidance (p. A2-59 to A2-61) of potential significant sources of lead indicates that none of these processes fall into this category. Further, there were no predicted exceedences of any air quality objectives in the air quality assessment submitted by Slipcatch Ltd to the Environment Agency, as part of their Permit application for permit under the Integrated Pollution, Prevention and Control regime. Neighbouring local authorities have similarly confirmed that there are no new industrial sources in their areas, which are likely to have a detrimental affect on air quality within Derby.

Item	Consideration
C) Industrial sources with substantially increased emissions, or new relevant exposure	<p><u>Substantially increased emissions:</u> A list of part A and Part B industrial sources is given in Appendix 5. None of the existing processes have experienced a substantial increase (greater than 30%) in emissions since the 2004 USA. Similarly neighbouring local authorities have confirmed that there has been no substantial increase in emissions from any existing processes in their areas, which are likely to have a detrimental affect on air quality within Derby.</p> <p><u>New relevant exposure:</u> Not applicable as no sources were identified as potential significant sources of lead in the 2004 USA.</p>

*** Further Assessment of this item required*

6.3 Changes Requiring Further Assessment

There are no changes which require further assessment as part of this USA.

6.4 Conclusion

The Council is not required to progress to a Detailed Assessment of lead at this time as summarised in Table 6.3.

<u>Table 6.3 – Conclusions for Lead</u>	
Source, location or data that need to be assessed	Detailed Assessment Required?
A) Monitoring data	No
B) New industrial sources	No
C) Industrial sources with substantially increased emissions, or new relevant exposure	No

7 NITROGEN DIOXIDE

7.1 Air Quality Objective

Nitrogen dioxide (NO₂) was assessed using the objectives given in Table 7.1.

Table 7.1 - Objectives for Nitrogen Dioxide

Objective	Measured as	To be achieved by
200 µg/m ³ (105ppb)	1-hour mean not to be exceeded more than 18 times per year	31 December 2005
40 µg/m ³ (21ppb)	Annual mean	31 December 2005

7.2 Consideration of the Checklist

The items given in Table 7.2 have been considered in accordance with Guidance note LAQM.TG(03). Where appropriate a further assessment of an item has been made below.

Table 7.2 – Checklist for Nitrogen Dioxide including the source, location or data that need to be assessed

Item	Consideration
A) Monitoring data outside an AQMA	<p>Monitoring is carried out at the Council House and in the vicinity of the inner and outer Ring Roads. There are 73 monitoring locations, some being within and some being outside the current AQMAs for NO₂. High resolution continuous monitoring and low resolution diffusion tube monitoring are both carried out and a copy of the Council's QA procedures for air quality monitoring is given in Appendix 4.</p> <p>The monitored concentrations for both inside and outside the existing NO₂ AQMAs have recently been reviewed and published in the 2006 DA for NO₂. No exceedences of the 1 hour objective were recorded. However, exceedences of the annual objective were monitored in some locations by the inner and outer Ring Roads, Brian Clough Way (A52), Nottingham Road and Derby Road. As a result of the DA, new AQMA boundaries for NO₂ were proposed to ensure inclusion of all relevant locations, where there was a likely exceedence of the annual objective. This included creating a new AQMA in Spondon and merging the current inner and</p>

Item	Consideration
A) Monitoring data outside an AQMA continued...	<p>outer Ring Road AQMAs along Osmaston Road. The inner and outer Ring Road AQMAs were also extended in some places and reduced in others (Appendix 3).</p> <p>There is no new monitoring data that can be assessed in this report.</p>
B) Monitoring data within an AQMA	<p>See comments above for monitoring data outside an AQMA. Notably, there is no new monitoring data to suggest that the AQMAs may require reconsideration at this time.</p>
C) Narrow congested streets with residential properties close to the kerb	<p>This was examined in the 2004 USA. It was concluded that there were no narrow or congested streets (roads with more than 10,000 vehicles per day, less than 10m wide with an average speed below 50 kilometres per hour) with residential properties within 5m of the kerb. The Council is unaware of any new circumstances, such as new relevant exposure, so this situation remains unchanged.</p>
D) Junctions	<p>The potential for busy junctions in Derby to cause exceedences of the objectives has recently been reviewed and published in the 2006 DA for NO₂. As a result of the DA, the AQMA boundaries for NO₂ were reviewed to ensure that they included all locations of relevant exposure where there were likely exceedences of the annual objective. There is no new traffic data that can be assessed in this report.</p>
E) Busy streets where people may spend 1 hour or more close to traffic	<p>This was examined in the 2004 USA. It was concluded that there were no busy streets (roads with more than 10,000 vehicles per day) with relevant public exposure of 1 hour or more within 5m of the kerb. The Council is unaware of any new circumstances, such as new relevant exposure, so this situation remains unchanged.</p>
F) Roads with high flow of buses and/or HGVs	<p>This was examined in the 2004 USA. It was concluded that there were no roads with a high flow of buses and/or HGVs (i.e. greater than 25%). The highest recorded flow of buses and HGVs on a road from traffic counts was 17%. This situation remains unchanged despite the temporary relocation of the bus station as part of the Riverlights development.</p> <p>The Riverlights development has resulted in the closure of the city's bus station and creation of a temporary bus station along Morledge, Corporation Street, Full Street and Derwent Street. The automatic traffic counter on Corporation Street shows that between 10 October 2005 and 27 May 2006, buses on this road accounted for 10.3% of the AADT. Assuming that this situation of < 25% HDVs is repeated on</p>

Item	Consideration
F) Roads with high flow of buses and/or HGVs continued...	Morledge, Full Street and Derwent Street, there is no need to proceed to a Detailed Assessment for NO ₂ in relation to the temporary bus station. In any case, the temporary nature of the bus station means that it's associated local air quality impacts fall outside of the Review and Assessment process.
G) New roads constructed or proposed since the previous round of review and assessment	<p><u>Alvaston Bypass:</u> This road was opened on 17 December 2003 and NO₂ concentrations associated with it were fully investigated within the 2006 DA for NO₂. No exceedences of the annual average objective were predicted at relevant locations adjacent to the bypass, although exceedences occurred along parts of Raynesway, the A6 and Harvey Road. These locations are included within the proposed revisions to the NO₂ AQMAs.</p> <p><u>Connecting Derby:</u> This is an integrated transport scheme, focussing upon traffic management and highway works. Phases 2 and 3A will create a more direct route around the inner ring road, whilst Phase 3B will make changes to the 'Five Lamps' junction.</p> <p>It has recently been determined that a public inquiry is not required for these phases, so the Connecting Derby planning application will now go back to full Council in September 2006. The associated Air Quality Impact Assessment is being revised as part of this process, to take account of the new monitoring data and the 2006 DA for NO₂. The original Air Quality Impact Assessment predicted that there will be an increase in NO₂ concentrations at some locations and a decrease at other locations. This is to be expected, given that the new inner ring road will form a more direct route around the city. Once the revised Air Quality Impact Assessment has been completed and planning approval granted, the need for a DA for NO₂ will be reviewed.</p>
H) Roads with significantly changed traffic flows, or new relevant exposure	<p>The 2006 DA for NO₂ considered all busy road junctions outside of the existing NO₂ AQMAs with an AADT greater than 10,000 vehicles per day. All roads with AADTs greater than 10,000 vehicles per day were included within this assessment, as was new relevant exposure close to these roads and junctions.</p> <p>The resultant DA for NO₂ was approved by Defra in May 2006 and proposed revisions to the existing NO₂ AQMAs are now subject to consultation. On this basis, there is no need to proceed to a DA for NO₂ at this time.</p>

Item	Consideration
I) Bus stations	<p>The bus station in Derby has closed and has temporarily been relocated along The Morledge, awaiting construction of a new bus station as part of the Riverlights project.</p> <p>The implications for air quality at its temporary location are considered in F) above.</p> <p>The effects of the Riverlights project, including the new bus station, were considered by the Environmental Impact Assessment associated with the planning application for this development. This concluded that there would be no exceedences of the NO₂ air quality objectives. The Council agrees with this conclusion given that:</p> <ul style="list-style-type: none"> ▪ There are no dwellings within 10m of the bus station, so it is unlikely that the annual objective will be exceeded at any relevant locations. ▪ The new station is fully enclosed separating the public and buses, so it is unlikely that the public will spend 1 hour or more adjacent to buses.
J) New industrial sources	<p>A list of Part A and Part B industrial sources is given in Appendix 5. New processes since the last 2004 USA are highlighted in grey. Comparison with the checklist given in the guidance (p. A2-59 to A2-61) of potential significant sources of nitrogen dioxide indicates that none of these processes fall into this category. Further, there were no predicted exceedences of any air quality objectives in the air quality assessment submitted by Slipcatch Ltd to the Environment Agency, as part of their Permit application under the Integrated Pollution, Prevention and Control regime. Neighbouring local authorities have similarly confirmed that there are no new industrial sources in their areas, which are likely to have a detrimental affect on air quality within Derby.</p>
K) Industrial sources with substantially increased emissions, or new relevant exposure	<p><u><i>Substantially increased emissions:</i></u> A list of part A and Part B industrial sources is given in Appendix 5. None of the existing processes have experienced a substantial increase (greater than 30%) in emissions since the 2004 USA. Similarly neighbouring local authorities have confirmed that there has been no substantial increase in emissions from any existing processes in their areas, which are likely to have a detrimental affect on air quality within Derby.</p> <p><u><i>New relevant exposure:</i></u> Not applicable as no sources were identified as potential significant sources of nitrogen dioxide in the 2004 USA.</p>

Item	Consideration
L) Aircraft	Emissions from aircraft operating below 200m must be considered. However, since East Midlands Airport is over 8km from the border of Derby aircraft are significantly higher than 200m when passing over Derby.

*** Further Assessment of this item required*

7.3 Consideration of Air Quality Action Plan

An Air Quality Management Area was declared for NO₂ in the vicinity of the inner and outer Ring Roads in August 2001. An Action Plan to control emissions of NO_x from traffic in Derby generally, as well as targeting the AQMA, was adopted by the Council in December 2003. It was predicted that a reduction of 7µg/m³ at the locations with the highest annual average NO₂ concentrations would lead to the annual objective being met at all locations in Derby.

Since then monitoring has showed a general decrease in annual average nitrogen dioxide concentrations but continued exceedences of the annual objective in some locations in Derby. The boundaries of the original AQMA were also reviewed in January 2003, based on updated modeling and monitoring results, when 2 separate AQMAs were declared for NO₂ based on the inner and outer Ring Roads. Further, following the 2006 DA for NO₂ another change in the AQMA boundaries is now proposed for consultation based on the results of further monitoring data. This includes creating a new AQMA in Spondon and merging the current separate inner and outer Ring Road AQMAs along Osmaston Road and extending and reducing this AQMA in other locations (Appendix 3).

An update on the action plan is given in Appendix 6 including details of its integration into the Local Transport Plan.

7.4 Changes Requiring Further Assessment

There are no changes which require further assessment as part of this USA.

7.5 Conclusion

The Council is not required to progress to a Detailed Assessment of nitrogen dioxide at this time, as summarised in Table 7.3.

<u>Table 7.3 – Conclusions for Nitrogen Dioxide</u>	
Source, location or data that need to be assessed	Detailed Assessment Required?
A) Monitoring data outside an AQMA	No
B) Monitoring data within an AQMA	No
C) Narrow congested streets with residential properties close to the kerb	No
D) Junctions	No
E) Busy streets where people may spend 1 hour or more close to traffic	No
F) Roads with high flow of buses and/or HGVs	No
G) New roads constructed or proposed since the previous round of review and assessment	No
H) Roads with significantly changed traffic flows, or new relevant exposure	No
I) Bus stations	No
J) New industrial sources	No
K) Industrial sources with substantially increased emissions, or new relevant exposure	No
L) Aircraft	No

8 SULPHUR DIOXIDE

8.1 Air Quality Objective

Sulphur dioxide was assessed using the objectives given in Table 8.1.

Table 8.1 - Objectives for Sulphur Dioxide

Objective	Measured as	To be achieved by
266 $\mu\text{g}/\text{m}^3$ (100ppb) not to be exceeded more than 35 times per year (99.9 th percentile)	15-minute mean	31 December 2005
350 $\mu\text{g}/\text{m}^3$ (132ppb) not to be exceeded more than 35 times per year (99.7 th percentile)	1-hour mean	31 December 2004
125 $\mu\text{g}/\text{m}^3$ (47ppb) not to be exceeded more than 3 times per year (99 th percentile)	24-hour mean	31 December 2004

8.2 Consideration of the Checklist

The items given in Table 8.2 have been considered in accordance with Guidance note LAQM.TG(03). Where appropriate a further assessment of an item has been made below.

Table 8.2 – Checklist for Sulphur Dioxide including the source, location or data that need to be assessed

Item	Consideration
A) Monitoring data outside an AQMA	The Council does not currently monitor sulphur dioxide.
B) Monitoring data within an AQMA	Not applicable as no AQMA for sulphur dioxide.

Item	Consideration
C) New industrial sources	A list of Part A and Part B industrial sources is given in Appendix 5. New processes since the last 2004 USA are highlighted in grey. Comparison with the checklist given in the guidance (p. A2-59 to A2-61) of potential significant sources of sulphur dioxide indicates that none of these processes fall into this category. Further, there were no predicted exceedences of any air quality objectives in the air quality assessment submitted by Slipcatch Ltd to the Environment Agency, as part of their Permit application under the Integrated Pollution, Prevention and Control regime. Neighbouring local authorities have similarly confirmed that there are no new industrial sources in their areas, which are likely to have a detrimental affect on air quality within Derby.
D) Industrial sources with substantially increased emissions, or new relevant exposure	<p><u><i>Substantially increased emissions:</i></u> A list of part A and Part B industrial sources is given in Appendix 5. None of the existing processes have experienced a substantial increase (greater than 30%) in emissions since the 2004 USA. Similarly neighbouring local authorities have confirmed that there has been no substantial increase in emissions from any existing processes in their areas, which are likely to have a detrimental affect on air quality within Derby.</p> <p><u><i>New relevant exposure:</i></u> Not applicable as no sources were identified as potential significant sources of sulphur dioxide in the 2004 USA.</p>
E) Areas of domestic coal burning	This was examined in the 2004 USA. It was concluded that it was unlikely that there would be any exceedences of the objectives due to domestic coal burning. This situation remains unchanged.
F) Small boilers > 5 MW _(thermal)	This was examined in the 2004 USA. It was concluded that there were no small boilers likely to give rise to exceedences of the objectives. The Council is unaware of any new small boilers in Derby that burn coal or fuel oil.
G) Shipping	Not applicable, as there is no shipping in Derby.
H) **Railway Locomotives	This was examined in the 2004 USA. A number of railway stations and a major railway depot at Derby Etches Park were considered but no concerns were raised. Since then, there has been considerable development around Derby Etches Park, which is considered in this USA. In order to be certain that there are no concerns at Derby railway station, the Council has also reviewed its initial assessment of the railway station in this USA. Further details are given in Section 8.3.

*** Further Assessment of this item required*

8.3 Changes Requiring Further Assessment

Railway Locomotives - Derby Etches Park

There has been considerable development around Derby Etches Park since the 2004 USA. As part of this USA, the Council undertook a survey of the area around the railway depot to identify any relevant locations where locomotives could be stationary with their engines running for 15 minutes or more within 15m of the public. The survey involved an officer walking around the area to identify any such locations which could potentially result in an exceedence of the air quality objectives for sulphur dioxide. Since no relevant locations were identified there is no need to progress to a Detailed Assessment for sulphur dioxide in respect of Derby Etches Park at this time.

Railway Locomotives - Derby Railway Station

The Council investigated whether locomotives were likely to be stationary at Derby Railway Station, with their engines running for 15 minutes or more, within 15m of the public. This investigation involved liaising with Mr R Walton, Safety Director, Midland Mainline Limited. Midland Mainline operate Derby Station on behalf of Network Rail, who own the station. The station is used by Midland Mainline as well as Central Trains and Virgin Trains.

All of the trains using Derby Station are diesel powered and their exhaust fumes will contain sulphur dioxide. However, it was clear from checking timetabled arrival and departure times that the dwell times for most trains are considerably less than 15 minutes. Whilst there were some timetabled dwell times of more than 15 minutes, procedures adopted by the train companies mean that a train is rarely left stationary and running, for more than 15 minutes. These procedures are described below.

Central Trains operate Class 170 Turbostar trains through the station, which are approximately 6 years old. If a train has to remain stationary adjacent to a platform for sometime, drivers will normally power down the train. Further, if a driver is away from a train which has been left running, it will 'shut out' automatically after 15 minutes if there is no driver's key. For health and safety reasons, drivers' keys are not left in trains located next to a platform, when drivers are away from their trains. If a train has been powered down for

sometime, a driver usually strikes the train up again approximately 5 to 10 minutes prior to departure.

Virgin Trains operate Virgin Voyager trains through the station, which are approximately 5 years old. These trains operate in a similar manner to those operated by Central Trains.

Midland Mainline operate their relatively new Meridian trains and some relatively old High Speed Trains (HSTs) through the station. The Meridian trains are approximately 2 years old and operate in a similar manner to those operated by Central Trains and Virgin Trains. The HSTs are approximately 30 years old. They do not have an automatic shut off. Further, if a HST remains stationary adjacent to a platform, at least one of its powered cars, (there is one at either end of the train) must be kept running to maintain the electrics and heating on the train. However, the average timetabled dwell time for HSTs at Derby Station is 2 minutes and there is no timetabled HST dwell times of 15 minutes or more. Further, no HSTs turnaround (i.e. finish and start) at Derby Station, which otherwise may involve a HST powered car being left stationary, running, and adjacent to a platform for a considerable period of time.

Evidence suggests that during normal operations at Derby Station locomotives are therefore unlikely to be left with their engines running adjacent to a platform for more than 15 minutes. Whilst inevitably this does occur from time to time, it is clear that this is not normal practice and, therefore is unlikely to result in an exceedence of any of the air quality objectives for sulphur dioxide. Consequently, there is no need to progress to a Detailed Assessment for sulphur dioxide in respect of Derby Station at this time.

8.4 Conclusion

The Council is not required to progress to a Detailed Assessment of sulphur dioxide at this time, as summarised in Table 8.3.

Table 8.3 – Conclusions for Sulphur Dioxide	
Source, location or data that need to be assessed	Detail Assessment Required?
A) Monitoring data outside an AQMA	No
B) Monitoring data within an AQMA	No
C) New industrial sources	No
D) Industrial sources with substantially increased emissions, or new relevant exposure	No
E) Areas of domestic coal burning	No
F) Small boilers > 5 MW _(thermal)	No
G) Shipping	No
H) Railway Locomotives	No

9 PM₁₀

9.1 Air Quality Objective

PM₁₀ was assessed using the objectives given in Table 9.1.

Table 9.1 - Objectives for PM₁₀

Objective	Measured as	To be achieved by
50 µg/m ³ not to be exceeded more than 35 times per year	24-hour mean	31 December 2004
40 µg/m ³	Annual mean	31 December 2004

9.2 Consideration of the Checklist

The items given in Table 9.2 have been considered in accordance with Guidance note LAQM.TG(03). Where appropriate, a further assessment of an item has been made below.

Table 9.2 – Checklist for PM₁₀ including the source, location or data that need to be assessed

Item	Consideration
A) Monitoring data outside an AQMA	<p>TEOM analysers are located at the Council House and adjacent to the outer ring road at Warwick Avenue. A copy of the Council's QA procedures for air quality monitoring is given in Appendix 4.</p> <p>The monitored concentrations have recently been reviewed and published in the 2006 DA for PM₁₀. No exceedences of the 24 hour or annual objective were recorded. There is no new monitoring data that can be assessed in this report.</p>
B) ** Monitoring data within an AQMA	<p>A gravimetric sampler and a TEOM analyser are located adjacent to the QDF site at Sinfin B, Rolls Royce. A copy of the Council's QA procedures for air quality monitoring is given in Appendix 4. Details of the monitoring results are given in Section 9.4 'Changes Requiring Further Assessment'. Notably there was a monitored exceedence of the 24 hour objective in the vicinity of QDF in 2005.</p>

Item	Consideration
B)** Monitoring data within an AQMA continued....	<p>Notwithstanding the above, it is important to note that QDF closed late in 2005. It is therefore anticipated that there will not be a monitored exceedence of the 24 hour objective in the vicinity of QDF in 2006. The associated informal Air Quality Action Plan is considered in Section 9.3 below.</p> <p>Evidence suggests that this AQMA may require revocation in the future, so there will be a need for a DA of PM₁₀ in this location. This assessment will be produced so as to make use of the January to December 2006 monitoring results.</p>
C) Busy roads and junctions in Scotland	Not applicable to Derby.
D) Junctions	The potential for busy junctions in Derby to cause exceedences of the objectives has recently been reviewed and published in the 2006 DA for PM ₁₀ . There is no new traffic data that can be assessed in this report.
E) Roads with high flow of buses and/or HGVs	<p>This was examined in the 2004 USA. It was concluded that there were no roads with a high flow of buses and/or HGVs (i.e. greater than 20%). The highest recorded flow of buses and HGVs on a road from traffic counts was 17%. This situation remains unchanged despite the temporary relocation of the bus station as part of the Riverlights development.</p> <p>The Riverlights development has resulted in the closure of the city's bus station and creation of a temporary bus station along Morledge, Corporation Street, Full Street and Derwent Street. The automatic traffic counter on Corporation Street shows that between 10 October 2005 and 27 May 2006, buses on this road accounted for 10.3% of the AADT. Assuming that this situation of <20% HDVs is repeated on Morledge, Full Street and Derwent Street, there is no need to proceed to a DA for PM₁₀ in relation to the temporary bus station. In any case, the temporary nature of the bus station means that it's associated local air quality impacts fall outside of the Review and Assessment process.</p>
F) New roads constructed or proposed since last round of review and assessment	<u>Alvaston Bypass:</u> This road was opened on 17 December 2003 and PM ₁₀ concentrations associated with it were fully investigated within the 2006 DA for PM ₁₀ . No exceedences of the 24 hour average objective were however predicted.

Item	Consideration
F) New roads constructed or proposed since last round of review and assessment continued...	<p><u>Connecting Derby</u>: This is an integrated transport scheme, focussing upon traffic management and highway works. Phases 2 and 3A will create a more direct route around the inner ring road, whilst Phase 3B will make changes to the 'Five Lamps' junction.</p> <p>It has recently been determined that a public inquiry is not required for these phases, so the Connecting Derby planning application will now go back to full Council in September 2006. The associated Air Quality Impact Assessment is being revised as part of this process, to take account of the new monitoring data and the 2006 DA for PM₁₀. In addition to the annual average objective, it will also specifically consider the 24 hour average objective. The original Air Quality Impact Assessment predicted that there will be an increase in annual average PM₁₀ concentrations at some locations and a decrease at other locations. Importantly however, there were no predicted exceedences of the annual average PM₁₀ objective. Once the revised Air Quality Impact Assessment has been completed and planning approval granted, the need for a DA for PM₁₀ will be reviewed.</p>
G) Roads with significantly changed traffic flows, or new relevant exposure	<p>The 2006 DA for PM₁₀ considered all busy road junctions with an AADT greater than 10,000 vehicles per day. All roads with AADTs greater than 10,000 vehicles per day and new relevant exposure were included within this assessment.</p> <p>No exceedences of the 24 hour objective were predicted. On this basis, there is no need for a further DA of PM₁₀ at this time.</p>
H) Roads close to the objective during the second round of review and assessment	See G) above.
I) New industrial sources	A list of Part A and Part B industrial sources is given in Appendix 5. New processes since the last 2004 USA are highlighted in grey. Comparison with the checklist given in the guidance (p. A2-59 to A2-61) of potential significant sources of PM ₁₀ indicates that none of these processes fall into this category. Further, there were no predicted exceedences of any air quality objectives in the air quality assessment submitted by Slipcatch Ltd to the Environment Agency, as part of their Permit application under the Integrated Pollution,

Item	Consideration
I) New industrial sources continued...	Prevention and Control regime. Neighbouring local authorities have similarly confirmed that there are no new industrial sources in their areas, which are likely to have a detrimental affect on air quality within Derby.
J) Industrial sources with substantially increased emissions, or new relevant exposure	<p><u>Substantially increased emissions:</u> A list of part A and Part B industrial sources is given in Appendix 5. None of the existing processes have experienced a substantial increase (greater than 30%) in emissions since the 2004 USA. Similarly neighbouring local authorities have confirmed that there has been no substantial increase in emissions from any existing processes in their areas, which are likely to have a detrimental affect on air quality within Derby.</p> <p><u>New relevant exposure:</u> Not applicable as no sources were identified as potential significant sources of sulphur dioxide in the 2004 USA.</p>
K) Areas of domestic solid fuel burning	This was examined in the 2004 USA. It was concluded that it was unlikely that there would be any exceedences of the objectives due to domestic coal burning. This situation remains unchanged.
L) Quarries/ landfill sites/ opencast coal/ handling of dusty cargoes at ports etc.	There are no sources of this nature within Derby.
M) Aircraft	Emissions from aircraft operating below 200m must be considered. However, since East Midlands Airport is over 8km from the border of Derby aircraft are significantly higher than 200m when passing over Derby.

*** Further Assessment of this item required*

9.3 Consideration of Informal Air Quality Action Plan

A PM₁₀ Air Quality Management Area was declared in August 2001 in the vicinity of QDF Components Limited's foundry on Victory Road (Appendix 2). However, subsequent monitoring of PM₁₀ (TEOM) during 2001 and 2002 showed compliance with the 24 hour objective. Implementation of an Action Plan in pursuit of the 24 hour objective in this location was therefore deferred, pending collection of further monitoring data. Unfortunately, the 2003

monitoring data (TEOM) showed exceedences of the 24 hour objective and an informal Action Plan for PM₁₀ was implemented. This included installation of a gravimetric sampler in the vicinity of QDF in October 2004, as well as liaising with QDF and Rolls Royce (a neighbouring site) on PM₁₀ emissions from their operations. This informal Action Plan was not formally published due to the flexibility given to the Council when it achieved an 'excellent' Comprehensive Performance Assessment in 2005. An update on the plan was, however, provided in the City Council's 2005 Progress Report (9).

A further update on the Action Plan is provided in Appendix 8, including discussions with QDF and Rolls Royce. The 2005 monitoring results (TEOM and Gravimetric) are reviewed below. Whilst the 24 hour objective was exceeded in 2005 it is anticipated that, following the closure of the QDF foundry in November 2005, it will be met in 2006. It is therefore proposed that monitoring continue in this location during 2006, to determine whether this will be the case, and therefore whether the PM₁₀ AQMA can be revoked. An entire calendar year of monitoring data will be required, in order to be confident in this conclusion.

A DA of PM₁₀ in this location will be carried out in due course including the analysis of the 2006 monitoring data.

9.4 Changes Requiring Further Assessment

Monitoring Data within an AQMA – Sinfin B Monitoring Site

The location of the Sinfin B monitoring site is given on the plan in Appendix 2. It is located immediately adjacent to the PM₁₀ Air Quality Management Area. Whilst this location is not immediately adjacent to the QDF foundry (worst-case scenario), PM₁₀ measured here clearly represent PM₁₀ concentrations in the area. A copy of the Council's QA procedures for air quality monitoring is given in Appendix 4.

A gravimetric sampler and a TEOM analyser are both located at this monitoring site. The TEOM analyser has been on site since the late 1990s and the gravimetric sampler was commissioned in October 2004. Whilst

results from the gravimetric sampler can be compared directly with the air quality objectives, results from the TEOM sampler have been adjusted to gravimetric equivalent concentrations for comparison with the objectives. To do this they have been multiplied by a factor of 1.3 in accordance with Guidance Note LQAM.TG(03). No local adjustment factor has been applied so as to allow consistent comparison of the TEOM results between 1999 and 2005.

A summary of the PM₁₀ monitoring results (TEOM and gravimetric) is given in Table 9.3. All the annual mean concentrations measured are less than the annual mean air quality objective of 40ug/m³. However, there have been exceedences of the 24 hour objective.

PM₁₀ concentrations measured using the TEOM analyser show that the 24 hour objective was exceeded in 1999, 2000, 2003 and 2004 (Table 9.3). There was however no exceedence of this objective in 2005. In fact the 18 days exceeding the 24 hour objective concentration of 50ug/m³ in 2005 was significantly less than in previous years.

In contrast to the 18 exceedences recorded by the TEOM analyser 39 exceedences were recorded by the gravimetric sampler. This is a significant difference, which results in a 2005 exceedence of the 24 hour objective. Having said this, further examination of the monitoring results shows that monthly mean and maximum daily PM₁₀ concentrations were lower in the latter half of the year, as compared to earlier part of the year (Figure 9.1). This is also true of exceedences of 24 hour objective concentration (Figure 9.2), which again is likely to be due to closure of the QDF foundry in October 2005.

Results from the gravimetric sampler can be compared directly with the air quality objectives and it is clear that there was an exceedence of the 24 hour objective in 2005. It is also clear that the correction factor applied to the PM₁₀ monitoring results from the TEOM analyser, to adjust them to gravimetric equivalent concentrations, underestimates the true gravimetric results. However, results from the TEOM analyser over the last 7 years do indicate a

significant reduction in the number of days exceeding the 24 hour objective concentration in 2005 compared to previous years. Further, PM₁₀ concentrations during the later half of 2005, excluding the high concentrations/exceedences usually observed around bonfire night, were much lower than in the first half of 2005. It seems likely that this situation arose following the scaling down of activities at QDF Components Ltd in 2005 with the final closure of the foundry in October 2005.

It remains to be seen whether the 2006 TEOM and gravimetric results will both record less than 35 exceedences of the 24 hour objective. Consideration of these results will be made in a DA for PM₁₀, with a view to determining whether the Victory Road PM₁₀ AQMA can be revoked.

9.5 Conclusion

The Council is required to progress to a Detailed Assessment for the Victory Road PM₁₀ AQMA to determine whether it can be revoked; since the QDF foundry closed in the autumn of 2005, it is anticipated that the 24 hour objective for PM₁₀ will be met in this location in 2006. No other Detailed Assessments are required for PM₁₀ at this time. A summary of the conclusions for PM₁₀ is given Table 9.4.

Table 9.3 – PM₁₀ Monitoring Results at SinfinB (numbers in red indicate an exceedence of the air quality objective)								
Year	1999	2000	2001	2002	2003	2004	2005	Objective
TEOM Results (TEOM results have been x1.3 to report gravimetric equivalent results in accordance with Guidance Note LAQM.TG (03))								
Annual Mean (gravimetric equivalent) µg/m ³	32.5	32.5	29	28.9	32.1	31	24.4	40
Max 24hr Mean (gravimetric equivalent) µg/m ³	113.1	139.1	88.4	87.4	84.5	110.9	83.4	None
Number of Days above 24hr objective conc. 50µg/m ³	46	41	31	27	57	40	18	35/year
Data Capture (%)	83	86	93	98	95	96	100	90%
Gravimetric Results								
Annual Mean µg/m ³							30	40
Max 24hr Mean µg/m ³							207	None
Number of Days above 24hr objective conc. 50µg/m ³							39	35/year
Data Capture (%)							94	90%

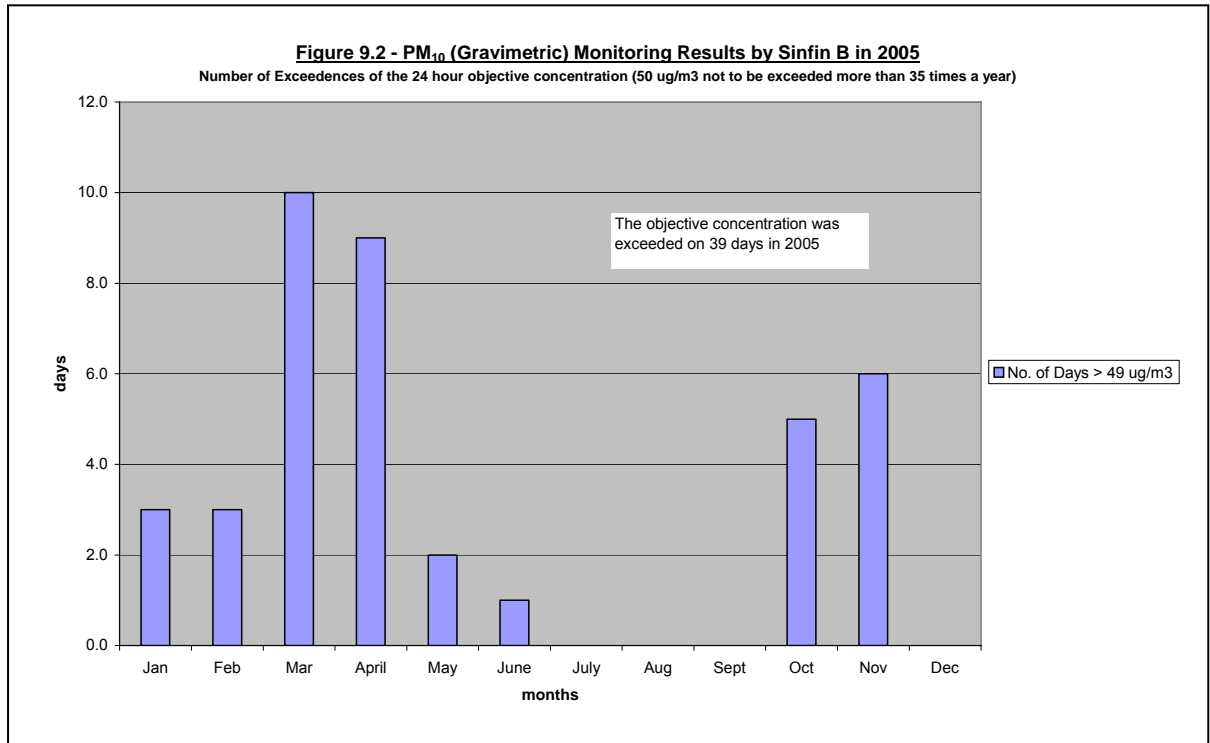
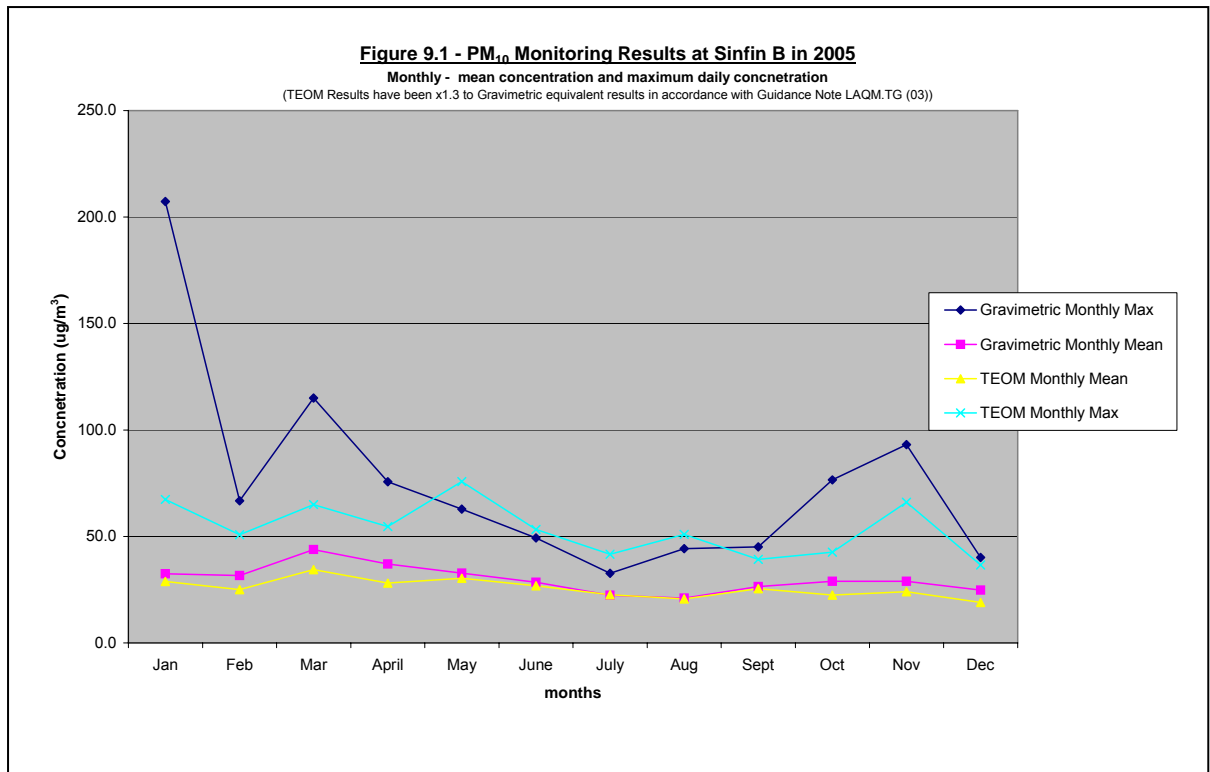


Table 9.4 – Conclusions for PM₁₀	
Source, location or data that need to be assessed	Detail Assessment Required?
A) Monitoring data outside an AQMA	No
B) Monitoring data within an AQMA	Yes
C) Busy roads and junctions in Scotland	No
D) Junctions	No
E) Roads with high flow of buses and/or HGVs	No
F) New roads constructed or proposed since last round of review and assessment	No
G) Roads with significantly changed traffic flows, or new relevant exposure	No
H) Roads close to the objective during the second round of review and assessment	No
I) New industrial sources	No
J) Industrial sources with substantially increased emissions, or new relevant exposure	No
K) Areas of domestic solid fuel burning	No
L) Quarries/ landfill sites/ opencast coal/ handling of dusty cargoes at ports etc.	No
M) Aircraft	No

10 GLOSSARY OF TERMS AND ABBREVIATIONS

AADT – Annual average daily traffic on a road/link obtained via a traffic count.

Air Dispersion Modelling - Mathematical modelling calculations using emissions data from an emissions inventory.

Air Quality Standard – These standards represent minimal/no risk health based standards, for ambient concentrations of pollutants. They are based purely on medical evidence, taking no account of costs, benefits or technical feasibility.

Air Quality Objective – These objectives take account of both costs and benefits, forming benchmarks in time, against which “Air Quality Standards” can be achieved.

Annual Mean – the average of the concentrations measured or calculated for each pollutant for one calendar year

ADMS Urban – An air dispersion model developed by CERC specifically to deal with modelling urban pollution or pollution from many sources.

Air Quality Action Plan – Plan setting out measures that will be taken in pursuit of an air quality objective in an AQMA.

AQAP – Air Quality Action Plan

AQMA – Air Quality Management Area

AURN – Automated Urban and Rural Network of air quality monitoring stations

Background Concentration – Concentration of a particular pollutant thought to be present in an area, which cannot be accounted for by dispersion modelling from local emissions. It is generally caused by transportation of pollutants over long distances.

BETX – Benzene, toluene, ethylbenzene, (m+p) – xylene and o xylene

CERC – Cambridge Environmental Research Consultants Limited

CO – Carbon monoxide

Data Capture – The percentage of all the possible measurements for a given period that were validly measured

DA – Detailed Assessment

Detailed Assessment – Follows on from the Updating and Screening Assessment. It is carried out for those pollutants and specific locations that have been identified as requiring a further assessment and must determine with reasonable certainty whether an air quality objective will be exceeded at a location with relevant public exposure and so the need to declare an AQMA.

Defra – Department for Environment, Food and Rural Affairs

DETR – Department for Environment, Transport and the Regions (now Defra)

DfT – Department for Transport

DMRB - Design Manual for Roads and Bridges

Emissions Inventory – A full list of sources that emit pollutants into the atmosphere over a sustained period of time.

Exceedence – A period of time where the concentration of a pollutant is greater than, or equal to, the appropriate air quality objective.

IPPC – Integrated Pollution, Prevention and Control Act 2000

LTP – Local Transport Plan

LTP1 – Local Transport Plan 2001-2006

LTP2 – Local Transport Plan 2006-2011

Maximum Hourly Average – The highest hourly reading of air pollution obtained during the time period under study

NAEI – National Atmospheric Emissions Inventory

NETCEN – National Environmental Technology Centre

NO – Nitric Oxide

NO₂ – Nitrogen Dioxide

NO_x – Nitrogen Oxides

NPL – National Physical Laboratory

O₂ – Oxygen

O₃ - Ozone

Part A Processes/Activities – Large emitters of pollution, which are regulated by either the Environment Agency (A1) or Local Authorities (A2)

Part B Processes/Activities – Smaller emitters of pollution, which are regulated by local authorities

Percentile – A value found by listing a set of numbers in order and calculating the number below which a certain percent of the data set lies. For example, the 99th percentile of values in a data set is the value below which 99% of the data falls.

PM₁₀ – Particulate matter with a diameter of 10µm or less

Progress Report – Must be completed in those years when neither a USA or DA are published to ensure continuity in the local air quality management process. It must consider new monitoring data and new local development that might affect air quality.

QA/QC – Quality Assurance/Quality Control.

QDF – QDF Components Limited

Relevant Location - The quality of the air at locations which are situated outside of buildings or other natural or man-made structures, above or below ground, and where members of the public are regularly present.

Review and Assessment – A review concerns the consideration of levels of pollutants in the air for which objectives have been prescribed and estimations of likely future levels. An assessment is the consideration of whether estimated future levels are likely to exceed the levels set in the objectives.

Running Mean – a mean or series of mean, calculated for overlapping time periods. For example, a daily running 8 hour mean equals any 8 hour period within that day.

SO₂ – Sulphur dioxide

Stack Characteristics – Details pertaining to a chimney which will affect calculated concentrations. It includes chimney height, chimney diameter, temperature, velocity of emission, and rate of pollutant emission.

Stage 1 and 2 Report – Report based on the original guidance for the review and assessment of air quality. Similar to an USA.

Stage 3 Report – Report based on the original guidance for the review and assessment of air quality. Similar to a DA.

Stage 4 Report – Report based on the original guidance for the review and assessment of air quality. It is a further review and assessment of air quality in an AQMA.

TEOM – Tapered element oscillating microbalance (used to measure PM₁₀)

µg/m³ – Microgrammes per cubic metre of air. A measure of concentration in terms of mass per unit volume. A concentration of 1µg/m³ means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.

UKAS – United Kingdom Accreditation Service

Updating and Screening Assessment – This assessment must be carried out every 3 years and is the initial stage in the review and assessment of air quality. It must identify those matters that have changed since the previous review and assessment and which may require further assessment including: new monitoring data, new objectives and new sources or significant changes to existing sources.

USA – Updating and Screening Assessment

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