



2018 Air Quality Annual Status Report (ASR)

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

(May, 2018)

Chesterfield Borough Council

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Derbyshire County Council; Endorsement from the Director of Public Health

Air pollution is a key Public Health priority, associated with a number of adverse effects across the life course. Sources of air pollution are predominately the result of human activity, and in particular road transport and industrial and domestic combustion.

Even modest reductions in air pollution could have significant direct and indirect benefits for the population of Derbyshire including reductions in Hospital admissions, GP consultations and congestion, and increases in physical activity and economic growth. With levels of traffic and urban development expected to rise, there is a growing need for collaborative action.

Improvements in air quality cannot be achieved in isolation and will require the action of organisations, business and individuals across Derbyshire. The Annual Status report is one of a number of strategies to support local action, and includes a range of measures which will support long term local air pollution improvement. Public Health will continue to work with partners to advocate for improvements in Air Quality and provide expertise and evidence to inform policy.

A handwritten signature in black ink, appearing to read 'Dean Wallace', written in a cursive style.

Dean Wallace, Director of Public Health, Derbyshire County Council
May 2018

Executive Summary: Air Quality in Our Area

Air Quality in Chesterfield

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas^{1,2}.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion³.

The main pollutant of concern in Chesterfield is Nitrogen Dioxide (NO₂) and the predominant source is traffic. The overall trend in levels of the pollutant continues to show a gradual decline in levels, but year-on-year data show fluctuating levels and at pollutant hotspots this variation demonstrates intermittent breaches of the Air Quality Objective.

One location (Church Street, Brimington) has required the declaration of an Air Quality Management Area and a second location (Sheffield Road, Stonegravels) is being considered due to the changes in levels of Nitrogen Dioxide.

Details of the Air Quality Management Area can be found on the Chesterfield BC website: <https://www.chesterfield.gov.uk/health-and-environment/air-quality/air-quality-management-area-brimington.aspx>

A map of the location can be found in Appendix D.

Fine particulate matter (PM₁₀ and PM_{2.5}) is also a concern. The levels measured do not indicate a breach of the Air Quality Objectives, but as a general systemic irritant, measures are required to address the general increase in traffic congestion, as this is the pre-dominant source of pollution across the Borough.

During 2017, no monitoring locations within Chesterfield breached the Air Quality Objectives.

¹ Environmental equity, air quality, socioeconomic status and respiratory health, 2010

² Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

³ Defra. Abatement cost guidance for valuing changes in air quality, May 2013

Actions to Improve Air Quality

Air quality monitoring, targeted on priority areas (where high traffic flows are located closely to housing), is continuing, allowing informed decisions on planning and public health initiatives to be made.

We attend, and participate in, the following policy and work groups:

- i) Active Travel Group
- ii) Planning and Health Group
- iii) Active Transport Group
- iv) Derbyshire Cycle Network
- v) Local Sustainable Travel Group
- vi) Derbyshire Air Quality Working Group
- vii) Derbyshire Environmental Pollution Group
- viii) Sheffield City Region Air Quality and Climate Group

Conclusions and Priorities

1) Conclusions

- i) The levels of pollution, attributed to traffic, have shown a reduction when the levels across the borough, as a whole, are considered. Some variation across the borough has been noted, but the reduction is, with a single exception, uniform.
- ii) Current levels within the Air Quality Management Area do not demonstrate an ongoing breach of the Air Quality Objective for Nitrogen Dioxide. However, this has been the only year since 2011 where no breach of the Objective is occurring and variation in levels has been noted in previous years. As such, we will not revoke the Chesterfield No1 Air Quality Management Area, unless the reduction is demonstrated to continue.
- iii) Levels on a single stretch of Sheffield Road (where terraced housing is close to a busy section of traffic light controlled road) have also shown a reduction in levels, all results at this location are below the Air Quality Objective for Nitrogen Dioxide. Once again, given the historic variation in the data, targeted monitoring will continue at this location.

2) Priorities

- i) Long term redevelopment schemes may have an adverse effect of the levels of traffic flow through the area of the Air Quality Management Area. The information supplied in support of these planning application required will be scrutinised carefully, in order to ensure that any such impacts are fully mitigated, by the use of (for example) travels plans, supporting car clubs, and supporting active travel schemes.
- ii) We will promote the adoption and use of Low Emission Vehicles, including the “future-proofing” of developments (including workplaces, commercial developments and residential areas) by requiring that the infrastructure for electric charging points be installed as part of the build phase. This is particularly important as central government has set an aspirational target for all new vehicles in the UK to be zero emission at source by 2040 (as contained in *The UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations: Detailed Plan*, published July 2017).
- iii) Where practical, and possible, Chesterfield BC’s internal procurement policy will promote the use of Low Emission Vehicles.
- iv) Encourage the planting of landscape features (trees and vegetation) such as “green” walls, setbacks, and green spaces, in order to reduce pollution exposure.
- v) The raising of public awareness of air quality and health issues, by the use of the public facing sections of our website, and by publicising national initiatives (such as Clean Air Day on June 21st).
- vi) We will work with County-wide sustainable travel initiatives to support modal shift either through our own workforce or wider population, through active travel, ensuring connectivity within communities and infrastructure such as (but not exclusively) cycle paths.
- vii) Complete, and publish, the Air Quality Action Plan related to the Chesterfield N^o 1 AQMA.

Local Engagement and How to get Involved

Most inputs regarding managing air quality is related to the planning of local developments (either by assessing the possible impact of proposed works, or by promoting low emission infrastructure).

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Following the VW emissions scandal in 2015, the reduction in the use of diesel fuels appears to be continuing. While this has a positive effect on public health and air quality grounds, it runs contrary to the previous policy which promoted the use of diesel as a positive action for addressing climate change. This continues to undermine the effectiveness of the air quality message. There is also a continued increase in the use of wood burning domestic heating appliances, again promoted as an effective alternative fuel source with positive climate change properties. Research indicates that these have an adverse effect on particulate pollution levels.

Information on action to improve air quality can be found on the Chesterfield BC website at:

<https://www.chesterfield.gov.uk/health-and-environment/air-quality.aspx>

Details on how the public can act to improve air quality can be found at:

<https://www.chesterfield.gov.uk/health-and-environment/air-quality/the-publics-role-in-air-quality.aspx>

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1 Local Air Quality Management

This report provides an overview of air quality in Chesterfield during 2017. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Chesterfield BC to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by Chesterfield BC can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at <https://www.chesterfield.gov.uk/health-and-environment/air-quality/air-quality-management-area-brimington.aspx>

See Appendix D: Map(s) of Monitoring Locations and AQMAs, which provides for a map of air quality monitoring locations in relation to the AQMA.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)		Action Plan (inc. date of publication)
						At Declaration	Now	
Chesterfield No 1	Declared 14th August 2015	NO ₂ Annual Mean	Brimington, Chesterfield	4 to 18 (evens only) Church Street, Brimington	NO	42.5µg/m ³ (average within AQMA)	35.3µg/m ³ (average within AQMA)	Currently in draft form

Chesterfield BC confirm the information on UK-Air regarding their AQMA(s) is up to date

2.2 Progress and Impact of Measures to address Air Quality in Chesterfield

Defra's appraisal of last year's ASR concluded that the report was well structured, detailed and provided the information required by the supporting guidance. The appraisal agreed that monitoring suggested that there may, occasionally, be additional exceedences of the Air Quality Objective for Nitrogen Dioxide outside the existing AQMA, and supported the decision to continue intensive monitoring of the terrace façade on Sheffield Road.

Chesterfield BC has taken forward a number of direct measures during the current reporting year of 2017 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

Chesterfield BC's priorities for the coming year are:

- i) to continue to press for action by the local Highway Authority to implement action to address the issue of congestion and associated poor air quality within Chesterfield No1 AQMA, and by extension the wider area.
- ii) to complete the AQMA Action Plan document.
- iii) to closely assess applications for housing developments which may place an increased traffic loading on the road network where air pollution levels are close to, or have already exceeded, the air quality objective.
- iv) to assess the suitability of the existing electric cars and vans currently in use, in order to look into the increased use of such vehicles across the local authority fleet, with the long term view being to encourage the introduction of low emission vehicles by partner agencies.
- v) to continue to work in conjunction with existing regional bodies (East Midlands Air Quality Network, Sheffield City Region Climate Change and Air Quality Group, etc.) to share experience and best practice.

The principal challenges and barriers to implementation that Chesterfield BC anticipates facing are:

- i) Chesterfield is a traffic node for goods vehicles and general traffic from the south of Manchester, Stockport, Macclesfield, and Stoke-on-Trent. These vehicles use the A619 to enter Chesterfield through the Peak District and

(if heading north) use this route to access the M-1. This places an increased traffic loading on the road passing through the AQMA.

- ii) The changes to local authority funding which are due to come into effect may have an adverse effect, in that there will be pressure to approve applications for both commercial and residential developments which would have a deleterious impact on air quality both within the existing AQMA, and across the wider Chesterfield BC area.
- iii) Lower than expected uptake of low emission vehicles across the region as a whole, in conjunction with a vehicle fleet which DVLA data suggest is older than the national average to a statistically significant degree, means that traffic pollution has a higher impact than traffic modelling data suggests.
- iv) The local Highway Authority (Derbyshire County Council) has not signed up to the On-street Residential Chargepoint Scheme.

Progress on the following measures has been slower than expected due to slower than hoped action by the local Highway Authority in planning and implementing actions to free up vehicle flows along the road affected the AQMA. Pollution levels are currently not breaching the NO₂ air quality objective, but this may be due to underlying variations in regional emissions. Changes to traffic lights controlling vehicle flows through the existing AQMA may have a positive effect pending further works being carried out to change the road junction, in order to address the problem fully.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Chesterfield BC anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of Chesterfield No 1 AQMA.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Industrial Emissions	Environmental Permits	Other measure through permit systems and economic instruments	LA Environmental Health	2010	2012	All Permitted process rated as Low/Medium Environmental Impact	General reduction in industrial emissions (including noise)	Completed	2014	Financial constraints on private businesses may exceed saving in Permit Fees
2	Joint Working	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	LA Environmental Health	2017	2018	None assigned	General reduction in traffic emissions	Implementation on-going	Ongoing	Reduction in numbers of staff dedicated to air quality roles/ increase in non-air quality work leading to pressure on available resources
3	Electric Vehicles	Policy Guidance and Development Control	Other policy	LA Environmental Health, LA Fleet Manager	2016	2017	None assigned	Reduced vehicle emissions	Implementation on-going	2018	Trial scheme completed, a small number of electric vehicles are being used. Funding sought to allow further uptake of Low Emission Vehicles for fleet, however budgetary pressures have made widespread uptake unlikely

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4	Agile working	Promoting Travel Alternatives	Encourage / Facilitate home-working	Corporate	2014	2015	Number of staff homeworking per day	Reduced vehicle emissions	Data no longer recorded	Ongoing	Conflicting requirement for staff (wish to encourage home working versus need to be present when required)
5	Publicity	Public Information	Via the Internet	LA Environmental Health	2013	2015	Number of website hits	Possible Reduction in vehicle emissions	Website kept up to date	Ongoing	Lack of IT support
6	Car Parking	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	Corporate	2017		Increased Parking Income / Number of staff homeworking	Possible Reduction in vehicle emissions	Currently being planned	2019	Scheme is being brought in to gain parking income from staff, but may encourage home working
7	East Midlands Air Quality Network	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	PHE/Derbyshire County Council/LA	Ongoing	Ongoing	N/A	Reduction in a Range of Pollutants	Work Plans/Action Plans Developed	N/A	Air Quality Working Group involves key players in public sector and voluntary sectors
8	Travel Plans Required as planning conditions for larger developments	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	LA	Ongoing	Ongoing	N/A	Reduced vehicle emissions	Implementation on-going	N/A	Travel Plans Required as planning conditions for larger developments

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9	100% Coverage of Smoke Control Area	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	LA	Completed	Completed	Air Quality Objective	Smoke and Sulphur Dioxide emissions reduced through Clean Air Act Regulation	Education and Enforcement, as required	N/A	Reduction in numbers of staff dedicated to air quality roles/ increase in non-air quality work leading to pressure on available resources
10	Making Air Quality Reports available to the Public	Public Information	Via the Internet	LA	Ongoing	Ongoing	Air Quality Objective	Reduction in a Range of Pollutants	Implementation on-going	Ongoing	Raise awareness on actions individuals can take

2.3 PM_{2.5} – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of PM_{2.5} (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM_{2.5} has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Chesterfield BC is taking the following measures to address PM_{2.5}:

We are a member of the East Midlands Air Quality Network and we will continue to work with partner agencies to ensure effective traffic management, in order to minimise the impact of traffic pollution across the borough.

Chesterfield BC is also a non-constituent member of the Sheffield City Region combined authority, and works as part of the Sheffield City Region Air Quality and Climate group.

The whole of the borough area of Chesterfield is included in well-established Smoke Control Areas (often referred to as Smokeless Zones). However, the effectiveness of these is continuing to be undermined by the increase in the use of DEFRA approved wood burning appliances which are effectively exempt from local authority enforcement actions. Research results increasingly indicate that these fireplaces have an adverse effect on particulate air pollution.

We are working with Derbyshire County Council (the local highways authority) in order to achieve the incremental changes in traffic management which would have sufficient beneficial impact to ameliorate the effects of traffic within the vicinity of the declared AQMA, and a concomitant reduction in adverse health effects on the local population.

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

Chesterfield BC undertook automatic (continuous) monitoring at 2 sites during 2017. Table A.1 in Appendix A shows the details of the sites. These sites are affiliated to AURN and this has allowed the gathering of full 12 months data at the roadside site. Data validation issues have meant that a large amount of nitrogen dioxide monitoring data from the Chesterfield Loundsley Green site has been discarded. This has meant that the monitoring data, for that site, has been annualised. Details of this (including the calculations) are included in Appendix C.

Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem (there are no such circumstances in this area, but we are part of the Non-Automatic Hydrocarbon Network). National monitoring results are available at https://uk-air.defra.gov.uk/data/data_selector

Maps showing the location of the monitoring sites are provided in Appendix D.

Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

Chesterfield BC undertook non-automatic (passive) monitoring of NO₂ at 38 sites during 2017 (two sites have been decommissioned during the year, due to the site owners withdrawing consent for the siting of the monitoring tubes). Table A.2 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. “annualisation”, travel blank correction, and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are adjusted for bias, travel blank correction, and (where required) “annualisation”. Distance correction is not required. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

Table A.3 in Appendix A compares the ratified and adjusted (for bias factor – 0.83, travel blank adjustments – 2.5µg/m³ mean over-read, and annualisation) monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

For diffusion tubes, the full 2017 dataset of monthly mean values is provided in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year.

No exceedences of the annual average levels of NO₂ has been found within the area of Chesterfield No1 AQMA. However, traffic analysis work (carried out in support of planning applications for housing developments in the vicinity of the AQMA) indicate that the road network (which includes the AQMA) is approaching capacity.

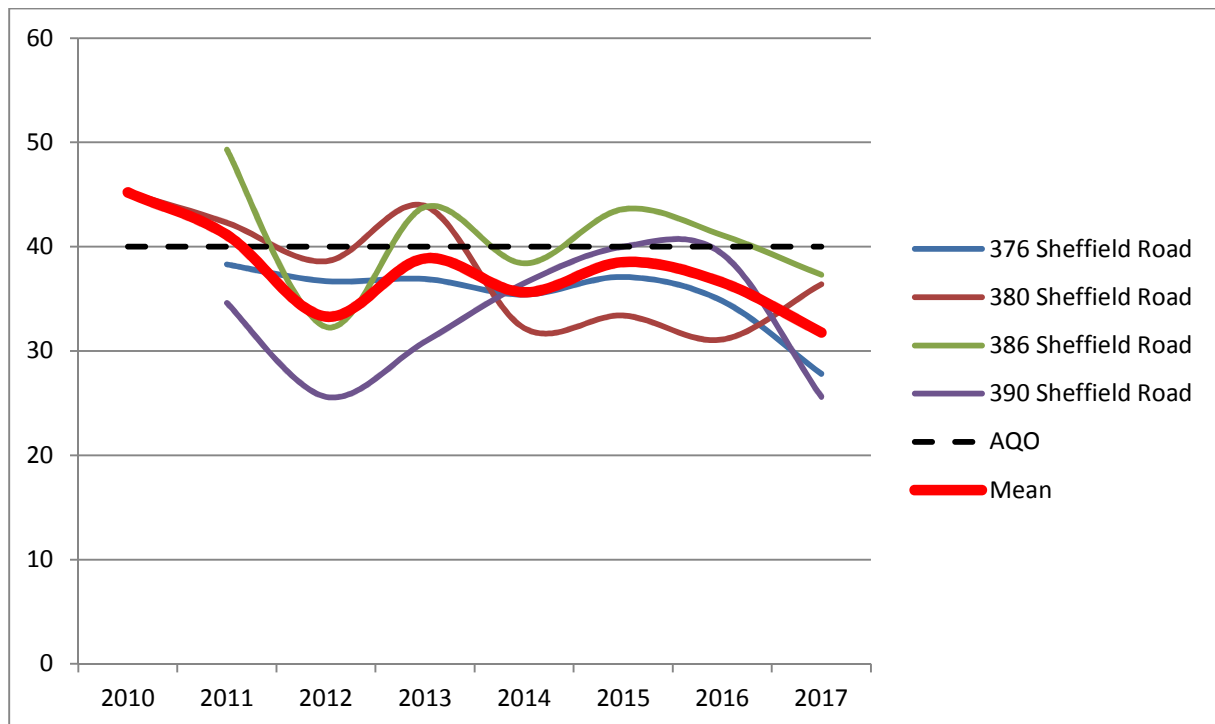
Intensive monitoring is also taking place at a row of houses affected by the change in a road junction serving a major supermarket (this has been discussed fully in the 2013 Detailed Assessment and 2014 Progress Report). This is a row of mixed commercial premises (comprising a public house, retail shop, sandwich shop, and hairdressers) and residential properties (7 homes). There are 4 diffusion tubes on this row of properties. **None of the locations on this façade demonstrate a breach of the air quality objective.**

This location was subject to a Detailed Assessment in 2012, and this was reported on in March 2013. The targetted intensive monitoring has continued at this location since that time, and levels have fluctuated around the air quality objective. There is little consistency in the monitoring results, but the overall trend demonstrates a gradual reduction on average levels (as shown in Figure 1, overleaf).

Figure 1 (below) demonstrates the wide variation in results from the monitoring which is closely co-located. Due to this, we are not confident that the data is robust enough to justify the declaration of an AQMA, nor to draw any firm conclusions with regard to long term trends.

Given the above, intensive monitoring will continue at this location.

Figure 1: Variation in NO₂ on Sheffield Road



The locations of the monitoring, using diffusion tubes due to the restricted space available, on the façade of the terraced houses is shown in Figure 2 (overleaf).

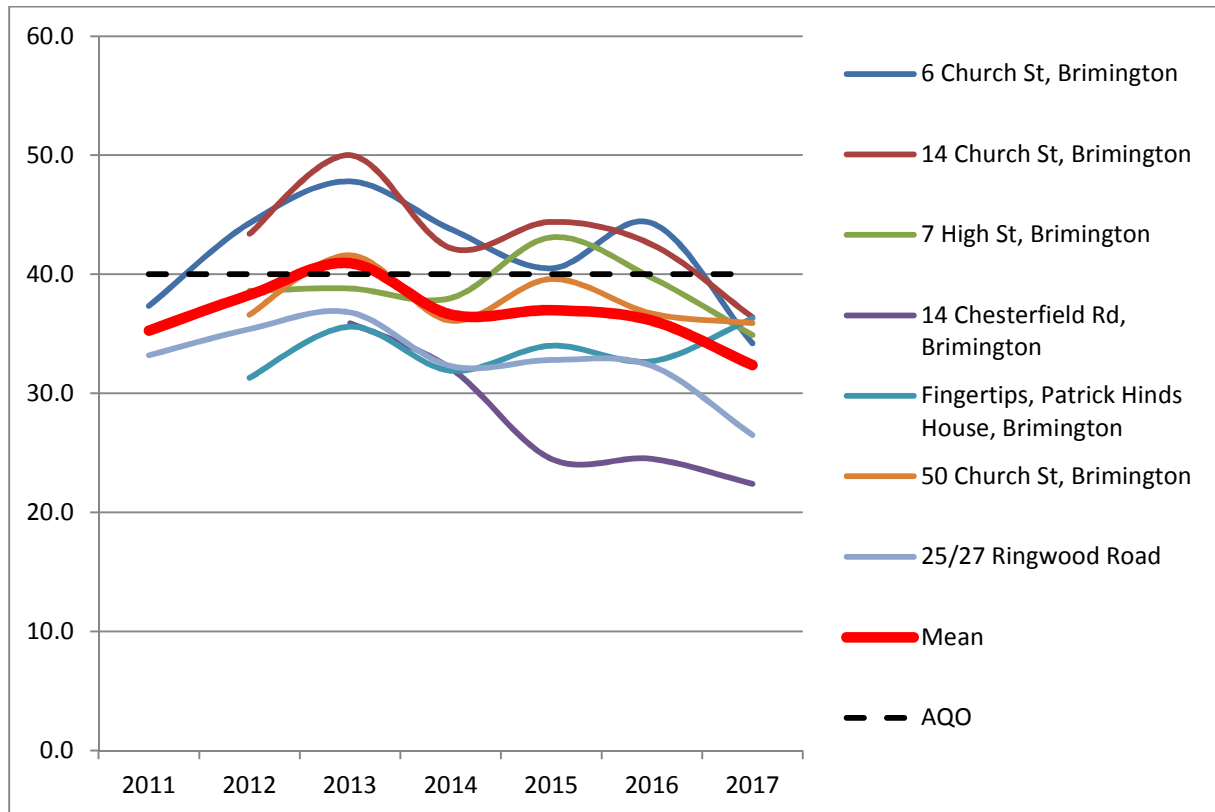
Figure 2: Locations of Diffusion Tube monitoring on the affected façade



Note: The green locations are below the AQO for NO₂. For comparison with Figure 1 (above), the premises numbers run left to right.

Ongoing monitoring within, and in the vicinity of, the Chesterfield No.1 AQMA has demonstrated continued fluctuation in levels, as shown in Figure 3 (below).

Figure 3: Variation in NO₂ in and around the vicinity of Chesterfield No.1 AQMA



The two monitoring locations within the AQMA do not demonstrate a breach of the AQO for NO₂. **For the first time since 2011, none of the monitoring locations within or around the AQMA demonstrate a breach of the AQO for NO₂.**

Recent traffic modelling work, in support of large scale residential development proposals in the Staveley and Rother Valley Corridor, has indicated that the one-way system which flows past the residential façade in the AQMA is expected to reach capacity in the next few years, even if the proposed residential developments do not take place. The intensive monitoring will continue within, and around the vicinity of the AQMA.

Figure 4 (overleaf) shows the locations of the above monitoring sites, and the existing boundary of the AQMA.

Figure 4: Locations of Diffusion Tube monitoring within and in the vicinity of Chesterfield No1 AQMA



Note: The green locations are below the AQO for NO₂ during the current year's data. The extent of the AQMA is shown in blue

None of the monitoring locations across Chesterfield breach the annual mean objective for Nitrogen Dioxide during 2017.

No annual mean results are greater than 60µg/m³, as such we can be confident in concluding that there are no sites with an exceedance of the 1-hour mean objective.

3.2.2 Particulate Matter (PM₁₀)

Both AURN sites monitor for PM₁₀. **The levels monitored do not breach either the annual mean or the 24 hour mean objectives.**

Table A.5 in Appendix A compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

Table A.6 in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations for the past 5 years with the air quality objective of 50µg/m³, not to be exceeded more than 35 times per year.

3.2.3 Particulate Matter (PM_{2.5})

Both AURN sites monitor for PM_{2.5}. **The data show that the levels of PM_{2.5} within the borough area comply with the annual average EU limit value (25µg/m³ by 2020).** The levels at Chatsworth Road have been fairly consistent for the last few years, and have shown a gradual slight decrease in levels. No long term trend data is yet available at the Loundsley Green site, as it has only operated at this site for three years. The levels at this background site are lower, as would be expected. Monitoring is continuing. Table A.7 in Appendix A presents the ratified and adjusted monitored PM_{2.5} annual mean concentrations for the past 5 years.

3.2.4 Sulphur Dioxide (SO₂)

Sulphur Dioxide is not a pollutant of concern, following the closure of a long standing chemical works which included a Sulphuric Acid production site in 2007. Prior to this the whole of the borough was covered by a number of smoke control areas. This, combined with the widespread uptake in the use of gas for domestic heating, meant that the use of coal and other solid fuels dramatically declined. As a result of these steps, **sulphur dioxide is no longer monitored in Chesterfield.**

3.2.5 Benzene

The Chesterfield Roadside site is part of the Non-Automatic Hydrocarbon Network. The results show that the **levels are well below the Air Quality Objective and demonstrate no likelihood of breaching the Air Quality Objective**, as the long term trend demonstrates a very gradual reduction in levels since 2010.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
AURN 1	Chesterfield Roadside	Roadside	463348	370651	NO ₂ PM ₁₀ PM _{2.5} Benzene	NO	Chemiluminescent FDMS FDMS Pumped Tubes	3	2	3
AURN 2	Chesterfield Loundsley Green	Urban Background	436472	372038	NO ₂ PM ₁₀ PM _{2.5} Heavy Metals	NO	Chemiluminescent FDMS FDMS Pumped Filters	N/A	17	3

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

Table A.2 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
1	Bradbury Club, 150 Chatsworth Rd	Façade	437222	370956	NO ₂	No	0	1m	N	2
2	Bridge Inn, Hollis Lane	Facade	438710	370950	NO ₂	No	0	2m	N	2
3	376 Sheffield Road	Façade	438291	373006	NO ₂	No	0	1m	N	2
4	390 Sheffield Road	Façade	438284	373057	NO ₂	No	0	1m	N	2
5	17, South Place	Façade	438293	370863	NO ₂	No	0	1m	N	2
6	6 Church Street, Brimington	Façade	440440	373514	NO ₂	Yes	0	1m	N	2
7	DCC Offices, West Street	Roadside	437670	371490	NO ₂	No	3m	1m	N	2
8	212 Derby Road	Façade	438395	369776	NO ₂	No	0	3m	N	2
9	287 Derby Road	Façade	438385	369574	NO ₂	No	0	2m	N	2
10	7 High Street, Brimington	Façade	440531	373484	NO ₂	No	0	1m	N	2
11	42, Whittington Hill	Façade	438307	374560	NO ₂	No	0	2m	N	2
12	460, Sheffield Road	Façade	438279	373336	NO ₂	No	0	2m	N	2

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13	10 Calow Lane, Hasland	Façade	439780	369440	NO ₂	No	0	1m	N	2
14	348 Derby Road, Storforth Lane	Façade	438357	369410	NO ₂	No	0	2m	N	2
15	Chatsworth Road AQ. Site	Co-location	436349	370658	NO ₂	No	4m	4m	Y	3
16	Chatsworth Road AQ. Site	Co-location	436349	370658	NO ₂	No	4m	4m	Y	3
17	Chatsworth Road AQ. Site	Co-location	436349	370658	NO ₂	No	4m	4m	Y	3
18	1 New Beetwell Street	Roadside	438104	370989	NO ₂	No	0	1m	N	2
19	28a Park Road	Façade	438090	370970	NO ₂	No	0	1m	N	2
20	74 Park Road	Façade	438072	370758	NO ₂	No	3m	1m	N	2
21	14 Chesterfield Road, Brimington	Roadside	440175	373396	NO ₂	No	1m	1m	N	2
22	25/27 Ringwood Road, Brimington	Façade	440669	373711	NO ₂	No	0	1m	N	2
23	29 Mansfield Road, Hasland	Façade	439830	369320	NO ₂	No	0	2m	N	2
24	10, Compton Street, Saltergate	Façade	437686	371433	NO ₂	No	0	1m	N	2
25	J+S Trophies, The Green, Hasland	Façade	439490	369608	NO ₂	No	0	3m	N	2
26	Harold Lillekar's Funerals, Mansfield Rd	Façade	439490	369590	NO ₂	No	0	6m	N	2
27	Lowgates, Staveley	Façade	443897	374912	NO ₂	No	0	3m	N	2

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28	Patrick Hinds House, Church St, Brimington	Façade	440323	373482	NO ₂	No	0	1m	N	2
29	Hollywell Cross R/T, Old Post Restaurant	Façade	438417	371357	NO ₂	No	0	1m	N	2
30	348, Chatsworth Rd, Brampton Mile	Façade	436702	370761	NO ₂	No	0	1m	N	2
31	386 Sheffield Road	Façade	438289	373028	NO ₂	No	0	2m	N	2
32	Warner Street, Hasland	Roadside	438976	370356	NO ₂	No	2m	1m	N	2
33	55 Duke Street, Staveley	Façade	443452	374762	NO ₂	No	0	4m	N	2
34	Travel Blank	-	-	-	-	-	-	-	-	-
35	632, Chatsworth Road, Storrs Road	Façade	435654	370537	NO ₂	No	0	3m	N	2
36	Lite Bites, Mansfield Road, Hasland	Façade	439710	369420	NO ₂	No	0	2m	N	2
37	50 Church Street, Brimington	Façade	440361	373513	NO ₂	No	0	1m	N	2
38	14 Church Street, Brimington	Façade	440421	373515	NO ₂	Yes	0	1m	N	2
39	43 Sheffield Road	Façade	438343	371908	NO ₂	No	0	1m	N	2
40	380 Sheffield Road	Façade	438290	373014	NO ₂	No	0	1m	N	2

41	James Street / Lockoford Lane	Roadside	438407	372798	NO ₂	No	2	1m	N	2
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Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).

(2) N/A if not applicable.

Table A.3 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2013	2014	2015	2016	2017
AURN 1	Roadside	Automatic	96.2	96.2	21.7	20.6	19.9	20.3	18.0
AURN 2	Urban Background	Automatic	53.8	53.8	-	-	14.4	16.7	12.4
1	Roadside	Diffusion Tube	100	100	30.9	26.9	28.7	23.5	23.3
2	Roadside	Diffusion Tube	91.6	91.6	37.7	34	32.9	28.4	24.9
3	Roadside	Diffusion Tube	75	75	36.9	35.4	36.6	34.8	27.8
4	Roadside	Diffusion Tube	83.3	83.3	30.9	36.5	39.5	39.3	25.6
5	Roadside	Diffusion Tube	100	100	29.5	26.9	28.8	27.8	21.9
6	Roadside	Diffusion Tube	100	100	47.8	43.8	40.5	44.3	34.2
7	Roadside	Diffusion Tube	83.3	83.3	23.3	24.1	22.6	24.4	21.0
8	Roadside	Diffusion Tube	91.6	91.6	32.8	30.7	30.3	28.8	24.0
9	Roadside	Diffusion Tube	25	25	31.6	30.2	27.5	28.0	-
10	Roadside	Diffusion Tube	100	100	38.8	38	43.1	39.7	34.9
11	Roadside	Diffusion Tube	100	100	37.9	35.2	24.6	23.8	20.5
12	Roadside	Diffusion Tube	100	100	29.4	27.6	28.7	28.3	23.0
13	Roadside	Diffusion Tube	91.6	91.6	24.3	24.6	23.5	22.4	19.6
14	Roadside	Diffusion Tube	100	100	38.1	34.7	35.3	33.6	27.7
15	Roadside	Diffusion Tube	83.3	83.3	21.7	18.2	19.4	18.8	17.3
16	Roadside	Diffusion Tube	83.3	83.3	21.7	18.2	19.4	18.2	16.7
17	Roadside	Diffusion Tube	83.3	83.3	21.9	19.1	20	17.8	16.1
18	Roadside	Diffusion Tube	83.3	83.3	-	-	25.3	22.4	19.5
19	Roadside	Diffusion Tube	58.3	58.3	-	-	27.2	23.7	18.8

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2013	2014	2015	2016	2017
20	Roadside	Diffusion Tube	75	75	-	-	28.4	23.8	21.3
21	Roadside	Diffusion Tube	91.6	91.6	35.9	32.1	24.5	24.5	22.4
22	Roadside	Diffusion Tube	100	100	36.8	32.3	32.8	32.2	26.5
23	Roadside	Diffusion Tube	75	75	27.7	25.2	24.3	24.4	23.1
24	Roadside	Diffusion Tube	100	100	37.7	35.8	36.6	33.0	32.4
25	Roadside	Diffusion Tube	91.6	91.6	36.1	33	33	32.4	28.2
26	Roadside	Diffusion Tube	16.6	16.6	20.3	18.3	19.9	19.1	-
27	Roadside	Diffusion Tube	100	100	33.3	31.3	30.6	31.9	28.3
28	Roadside	Diffusion Tube	100	100	35.6	31.9	34	32.7	36.3
29	Roadside	Diffusion Tube	91.6	91.6	41.6	35.6	36.3	32.4	30.7
30	Roadside	Diffusion Tube	91.6	91.6	33	30.2	28.5	26.6	23.9
31	Roadside	Diffusion Tube	100	100	43.8	38.4	43.1	41.4	37.3
32	Roadside	Diffusion Tube	75	75	36.1	29.9	31.4	33.3	28.7
33	Roadside	Diffusion Tube	91.6	91.6	39.9	32.8	38.4	36.6	34.1
34	Travel Blank	Diffusion Tube	100	100	-	-	-	-	-
35	Roadside	Diffusion Tube	100	100	33.6	29.7	29.4	29.8	28.4
36	Roadside	Diffusion Tube	100	100	31.1	27.1	27.8	27.1	23.0
37	Roadside	Diffusion Tube	100	100	41.6	36.1	39.6	36.7	35.9
38	Roadside	Diffusion Tube	91.6	91.6	50	42.2	44.4	42.5	36.4
39	Roadside	Diffusion Tube	91.6	91.6	31.6	29.2	27.5	28.0	26.0
40	Roadside	Diffusion Tube	83.3	83.3	43.9	32.2	33	31.1	36.4
41	Roadside	Diffusion Tube	100	100	33.8	31.2	28.8	30.0	27.1

- ☒ Diffusion tube data has been bias corrected
- ☒ Annualisation has been conducted where data capture is <75%
- ☒ If applicable, all data has been distance corrected for relevant exposure

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Diffusion Tubes numbered 9 (*287 Derby Road*) and 26 (*Harold Lilleker's Funerals, Hasland*) have been discontinued, due to poor data capture. The data has not been annualised due to the very poor data rates.

Figure A.5 – Trends in Annual Mean NO₂ Concentrations

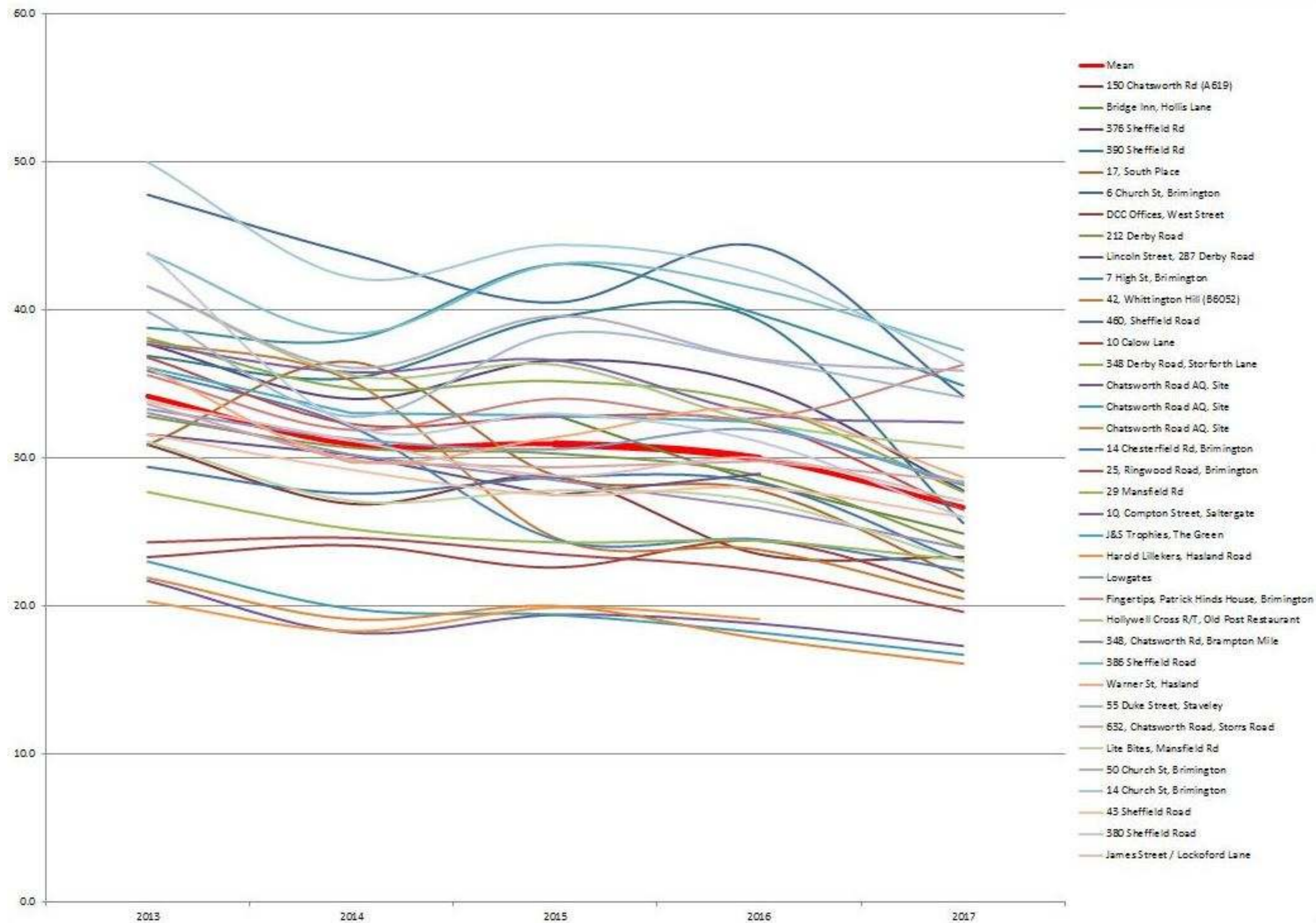


Table A.4 – 1-Hour Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾				
					2013	2014	2015	2016	2017
AURN 1 Chesterfield Roadside	Roadside	Automatic	96.1	96.1	0	0	0	0	0
AURN 2 Chesterfield Loundsley Green	Urban Background	Automatic	53.8	53.8	-	-	0 (53.5)	0	0 (58.2)

Notes:

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times/year) are shown in **bold**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

Table A.5 – Annual Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	PM ₁₀ Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2013	2014	2015	2016	2017
AURN 1 Chesterfield Roadside	Roadside	96.6%	96.6%	15.9	19	19.8	17.7	14.3
AURN 2 Chesterfield Loundsley Green	Urban Background	83.1%	83.1%	-	-	14.4	14.8	12.0

Annualisation has been conducted where data capture is <75%

Notes:

Exceedances of the PM₁₀ annual mean objective of 40µg/m³ are shown in **bold**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure A.6 – Trends in Annual Mean PM₁₀ Concentrations

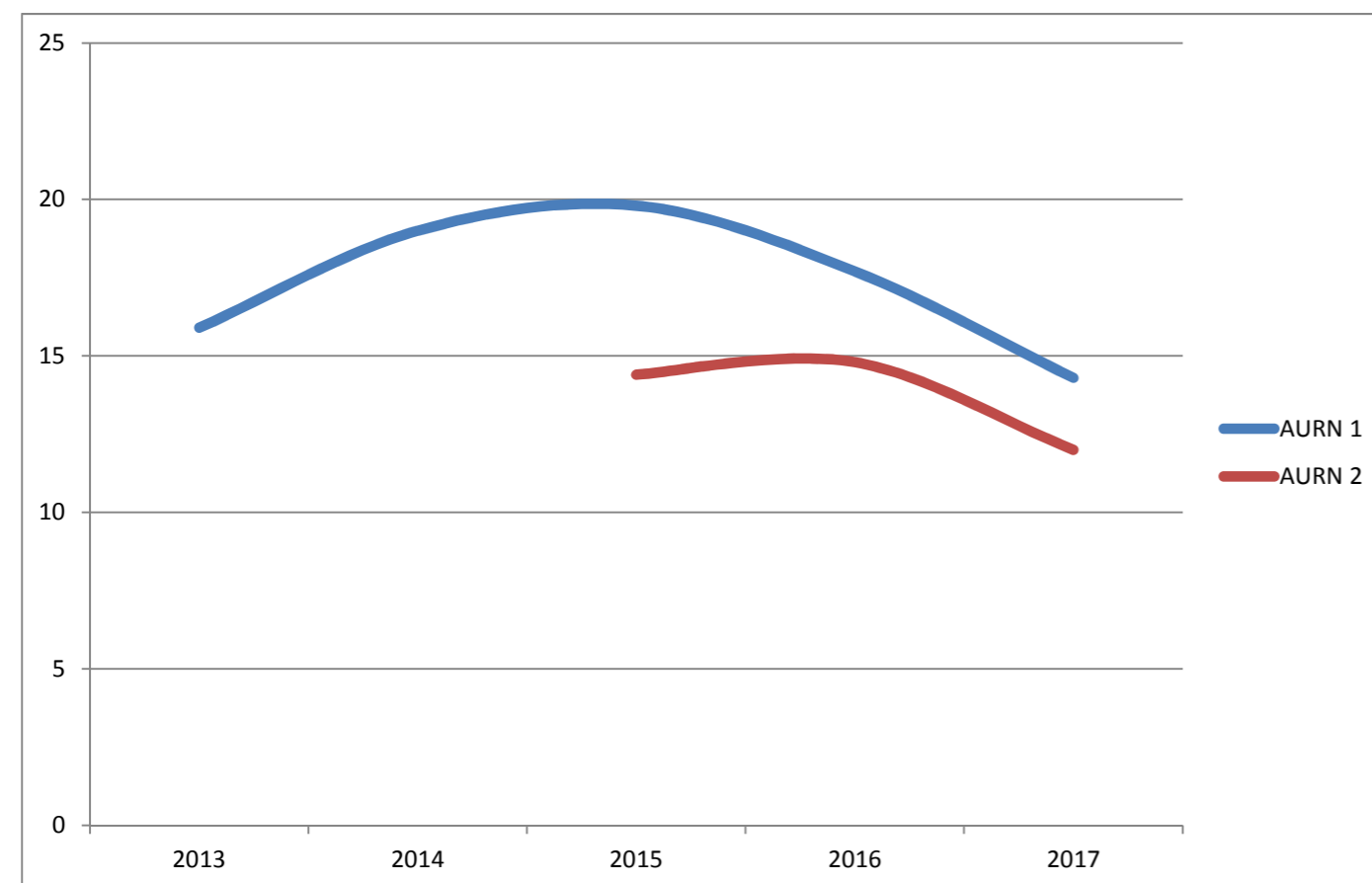


Table A.6 – 24-Hour Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	PM ₁₀ 24-Hour Means > 50µg/m ³ ⁽³⁾				
				2013	2014	2015	2016	2017
AURN 1 Chesterfield Roadside	Roadside	95.6%	95.6%	6 (26)	11	2	0	3
AURN 2 Chesterfield Loundsley Green	Urban Background	82.2%	82.2%	-	-	1 (23)	0	3 (23.1)

Notes:

Exceedances of the PM₁₀ 24-hour mean objective (50µg/m³ not to be exceeded more than 35 times/year) are shown in **bold**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

Figure A.7 – Trends in Number of 24-Hour Mean PM₁₀ Results >50µg/m³

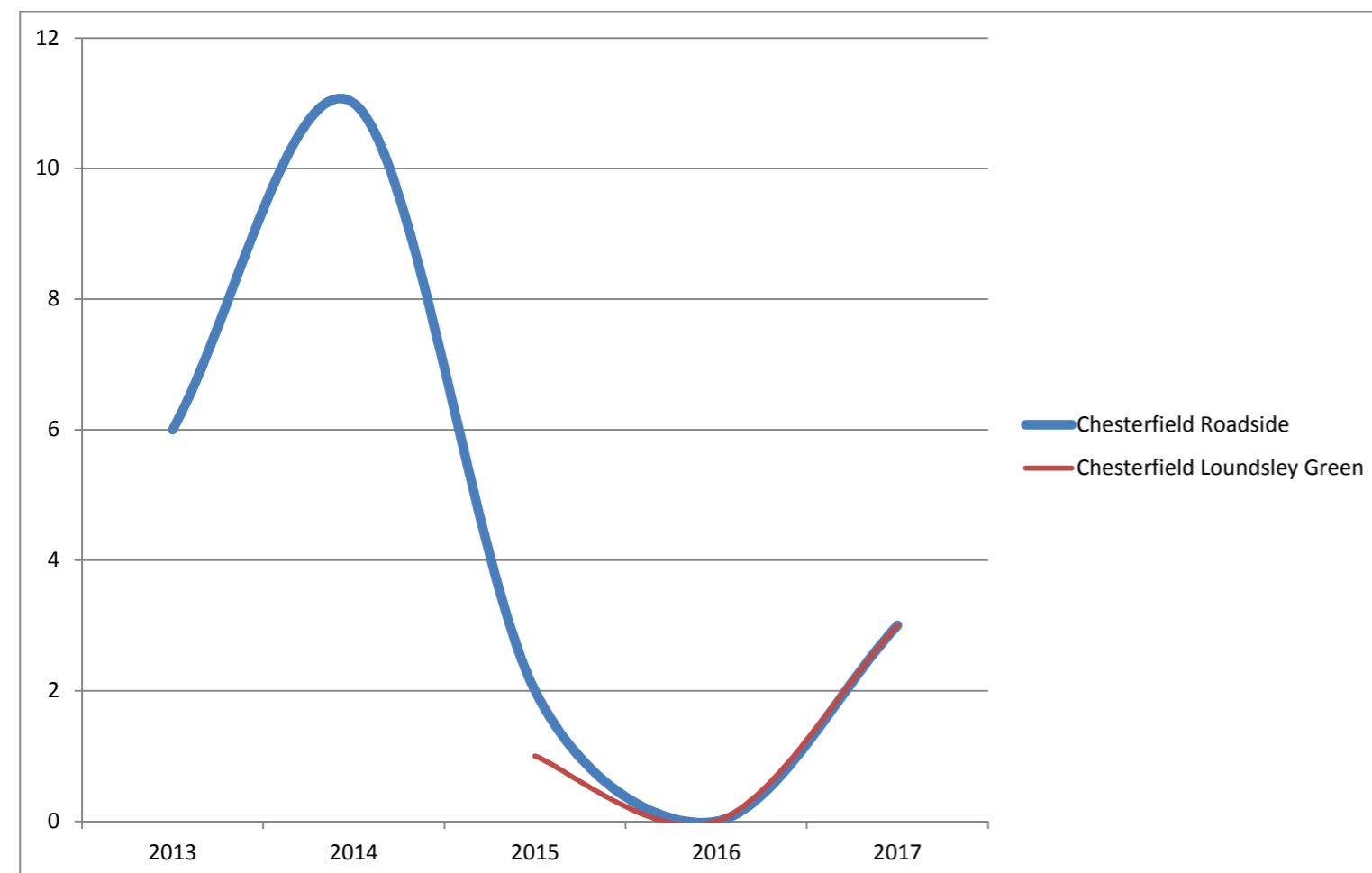


Table A.7 – PM_{2.5} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	PM _{2.5} Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2013	2014	2015	2016	2017
AURN 1 Chesterfield Roadside	Roadside	97.6%	97.6%	10.2	11.5	10.4	11.3	8.8
AURN 2 Chesterfield Loundsley Green	Urban Background	97.1%	97.1%	-	-	7.8	10.3	8.7

Annualisation has been conducted where data capture is <75%

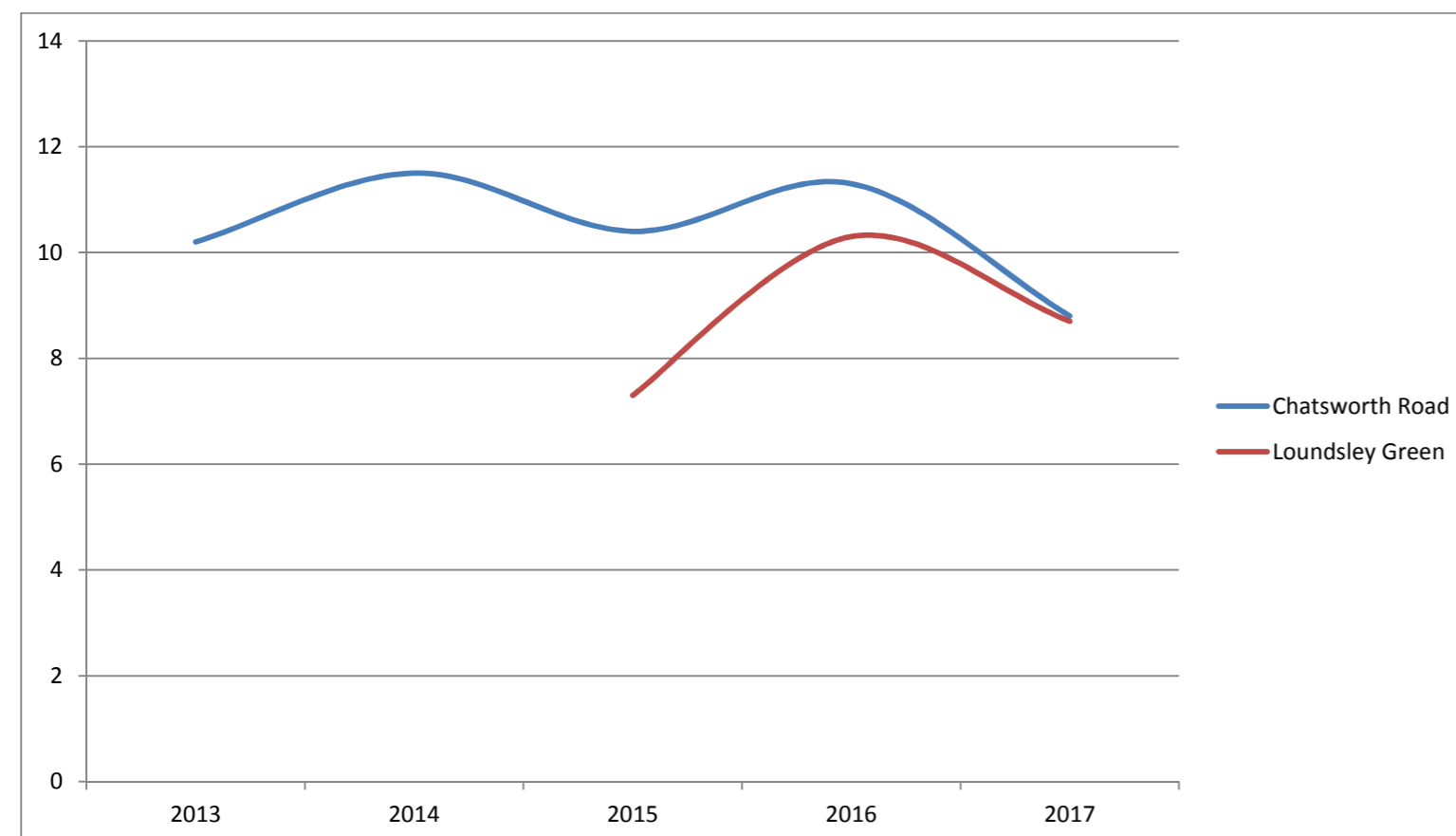
Notes:

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure A.8 – Trends in Annual Mean PM_{2.5} Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2017

Table B.1 – NO₂ Monthly Diffusion Tube Results - 2017

Site ID	NO ₂ Mean Concentrations (µg/m ³)												Annual Mean	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.83), Travel Blank Adjusted (-2.5) and Annualised (where needed) ⁽¹⁾
1	41	36	30	30	28	28	25	26	30	30	27	36	30.6	23.3
2	36	33	35	35	-	28	27	33	30	31	34	35	32.5	24.9
3	-	-	39	39	-	29	29	34	36	30	40	48	36.0	27.8
4	47	36	-	41	-	30	23	27	30	32	30	37	33.3	25.6
5	33	38	32	25	27	24	24	27	26	27	31	32	28.8	21.9
6	48	47	45	48	50	39	38	38	39	39	44	49	43.7	34.2
7	33	31	28	24	35	18	38	20	-	22	29	-	27.8	21.0
8	-	33	35	30	35	33	27	29	28	29	33	34	31.5	24.0
9	-	-	-	-	-	-	-	27	-	-	30	32	-	-
10	48	44	43	50	34	43	44	45	40	42	46	55	44.5	34.9
11	38	32	27	28	27	22	23	23	23	24	30	29	27.2	20.5
12	38	32	33	33	23	24	26	27	28	28	37	34	30.3	23.0
13	41	29	28	23	23	20	17	-	24	23	30	29	26.1	19.6
14	47	35	40	33	37	32	35	35	34	31	38	33	35.8	27.7
15	37	30	25	20	15	19	15	-	-	20	24	28	23.3	17.3
16	28	34	27	21	17	17	15	-	-	21	21	25	22.6	16.7
17	34	24	24	19	18	15	16	-	-	21	24	24	21.9	16.1
18	35	-	31	26	21	21	20	-	25	25	27	29	26.0	19.5
19	-	-	-	22	24	-	-	22	24	24	26	34	25.1	20.1
20	36	-	35	26	-	25	23	-	28	26	25	30	28.2	21.3
21	39	34	33	27	26	23	-	25	26	27	33	32	29.5	22.4
22	39	38	40	34	29	29	28	32	30	29	40	45	34.4	26.5
23	38	34	35	31	-	-	-	22	25	25	30	33	30.3	23.1
24	57	47	48	47	22	41	19	40	36	42	47	52	41.5	32.4
25	54	-	40	35	34	33	28	28	32	33	41	43	36.5	28.2
26	35	-	27	-	-	-	-	-	-	-	-	-	-	-
27	45	46	37	39	35	29	29	33	31	30	43	42	36.6	28.3
28	51	54	50	48	44	44	39	40	45	41	51	48	46.3	36.3
29	48	48	49	37	44	33	32	34	36	31	42	-	39.5	30.7
30	41	-	40	24	33	27	25	28	29	29	32	36	31.3	23.9
31	57	59	53	46	40	43	35	41	44	44	51	56	47.4	37.3
32	49	-	40	42	-	27	25	30	41	32	42	43	37.1	28.7
33	57	43	46	48	34	41	38	37	37	47	51	-	43.5	34.1
34	2	4	3	2	-	4	2	3	1	3	2	2	2.5	-
35	45	48	38	36	32	34	29	34	33	35	39	38	36.8	28.4
36	43	39	33	31	25	23	23	24	26	26	38	32	30.3	23.0
37	58	44	54	45	38	43	38	40	41	45	48	55	45.8	35.9
38	63	52	52	47	-	38	38	39	38	43	50	50	46.4	36.4

39	47	43	-	32	32	28	21	30	34	31	34	40	33.8	26.0
40	-	-	55	40	33	32	40	48	49	45	61	60	46.3	36.4
41	52	44	40	33	33	23	27	27	32	29	47	35	35.2	27.1

- Local bias adjustment factor used
- National bias adjustment factor used
- Annualisation has been conducted where data capture is <75%

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

Distance correction is not required – see Appendix C

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

NO₂ diffusion tubes are supplied by South Yorkshire Air Quality Samplers, the preparation method being 50% triethanolamine in acetone. The laboratory follows the procedures set out in the Harmonisation Practical Guidance. The national bias factor for the tubes supplied by this source is 0.88. Data from the two sites operated by Chesterfield BC is supplied to DEFRA for input into the calculation of this factor.

Factor from Local Co-location Studies (if available)

The local bias factor for the traffic site operated by Chesterfield BC is as follows:

Chesterfield Roadside (Chatsworth Road): 0.83

The calculation for deriving this factor is shown below:

Checking Precision and Accuracy of Triplicate Tubes

From the AEA group

Diffusion Tubes Measurements									
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	04/01/2017	01/02/2017	37.0	28.0	34.0	33	4.6	14	11.4
2	01/02/2017	01/03/2017	30.0	34.0	24.0	29	5.0	17	12.5
3	01/03/2017	29/03/2018	25.0	27.0	24.0	25	1.5	6	3.8
4	29/03/2018	27/04/2018	20.0	21.0	19.0	20	1.0	5	2.5
5	27/04/2018	31/05/2017	15.0	17.0	18.0	17	1.5	9	3.8
6	31/05/2017	28/06/2017	19.0	17.0	15.0	17	2.0	12	5.0
7	28/06/2017	02/08/2017	15.0	15.0	16.0	15	0.6	4	1.4
8	02/08/2017	31/08/2017							
9	31/08/2017	27/09/2017							
10	27/09/2017	01/11/2017	20.0	21.0	21.0	21	0.6	3	1.4
11	01/11/2017	06/12/2017	24.0	21.0	24.0	23	1.7	8	4.3
12	06/12/2017	04/01/2018	28.0	25.0	24.0	26	2.1	8	5.2
13									

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
30.48	92.9	Good	Good
22.53	96.7	Good	Good
21.13	97.4	Good	Good
14.85	99.5	Good	Good
15.58	95.4	Good	Good
11.43	94.8	Good	Good
12.86	97.6	Good	Good
13.15	99.3		Good
15.92	98.7		Good
15.33	99.9	Good	Good
20.78	99.3	Good	Good
22.06	98.9	Good	Good

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID:

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%

Bias calculated using 10 periods of data

Bias factor A 0.83 (0.77 - 0.9)

Bias B 21% (11% - 31%)

Diffusion Tubes Mean: 23 μgm^{-3}

Mean CV (Precision): 9

Automatic Mean: 19 μgm^{-3}

Data Capture for periods used: 97%

Adjusted Tubes Mean: 19 (17 - 20) μgm^{-3}

Precision 10 out of 10 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval)
WITH ALL DATA

Bias calculated using 10 periods of data

Bias factor A 0.83 (0.77 - 0.9)

Bias B 21% (11% - 31%)

Diffusion Tubes Mean: 23 μgm^{-3}

Mean CV (Precision): 9

Automatic Mean: 19 μgm^{-3}

Data Capture for periods used: 97%

Adjusted Tubes Mean: 19 (17 - 20) μgm^{-3}

Overall survey -->

Good precision	Good Overall DC
----------------	-----------------

(Check average CV & DC from Accuracy calculations)

Jaume Targa, for AEA
Version 04 - February 2011

Further details on the sites are given in Appendix D of this report

Discussion of Choice of Factor to Use

The bias factor used in adjusting the data for this report is a local factor and, more specifically, is calculated using the traffic site, Chesterfield Roadside. This site is used as it is in a very similar location to those where the diffusion tubes are all now placed. The local factor (0.83) varies from the national factor (0.88) but as the data is specific to this region and, more pertinently, to the roadside monitoring which is now being uniformly undertaken, it is believed that the use of the local factor is fully justified. The locally derived bias factor has been calculated and used each year since 2011.

We are aware that 2 months of co-location data are missing and have, as a result, also calculated the monitoring results using the national bias factor. The highest value of raw data (47.4) at 386 Sheffield Road is corrected to 39.5 when all adjustments are applied. As such we can be confident in concluding that, while there is a small increase in the final results, **the final outcome remains that none of the sites breach the Air Quality Objective.**

The reported results use the locally calculated bias factor, for the reasons discussed above

Distance Correction

The monitoring locations are mounted on facades (or directly equivalent locations, such as lamp standards located at the façade), as such no distance correction is required.

Travel Blank

The mean result for analysis of the travel blank (which has not been exposed) is $2.5\mu\text{g}/\text{m}^3$, prior to the bias factor adjustments being made.

PM Monitoring Adjustment

Monitoring is carried out using FDMS equipment, no data adjustment is required.

Short-term to Long-term Data adjustment

Details of annualisation of diffusion tubes data (where required), is given below:

Start date	End Date	AURN B1	28a Park Rd D1	Corresponding AURN B1 when D1 is Available
04/01/2017	01/02/2017	30.48		
01/02/2017	01/03/2017	22.53		
01/03/2017	29/03/2018	21.13		
29/03/2018	27/04/2018	14.85	22	14.85
27/04/2018	31/05/2017	15.58	24	15.58
31/05/2017	28/06/2017	11.43		
28/06/2017	02/08/2017	12.86		
02/08/2017	31/08/2017	13.15	22	13.15
31/08/2017	27/09/2017	15.92	24	15.92
27/09/2017	01/11/2017	15.33	24	15.33
01/11/2017	06/12/2017	20.78	26	20.78
06/12/2017	04/01/2018	22.06	34	22.06

Mean (Am) 18.01 25.14 (Pm) 16.81

Minus Travel Blank -2.5 22.64

Bias Factor Adjustment 0.83 18.79

Ratio (Am/Pm) 1.071286932

Annualised Value 20.13

This annualising was carried out using the process set out in Box 7.10 on page 7-56 of Local Air Quality Management Technical Guidance (TG16)

Details of annualisation of Chesterfield Loundsley Green AURN data is given below:

AURN Site	Annual Mean 2017	Period Mean 2017	Ratio (Am/Pm)
Manchester Piccadilly	35.72	40.96	0.87
Nottingham Centre	29.67	34.24	0.87
Sheffield Devonshire Green	22.3	26.03	0.86
Sheffield Tinsley	26.74	31.09	0.86

Mean Ratio (Ra) 0.86

Annualised Value (14.73 x Ra) **12.67**

Note: The Period Mean 2017 data includes only the periods which match times when the Chesterfield Loundsley Green Site was collecting data.

This annualising was carried out using the process set out in Box 7.9 on page 7-49 of Local Air Quality Management Technical Guidance (TG16).

QA/QC of automatic monitoring

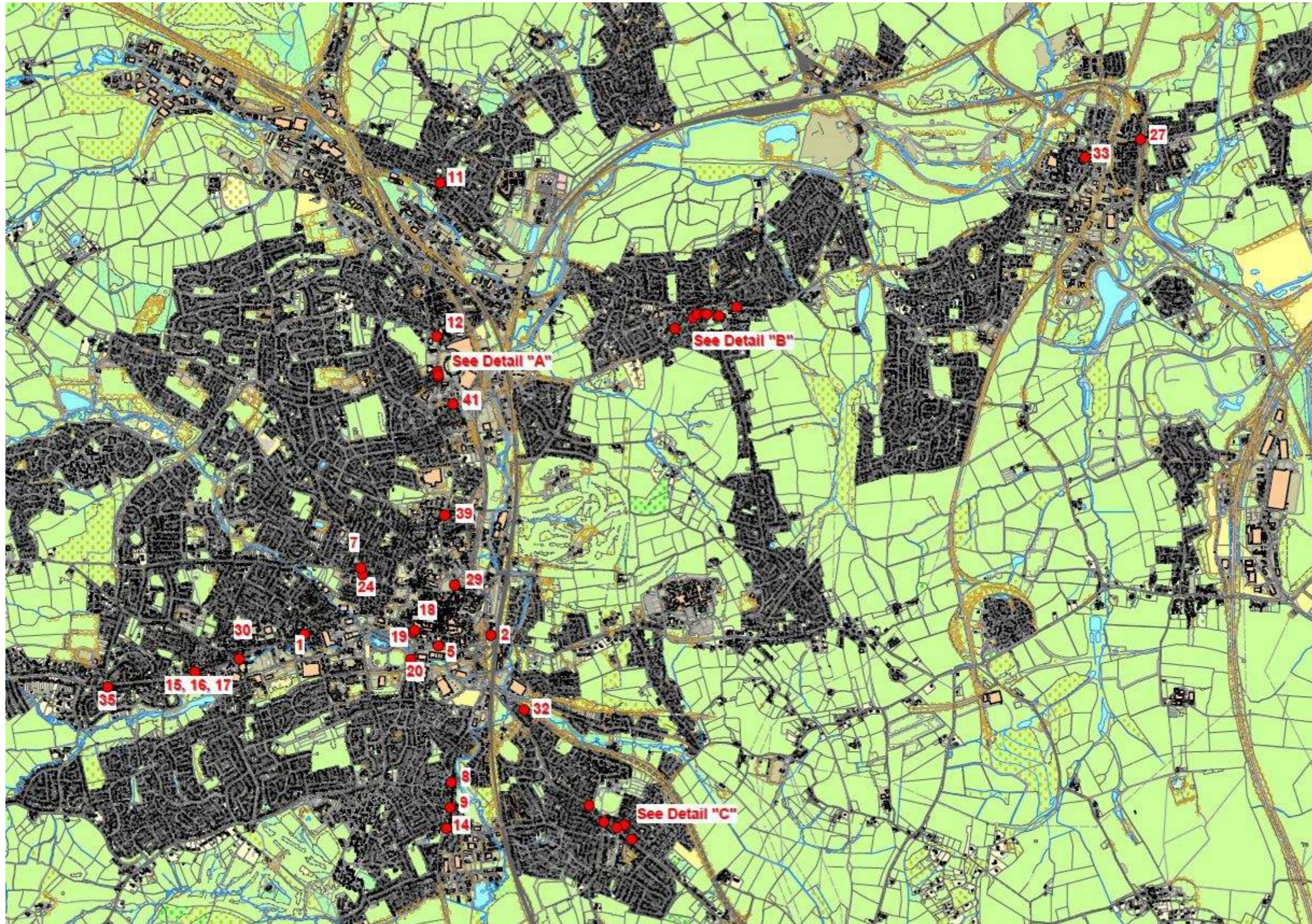
Data validation is carried out by BureauVeritas on behalf of DEFRA. On site calibration is carried out by Chesterfield BC staff on a 14 day cycle, using standard calibration gases, and the calibration data is sent direct to BureauVeritas, and RicardoAEA, by email. The margin of error for the NO_x Monitor at the Chesterfield Roadside site is 11.1%. The margin of error for the NO_x Monitor at the Chesterfield Loundsley Green site is 11.9%. The margins of error for the Particulate Monitors at both sites are 8.7% and 16.4% for the PM₁₀ and PM_{2.5}, respectively. This meets the requirements of the air quality Directive 2008/50/EC.

QA/QC of diffusion tube monitoring

The diffusion tube monitoring is carried out in full compliance with the guidance contained in the document "Diffusion Tubes for Ambient NO₂ Monitoring: Practical Guidance for Laboratories and Users".

The AIR-PT scheme results show the overall performance of the analysis laboratory as good.

Appendix D: Map(s) of Monitoring Locations and AQMAs



Detail A

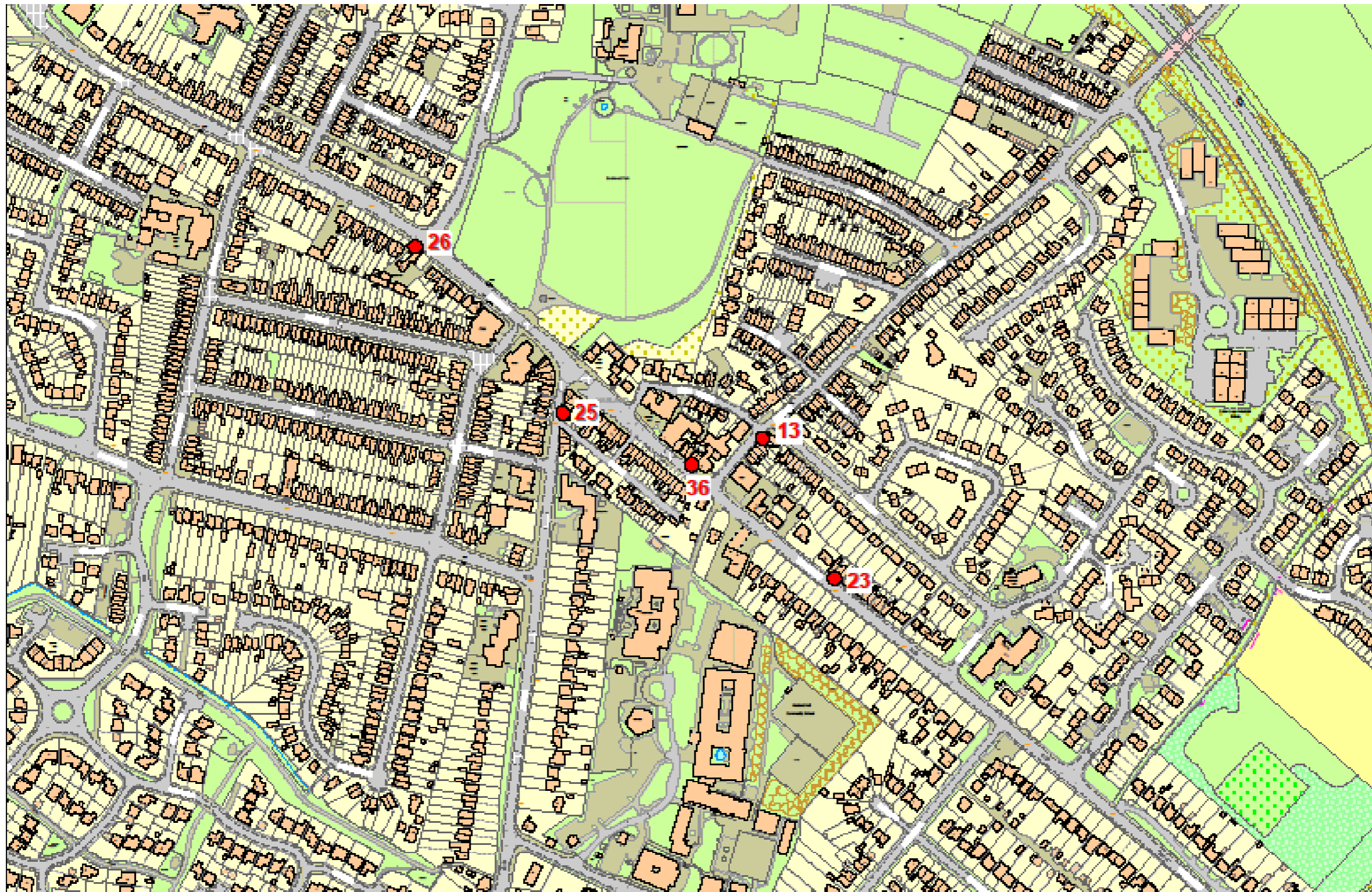


Detail B



Note: See location details of Chesterfield No 1 AQMA (overleaf)

Detail C



Location and extent of Chesterfield No 1 AQMA



Note: the detail relates to the section of highway shown at the centre of Detail B (above)

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective ⁴	
	Concentration	Measured as
Nitrogen Dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

⁴ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Appendix F: Derbyshire Air Quality Working Group

Derbyshire County and City Air Quality Working Group

Terms of Reference 2017/18

Purpose of the Air Quality Working Group

To provide assurance to the Health Protection and Health and Wellbeing Boards of Derbyshire County and Derby City Councils around the strategic priorities to address air quality, including the management, monitoring, planning and response required to address air quality across the geographical area and protect the public's health.

A working group for agreeing strategic priorities and ensuring collaborative action around air quality through the facilitation of relationships between stakeholders, sharing best practice, ensuring collaborative working in applications for resources, collating common evidence base and monitoring progress on action.

Scope

To provide strategic oversight of work to address air quality across the geographical area. This will include priorities and initiatives across a range of stakeholders including;

- Derby City and Derbyshire County Borough and District Councils; Planning, Transport, Environmental Health
- Derbyshire County and City Council; Planning and Transport
- Derbyshire County and Derby City Public Health
- NHS Clinical Commissioning Groups / Provider organisations

Objectives

To provide strategic oversight of work to reduce the impact of air quality on health across Derbyshire County and Derby City.

Discharging Functions

The group will discharge functions through local task and finish groups as required or associated groups as required including Planning and Health and Chief Regulators Group. Members will be expected to ensure arrangements for reporting as required within their respective organisation.

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
AIR-PT	UKAS accredited laboratory proficiency testing scheme
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide
TEA	Tetra Ethyl Acetate

References

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Environment Act 1995

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Improving air quality in the UK – Tackling nitrogen dioxide in our towns and cities. Technical report, December 2015

NO₂ Diffusion Tubes for LAQM: Guidance Notes for Local Authorities, March 2006

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Diffusion Tubes for Ambient NO₂ Monitoring: Practical Guidance, Feb 2008

QA/QC Procedures for the UK Automatic Urban and Rural Air Quality Monitoring Network

Fine Particulate Matter (PM_{2.5}) in the United Kingdom, DEFRA 2012

Assessment of Particulate Emissions from Wood Log and Wood Pellet Heating Appliances, Ricardo-AEA 2017

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Evidential Value of DEFRA Air Quality Compliance Monitoring, AQEG 2015

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<http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>

