CITY OF WOLVERHAMPTON COUNCIL

Response to Request for Information

Reference EIR 000124
Date 21 March 2017

Air Quality Data

Request:

Would you be able to provide air quality data for 2015?

In response to your above request, please find on the next page the information you require.

CITY OF WOLVERHAMPTON COUNCIL

2016 Air Quality Annual Status Report (ASR)

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

Date: November 2016

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Date	November 2016

Executive Summary: Air Quality in Our Area

This report has been produced as part of the on-going process of the review and assessment of air quality within the city of Wolverhampton.
The council has introduced a range of measures intended to improve air quality within the city. Two key initiatives, the Interchange project and the City Centre Scheme, have dramatically improved air quality within the city centre. Together they have resulted in a 24% reduction in nitrogen dioxide (NO_2) levels over the last 6 years.

A comprehensive review of all monitoring data collected over the last 12 months has been carried out, and has shown that air quality continues to improve across the whole of the city. In 2015 NO_2 levels dropped by 2% compared with 2014 levels and there were no exceedances of the annual mean air quality objective at locations where there is relevant exposure.

The council has a number of initiatives in place which are due to be completed over the next 2 years, and which will further reduce vehicle emissions within the city centre. The council will continue monitoring pollution levels to determine the effectiveness of these initiatives.

The main priority of the council over the next 12 months is to assess $PM_{2.5}$ levels and determine their impact on public health. In order to progress this initiative, the council has purchased 4 $PM_{2.5}$ monitors which have been located at potential hot spots within the city centre and is working closely with Public Health colleagues.

A review of emission sources has found that there have been no new industrial processes, or any other significant sources which have been granted planning approval that could contribute to poor air quality since the previous Updating and Screening Assessment (USA) in 2015.

A detailed assessment of PM_{10} concentrations has confirmed that PM_{10} concentrations are consistently meeting the air quality objectives. The council has decided to continue to monitor the levels of this pollutant for a further twelve months prior to considering what action to take regarding the air quality management area with respect to this pollutant.

Air Quality in the City of Wolverhampton

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 billion[3].

The main air quality issues in Wolverhampton relate to NO_2 from road traffic. Consequently the areas most affected are close to busy roads, junctions and parts of the city centre, particularly where the traffic is congested, the roads are narrow, or there is a high proportion of heavy goods vehicles (HGV's).

Trend data over the last 15 years shows that levels of NO_2 are going down. This has led to a significant drop in the number of locations where the air quality objective for NO_2 is being exceeded. In 2015 there were no exceedances of the objective at locations where members of the public are likely to be exposed. However, there are still air quality hot spots along the A449, A454 and within the city centre itself.

In order to address and improve air quality across its area the council works closely with its partners at a local, sub regional and regional level. The council is a board member of the West Midlands Low Emissions Towns and Cities Program (WMLETCP) and is leading on the emerging Black Country Ultra Low Emission Vehicle Strategy and Implementation Plan.

During the last 12 months the seven Metropolitan Authorities (Birmingham, Coventry, Dudley, Sandwell, Solihull, Walsall and Wolverhampton), along with representatives from the three Local Enterprise Partnerships and five none-constituent Authorities have joined together to form the West Midlands Combined Authority (WMCA).

The WMCA has been established to plan and deliver a transport system across the West Midlands Metropolitan area that will boost the regional economy and improve

[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

the daily lives of residents and workers and will control many of the strategic functions across the region to ensure a common approach.

The West Midlands Integrated Transport Authority (ITA) was replaced by Transport for West Midlands (TFWM), the transport arm of the Combined Authority, in June 2016 and is continuing to develop the West Midlands Transport Emissions Framework. The Framework forms part of the West Midlands Strategic Transport Plan which has replaced the Local Transport Plan 3, and includes regional policies to accelerate the uptake of ULEV's across the private sector, fleet vehicles and taxis.

Actions to Improve Air Quality

Over the last 5 years the council has introduced a range of measures which have been effective in reducing pollution levels and enabled the council to comply with the air quality objectives; these measure fall into the following core areas:

- road improvements,
- public transport improvements,
- bus route improvements,
- traffic management,
- promoting travel alternatives,
- promoting low emission vehicles,
- air quality planning and guidance.

Over the past year the Wolverhampton City Centre Scheme, which was completed in 2015, has been particularly successful and has resulted in a 14% reduction in NO_2 in the south east part of the city centre.

In addition to this there are a further 2 major improvement schemes within the city centre which are currently on going. The railway station redevelopment and the metro extension are due to be completed over the next 24 months. They will reduce vehicle traffic within the ring road and are expected to lead to a corresponding reduction in NO_2 levels.

The council's Transport Strategy section are setting up a Statutory Quality Bus Partnership (SQP) within the next 12 months, which will ensure that all buses that enter the city centre will be required to meet EURO 6 by 2021/22.

The council has continued to work closely with its partners on the WMLETCP to develop a Low emission Vehicle Strategy for the West Midlands. This is expected to be published by the end of 2016.

Over the last 12 months the four Black Country Council's, Dudley, Walsall, Sandwell and Wolverhampton have collaborated to produce a Black Country Air Quality Supplementary Planning Document which incorporates the WMLETCP Good Practice Air Quality Planning Guide into planning policy and ensure a consistent approach to planning across the Black Country. This will be adopted as planning policy early 2017

The council's Sustainability Officer is leading on the emerging sub regional Black Country Ultra Low Emission Vehicle Strategy and Implementation Plan comprising of Dudley, Sandwell, Walsall and Wolverhampton Councils. The Implementation Plan will form part of a Black Country Transport Strategy and will help deliver a step change in the number of ULEV's in the sub-region by meeting existing demand and stimulating further demand by providing vehicle owners and operators with the confidence to invest in ULEVs. The Implementation Plan will drive each council's own capital and revenue programmes and inform funding bids to the Local Growth Fund, Combined Authority, Office for Low Emission Vehicles (OLEV), European Structural Investment Fund (ESIF), Horizon 2020 and other appropriate funds. It will also support the wider promotion of ULEVs to the public, other public sector organisations and to businesses.

Local Priorities and Challenges

In 2015 there were no areas of Wolverhampton where there is public exposure which exceeded the air quality objectives. However there are some areas of the city centre where NO_2 levels remain elevated. The council has a number of initiatives in place which will reduce vehicle emissions within the city centre and will continue to monitor pollution levels to determine the effectiveness of these initiatives.

The main priority for the council over the next 12 months is to assess $PM_{2.5}$ levels and determine their impact on public health. In order to progress this initiative the council has purchased 4 $PM_{2.5}$ monitors which have been located at potential hot spots within the city centre.

How to Get Involved

The council has a number of initiatives to encourage people to use alternative forms of transport and to think about where they need to use their car:

- Wolverhampton Car Share
- Walking strategy
- Cycle strategy

Residents can play their part in improving air quality and making Wolverhampton a better place to live, by thinking about their car use.

- Do you need to use your car for short trips to the local shops?
- Can you use the bus or train or metro?
- Can you share a lift?
- Can you walk to school?

Further information can be obtained from the council's web site:
http://www.wolverhampton.gov.uk/home

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1 Local Air Quality Management

This report provides an overview of air quality in the City of Wolverhampton during 2015. 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 the City of Wolverhampton Council 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 the objectives.

The City of Wolverhampton Council has declared the whole city an AQMA for nitrogen dioxide and PM10's. Further information on the AQMA including a map of the AQMA is available online at:

https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=319

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

The City of Wolverhampton Council has taken forward a number of measures during the current reporting year of 2015 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. Key completed measures are:

Local Actions

- **Wolverhampton Interchange Project Phase 1 - key outcomes:**
  A new access road into the bus station off the ring road has reduced the number of buses within the city centre resulting in a 23% reduction in NO2 levels in the city centre resulting in the number of exceedance areas dropping from 19 in 2009 to 4 in 2013.
- **Wolverhampton City Centre Scheme - key outcomes:**
  Pedestrianisation and the re-routing of traffic in the Market Street area of the city centre has led to a reduction in NO2 levels of 14% in Market Street, Queen Street and Princess Street.

- **Statutory quality bus partnership (SQP) - key outcomes:**
  Sets an agreed standard for all buses to achieve EURO 6 within the city centre by 2021/22

- **Urban Traffic Control Major Scheme - Key outcomes:**
  20 traffic signals upgraded to SCOOT with bus priority.
  80 PELICAN crossings upgraded to PUFFIN crossings.
  4 nitrogen dioxide monitors have been installed at major traffic light junctions linked in to the traffic control systems.
  A journey time monitoring system comprising of 28 ANPR cameras has been installed on major access routes into the city.

Regional Actions

- **West Midlands Low Emissions Towns & Cities Program (LETCP) - key outcomes:**
  The Good Practice Planning Guide - All new developments are required to implement a range of measures to minimise road traffic emissions; including electric vehicle charging points, transport management plans, and damage cost calculations

  The Good Practice Procurement Guide -

  Low emission Zone feasibility study, conducted by AEA Technology.

- **Black Country Air Quality SPD - key outcomes:**
  Incorporates the LETCP good Practise Planning guide into planning policy and ensures a consistent approach to development control across the Black Country.
- **West Midlands Strategic Transport plan: Movement for Growth.**
  The Strategic Transport Plan was initially adopted in December 2015 by the former Integrated Transport Authority (ITA) and is now being developed and delivered by Transport for West Midlands (TfWM), the transport arm of the West Midlands Combined Authority.
  The plan sets out the long term transport strategy for the West Midlands region. Cleaner air and improving public health through better public transport

and accelerating the uptake of ultra low emission vehicles, are central to the vision statement of the plan:

"We will make great progress for a Midlands economic 'Engine for Growth', clean air, improved heath and quality of life for the people of the West Midlands."

The key policy objectives to tackle poor air quality are:

Policy 9 - To significantly improve the quality of the local environment;
Policy 10 - To help tackle climate change by ensuring a large decrease in greenhouse gases from the West Midlands Metropolitan Area's transport system; and
Policy 11 - To significantly reduce diabetes, obesity, respiratory and cardio-vascular problems through reduced transport emissions and increased active travel.

The City of Wolverhampton Council expects the following measures to be completed over the course of the next reporting year:

Local Actions

- **Midland Metro City Centre extension:**
  The Midland Metro extension will link the Metro with the main bus station and railway station to provide a fully integrated transport system. This is expected to reduce car ingress into the city centre, lowering vehicle emissions.
- **Railway station access improvements**
  The provision of a new station building and access road will reduce road traffic within the ring road along Broad Street, Fryer Street and Lichfield Street.

Regional Actions

- **WMLETCP Low Emission Strategy**

  The Low Emissions Strategy will feed into the West Midlands Transport Emissions Framework and provide a template for updating the council's action plan.

- **Black Country Air Quality SPD**

  The air quality SPD incorporates the WMLETCP Good Practice Planning guide into planning policy, accelerating the provision of a low emission vehicle infrastructure and ensuring a consistent approach across the sub region.

- **Black Country Ultra Low emission Vehicle Strategy and Implementation Plan**

  The Implementation Plan will form part of a Black Country wide Transport Strategy complementing the WMLETCP Low Emission Strategy and help deliver a step change in the number of ULEV's in the sub-region by meeting existing demand and stimulating further demand by providing vehicle owners and operators with the confidence to invest in ULEVs.

- **West Midlands Transport Emissions Framework**

  The West Midlands Transport emissions Framework is in direct response to the Defra Air Quality Action Plan which requires the implementation of Clean Air Zone. It is aligned to the Strategic Transport Plan and will provide a coordinated approach at Combined Authority level, to tackle air quality issues and improve our overall transport emissions.

  The measures to be developed in 2016/17 are:

  - Developing and adopting agreed metropolitan wide policies and targets towards the accelerated uptake and adoption of Ultra Low Emissions Vehicles and associated infrastructure including hydrogen and gas refuelling opportunities. This could be potentially supported through the Planning System;
  - Developing and adopting agreed metropolitan wide policies and actions for Low Emission Zones or Clean Air Zones - in specific and suitable locations;
  - Accelerated timescales to clean up West Midlands buses, through the ITA Bus Alliance and the West Midlands Low Emissions Bus Delivery Plan;
  - Making traffic management and regulation smarter through a West Midlands Key Route Network (KRN);
  - Developing and adopting Metropolitan policies and targets for the cleaning of public and commercial fleets;
  - Developing and adopting specific policies to encourage the wider roll out of Car Clubs and active travel measures;
  - Further development of the Metropolitan Strategic Cycle Network - linked to the ITA Cycle Charter;

- Developing targeted policies toward zero emissions taxi and private hire fleets;
- Exploring the development of Low Emission Neighbourhoods and Green Travel Districts (GTD); and
- Developing an agreed funding, development and delivery framework.

The effectiveness of these actions will be determined following a review of the monitoring data.

The council has recently purchased 4 $PM_{2.5}$ monitors to assess $PM_{2.5}$ levels across the city. Future actions will be prioritised based on the information gathered from these monitors and will target those areas where $PM_{2.5}$ levels are elevated.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
1	Wolverhampton Interchange project phase 1	Transport Planning and infrastructure	Public transport improvements-interchanges stations and services	CWC		2010 -2011	None set	West Midlands Local Transport Plan 3 performance aim: "A net reduction of Nitrogen Dioxide (NO2) in those areas, as confirmed by each local authority within the West Midlands, where the annual average NO2 values are predicted to exceed 40µg/m3 between 2008 (baseline) and 2015".	Completed 2011	Completed 2011	The provision of a new access road into the bus station from the ring road, has led to a net reduction in the numbers of buses within the city centre. NO2 levels dropped by 23% following completion of the scheme. The number of monitoring sites exceeding the air quality objective reduced from 19 in 2009 to 4 in 2013.
2	Midland Metro city centre extension.	Transport Planning and infrastructure	Public transport improvements-interchanges stations and services	CWC	completed	2017/18		As per measure No 1	Submission of Noise and Air Quality assessments. Necessary approvals have been obtained. Preliminary ground works due to start September 2016	2017/18	The development of a fully integrated transport structure will provide new linkages and encourage a modal shift in transport, enhancing and improving City Centre access. By improving public transport links it is anticipated car ingress into the city centre will be reduced lowering vehicle emissions and improving air quality.

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
3	Railway station redevelopment	Transport Planning and infrastructure	Public transport improvements-interchanges stations and services	CWC	2016	2017/18	None set	As per measure No 1	Work started summer 2016	End 2016	The provision of a new station building and access road will reduce traffic within the ring road particularly along Broad Street, Fryer Street and Lichfield Street, thereby reducing NO2 emissions within the city centre. The effectiveness of this will be determined following a review of the monitoring data
4	Wolverhampton City Centre Scheme	Transport Planning and infrastructure	Public transport improvements-interchanges stations and services	CWC	Completed	Completed	None set	As per measure No 1	Completed	Completed	The pedestrianisation of Market Street and the re-routing of traffic along Queen St and Princess St have reduced NO2 levels in this area of the city centre by 14%.
5	Showcase route extension and improvements.	Transport Planning and Infrastructure.	Bus route improvements.	CWC & Centro.	Completed	On going	None set	As per measure No 1.	WCW has implement a programme of enhanced bus routes featuring real time information at bus stops, improved bus shelters and lighting at stops and bus priority at junctions. Electric hybrid buses were introduced on show case route 1 in 2011.	Completed.	This is part of a range of measures aimed at reducing emissions from buses and encouraging the use of public transport.
6.	Statutory quality bus partnership (SQP) covering the city centre.	Transport Planning and Infrastructure.	Bus route improvements.	CWC & Centro	Completed	On going	None set	As per measure No 1	Draft SQP currently out for consultation	SQP to be in place by end 2016	The SQP will enable better control of the quality of vehicles, emissions standards and the management of bus stops to ensure reliability and journey times within the city centre. Sets an agreed standard for all buses to achieve EURO 6 within the city centre by 2021/22

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
7.	Increased bus lane enforcement	Transport Planning and Infrastructure	Bus route improvements	CWC	Completed	On going	None set	As per measure No 1	6 bus lane enforcement cameras have been installed on bus lanes. These became live on the 1st June 2015	On going	See point 6
8.	Urban traffic Control Major Scheme	Traffic Management	UTC, Congestion management, traffic reduction	CWC		1/9/08 – 30/9/14	None set	As per measure No 1	Approximately 20 traffic signals were upgraded to SCOOT with bus priority during 2013/14. Approximately 80 traffic PELICAN crossings have been upgraded to PUFFIN crossings over the last 5 years. 4 nitrogen dioxide monitors linked in to the traffic control system have been installed at major traffic light junctions. These monitor air pollution levels and traffic flow. A journey time monitoring system comprising of 28 ANPR cameras has been installed within the city. The traffic light signalling system has been upgraded to wireless digital communications. This has improved the control of traffic light signals and traffic flow within the city.	30/9/14	The UTC Major Scheme seeks to make more efficient use of the existing infrastructure and reduce congestion on the network of strategic routes throughout the West Midlands. It will make traffic signals more efficient, provide a common platform for bus priority measures, deliver more variable message signs, and, create a technical platform which enables intelligent transport services to be deployed. The project has been developed in partnership with the police, Highways Agency and public transport operators.

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
9.	Wolverhampton Car Share (WCS).	Alternatives to private vehicle use	Car & lift sharing schemes	CWC	NA	On going	None set	As per measure No 1	The car share scheme was re launched in 2015 as part of the councils revised travel plan which was produced in January 2015. Wolverhampton City Council is working jointly with South Staffs Council on a car share scheme for the i54 development which includes the new Jaguar Land Rover engine plant.	On going	This forms part of the Green Travel Plan encouraging alternative means of travel. These measures are aimed at reducing the number of vehicles entering the city centre, reducing vehicle emissions.
10.	Walking Strategy	Promoting Travel Alternatives	Promotion of walking	CWC	Na	On going	None set	As per measure No 1	Active Travel Strategy to promote walking and cycling launched December 2014 in conjunction with the council's Transportation and Public Health divisions.	On going	The promotion of alternative forms of transport is intended to reduce the number of vehicles on the road improving congestion and reducing vehicle emissions
11.	Cycle Strategy	Promoting Travel Alternatives	Promotion of cycling	CWC	Na	On going	None set	As per measure No 1	Active Travel Strategy to promote walking and cycling launched December 2014 in conjunction with Transportation and Public Health. In addition the council has set up a cycle forum and cycle training in schools to promote and encourage cycling. The council has also launched a "Bike to work" scheme via the employee benefits scheme.	On going	See measure No 11
12.	Green fleet review	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	CWC		On going	None set	As per measure No 1			

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
13.	WCC Fleet modernisation	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	CWC	NA	On going	None set	As per measure No 1	On going process of fleet modernisation. HGV's using Ad blue systems. Low emission vehicles have been adopted in limited numbers where appropriate. Electric vehicle trials are on-going. The Council's fleet of mowers has been upgraded with rotary mowers which are more economical and use less fuel. Heavy commercial vehicles meet EURO VI.	On going, the council intends to adopt low emission vehicle technologies where appropriate as they become available.	The adoption of low emission vehicle technology will reduce the overall emissions from the council fleet.
14.	Local sustainable transport initiatives	Promoting Low Emission Transport	Other	CWC	Na	On going	None set	As per measure No 1	£3m obtained from Local sustainable transport bid for the period 2015 to 2019, £4.6m received from the growth fund covering the period 2015 to 20. The following initiatives are on-going: promotion of sustainable transport, managing short trips, Smarter Networks, Smarter Choices, cycle to work scheme, salary sacrifice scheme to purchase bikes, cycle parking, promotion of walking, monthly payments for transport season tickets, public transport scratch cards for work related trips.	2020	Part of a range of initiatives aimed at improving fleet emissions by encouraging the take up of low emission vehicles, driver training and vehicle management.

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
15.	West Midlands Low Emissions Towns & Cities Program (LETCP)	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	LETCP Board comprising Walsall (Chair), Birmingham, Coventry, Dudley, Sandwell, Solihull, and Wolverhampton councils		On going	None set	As per measure No 1	• Good Practice Air Quality Planning Guidance - May 2014; • Good Practice Procurement Guidance - September 2014; • West Midlands LETCP Low Emission Zones - Technical Feasibility Study Work Package 1 Scenario modelling base case; • West Midlands LETCP Low Emissions Zones - Technical Feasibility Study WP1a Scenario modelling; • West Midlands LETCP 'Economic and health impacts of air pollution' study has been completed • Draft West Midlands LETCP Low Emissions Strategy, completion is scheduled for late 2016. Publication of the Good Practice Air Quality Planning Guidance and the Good Practice Procurement Guidance. These documents have been adopted by CWC and are being implemented.	On going	The LETCP program comprises of a range of measures and guidance to drive policy and reduce emissions from road traffic across the West Midlands.

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
16.	Black Country Ultra Low emission Vehicle Strategy and Implementation Plan	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	City of Wolverhampton Council in conjunction with Dudley MBC, Sandwell MBC and Walsall MBC.		On going	None set	As per measure No 1	A draft Low Emissions Strategy has been written and has gone out to consultation.	The strategy is to be published by the end 2016	The emerging Black Country Ultra Low Emission Vehicle Strategy and implementation plan will form part of a Black Country Transport Strategy and will help deliver a step change in the number of ULEV's in the sub-region by meeting existing demand and stimulating further demand by providing vehicle owners and operators with the confidence to invest in ULEVs. The Implementation Plan will drive each council's own capital and revenue programmes and inform funding bids to the Local Growth Fund, Combined Authority, Office for Low Emission Vehicles (OLEV), European Structural Investment Fund (ESIF), Horizon 2020 and other appropriate funds. It will also support the wider promotion of ULEVs to the public, other public sector organisations and to businesses.

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
17.	West Midlands Transport Emissions Framework	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	Combined Authority		On going	None set	As per measure No 1	Scoping study completed – Developing a WM Transport emissions Framework	2017	The West Midlands Transport emissions Framework is in direct response to the Defra Air Quality Action Plan which requires the implementation of Clean Air Zones. It is aligned to the Strategic Transport Plan and will provide a coordinated approach at Combined Authority level, to tackle air quality issues and improve our overall transport emissions.
18.	Encouragement of city centre living	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	CWC		On going	None set	As per measure No 1	As part of its Local Development Scheme the city council has 3 Area Action Plans including the new City Centre AAP which promotes city centre living.	On going	City centre living reduces the need for car ownership and promotes the use of public transport.
19.	Black Country Air Quality SPD	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Dudley MBC		2016/17	None set	As per measure No 1	The 4 Black Country authorities, Dudley, Sandwell, Walsall and Wolverhampton are working together to produce a Black Country supplementary planning document (SPD) to incorporate the LETCP Air Quality good Practice Guide into planning policy.	December 2016	The SPD requires new development to incorporate a range of measures to reduce emissions from road traffic. These include the provision of electric charging points, traffic management plans, and a damage cost calculator. The level of mitigation required is proportional to the size of the development.

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

Policy Guidance LAQM.PG16 requires Local Authorities 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, with new studies also suggesting links to much wider health issues than previously thought including conditions such as diabetes and dementia.

The City of Wolverhampton Council Public Protection team is working closely with Public Health colleagues to assess the current levels of $PM_{2.5}$ within the city and their impact on public health. The council has recently purchased 4 new particle monitors which have the capability to measure $PM_{2.5}$. These have been deployed at potential hot spots within the city to identify priority areas for the reduction of $PM_{2.5}$. Where priority areas are identified, actions aimed at reducing $PM_{2.5}$ levels in those areas will be considered and implemented.

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.

The City of Wolverhampton Council undertook automatic (continuous) monitoring at 5 sites during 2015. Table A.1 in Appendix A shows the details of the sites. NB. 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. National monitoring results are available at https://uk-air.defra.gov.uk/

A map showing the location of the monitoring sites is 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

The City of Wolverhampton Council undertook non- automatic (passive) monitoring of NO_2 at 50 sites during 2015. Table A.2 in Appendix A shows the details of the sites.

A Map showing the location of the monitoring sites is provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for “annualisation” and bias. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3.

For diffusion tubes, the full 2015 dataset of monthly mean values is provided in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

Four sites have exceeded the annual mean objective, however there is no relevant exposure at these locations.

There have been no exceedances of the annual mean air quality objective at locations where there is relevant exposure. As none of the annual means from the diffusion tube sites are greater than 60µg/m3, there is unlikely to be any exceedances of the 1-hour mean objective at these sites.

3.2.2 Particulate Matter (PM_{10})

Table A.5 in Appendix A compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3.

Table A.6 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past 5 years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year.

During 2015 there were no exceedences of the air quality objective.

3.2.3 Particulate Matter ($PM_{2.5}$)

The council has recently purchased 4 PM2.5 monitors to be located across the city. Data from these will be presented in the next ASR.

3.2.4 Sulphur Dioxide (SO_2)

Table A.7 in Appendix A compares the ratified continuous monitored SO_2 concentrations for year 2015 with the air quality objectives for SO_2.

During 2015 there were no exceedences of the air quality objective.

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)
A1	Lichfield Street	Roadside	391647	298784	NO_2, PM_{10}	Yes	Chemiluminescent, TEOM	2	2	2.5
A2	Penn Road	Roadside	390374	296775	NO_2, PM_{10}	Yes	Chemiluminescent, TEOM	N/A	6.5	2.5
A4	Stafford Road	Roadside	391261	302199	NO_2, SO_2, PM_{10}	Yes	Chemiluminescent, UV Fluorescence, TEOM	5	8.5	2.5
A5	Willenhall Road	Roadside	394754	298429	NO_2, SO_2, PM_{10}	Yes	Chemiluminescent, UV Fluorescence, TEOM	5	9.5	2.5
A9	St Peter's Square	Urban Background	390740	302692	NO_2, PM_{10}	Yes	Chemiluminescent, TEOM	N/A	30	2.5

(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 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)
BIL1	Roadside ISA	395057	296541	NO_2	Y	0	4m		3m
BIL2	Roadside ISA	395085	296475	NO_2	Y	0.5	4.5m		3m
BIL3	Roadside ISA	395102	296495	NO_2	Y	N/A	10m		3m
BIL4	Roadside ISA	395117	296454	NO_2	Y	0	2.5m		3m
LIC1	Roadside ISA	391698	298776	NO_2	Y	N/A	3.5m		3m
LIC2	Roadside ISA	391508	298744	NO_2	Y	0	3m		3m
LIC3	Roadside ISA	391620	298772	NO_2	Y	N/A	6m		3m
LIC4,5,6	Roadside ISA	391643	298786	NO_2	Y	1.5	1.5m	Y	3m
LIC7	Roadside ISA	391663	298764	NO_2	Y	N/A	4m		3m
LIC8	Roadside ISA	391454	298733	NO_2	Y	N/A	3m		3m
LIC9	Roadside ISA	391706	298757	NO_2	Y	N/A	3m		3m
PIP1	Roadside ISA	391768	298662	NO_2	Y	N/A	2m		3m
PRI1	Roadside ISA	391548	298940	NO_2	Y	N/A	3m		3m
PRI2	Roadside ISA	391566	298795	NO_2	Y	0	3m		3m
PRI4	Roadside ISA	391581	298686	NO_2	Y	N/A	5m		3m
QUE1	Roadside ISA	391607	298652	NO_2	Y	0	2.5m		3m
QUE2	Roadside ISA	391622	298639	NO_2	Y	N/A	4.5m		3m
QUE3	Roadside ISA	391673	298668	NO_2	Y	0	2.5m		3m
QUE4	Roadside ISA	391707	298660	NO_2	Y	N/A	4.5m		3m

Site ID	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)
STA1	Roadside ISA	391377	299818	NO_2	Y	2	2m		3m
STA5,6,7	Roadside ISA	391261	302199	NO_2	Y	6.5	8.5m	Y	3m
STA9	Roadside ISA	391540	303373	NO_2	Y	8	3.5m		3m
STA9A	Roadside ISA	391536	303348	NO_2	Y	0	7m		3m
WIL1	Roadside ISA	394187	298451	NO_2	Y	14.5	14.5m		3m
WIL2	Roadside ISA	394712	298428	NO_2	Y	0	6.5m		3m
BRI	Roadside	388182	298782	NO_2	Y	0	11m		3m
BRO	Roadside	391676	298865	NO_2	Y	5	5.5m		3m
CAN	Roadside	393008	300867	NO_2	Y	7.5	6.5m		3m
CLE	Roadside	391485	298348	NO_2	Y	N/A	5m		3m
CUL	Roadside	393365	297369	NO_2	Y	0	2.5m		3m
DUD	Roadside	391530	297308	NO_2	Y	1	3.5m		3m
HOR	Roadside	392115	298608	NO_2	Y	0.5	2.7m		3m
NEA	Roadside	394717	299894	NO_2	Y	4.5	2m		3m
OXF	Roadside	395384	296293	NO_2	Y	0	3.2m		3m
PAR	Roadside	392306	296547	NO_2	Y	10.3	2.7m		3m
TET	Roadside	389297	299886	NO_2	Y	3.2m	3.2m		3m
TRI	Roadside	395540	296479	NO_2	Y	-1	11m		3m
WAT	Roadside	391134	298877	NO_2	Y	N/A	3m		3m
WOL	Roadside	394031	297172	NO_2	Y	4	2m		3m
PRO	Intermediate	394633	296089	NO_2	Y	N/A	28m		3m

Site ID	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)
COL	Background	395855	300586	NO_2	Y	N/A	48m		3m
MAR	Background	390705	302736	NO_2	Y	N/A	165m		3m
WAR	Background	389067	296785	NO_2	Y	N/A	50m		3m
WRE	Background	392090	296095	NO_2	Y	N/A	50m		3m
CC1	Roadside	391379	298687	NO_2	Y	N/A	5.9m		3m
CC2	Roadside	391309	298554	NO_2	Y	0	2.8m		3m
CC3	Roadside	391467	298374	NO_2	Y	N/A	5.8m		3m
CC5	Roadside	391538	298327	NO_2	Y	N/A	9.5m		3m
CC7	Roadside	391597	298579	NO_2	Y	0	2.9m		3m
PEN	Roadside	390379	296752	NO_2	Y	0	11.7m		2.5m

(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 NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2015 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2011	2012	2013	2014	2015
A1	Roadside	Automatic		99	36	**46**	39	37	34
A2	Roadside	Automatic		98	38	**43**	**45**	**42**	**44**
A4	Roadside	Automatic		100	34	31	31	29	25
A5	Roadside	Automatic		100	38	**44**	37	28	31
A9	Urban Background	Automatic		98	N/A	32	31	27	29
BIL1	Roadside	Diffusion Tube		100	37	**42**	**43**	35	38
BIL2	Roadside	Diffusion Tube		92	32	34	33	28	28
BIL3	Roadside	Diffusion Tube		100	33	**47**	36	39	36
BIL4	Roadside	Diffusion Tube		100	33	37	33	31	29
LIC1	Roadside	Diffusion Tube		100	33	**42**	**41**	**46**	**42**
LIC2	Roadside	Diffusion Tube		92	**45**	**46**	39	38	36
LIC3	Roadside	Diffusion Tube		92	36	**47**	40	**41**	39
LIC4,5,6 [4]	Roadside	Diffusion Tube		92	32	40	38	38	
LIC7	Roadside	Diffusion Tube		100	33	40	37	38	36
LIC8	Roadside	Diffusion Tube		67	31	36	29	29	28
LIC9	Roadside	Diffusion Tube		100	34	**47**	**41**	**43**	**42**
PIP1	Roadside	Diffusion Tube		100	37	**46**	**41**	38	**48**
PIP2	Roadside	Diffusion Tube		NA	35	38	36	closed	closed
PRI1	Roadside	Diffusion Tube		100	39	39	36	38	35

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2015 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2011	2012	2013	2014	2015
PRI2	Roadside	Diffusion Tube		100	38	**41**	36	36	35
PRI3	Roadside	Diffusion Tube		NA	32	32	32	closed	closed
PRI4	Roadside	Diffusion Tube		92	**48**	40	36	34	24
PRI5	Roadside	Diffusion Tube		NA	35	35	35	closed	closed
QUE1	Roadside	Diffusion Tube		100	36	32	30	28	24
QUE2	Roadside	Diffusion Tube		67	**41**	39	33	33	29
QUE3	Roadside	Diffusion Tube		83	**46**	36	31	28	25
QUE4	Roadside	Diffusion Tube		100	**41**	37	28	29	29
STA1	Roadside	Diffusion Tube		100	28	30	27	27	28
STA5,6,7 [4]	Roadside	Diffusion Tube		83	34	38	31	29	
STA9	Roadside	Diffusion Tube		83	47	**45**	30	29	28
STA9A	Roadside	Diffusion Tube		100	31	35	32	30	30
WIL1	Roadside	Diffusion Tube		100	23	27	23	22	21
WIL2	Roadside	Diffusion Tube		100	36	39	37	37	35
WIL3	Roadside	Diffusion Tube		NA	30	34	closed	closed	closed
PAR	Roadside	Diffusion Tube		100	31	36	30	30	32
BRI	Roadside	Diffusion Tube		92	21	22	20	21	19
BRO	Roadside	Diffusion Tube		100	**44**	**45**	**41**	40	38
CAN	Roadside	Diffusion Tube		92	28	30	27	27	25
CLE	Roadside	Diffusion Tube		100	31	32	26	30	26
CUL	Roadside	Diffusion Tube		100	23	26	21	21	21

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2015 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2011	2012	2013	2014	2015
DUD	Roadside	Diffusion Tube		100	26	27	25	25	23
HOR	Roadside	Diffusion Tube		100	36	36	35	34	36
NEA	Roadside	Diffusion Tube		100	22	24	21	21	21
OXF	Roadside	Diffusion Tube		100	25	31	30	30	29
TET	Roadside	Diffusion Tube		100	38	39	34	34	34
WAT	Roadside	Diffusion Tube		92	30	35	34	33	32
WOL	Roadside	Diffusion Tube		100	19	20	19	17	18
PEN	Roadside	Diffusion Tube		100	N/A	N/A	N/A	23	22
PRO	Intermediate	Diffusion Tube		92	25	27	25	23	23
SPS	Intermediate	Diffusion Tube		NA	23	26	26	closed	closed
TRI	Intermediate	Diffusion Tube		100	24	25	22	23	22
COL	Background	Diffusion Tube		100	16	18	16	16	14
MAR	Background	Diffusion Tube		92	13	18	15	14	14
WAR	Background	Diffusion Tube		100	14	15	13	13	12
WRE	Background	Diffusion Tube		100	15	17	16	16	14
CC1	Roadside	Diffusion Tube		100	N/A	N/A	29	31	29
CC2	Roadside	Diffusion Tube		100	N/A	N/A	27	27	27
CC3	Roadside	Diffusion Tube		92	N/A	N/A	29	31	26
CC4	Roadside	Diffusion Tube		NA	N/A	N/A	29	closed	closed
CC5	Roadside	Diffusion Tube		100	N/A	N/A	28	28	27
CC6	Roadside	Diffusion Tube		NA	N/A	N/A	31	closed	closed

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2011	2012	2013	2014	2015
CC7	Roadside	Diffusion Tube		92	N/A	N/A	31	30	28
Lichfield St, Bilston	Intensive survey area	Diffusion Tube		98	34	39	36	33	32
Lichfield St, East of Princess Sq	Intensive survey area	Diffusion Tube		90	34	**43**	39	**41**	39
Lichfield St, West of Princess Sq	Intensive survey area	Diffusion Tube		96	37	**41**	34	34	33
Princess St/Stafford St	Intensive survey area	Diffusion Tube		97	38	37	35	36	31
Queen St	Intensive survey area	Diffusion Tube		88	**41**	35	31	30	27
Stafford Rd	Intensive survey area	Diffusion Tube		92	31	36	30	29	29
Willenhall Rd	Intensive survey area	Diffusion Tube		100	30	34	29	29	27
Other Roadside sites	Intensive survey area	Diffusion Tube		98	29	31	26	28	28
Intermediate sites	Intensive survey area	Diffusion Tube		96	24	26	24	23	22
Background sites	Intensive survey area	Diffusion Tube		98	15	16	15	15	13

Notes: Exceedances of the NO_2 annual mean objective of $40\mu g/m^3$ are shown in **bold**.

NO_2 annual means exceeding $60\mu g/m^3$, indicating a potential exceedance of the NO_2 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 Technical Guidance LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table A.4 – 1-Hour Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	NO_2 1-Hour Means > 200µg/m^3 (3)				
					2011	2012	2013	2014	2015
A1	Roadside	Automatic		99	1	1	0	0	0
A2	Roadside	Automatic		98	0	1	0	0	0
A4	Roadside	Automatic		100	0	0	0	0	0
A5	Roadside	Automatic		100	0	5	1	1	0
A9	Urban Background	Automatic		98	N/A	0	0	0	0

Notes: Exceedances of the NO_2 1-hour mean objective (200µg/m^3 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 PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	PM_{10} Annual Mean Concentration ($\mu g/m^3$) (3)				
				2011	2012	2013	2014	2015
A1	Roadside		99	23	20	21	20	19
A2	Roadside		98	25	22	23	21	19
A4	Roadside		100	23	19	19	18	17
A5	Roadside		100	23	21	22	20	20
A9	Urban Background		98	N/A	21	20	20	18

Notes: Exceedances of the PM_{10} annual mean objective of $40\mu g/m^3$ 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 Technical Guidance LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table A.6 – 24-Hour Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	PM_{10} 24-Hour Means > 50µg/m^3 (3)				
				2011	2012	2013	2014	2015
A1	Roadside		99	16	7	8	10	5
A2	Roadside		98	15	8	10(38)	8	3
A4	Roadside		100	7	9	6	5(30)	2
A5	Roadside		100	11	11	5	6	4
A9	Urban Background		98	N/A	6	6	11	6

Notes: Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 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.

Table A.7 – SO_2 Monitoring Results

Site ID	Site Type	Valid Data Capture for monitoring Period (%) (1)	Valid Data Capture 2014 (%) (2)	Number of Exceedances (percentile in bracket) (3)		
				15-minute Objective (266 µg/m^3)	1-hour Objective (350 µg/m^3)	24-hour Objective (125 µg/m^3)
A4	Roadside		100	0	0	0
A5	Roadside		100	0	0	0

Notes: Exceedances of the SO_2 objectives are shown in **bold** (15-min mean = 35 allowed a year, 1-hour mean = 24 allowed a year, 24-hour mean = 3 allowed a year)

(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 relevant percentiles are provided in brackets.

Appendix B: Full Monthly Diffusion Tube Results for 2015

Table B.2 – NO_2 Monthly Diffusion Tube Results - 2015

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted (1)
BIL1	50	47	56	58	38	39	43	46	64	73	45	73	53	38
BIL2	42	39	43	42	28	30		32	45	50	34	32	38	28
BIL3	61	42	53	57	43	35	35	46	61	71	43	49	50	36
BIL4	42	41	46	45	34	27	32	37	46	56	34	38	40	29
LIC1	70	62	69	70	29	55	52	51	63	67	57	48	58	**42**
LIC2	53	49		65	47	47	41	46	52	56	43	49	50	36
LIC3	60	56	60	64		45	43	44	54	59	51	56	54	39
LIC4		57	65	68	49	45	40	45	56	62	47		53	39
LIC5	54	56	56	61	43	42	41	43	59	67	41	39	50	37
LIC6	50	39	54	60	41	42	41	45	62	68	39		49	36
LIC7	55	47	60	54	42	48	40	44	47	57	48	46	49	36
LIC8	37	36	50	42	35	34	30	35					37	27

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted (1)
LIC9	58	67	62	65	54	50	48	52	58	66	63	57	58	**42**
PIP1	83	73	75	68	63	56	55	60	68	69	60	60	66	**48**
PRI1	50	49	49	56	35	44	41	44	52	65	46	43	48	35
PRI2	56	49	54	54	45	39	37	41	52	59	41	44	48	35
PRI4	44	32	37	36		21	23	26	33	47	32	31	33	24
QUE1	38	34	39	36	26	25	23	27	38	47	31	30	33	24
QUE2	48	36				37	31	37	46	56	39		41	30
QUE3	36	32	40		26		23	29	41	51	33	30	34	25
QUE4	33	41	45	46	36	27	32	36	49	52	38	36	39	29
STA1	41	45	44	44	28	26	31	37	37	49	37	44	38	28
STA5	46	52			39	29	38	34	41	51		47	42	31
STA6	52	45	42	45	33	26	37	39	39	51	38	44	41	30
STA7	53			45	43	35	34	39	42	50		44	43	31
STA9		45		40	29	30	31	30	41	56	39	47	39	28
STA9A	45	45.8	43	48	35	30	32	35	43	53	39	40	41	30

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted (1)
WIL1	25	35	32	37	21	20	22	26	36	35	32	26	29	21
WIL2	57	42	54	62	23	45	44	48	50	57	45	47	48	35
PAR	35	53	41	49	39	35	38	39	50	62	37	43	43	32
BRI	26	22	31	35	22	16	20	21	27	34		28	26	19
BRO	46	51	54	63	39	45	42	51	56	66	51	55	52	38
CAN	44	33		34	24	24	28	33	36	52	36	28	34	25
CLE	48	41	46	43	32	26	22	25	36	41	34	30	35	26
CUL	37	36	31	36	20	14	19	22	31	40	32	31	29	21
DUD	37	37	32	35	22	20	21	29	30	48	30	39	32	23
HOR	64	40	57	55	38	41	41	48	53	64	45	43	49	36
NEA	36	32	32	36	19	17	20	21	30	40	25	34	28	21
OXF	37	38	48	50	32	36	30	37	49	54	36	32	40	29
TET	53	55	49	52	41	40	43	42	47	49	44	46	47	34
WAT	42	44	52	47	36	35	36	42	49	58		49	45	32
WOL	30	26	29	30	18	16	12	19	26	38	27	35	25	18

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted (1)
PEN	41	32	33	32	27	27	28	28	33	41	22	21	30	22
PRO	41	31	40	33	24	20	21		35	42	34	29	32	23
TRI	39	25	33	37	23	18	22	24	32	40	32	32	30	22
COL	24	23	21	25	14	12	15	13	19	30	19	25	20	14
MAR	26	18	19		12	11	11	12	21	31	23	24	19	14
WAR	21	21	21	17	11	10	11	11	19	24	12	16	16	12
WRE	18	21	25	22	13	10	14	14	26	30	18	17	19	14
CC1	47	35	51	45	34	33	26	36	39	54	41	35	40	29
CC2	51	28	45	39	32	30	31	30	41	48	39	30	37	27
CC3	40	38	49		32	30	31	31	43	50	30	25	36	26
CC5	44	41	45	43	34	38	34	34	39	51	25	26	38	27
CC7	32	39	43	47	30	28	28		49	54	36	36	38	28

(1) See Appendix C for details on bias adjustment

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

C1 Diffusion Tube Bias Adjustment Factors

The council uses diffusion tubes prepared using 50% TEA in acetone which, since 1 April 2014, are supplied by ESG Didcot. Prior to this they were supplied by Gradko International Ltd.

The tubes arrive from ESG and are stored in a refrigerator prior to being labelled with a site and date code. The tubes are then exposed in accordance with the start and end dates for the national NO_2 survey. Following exposure the tubes are capped and immediately dispatched to ESG for analysis.

The bias adjustment factor for the tubes and supplier have been obtained from the LAQM tools website, Review & Assessment database, Spreadsheet Version Number: 06/16, these are detailed below.

C1.1 Factor from Local co-location Studies

Triplicate tubes are exposed at the automatic monitoring stations in order to calculate a bias correction factor. The correction factor is applied to the yearly average to enable comparison with the annual NO_2 objective. The results from the co-location studies for 2011-15 are shown in the table below.

Prior to its closure in 2007 the Wolverhampton Centre AURN station was used for the co-location study. Since 2007 co-location tubes have been placed at the Lichfield Street and Stafford Road automatic stations. The factor applied to the data set is the mean bias adjustment factor from Tables C.1 to C.5.

Table C.1 – Chemiluminescent v Diffusion Tube Values 2011 (µg/m^3)

Site	Mean	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	%
Diffusion Tube Values µg/m^3														
LIC4	37	50	39	39	43	30	23	35	35	32	37	48	36	100
LIC5	38	59	38	38	36	25	27	40	33	32	41	48	33	100
LIC6	40	69	37	43	40	33	27	37	33	29	40	49	38	100
Mean		49	36	42	38	37	35	38	37	39	37	44	40	
Standard deviation		5	4	3	2	2	4	2	2	2	3	1	4	
Coefficient of variation		11.1	10.5	8.0	4.0	4.3	11.3	5.8	6.1	6.2	9.0	3.3	10.1	
Data quality		Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	
STA5	39	55	32	40	39	35	37	37	39	37	33	45	42	100
STA6	39	45	39	46	39	38	30	36	35	37	40	42	35	100
STA7	40	47	38	41	36	37	36	40	35	41	38	45	42	100
Mean		49	36	42	38	37	35	38	37	39	37	44	40	
Standard deviation		5	4	3	2	2	4	2	2	2	3	1	4	
Coefficient of variation		11.1	10.5	8.0	4.0	4.3	11.3	5.8	6.1	6.2	9.0	3.3	10.1	
Data quality		Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	
Mean of triplicate tubes														
Lichfield St	36	44	40	44	40	29	25	31	29	27	40	48	34	100
Stafford Rd	33	42	36	44	34	25	23	34	31	31	34	36	29	100
Monthly Chemiluminescent Values														
Lichfield St	38	59	38	40	40	29	26	37	34	31	39	48	36	100
Stafford Rd	39	49	36	42	38	37	35	38	37	39	37	44	40	100
Ratios of diffusion Tube Values: Chemiluminescent values														
Lichfield St	0.94	0.74	1.06	1.11	1.01	0.97	0.97	0.82	0.84	0.86	1.02	0.99	0.96	0.74
Stafford Rd	0.85	0.86	1.00	1.03	0.90	0.68	0.66	0.92	0.84	0.79	0.93	0.83	0.72	0.86
Mean bias	0.89													

Table C.2 – Chemiluminescent v Diffusion Tube Values 2012 (µg/m^3)

Site	Mean	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	%
Diffusion Tube Values µg/m^3														
LIC4	45	43	50	39	40	34		29	36	37	44	38	45	92
LIC5	49	47	47	30	45	35	31	36	38		44		49	83
LIC6	48	42	53	33	42	36	35		39	38	47	41	48	92
Mean		47	44	50	34	43	35	33	32	38	37	45	39	
Standard deviation		1.8	2.6	3.1	4.2	2.5	1.1	2.8	5.0	2.0	0.8	1.9	2.3	
Coefficient of variation		3.9	5.8	6.1	12.3	5.8	3.2	8.5	15.6	5.2	2.1	4.3	6.0	
Data quality		Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	
STA5	49	45	42	25	32	32	31	33	39	42	42	42	49	100
STA6	48	42	44	28		31	31	29	35	42	42	37	48	92
STA7	49	40	46	24	34	29	29	31	39	48	45	37	49	100
Mean		48	42	44	26	33	30	31	31	38	44	43	39	
Standard deviation		0.6	2.4	2.1	2.0	1	2	1	2	2	3	2	3	
Coefficient of variation		1.3	5.7	4.7	7.7	4.6	5.3	3.6	6.8	5.9	7.9	3.5	7.5	
Data quality		Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	
Mean of triplicate tubes														
Lichfield St	41	47	44	50	34	43	35	33		38		45		75
Stafford Rd	38	48	42	44	26	33	35	33	34	38	37	46	40	100
Monthly Chemiluminescent Values														
Lichfield St	49	53	50	53	52	48	38	40		48		61		75
Stafford Rd	34	42	42	42	36	31	25	25	25	31	34	36	34	100
Ratios of diffusion Tube Values: Chemiluminescent values														
Lichfield St	1.20	1.13	1.13	1.07	1.52	1.12	1.10	1.23		1.27		1.35		1.13
Stafford Rd	0.88	0.87	0.99	0.96	1.42	0.93	0.71	0.76	0.73	0.80	0.92	0.79	0.86	0.87
Mean bias	1.05													

Table C.3 – Chemiluminescent v Diffusion Tube Values 2013 (µg/m^3)

Site	Mean	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	%
Diffusion Tube Values µg/m^3														
LIC4	40	39	50	50	48	39	37	43	42	39		57	33	92
LIC5	39	45	60	48	34	38	39	43	38	42	36	56	36	100
LIC6	40	47	49	46	44	38	38	45	38	44	40	56	33	100
Mean		44	53	48	42	38	38	44	39	42	38	56.4	34.1	
Standard deviation		3.9	6.1	2.0	6.9	0.7	0.8	1.2	2.0	2.1	3.0	0.6	1.5	
Coefficient of variation		8.9	11.6	4.2	16.5	1.8	2.0	2.7	5.1	5.1	7.9	1.1	4.5	
Data quality		Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	
STA5	35	38	44	30	34	28	28	32	34	36	36	44	38	100
STA6	32	38	38	31	34	35	28	32	34	37	33	47		92
STA7	32	39	40	36	30	31	27	31	35	34	34	45	34	100
Mean		38	41	32	32	31	28	32	34	36	34	45	36	
Standard deviation		0.6	2.6	3.3	2.4	3.3	0.7	0.4	0.6	1.2	1.5	1.2	2.6	
Coefficient of variation		1.6	6.5	10.1	7.3	10.6	2.4	1.3	1.8	3.5	4.3	2.6	7.2	
Data quality		Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	
Mean of triplicate tubes														
Lichfield St	**43**	44	53	48	42	38	38	44		42	38	56	34	92
Stafford Rd	**35**	38	41		32	31	28	32	34	36	34	45	36	92
Monthly Chemiluminescent Values														
Lichfield St	40	48	55	55	34	36	34	44		38	32	40	27	92
Stafford Rd	32	36	36		31	27	23	29	29	34	31	44	31	92
Ratios of diffusion Tube Values: Chemiluminescent values														
Lichfield St	0.93	1.09	1.04	1.15	0.82	0.94	0.90	1.01		0.92	0.85	0.71	0.78	
Stafford Rd	0.90	0.95	0.89		0.94	0.86	0.83	0.91	0.83	0.96	0.90	0.97	0.85	
Mean bias	**0.92**													

Table C.4 – Chemiluminescent v Diffusion Tube Values 2014 (µg/m^3)

Site	Mean	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	%
Diffusion Tube Values µg/m^3														
LIC4		36	NA	45	56	48	45	39	47	95	44	79		83
LIC5		41	28	44	56	51	54	50	49	94	43	62	55	100
LIC6		37	NA	53	54	56	39	46	43	90	41	76	45	92
Mean		38		47	55	52	46	45	46	93	42	72.4	50.0	
Standard deviation		2.5		5.2	1.2	4.1	7.7	5.6	2.7	2.2	1.9	9.2	7.1	
Coefficient of variation		6.5		11.0	2.2	7.9	16.8	12.5	5.8	2.4	4.4	12.7	14.3	
Data quality		Good		Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	
STA5		34	31	36	41	36	25	35	36	37	44	50		92
STA6		43	33	43	45	33	32	29	38	35	40	52	60	100
STA7		35	34	38	49	36	33	28	40	39	47	53	58	100
Mean		37	33	39	45	35	30	31	38	37	44	51	59	
Standard deviation		4.5	1.8	3.7	3.7	2	4	4	2	2	3	2	1	
Coefficient of variation		12.1	5.3	9.5	8.3	4.7	14.2	13.4	5.2	5.5	7.4	2.9	1.9	
Data quality		Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	
Mean of triplicate tubes														
Lichfield St		36		46	36	32	40	38	31	59	36	50	32	92
Stafford Rd		31	29	36	34	31	27	25	23	27	29	32	38	100
Monthly Chemiluminescent Values														
Lichfield St		38		47	55	52	46	45	46	93	42	72	50	92
Stafford Rd		37	33	39	45	35	30	31	38	37	44	51	59	100
Ratios of diffusion Tube Values: Chemiluminescent values														
Lichfield St			0.97	0.66	0.62	0.87	0.85	0.66	0.64	0.86	0.69	0.65	0.95	
Stafford Rd		0.87	0.93	0.77	0.88	0.89	0.81	0.61	0.73	0.66	0.63	0.65	0.82	
Mean bias		**0.92 (Gradko)**			**0.71 (ESG Didcot)**									

Table C.5 – Chemiluminescent v Diffusion Tube Values 2015 (µg/m^3)

Site	Mean	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	%
Diffusion Tube Values µg/m^3														
LIC4	53	NA	57	65	68	49	45	40	45	56	62	47	NA	83
LIC5	50	54	56	56	61	43	42	41	43	59	67	41	39	100
LIC6	50	50	39	54	60	41	48	41	45	62	68	39	NA	92
Mean		52	51	58	63	44	45	41	44	59	66	42.4	39	
Standard deviation		3.2	9.7	5.9	4.6	4.1	2.9	0.6	1.2	3.0	3.6	3.9		
Coefficient of variation		6.1	19.1	10.2	7.3	9.4	6.5	1.4	2.6	5.0	5.5	9.2		
Data quality		Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good		
STA5	42	46	52	NA	NA	39	29	38	34	41	51	NA	47	75
STA6	41	52	45	42	45	33	26	37	39	39	51	38	44	100
STA7	43	53	NA	NA	45	43	35	34	39	42	50	NA	44	75
Mean		51	48	42	45	38	30	36	37	40	51	38	45	
Standard deviation		3.7	5.2		0.5	5	4	2	3	2	1		2	
Coefficient of variation		7.4	10.7		1.1	13.3	14.6	5.3	7.3	4.6	1.5		3.6	
Data quality		Good	Good		Good	Good	Good	Good	Good	Good	Good		Good	
Mean of triplicate tubes														
Lichfield St	50	52	51	58	63	44	45	41	44	59	66	42	39	92
Stafford Rd	42	51	48	42	45	38	30	36	37	40	51	38	45	83
Monthly Chemiluminescent Values														
Lichfield St	36	36	38	40	34	34	34	29	31	34	38	38	40	92
Stafford Rd	32	38	40	36	34	27	25	25	27	29	36	32	29	83
Ratios of diffusion Tube Values: Chemiluminescent values														
Lichfield St	0.71	0.70	0.76	0.69	0.55	0.78	0.77	0.70	0.69	0.59	0.58	0.90	1.04	
Stafford Rd	0.75	0.76	0.83	0.87	0.77	0.70	0.82	0.69	0.71	0.71	0.71	0.85	0.64	
Bias	**0.73**													

C1.2 Discussion of Choice of Factor to Use

A comparison of the relevant bias adjustment factors is shown in Table A1.2 below. The national factors have been calculated using data from a number of authorities with tubes which will have been prepared and analysed in different batches and at different times.

The local bias adjustment factors are derived from triplicate co-located tubes exposed alongside an automatic analyser. These tubes are from the same batch as the measurement tubes and are handled, stored and analysed in the same way.

Table C.6 National and local bias adjustment factors.

Year	National Bias Adjustment Factor	Local Bias Adjustment Factor
2001	1.45	1.01
2002	1.27	0.95
2003	1.11	0.97
2004	1.10	0.93
2005	1.10	1.00
2006	1.01	1.03
2007	0.99	0.93
2008	0.94	0.97
2009	0.97	1.08
2010	0.99	0.97
2011	0.94	0.89
2012	1.02	1.05
2013	1.01	0.92
2014	0.98 (Gradko) 0.81 (ESG)	0.92 (Gradko, January to March) 0.71 (ESG Dicot, April to December)
2015	0.79	0.73

Trend data using both correction factors is presented in Figures A1.1 and A1.2. This shows that the national correction factor artificially raises the NO_2 concentrations at the start of the period, and produces an overall downward trend of 18$\mu g/m^3$ at roadside locations and 14$\mu g/m^3$ at background locations (Figure A1.1).

The diffusion tube NO_2 concentrations corrected with the locally derived adjustment factors (Figure A1.2) give a downward trend of 8$\mu g/m^3$ at roadside locations and 7$\mu g/m^3$ at background locations. These correction factors produce trend data which is more consistent with the data from the automatic analyser which is shown for comparison.

Based on this assessment local correction factors have been used to correct the diffusion tube data.

Figure C.1 Annual mean NO_2 values using national bias adjustment factor.

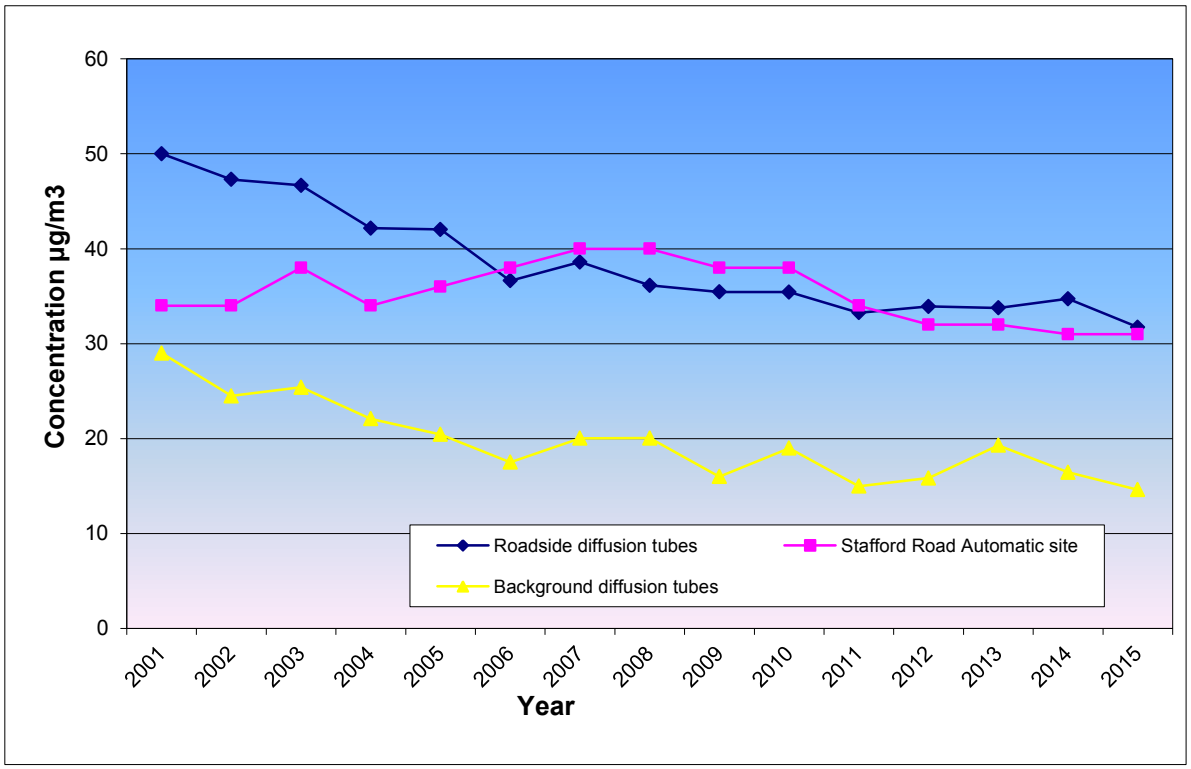
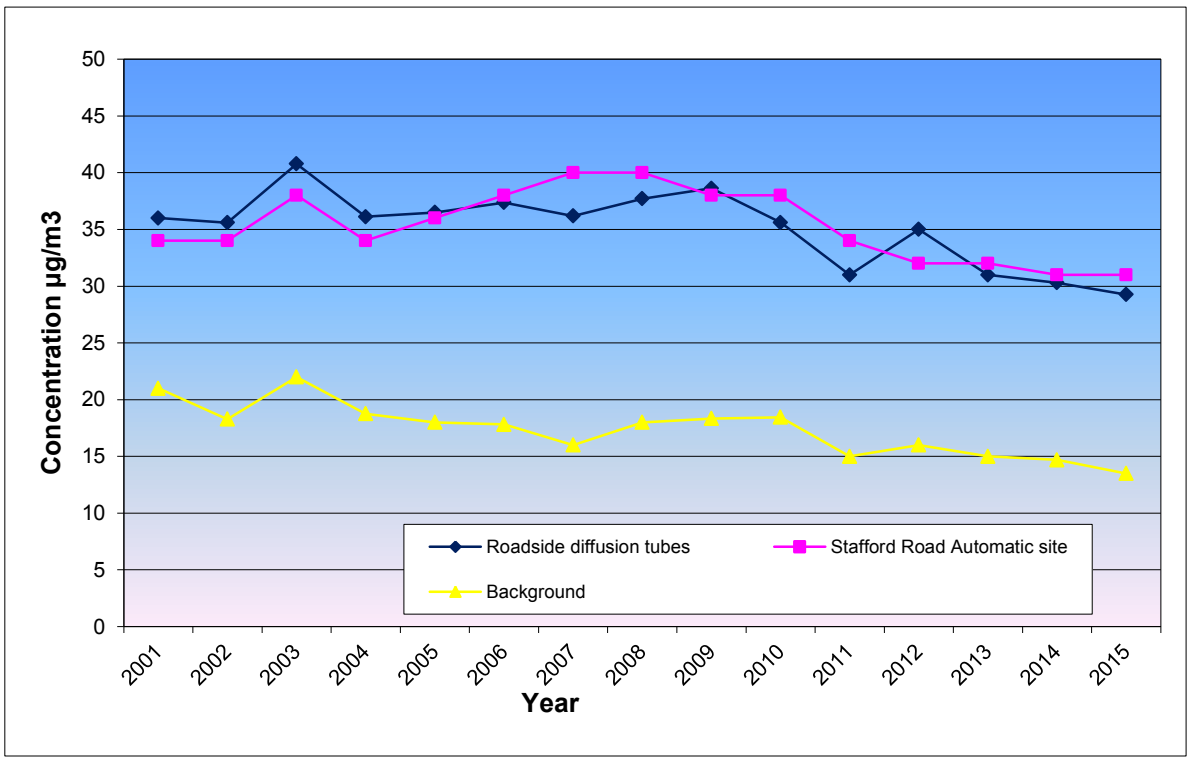


Figure C.2 Annual mean NO_2 values using local bias adjustment factor.



C1.3 PM Monitoring Adjustment

Particle monitoring is carried out using Tapered Element Oscillating Microbalance (TEOM) analysers. Since 2008 data has been corrected using the volatile correction model (VCM) in accordance with LAQM.TG16. The VCM was not available prior to 2008, therefore pre 2008 data has been corrected by applying the 1.3 correction factor to the annual mean in accordance with the previous guidance in LAQM.TG03.

C2 Short-term to Long-term Data adjustment

Data capture for LIC8 and QUE2 NO^2 diffusion tube sites was 67% during 2015. As this is below the minimum requirement of 75% for data capture, the results have been adjusted to provide an estimated annual mean concentration in accordance with the method outlined in Box 7.9 of LAQM.TG16, using data from the closest available continuous monitoring background sites. The correction factors for each site are calculated below.

Table C.7 Short-Term to Long-Term Monitoring Data Adjustment for diffusion tube site ref LIC8

Site	Site Type	Annual Mean ($\mu g/m^3$)	Period Mean ($\mu g/m^3$)	Ratio
Birmingham Acocks Green	Background urban	18.78	18.10	1.038
Birmingham Tyburn	Background urban	29.71	28.85	1.030
Walsall Woodlands	Background urban	19.14	17.62	1.086
Average				**1.051**

Table C.8 Short-Term to Long-Term Monitoring Data Adjustment for diffusion tube site ref QUE2

Site	Site Type	Annual Mean ($\mu g/m^3$)	Period Mean ($\mu g/m^3$)	Ratio
Birmingham Acocks Green	Urban Background	18.78	18.10	0.972
Birmingham Tyburn Rd	Background urban	29.71	28.85	0.960
Walsall Woodlands	Background urban	19.14	19.01	1.007
Average				**0.980**

C3 QA/QC of automatic monitors

The council follows the QA/QC procedures outlined in Chapter 7 of LAQM.TG16 in order to minimise data loss and achieve the required 90% data capture.

The chemiluminescent monitors are calibrated daily using on site calibration gases. This involves feeding zero air gas, followed by a span gas containing a known concentration of NO_2 through the analyser. A correction factor is then applied based on the analyser's response. The calibration reports are checked daily for drift and the correct application of the correction factor. Data is stored in both raw and corrected form.

A site visit is made every month to change filters and carry out a manual calibration which is checked against the automatic daily calibrations. Copies of the calibration reports, calibration gas logs and engineer's reports are retained on file.

All the sites are covered by a service contract provided by Enviro Technology Services plc (ET). The sites are serviced every 6 months by an ET service engineer in accordance with the manufacturer's instructions and warranty conditions. ET also provide a 48-hour call out response to cover breakdowns.

Raw data is examined on a daily basis to screen out erroneous and unusual measurements, having regard to the recommendations in Chapter 7 of LAQM.TG16.

C4 QA/QC of diffusion tube monitoring

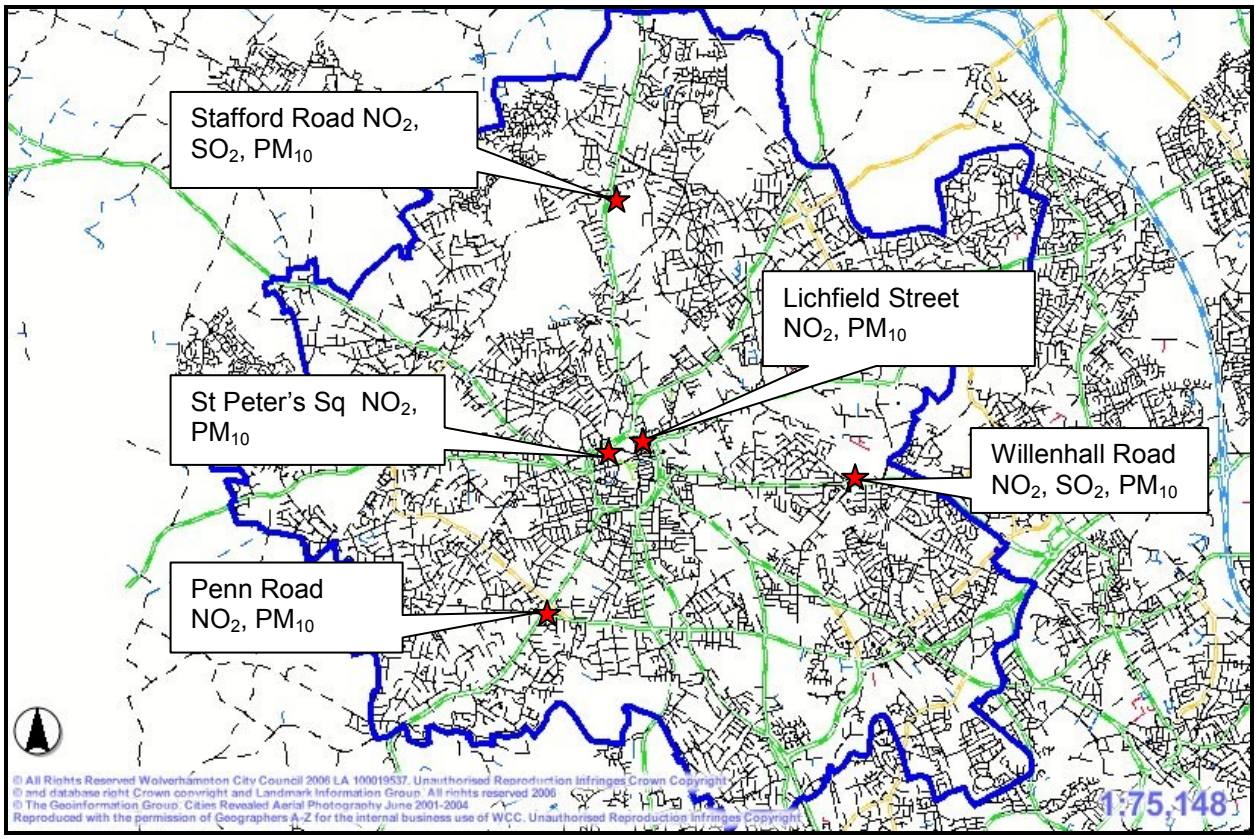
Since April 2014 the diffusion tubes used by the council have been supplied and analysed by ESD Didcot. The laboratory is UKAS accredited and takes part in the AIR NO2 Proficiency Testing Scheme (AIR-PT) which is operated by LGC Standards and supported by the Health and Safety Laboratory (HSL).

A summary of the performance of ESG Didcot in rounds AR006 to AR010 of the AIR-PT scheme covering the period January 2015 to November 2015 has been obtained from the Local Authority Air Quality Support web site. The results indicate that the laboratories analytical procedures do not have any systematic sources of bias. There are no rounds available covering December 2015

Triplicate tubes are exposed at the chemiluminescent monitoring stations in order to calculate bias correction which is applied to the yearly average to enable comparison with the annual NO_2 objective. The data from the triplicate tubes covering the period of this report show good precision.

Appendix D: Map of Monitoring Locations

Figure D.1 Location of Automatic Monitoring Sites



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/m^3).

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
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

References

(1) Local Air Quality Management – Technical Guidance (TG16), Department for Environment, Food and Rural Affairs 2016.

(2) 2015 Updating and Screening Assessment, Wolverhampton City Council.

(3) 2014 Progress Report, Wolverhampton City Council.

(4) LAQM Tools; Local Air Quality Management website www.airquality.co.uk