2016 Air Quality Annual Status Report (ASR)

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

June 2016

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Executive Summary: Air Quality in Nottingham City

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 Nottingham

Nottingham has two Air Quality Management Areas, both for nitrogen dioxide (NO2), where modelling predicted and/or monitoring demonstrated that the nitrogen dioxide annual mean objective of 40 ug/m3 (by 2005) is being, or was likely to be, exceeded by the 'due date' of 2005.

These two AQMAs were designated primarily due to nitrogen dioxide emissions from traffic, although NOx from gas fired boilers, (commercial and domestic heating and cooking) also contribute to ambient NO2 concentrations in the City area.

Modelling commissioned by DEFRA identified Nottingham as one of 5 cities where it is predicted that the EU nitrogen dioxide annual mean limit value 40 µg/m^3 will not be met. Nottingham together with the other cities will be required ('mandated') to introduce measures to reduce nitrogen dioxide and prevent the predicted infraction of the EU annual mean limit value for nitrogen dioxide of 40 µg/m3.

Latest Monitoring

Real time monitoring of nitrogen dioxide (NO_2) and particles (PM_{10}, $PM_{2.5}$) within the AQMA are presented below, in Figures 1 and 2 respectively, as annual means.

Figure 1

[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

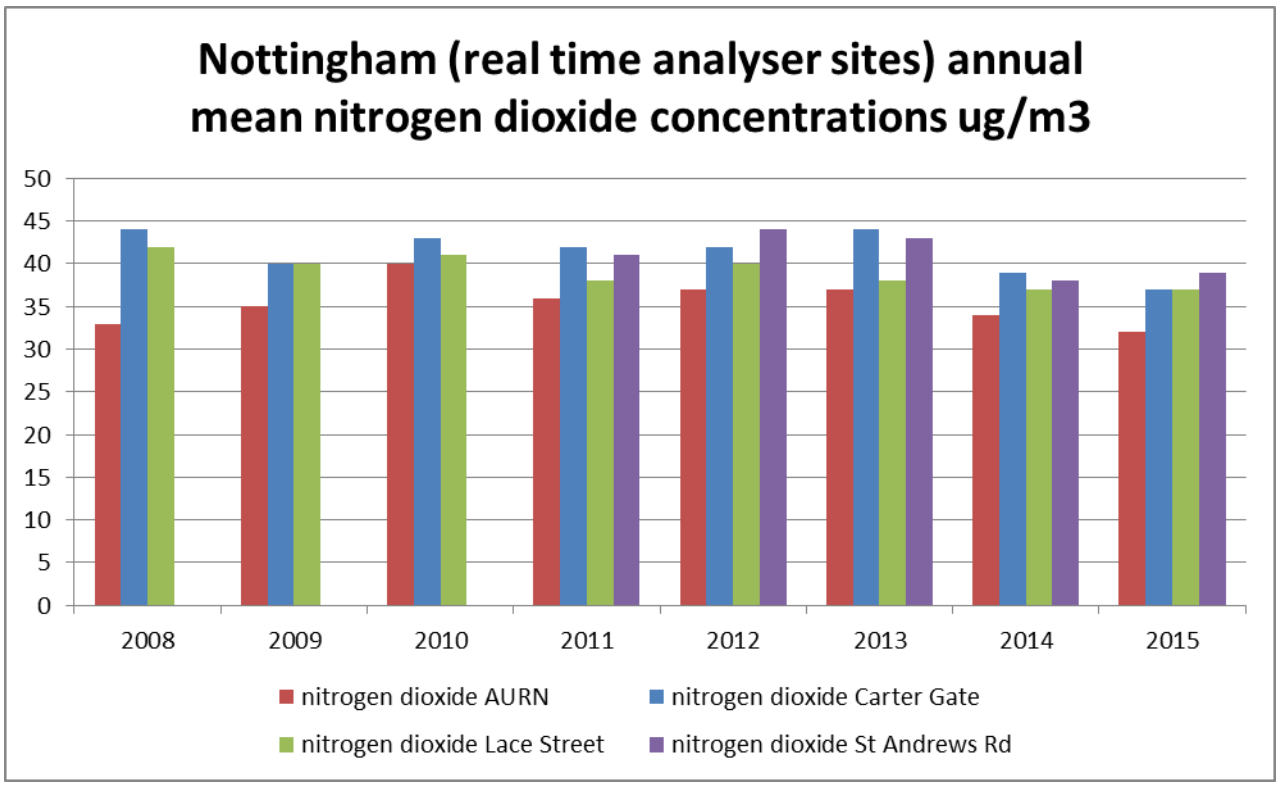
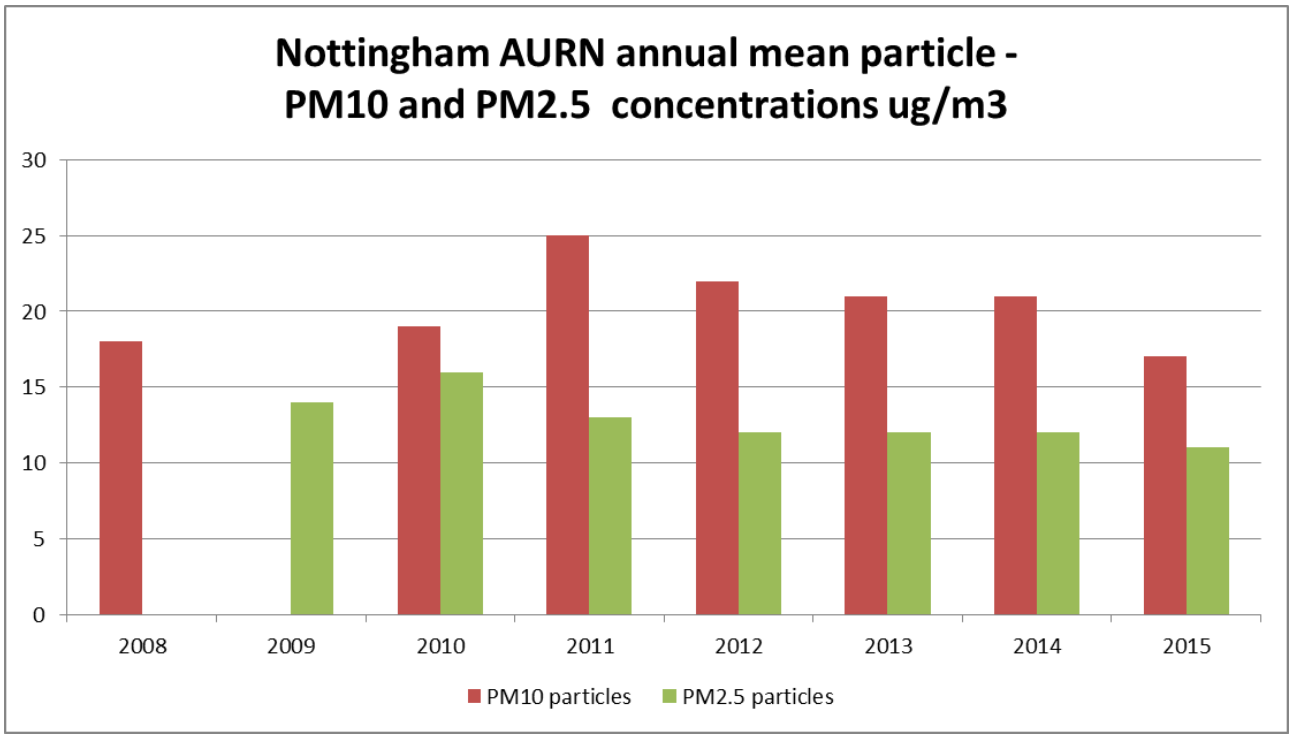

Nottingham (real time analyser sites) annual mean nitrogen dioxide concentrations ug/m3
50
45
40
35
30
25
20
15
10
5
0
2008
2009
2010
2011
2012
2013
2014
2015
nitrogen dioxide AURN
nitrogen dioxide Carter Gate
nitrogen dioxide Lace Street
nitrogen dioxide St Andrews Rd

Figure 2


Nottingham AURN annual mean particle - PM10 and PM2.5 concentrations ug/m3
30
25
20
15
10
5
0
2008
2009
2010
2011
2012
2013
2014
2015
PM10 particles
PM2.5 particles

Actions to Improve Air Quality

Nottingham's primary approach to reducing nitrogen dioxide concentrations from traffic has been to:

- constrain traffic levels in the City area
- reduce traffic levels by developing a spatially (and temporally) comprehensive public transport system/network of both buses and tram network
- encourage and facilitate walking and cycling
- reduce the need to drive by developing suburban centres for shopping and leisure.

Local Priorities and Challenges

The local (and conurbation wide) priority to improve air quality continues to be how to reduce levels of nitrogen dioxide.

The local priorities and challenges to improve air quality are to design and implement:

i. a low emission zone for the City, and how it can/will work most effectively with,
ii. the Ultra Low Emission Vehicle (ULEV) grant award,
iii. the Clean Air Zone,
iv. undertake further work with Nottingham's Quality Bus partnership to upgrade buses to EURO V standard (potentially by replacing diesel fuel with compressed natural gas (CNG)),
v. Work with Nottingham's taxi companies to introduce a low or zero emission fleet.
vi. Further development/extension of Nottingham's Tram network (lines 4 and 5),
vii. Work with major employers to review vehicle use to reduce emissions
viii. Continue to roll-out/improve energy efficiency in Nottingham City Council's housing stock, when funding permits,
ix. Promote energy efficiency in the commercial/industrial sector.

How to Get Involved

When burned in air, fossil fuels emit carbon dioxide, nitrogen oxides (NOx) – nitrogen oxide (NO) and nitrogen dioxide (NO_2), and particles (PM_{10} and $PM_{2.5}$).

Although it doesn't affect 'air quality' carbon dioxide is a greenhouse gas and contributes to climate change.

Nitrogen dioxide and particles adversely affect local air quality therefore reducing emissions of these pollutants will improve air quality.

We can all do something to reduce emissions of air pollution and thereby improve air quality:-

Travel choices: walk, cycle, public transport, journey/travel planning

Walking and cycling are called 'active travel' and have health benefits in addition to reducing air pollution. Follow the links below to Nottingham's Big Wheel website for more information

http://www.thebigwheel.org.uk/

http://www.thebigwheel.org.uk/change-your-travel-2/walking-2/

http://www.thebigwheel.org.uk/change-your-travel-2/cycling-2/

When looking to replace your motor car consider do you really need a car? If you drive infrequently it may be cheaper to hire a vehicle, belong to a car club or use a taxi. The costs of owing, insuring, fuelling (and depreciation on) a vehicle typically run to several thousands of pounds a year and you may save a lot of money by not owning a car.

If you need a car consider whether an electric, plug in hybrid or hybrid car can meet the majority of your travel needs. Again the running costs of electric and hybrid vehicles can be lower than a conventional petrol or diesel fuel vehicle.

Follow the links below to Nottingham's Big Wheel website for more information

http://www.thebigwheel.org.uk/change-your-travel-2/car-users-2/

Nottingham Car Club: http://www.nottinghamcity.gov.uk/carclub

Energy efficiency:

We use energy in the form of electricity or natural gas to heat our homes, cook and power electrical equipment. Insulating our homes and using energy efficient appliances reduces energy consumption and emissions, both at power stations and locally from domestic gas boilers and gas cookers.

Visit http://www.energysavingtrust.org.uk/ for ideas on home to save energy and money.

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Precision vs Accuracy (Bias) 25

A further aspect of QA/QC for a laboratory is the reproducibility of results i.e. precision. Precision should not be confused with accuracy. Diffusion tube precision can be described as the ability of a measurement to be consistently reproduced, i.e. how similar the results of duplicate or triplicate tubes are to each other. 25

Accuracy represents the ability of the measurement to represent the 'true' value, which for the monitoring results, is defined as the results from the automatic analysers. When averaged over a number of sets of results bias can be evident. This represents the overall tendency of the diffusion tubes to depart from the 'true' value, i.e. to systematically over-or under-read when compared against the reference method. 25

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1 Local Air Quality Management

This report provides an overview of air quality in Nottingham City Council's area 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 Nottingham City 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.

A summary of AQMAs declared by Nottingham City Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at

http://info.nottinghamcity.gov.uk/insightmapping/#

(Select the 'Environment' layer and the Air Quality Management Areas tick box.)

AQMA No. 2

https://uk-air.defra.gov.uk/aqma/details?aqma_id=698

AQMA No. 3

https://uk-air.defra.gov.uk/aqma/details?aqma_id=699

and

Nottingham Insight: Nottingham's Local Air Quality Management reports

http://www.nottinghaminsight.org.uk/f/63682/Library/Environment/Air-Quality/

See the full list of Local Authority Air Quality Management Areas at

http://uk-air.defra.gov.uk/aqma/list

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Pollutants and Air Quality Objectives	City / Town	One Line Description	Action Plan
AQMA No. 2	NO_2 annual mean	Nottingham City	An area encompassing the City Centre arterial routes, roads and junctions including: A60, A610, A6002, A6005, A6008, A612 and properties fronting onto these roads.	Local Transport Plan Implementation Plan 2015-2017 and 2016-2019 http://www.nottinghaminsight.org.uk/insight/search/unified_search.aspx?q=transport plan]
AQMA No. 3	NO_2 annual mean	Nottingham City	Beeston Road (A6005) and properties fronting onto it.	Local Transport Plan Implementation Plan 2015-2017 and 2016-2019 http://www.nottinghaminsight.org.uk/insight/search/unified_search.aspx?q=transport plan]

Nottingham City Council's proposed Local Plan details how Nottingham proposes to sustainably develop and regenerate Nottingham. A number of policies will contribute to reducing emissions that cause air pollution.

Please follow the link below to view the draft local plan.

http://www.nottinghamcity.gov.uk/planning-and-building-control/planning-policy/the-local-plan-and-planning-policy/consultation-on-the-land-and-planning-policies-document/

On the page are links to a number of supporting documents including the 'Climate Change Background Paper Jan 16' where-in details of action under the existing Local Plan to reduce carbon emissions and mitigate for climate change are detailed.

The link below details action taken by Nottingham with respect to its own domestic property portfolio.

http://www.nottinghamcity.gov.uk/housing/greener-housing/

2.2 Progress and Impact of Measures to address Air Quality in Nottingham City Council

Nottingham City 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 (with expected completion dates) or planned are set out in **Error! Reference source not found.**. More detail on these measures can be found in their respective Action Plans Local Transport Plan Implementation Plan 2015-2017 and 2016-2019.

Nottingham City Council's Air Quality Action Plan, currently forms part of the Local Transport Plan and may be downloaded from

http://www.nottinghaminsight.org.uk/insight/ (search for air quality action plan)

From 2017 the Air Quality Action Plan will be a stand-alone document covering a wider range of measures to improve air quality then just transport initiatives.

Go Ultra Low City

Nottingham is one of the UK's Go Ultra Low City enabling us to implement a wide range of new initiatives to make electric vehicles and sustainable transport more accessible.

http://www.nottinghamcity.gov.uk/golownottm

Table 2.2 – 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	Nottingham Cycle City Ambition Programme	Transport Planning and Infrastructure	Cycle Network	Nottingham City Council	2014/15	2015/16 – 2016/17	LTP Indicator: Cycle Index	Positive effect on Dunkirk and City Centre AQMAs	Works on site on Western Cycle corridor, Design work taking place of the other corridors.	March 2017	
2	Southside Transport Strategy (Broadmarsh)	Traffic Management	Strategic Highway Improvements, Reprioritising road space away from cars including Access management, selective vehicle priority, bus priority, high vehicle occupancy lane.	Nottingham City Council	2014/15	January 2016-October 2018		Positive major effect on City Centre AQMA	Works on Southern Relief route works started on January 2016. Works to take place to enable alterations to traffic flow late 2016/ early 2017.	October 2018	
3	Southern Growth Corridor	Transport Planning and Infrastructure	Public Transport Improvements – interchanges, stations and services	Nottingham City Council	2015/16	2016/17 – 2017/18	LTP Indicator: Public Transport usage (Bus), Uptake of electric vehicles (local definition of VEH0150)	Positive effect on City Centre AQMA	Currently at design stage. Considering incorporation of electric vehicle priority.	March 2018	
4	Nottingham Enterprise Zone Sustainable Transport Package	Transport Planning and Infrastructure	Cycle Network	Nottingham City Council	2016/2017	2016/17 – 2017/18	Public Transport usage (Bus), LTP Indicator: Cycle Index	Nil	Currently at design stage.	March 2018	

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
5	Connecting Eastside Phase 2	Traffic Management	Strategic Highway Improvements, Reprioritising road space away from cars including Access management, selective vehicle priority, bus priority, high vehicle occupancy lane.	Nottingham City Council	2016/17	2016/17 – 2017/18		Positive major effect on City Centre AQMA	Design work being undertaken at present. Exact implementation date to be determined	2018	
6	Smarter Travel Hubs / Youth Employment Initiative Access to Work	Promoting Travel Alternatives	Personalised Travel Planning	Nottingham City Council / Sustrans	2015	2016/17 – 2017/18		City-wide effect	Procurement taking place for scheme	2018	
7	Manvers Street Toucan Crossing	Traffic Management	UTC, Congestion Management, traffic reduction	Nottingham City Council	2016	2016/17	LTP Indicator: Cycle Index	Localised minor positive effect on City Centre AQMA	Design work taking place	March 2017	
8	North/South Cycle Route	Transport Planning and Infrastructure	Cycle Network	Nottingham City Council	2016/17	2016/17	LTP Indicator: Cycle Index	Localised minor positive effect on City Centre AQMA	Advanced design work has taken place – programming of works being undertaken	March 2017	
9	Daycare Centre Bus Stops	Transport Planning and Infrastructure	Public Transport Improvements – interchanges, stations and services	Nottingham City Council	2015/16	2015/16 - 2016/17	LTP Indicator: Public Transport usage (Bus)	Location dependent	-	March 2017	

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
10	Park and Ride Electric Charging Points	Transport Planning and Infrastructure	Public Transport Improvements – interchanges, stations and services	Nottingham City Council	2015/16	2015/16 - 2016/17	LTP Indicator: Public Transport usage (Bus)	Positive Minor effect on City Centre AQMA	Procurement taking place of electric charging points	March 2017	
11	Arkwright Walk Highway Works	Transport Planning and Infrastructure	Cycle Network	Nottingham City Council	2016	2016	LTP Indicator: Cycle Index	Localised minor positive effect on City Centre AQMA	Design work taking place	March 2017	
12	City Centre traffic management (Clear Zone / Broad Street Environs) Contribution	Traffic Management	UTC, Congestion Management, traffic reduction	Nottingham City Council	2016/17	2016/17		Minor positive effect on City Centre AQMA	Work taking place regarding TRO changes	March 2017	
13	Nottingham Workplace Parking Levy (WPL)	Traffic Management	Workplace Parking Levy, Parking Enforcement on Highway	Nottingham City Council	2011	2012 - onwards	WPL liable businesses, WPL compliance	City-wide effect	Ongoing	2037	
Alpha	Midland Mainline Electrification	Transport Planning and Infrastructure	Public Transport Improvements – interchanges, stations and services.	Network Rail	2016 / 2017	2016 - 2022		Positive Minor effect on City Centre AQMA	Scheme reprogrammed post review. Works in Nottingham expected towards end of programme	2023	

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
Beta	A52 Nottingham Junctions Improvement	Traffic Management	Strategic Highway Improvements, Reprioritising road space away from cars including Access management, selective vehicle priority, bus priority, high vehicle occupancy lane.	Highways England	2016-19	2019 onwards		Impact on the Wilford Hill AQMA Rushcliffe (Greater Nottingham area)		2021	
Gamma	M1 Smart Motorway	Traffic Management	Strategic Highway Improvements, Reprioritising road space away from cars including Access management, selective vehicle priority, bus priority, high vehicle occupancy lane.	Highways England	2017			Impact on AQMAs along M1 motorway (Greater Nottingham area)		2020	

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.

Nottingham City Council is taking and considering the following measures to address $PM_{2.5}$:

Existing measures are focused on

i. reducing emissions from transport by minimising/preventing traffic growth and encouraging/facilitating walking, cycling and use of public transport and

ii. on-going regulatory activity re Permitted Processes and Smoke Control Orders and bonfires, construction/demolition activity, and uncontrolled burning.

Additional measures being considered include:-

i. A review of 'EU' classification/measures that may be implemented locally

ii. Reducing emissions from non-vehicle fixed and mobile sources and

iii. Planting to reduce weathering/entrainment of soil/surface particles and increasing green surface area for adsorption/impingement/entrapment of particles by foliage.

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

Nottingham City Council undertakes continuous automatic monitoring at a number of locations in its area and Defra have an Automatic Urban and Rural Network (AURN) site in the city centre. Appendix D shows the locations of the continuous monitoring sites as red boxes.

AURN (AURN CSE), Clinton Street East, City Centre

The AURN station is located in the city centre and is currently classified as an 'Urban Background' (previously 'Urban Centre') site. Relevant exposure is at residential properties approximately 40 metres to the south and approximately 23 metres to the north east of the site.

Carter Gate NOx (CG NOx), Carter Gate, City Centre

This unit has been located at Carter Gate monitoring since December 2003. The site is a suburban mixed commercial/residential area of the City adjacent to the A60. It is approximately 10 metres from the A60 which is a major traffic route and, approximately 3 metres from a busy B road. It is classed as a 'Roadside' site. There are residential properties approximately 12 metres from the unit and 8 metres away from the A60.

Lace Street NOx (LS NOx), Lace Street, Dunkirk

This is a fixed unit located at Lace Street since March 2007. The site is a suburban, mixed commercial/residential area of the City adjacent to the A6005, a busy road traffic route. It is approximately 4 metres from the A6005 and 1 metre from a minor road and is classed as a 'Roadside' site. The unit is sited on the pavement at the boundary with a residential property and in-line with the facade building line.

St Andrews Road NOx (SA NOx), St Andrew's Road, Mapperley

This site was established in June 2010 following the expansion of Nottingham City Council's Air Quality Management Area No.2. The monitoring unit is located on a small residential street - St Andrews Road, approximately 13 metres from the A60

Mansfield Road. The A60 is a major traffic route through the City, and south across the River Trent.

The SA NOx is a fixed unit sited on the pavement at the boundary of a residential property. It is classed as a ‘Roadside’ site.

A new DEFRA funded roadside monitoring site for the outer ring road was commissioned in early 2016.

Details of quality assurance and quality control (QA/QC) for the automatic monitoring sites are detailed in Appendix C).

Nottingham City Council undertook automatic (continuous) monitoring at 3 sites during 2015. Table A.1 in Appendix A shows the details of the sites. National monitoring results are available at https://uk-air.defra.gov.uk/data/DAQI-regional-data

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

Nottingham City Council undertook non- automatic (passive) monitoring of NO_2 at 32 sites during 2015. 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) 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.

Particulate Matter (PM_{10})

Nottingham City Council does not undertake its own monitoring for PM_{10}. However, monitoring is undertaken at the DEFRA AURN station located in the City centre and therefore reported here. Monitoring since 2011, when the PM_{10} FDMS, unit was installed, shows levels meet both air quality objectives (annual mean and daily mean).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.

Note: There were no exceedences of the air quality objectives for PM_{10}.

3.2.2 Particulate Matter ($PM_{2.5}$)

Nottingham City Council does not undertake its own monitoring for $PM_{2.5}$. However, monitoring is undertaken at the DEFRA AURN station located in the City centre and therefore reported here. Monitoring since 2011, when the $PM_{2.5}$ FDMS, unit was installed, shows levels meet both air quality objectives (annual mean and daily mean).

Table A.7 in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past 5 years.

3.2.3 Sulphur Dioxide (SO_2)

Nottingham City Council does not undertake its own monitoring for sulphur dioxide. However, monitoring is undertaken at the DEFRA AURN station located in the City centre and therefore reported here. Monitoring shows levels meet all air quality objectives.

Table A.8 in Appendix A compares the ratified continuous monitored SO_2 concentrations for year 2015 with the air quality objectives for SO_2.

Note: There were no exceedences of the air quality objectives for SO_2.

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)
CG NOx	Carter Gate	Roadside	457946	339668	NO2 NO NOx	Y	Chemiluminescent	12	4	2.5
LS NOx	Lace Street	Roadside	454941	338315	NO2 NO NOx	Y	Chemiluminescent	3	9	1.5
SA NOx	St. Andrews Road	Roadside	456967	341382	NO2 NO NOx	Y	Chemiluminescent	12	13	1.7
AURN CSE	Clinton St East.	Urban background	457437	340049	PM2.5,PM10 NO2, NO, NOx O3 SO2	N	FDMS, FDMS Chemiluminescent Ultra Violet Absorption (UVA) Ultra Violet Fluorescence (UVF)	0	35	3

(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	Woodside Road	Roadside	452796	338216	NO_2	Y	0	10	N	2
2	Derby Road	Roadside	454522	338938	NO2	N	0	23	N	2
3	Marlborough Street	Roadside	455207	338269	NO2	N	0	5	N	2
4	Beeston Rd	Roadside	454782	338146	NO2	Y	0	10	N	2
5	Abbey Street	Roadside	455153	338510	NO2	N	0	5	N	2
6	Western Blvd	Roadside	454466	340111	NO2	N	0	17	N	2
7	Wilkinson St	Roadside	455823	341993	NO2	N	0	21	N	2
8	Nottingham Rd	Roadside	455573	342860	NO2	N	0	13	N	2
9	Nottingham Road	Roadside	455605	342838	NO2	N	0	3	N	2
10	Valley Road	Roadside	455533	342826	NO2	N	0	7	N	2
11	Danethorpe Vale	Roadside	457250	343815	NO2	N	0	17	N	2

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)
12	Bentinck Rd - Sch	Roadside	455808	340799	NO2	N	0	6	N	2
13	Ilkeston Road	Roadside	455435	340136	NO2	N	0	3	N	2
14	Ilkeston Road	Roadside	455494	340142	NO2	N	0	4	N	2
15	Gregory Blvd	Roadside	455358	341086	NO2	N	0	10	N	2
16	Castle Gardens	Roadside	455870	339133	NO2	N	0	3	N	2
17	Castle Boulevard	Roadside	455861	339133	NO2	N	0	5	N	2
18	LP 3P17 Park Road	Roadside	455809	339178	NO2	N	4	27	N	2
19	Castle Blvd	Roadside	456852	339303	NO2	Y	0	4	N	2
20	Canning Terrace	Roadside	456399	340191	NO2	Y	0	5	N	2
21	Maid Marian Way	Roadside	457092	339641	NO2	N	0	3	N	2
22	LP 80A01 Alfreton Rd	Roadside	456160	340389	NO2	N	0	3	N	2

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)
23	Mansfield Rd	Roadside	457105	340947	NO2	Y	0	2	N	2
24	St Andrew's Rd B	Roadside	456967	341382	NO2	Y	12	16	Y	1.5
25	St Andrew's Rd M	Roadside	456967	341382	NO2	Y	12	16	Y	1.5
26	St Andrew's Rd T	Roadside	456967	341382	NO2	Y	12	16	Y	1.5
27	Cartergate	Roadside	457959	339681	NO2	Y	0	8	N	2
28	Trent Bridge	Roadside	458051	338328	NO2	Y	0	2	N	2
29	Meadow Lane	Roadside	458464	339010	NO2	N	0	3	N	2
30	LP 53890 Manvers Street	Roadside	458081	339896	NO2	N	0	3	N	2
31	Middleton Boulevard	Roadside	454371	339945	NO2	N	0	17	N	2
32	Middleton Boulevard	Roadside	454496	339432	NO2	N	0	19	N	2

(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
CG NOx	Roadside	Automatic		98.3	**42**	**42**	**44**	39	37
LS NOx	Roadside	Automatic		51.1	38	40	38	37	37
SA NOx	Roadside	Automatic		92.3	**41**	**44**	**43**	38	39
AURN	Urban Background	Automatic			36	37	37	34	32
1	Roadside	Diffusion Tube		100	**-**	**-**	**-**	38	38
2	Roadside	Diffusion Tube		100	-	-	-	28	30
3	Roadside	Diffusion Tube		100	-	-	-	31	25
4	Roadside	Diffusion Tube		100	39	**41**	40	37	33
5	Roadside	Diffusion Tube		100	-	-	-	33	36
6	Roadside	Diffusion Tube		100	34	33	33	32	31
7	Roadside	Diffusion Tube		100	34	36	32	31	31
8	Roadside	Diffusion Tube		100	**41**	**42**	37	39	38
9	Roadside	Diffusion Tube		100	-	-	36	**42**	**42**
10	Roadside	Diffusion Tube		83	-	-	35	38	39
11	Roadside	Diffusion Tube		100	31	31	29	30	30
12	Roadside	Diffusion Tube		92	36	39	36	35	32
13	Roadside	Diffusion Tube		100	-	-	-	36	36
14	Roadside	Diffusion Tube		100	-	-	-	**45**	**41**
15	Roadside	Diffusion Tube		100	34	33	32	32	36
16	Roadside	Diffusion Tube		100	-	**51**	**49**	**52**	**48**

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
17	Roadside	Diffusion Tube		100			-	**42**	**48**
18	Roadside	Diffusion Tube		100			-	32	32
19	Roadside	Diffusion Tube		100	**42**	**45**	40	40	37
20	Roadside	Diffusion Tube		100	**51**	**57**	**52**	**50**	**48**
21	Roadside	Diffusion Tube		100			-	**44**	**44**
22	Roadside	Diffusion Tube		100			-	**48**	**41**
23	Roadside	Diffusion Tube		100			-	**45**	**43**
24	Roadside	Diffusion Tube		100			-	40	38
25	Roadside	Diffusion Tube		100			-	39	38
26	Roadside	Diffusion Tube		100			-	**41**	39
27	Roadside	Diffusion Tube		100			-	**41**	**42**
28	Roadside	Diffusion Tube		100			**42**	**42**	37
29	Roadside	Diffusion Tube		100			-	**44**	**42**
30	Roadside	Diffusion Tube		100			-	**45**	**41**
31	Roadside	Diffusion Tube		83			-	28	31
32	Roadside	Diffusion Tube		75			-	23	26

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

NO_2 annual means exceeding 60µg/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
CG NOx	Roadside	Automatic		98	0	0	0	0	0
LS NOx	Roadside	Automatic		51	0	0	0	0	0(139)
SA NOx	Roadside	Automatic		92	0	0	0	0	0
AURN	Urban Background	Automatic		87	0	0	0	0	0(83)

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 90%, 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
AURN	Urban Background	-	84	25	22	21	21	17

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 > 50$\mu g/m^3$ (3)				
				2011	2012	2013	2014	2015
AURN	Urban Background	-	84	0	0	0	0	0(28)

Notes: Exceedances of the PM_{10} 24-hour mean objective (50$\mu g/m^3$ 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 90%, the 90.4th percentile of 24-hour means is provided in brackets.

Table A.7 – $PM_{2.5}$ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2015 (%) [2]	$PM_{2.5}$ Annual Mean Concentration (µg/m^3) [3]				
				2011	2012	2013	2014	2015
AURN	Urban Background	-	83	13	12	12	12	11

(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.8 – 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)
AURN	Urban Background		94	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 90%, the relevant percentiles are provided in brackets.

Appendix B: Full Monthly Diffusion Tube Results for 2015

Table B.1 – NO_2 Monthly Diffusion Tube Results - 2015

Site ID	NO_2 Mean Concentrations (µg/m^3)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted (1)
1	42.4	50.8	36.9	49.4	36.6	33.3	36.6	43.2	40.3	48.5	36.8	17.2	39.3	37.8
2	35.1	37.2	40.4	28.2	25.7	23.4	25.7	30.3	28.3	37.0	38.0	30.8	31.7	30.4
3	27.5	31.0	32.7	26.3	16.6	16.7	19.1	23.1	26.4	37.5	29.9	24.4	25.9	24.9
4	39.5	43.4	31.5	39.5	28.3	32.1	29.2	29.3	30.2	42.1	40.3	29.8	34.6	33.2
5	37.3	46.0	40.6	37.9	34.2	32.0	30.0	36.4	34.6	46.4	38.6	34.6	37.4	35.9
6	39.7	40.7	36.9	27.2	28.3	26.5	29.4	32.5	31.7	38.5	33.5	26.7	32.6	31.3
7	39.7	40.3	36.7	32.8	29.0	25.6	29.5	28.0	30.1	36.2	32.8	30.4	32.6	31.3
8	44.7	47.0	41.3	0.4	61.7	35.7	35.9	40.8	41.5	47.2	46.6	37.3	40.0	38.4
9	41.5	53.3	52.7	0.4	72.7	36.9	40.7	48.1	37.9	50.3	47.6	37.4	43.3	41.6
10	49.5	49.6	34.9	33.3	35.9	34.2	34.4	37.8	42.5	55.6	missing	missing	40.8	39.1
11	36.1	37.4	36.0	25.2	27.7	25.5	28.8	30.2	24.2	32.5	35.7	29.4	30.7	29.5
12	36.6	41.4	0.0	31.4	Missing	33.5	30.4	40.6	34.8	46.3	44.1	29.7	33.5	32.2
13	34.8	35.5	45.4	36.4	46.5	24.4	27.9	34.8	46.1	55.4	37.8	30.0	37.9	36.4
14	47.1	51.1	35.1	58.0	28.7	32.6	40.1	52.7	33.4	48.3	43.7	38.4	42.4	40.7
15	33.5	41.9	51.8	30.9	58.7	26.9	29.9	28.6	35.2	41.2	37.4	27.9	37.0	35.5
16	50.2	56.6	45.7	45.7	48.5	42.7	42.4	46.5	48.2	59.7	65.9	50.5	50.2	48.2

Site ID	NO_2 Mean Concentrations (µg/m^3)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted (1)
17	53.8	46.4	34.8	44.8	24.7	40.3	46.2	51.6	44.5	53.6	53.0	42.1	50.2	48.2
18	38.9	40.4	41.9	28.3	37.8	24.0	26.4	26.2	29.2	39.2	32.2	29.6	32.8	31.5
19	40.0	47.9	52.7	37.5	45.1	36.5	33.6	0.0	39.8	50.6	39.8	35.9	38.3	36.7
20	45.3	53.5	47.7	47.8	38.5	41.7	44.2	54.0	61.8	75.9	46.5	37.8	49.5	47.6
21	46.2	49.8	44.7	48.5	28.8	41.8	44.1	48.7	54.4	67.5	46.4	35.3	46.3	44.5
22	41.5	42.3	49.5	41.0	40.2	34.7	36.1	42.4	52.7	67.0	40.1	30.1	43.1	41.4
23	41.6	49.5	43.3	44.6	38.3	36.5	42.0	48.0	46.5	69.5	42.6	38.1	45.0	43.2
24	53.3	46.7	39.2	31.9	37.4	35.9	37.4	38.8	35.3	40.4	45.7	38.0	40.0	38.4
25	54.8	51.7	41.0	30.8	34.6	36.0	38.2	39.7	35.5	38.9	39.7	39.5	40.0	38.4
26	51.4	45.2	41.5	32.1	37.0	35.2	37.8	42.8	35.4	44.2	41.9	43.0	40.6	39.0
27	52.0	59.4	46.4	36.4	38.3	38.3	38.6	44.1	40.4	49.7	43.5	33.4	43.4	41.7
28	0.0	40.6	49.8	37.5	47.4	31.4	37.6	38.6	39.1	52.1	51.2	38.6	38.7	37.1
29	49.3	52.5	49.9	42.1	27.9	35.5	43.7	49.9	41.4	62.6	28.5	38.5	43.5	41.7
30	51.0	55.0	29.6	45.0	21.2	40.3	46.1	47.2	47.7	57.6	43.9	27.1	42.6	40.9
31	33.7	39.4	Missing	29.9	Missing	26.1	27.4	28.8	30.9	39.8	41.9	25.3	32.3	31.0
32	31.5	34.3	Missing	20.9	Missing	20.6	20.7	21.4	25.9	30.8	Missing	38.1	24.4	26.0

(1) See Appendix C for details on bias adjustment (Note: Nottingham's 2015 bias adjustment = 0.96)

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

QA/QC for Diffusion Tube Monitoring

Gradko International supply and analyse Nottingham City Council's diffusion tubes. The organisation is UKAS accredited and is assessed annually for compliance to ISO 17025 and participates in other proficiency schemes.

Gradko have confirmed that their procedures follow the guidance issued on behalf of Defra (AEA Energy & Environment, Feb 2008) relating to the preparation, extraction, analysis and calculation procedures for passive NO_2 diffusion tubes

Gradko participate in a number of QA/QC monitoring systems to demonstrate satisfactory performance including the Workplace Analysis Scheme for Proficiency (WASP) programme to ensure uniformity in data throughout the year.

Precision vs Accuracy (Bias)

A further aspect of QA/QC for a laboratory is the reproducibility of results i.e. precision. Precision should not be confused with accuracy. Diffusion tube precision can be described as the ability of a measurement to be consistently reproduced, i.e. how similar the results of duplicate or triplicate tubes are to each other.

Accuracy represents the ability of the measurement to represent the 'true' value, which for the monitoring results, is defined as the results from the automatic analysers. When averaged over a number of sets of results bias can be evident. This represents the overall tendency of the diffusion tubes to depart from the 'true' value, i.e. to systematically over-or under-read when compared against the reference method.

Once identified, bias can be adjusted for to improve the accuracy of diffusion tube results. This is done using bias adjustment factors which have been found to be

specific to a laboratory and tube preparation method. See Appendix A subsection A-1 above.

Unlike bias, poor precision cannot be adjusted for. It can only be improved by careful handling of the tubes in both the laboratory and the field.

The LAQM website provides a link to the summary of precision results for individual laboratories - **Summary of Diffusion Tube Precision 2008-2012**. It can be downloaded as a PDF from http://laqm.defra.gov.uk/diffusion-tubes/precision.html.

The precision rating for Gradko for 2015 was 'good'. This precision reflects the laboratory's performance/consistency in preparing and analysing the tubes, as well as the subsequent handling of the tubes in the field.

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Data Quality Check
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	07/01/2015	06/02/2015	53	55	51	53.2	1.69	3.18	4.20	Good
2	06/02/2015	04/03/2015	47	52	45	47.9	3.40	7.11	8.45	Good
3	04/03/2015	01/04/2015	39	41	41	40.5	1.20	2.97	2.99	Good
4	01/04/2015	28/04/2015	32	31	32	31.6	0.68	2.16	1.69	Good
5	28/04/2015	27/05/2015	37	35	37	36.3	1.50	4.12	3.72	Good
6	27/05/2015	30/06/2015	36	36	35	35.7	0.40	1.13	1.00	Good
7	30/06/2015	29/07/2015	37	38	38	37.8	0.40	1.04	0.98	Good
8	29/07/2015	26/08/2015	39	40	43	40.4	2.10	5.20	5.22	Good
9	26/08/2015	30/09/2015	35	36	36	35.5	0.11	0.31	0.27	Good
10	30/09/2015	28/10/2015	40	39	44	41.2	2.74	6.66	6.81	Good
11	28/10/2015	27/11/2015	46	40	42	42.5	3.03	7.13	7.52	Good
12	27/11/2015	06/01/2016	38	39	43	40.2	2.56	6.38	6.36	Good
13										

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

Site Name/ ID:	ST.ANDREWS ROAD 2015 NOX	

Jaume Targa, for AEA

Version 04 - February 2011

Adjusted measurement (95% confidence level)
Without periods with CV larger than 20%

Bias calculated using 12 periods of data
Tube Precision: 4 Automatic DC: 93%
Bias factor A: 0.96 (0.91 - 1.01)
Bias B: 4% (-1% - 10%)

Information about tubes to be adjusted
Diffusion Tube average: 40 μgm^{-3}
Average Precision (CV): 4
Adjusted Tube average: 39 +/- 2 μgm^{-3}

Adjusted measurement (95% confidence level)
with all data

Bias calculated using 12 periods of data
Tube Precision: 4 Automatic DC: 93%
Bias factor A: 0.96 (0.91 - 1.01)
Bias B: 4% (-1% - 10%)

Information about tubes to be adjusted
Diffusion Tube average: 40 μgm^{-3}
Average Precision (CV): 4
Adjusted Tube average: 39 +/- 2 μgm^{-3}

QA/QC Information for Automatic Monitoring

Quality Control, Maintenance, Calibration

AURN Site

The analysers at the AURN site are subject to a four weekly calibration regime. The calibrations are undertaken by a trained local site operator (LSO) and conducted in accordance with the Local Site Operators' Manual.

CG NOx, LS NOx and SA NOx Sites

At Nottingham City Council's CG NOx, LS NOx and SA NOx sites calibrations are carried out fortnightly. The calibrations, using zero air and span gases, are undertaken by the LSOs that prior to 2016 were also the LSOs for AURN site. Calibrations are conducted using the same principles and procedures as given in the AURN LSO Manual.

The equipment is fully serviced every six months by EnviroTechnology Services plc, Gloucester.

Calibration Gas Traceability

AURN Site

Calibration gases used in the AURN are supplied by AIR Liquide who have demonstrated compliance with relevant quality control procedures in the preparation of gas mixtures. The gas mixtures are certified by AEA Energy & Environment.

CG NOx, LS NOx and SA NOx Sites

Calibration gases used in the CG NOx, LS NOx and SA NOx monitoring sites are supplied by AIR Liquide who have demonstrated compliance with relevant quality control procedures in the preparation of gas mixtures. The gases are supplied with a certificate of analysis.

Data Collection and Processing

AURN Site

The AURN station's data is continuously interrogated by Bureau Veritas the Central Management and Co-ordination Unit (CMCU). The data obtained is validated by CMCU and passed to the Data Dissemination Unit (DDU).

Information about the AURN station and available data can be found on the internet at http://uk-air.defra.gov.uk

CG NOx, LS NOx and SA NOx Sites

During 2015 data collection, validation and ratification was carried out by the Council's Environmental Health and Safer Places team and Air Quality Data Management Ltd.

Throughout 2015, data from the CG NOx, LS NOx and SA NOx sites was polled remotely directly from the analysers and collected as 15 minute averages using Envista ARM data collection software. The data has been scaled and converted into hourly (or other values) using the Envista ARM data management system

The software allows users to remotely view, analyse, report and distribute environmental quality data. Manipulation of raw data to verified data can be conducted in a structured approach.

Data validation is carried out and involves screening the scaled values to identify unusual measurements, errors due to equipment failure etc. and flagging them for further investigation.

Data ratification is carried at approximately 2 monthly intervals. This involves looking at the data more closely and includes:

- examination of calibration records to ensure correct application of calibration factors;

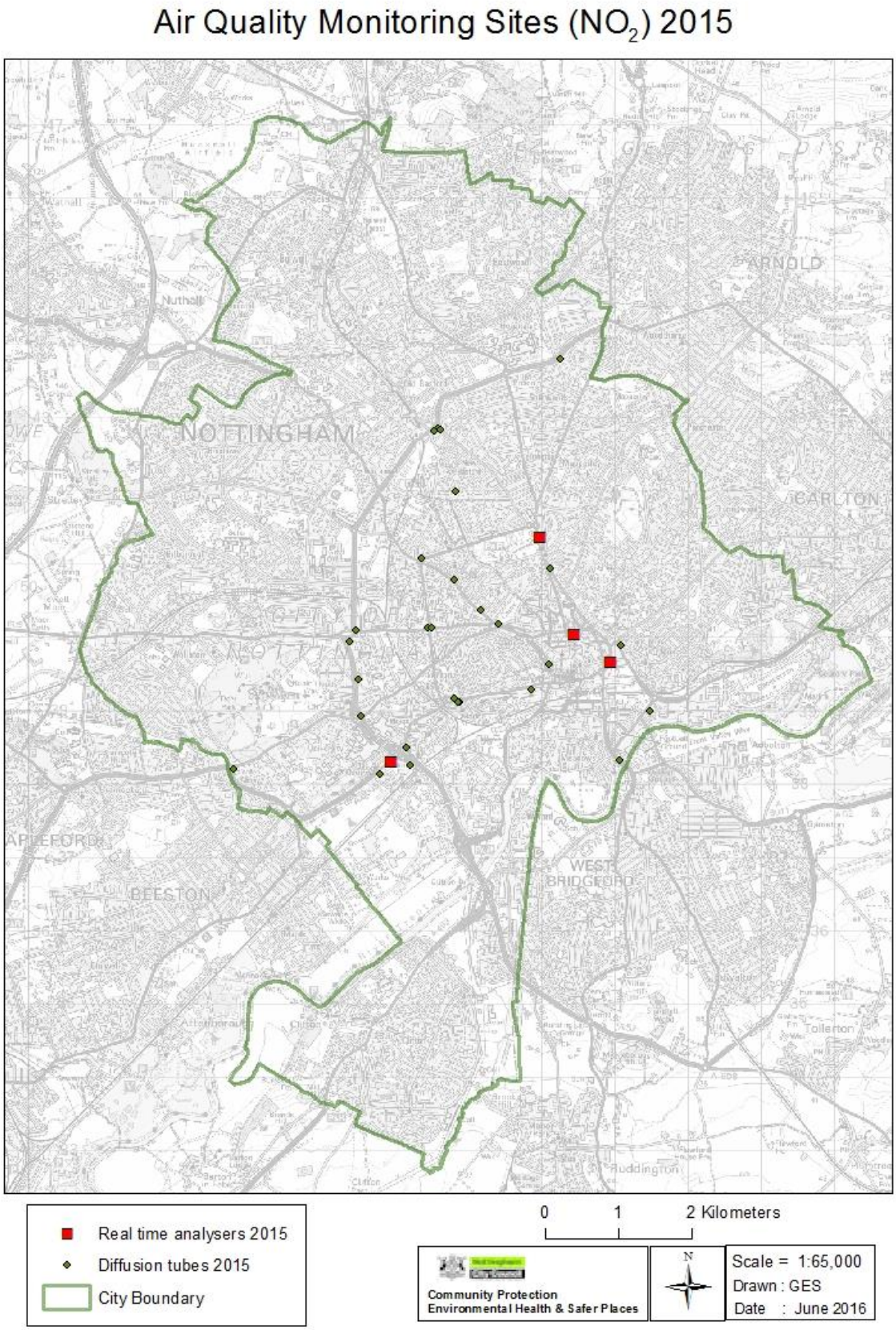
- examination of data for other pollutants and monitoring sites to highlight any anomalies;

- deletion of data shown from chart or other records to be spurious, for example, spikes generated by the analyser;

- correction of any baseline drift as indicated by examination of daily automatic calibration records.

Once this process has been carried out and data has been verified, amended or rejected as appropriate, the data is ratified. This final data set is used for the R & A process.

Appendix D: Map of Monitoring Locations



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
…	…

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Nottingham City Council
Local Air Quality Management: Detailed Assessment for Nitrogen Dioxide November 2013

Nottingham City Council Website **http://www.nottinghamcity.gov.uk**

The Air Quality (England) (Amendment) Regulations 2002 (SI 3043)

The Pollution Prevention and Control Act 1999