



2017 Air Quality Annual Status Report (ASR)

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

June 2017

Rushcliffe Borough Council

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Executive Summary: Air Quality in Our Area

Rushcliffe Borough Council has two existing AQMA's for the exceedance of the NO₂ annual mean values. No other pollutants are now monitored or are above the objectives. These are associated with major traffic routes/junctions into/out of the City of Nottingham and along a small section of the A52 at a busy junction.

Monitoring in AQMA 1 indicates that there has been a slight increase in levels within the Trent Bridge area in this reporting year, although previously levels have been both above and below the Air Quality Standards (AQS).

The AQMA1/2011 at the Stragglethorpe/A52 location has indicated much lower levels of NO₂; there has now been two full years of monitoring with a real time monitor. Levels are still slightly elevated but better than predicted.

The AQMA 2 at the A52 southern ring road between the Borough boundary and the eastern side of Nottingham Knight Roundabout was formally revoked in 2017 and therefore is no longer in force.

This report contains a full data set of air quality monitoring undertaken in 2016 and trends for the last 5 years.

Table 2.2 in this report outlines the actions the Council (and its Partners) has and will be taking in order to achieve compliance with the AQS.

Air Quality in Rushcliffe Borough Council

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

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

Rushcliffe currently has two active AQMAs in the area. The locations of the current AQMAs can be seen at <http://uk-air.defra.gov.uk/aqma/list>.

The table advises that AQMA 2 is still in force however this was formally revoked early in 2017.

Within 2016 there have been a number of new developments proposed and where appropriate air quality assessments have been reviewed. Most of these were submitted with the applications due to the planning screening process. There were a few biomass plant applications however these were small scale plants and these are in rural areas, have been assessed for air quality impacts and are not predicted to be a cause of exceedance of any air quality objectives. There were also a number of housing developments with 50-100 houses proposed and air quality assessments were submitted by the applicant e.g. within or close to an AQMA. There was also an application by British Gypsum for an extension to the existing mill building. The air quality assessment for this application was reviewed and it was deemed that the impacts on air quality would be negligible. A number of housing construction projects are being progressed e.g. 3000 dwellings at Clifton Pastures and the Sharpill Woods development; these sites have been subject to air quality assessments. The NET Line 2 tram system is now fully operational and passes through parts of Rushcliffe. However, the NET as a whole has the benefit of reducing traffic in the wider Nottingham area and will benefit commuter routes as well as the Nottingham City.

The air quality action plan is linked to the Local Transport Plan (LTP) which is implemented by the County Council. In addition Rushcliffe Borough Council considers air quality impacts for planning applications and developments in the borough. Applications that can impact on the meeting of AQS are assessed at the planning application stage. Construction impacts and operational impacts are considered and where appropriate conditions are applied or the application is amended to address any concerns found.

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

Rushcliffe also looks at its own operations and has developed a travel plan that was implemented as part of its move to the new Arena site in December 2016. Prior to this the authority moved to a greater remote worker base with limited worker capacity at the Arena. This will result in lowered transport related impacts from our own operations.

The Environmental Health Service also works with other local authorities in the area through the Notts Pollution Working Group (NEPWG), the East Midlands Air Quality Network (EMAQN), a newly set up body with Public Health England (PHE) and works with other organisations to promote greener transport measures or measure to improve the air quality in the Nottingham urban area.

Actions to Improve Air Quality

The core actions of the plan are the integration of measures with the LTP which is implemented via the Nottinghamshire County Council Transport Planners. In addition Rushcliffe Borough Council reviews planning applications for potential adverse impacts and promotes air quality improvements within the borough boundary and wider by being a member of the NEPWG and more recently the EMAQN (East Midlands Air Quality Network) which is a group set up and chaired by the PHE to promote air quality improvements in the regional area.

In addition actions by the Nottingham City Council will have some impact on the levels in RBC. The NET has now fully opened and will reduce car vehicle journeys from the new tram stop and car park at Clifton which passes through and has stops in the RBC area before entering the City Centre.

The individual measures are shown later in this report.

Conclusions and Priorities

The location of AQMA 1 (on the approaches to Lady Bay Bridge and Trent Bridge) and the site constraints makes it difficult to remedy the problems with small-scale infrastructure improvements and therefore smarter choices measures (such as travel planning, and marketing and promotion of alternatives to the car) are more likely to provide improvements. Measures that facilitate and encourage walking, cycling and bus use will therefore be the priority actions in the foreseeable future.

Monitoring of the Local Transport Plan actions shows that the transport indicators are on target (with minor exceptions) across the county.

The County Council has concerns about potential cumulative impacts of proposed future development on the Trent Bridge AQMA as the Local Development documents have identified areas around the district for significant growth which may potentially impact on the AQMAs, and traffic growth will be above those that are forecast without the development occurring. Objection to such growth may be difficult and Section 38, 278 and 106 planning obligations will all be used to mitigate localised traffic impacts of individual developments as far as is possible and seek to ensure sustainable development takes place.

There is currently only planned mitigation of the cumulative traffic growth from proposed development on the strategic road network and the planning authority also has no plans to undertake air quality modelling of the cumulative impacts (particularly on the AQMAs) of the proposed developments.

The cumulative impacts of developments will, however, impact on the AQMA on Trent Bridge without significant sustainable transport measures being introduced and maintained at the developments (funded through the development control process); and the planning authority does not currently have any planned mitigation of the traffic growth at AQMA locations as part of the housing development proposals.

Without significant mitigation at these locations to specifically address housing proposals (e.g. significant sustainable transport improvements), any measures subsequently included within an AQMA action plan would be very unlikely to mitigate this planned growth.

The top-slicing of 43% of the integrated transport block from 2015/16 onwards by the government and allocating it to the Local Growth Fund means that from 2015/16 the integrated transport funding allocated to Nottinghamshire County Council reduced by approximately £3.5m; significantly reducing the funding available for transport improvements that will deliver air quality improvements.

The cessation of the Local Transport Fund funding in March 2016 and the Department for Transport's decision to not award Sustainable Transport Transition Year Funding 2016/17 to the D2N2 area bid also means that several of the proposed actions in the action plan will be delayed further until such time as funding becomes available from Central Government.

Local Engagement and how to get involved

Any new planning proposal where air quality may cause an impact is available for consultation through the planning process. All air quality assessments are available for the public to view and comment on. Any changes or new permitted processes that may have an impact on air quality are subject to public consultation and the department will ensure that public engagement is undertaken as well as statutory consultee engagement.

Members of the public can also take actions that will improve air quality within the Rushcliffe area by using public transport or for shorter journeys walking, running or cycling.

To get involved in improving the air quality in our area the public are asked to contact the Environmental Health Service at Rushcliffe Borough Council. The contact details are at the front of this report. The LTP plan is implemented by the County Council Local Transport Planners and they can be contacted via the Nottinghamshire County Council Website www.nottinghamshire.gov.uk or

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1 Local Air Quality Management

This report provides an overview of air quality in Rushcliffe Borough Council during 2016. 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 Rushcliffe Borough 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 **Appendix E**.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

A summary of AQMAs declared by Rushcliffe Borough 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://www.rushcliffe.gov.uk/environmentalhealth/pollution/airquality/>.

The maps are listed in the right hand column of Table 2.1. The current AQMA's are also present at <http://uk-air.defra.gov.uk/aqma/list>. This list does contain AQMA2 however this was revoked in 2017.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)		Action Plan (inc. date of publication)
						At Declaration	Now	
AQMA No1 Trent Bridge	1/9/2005	NO ₂ annual mean	West Bridgford	An area encompassing the Lady Bay Bridge/Radcliffe Road junction, the Trent Bridge/Loughborough Road/Radcliffe Road junction and the Wilford lane/Loughborough Road/Melton Road junction in West Bridgford.	NO	47.0	30.0	Air Quality Action Plan for Rushcliffe updated 2010 http://www.rushcliffe.gov.uk/media/rushcliffe/media/documents/pdf/environmentandwaste/airquality/AQAP%20revision.pdf
AQMA No 1 2011	1/10/2011	NO ₂ annual mean	Radcliffe on Trent	Land adjacent to the A52 at Stragglethorpe Junction.	YES	50.5	41.0	Stragglethorpe Road AQAP 2013 http://www.rushcliffe.gov.uk/media/rushcliffe/media/documents/pdf/environmentandwaste/airquality/Stragglethorpe%20air%20quality%20action%20plan%202013.pdf

Rushcliffe Borough Council confirm the information on UK-Air regarding their AQMA(s) is up to date

2.2 Progress and Impact of Measures to address Air Quality in Rushcliffe Borough Council

Defra's appraisal of last year's Annual Status Report (ASR) concluded the local authority could outline how they plan to work together with Public Health to address health issues associated with PM2.5. This is now included within Table 2.2. It also concluded that it would be useful to develop KPIs to include in Table 2.1 so that it is obvious how the measures being taken to improve air quality are being assessed. Although the DEFRA feedback advised on Table 2.1, this report has considered the development of KPIs and included them within Table 2.2.

Rushcliffe Borough Council has taken forward a number of direct measures during the current reporting year of 2016 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

More detail on these measures can be found in their respective Action Plans and also within the third Local Transport plan that consists of the Local Transport Plan Strategy and Implementation Plan. Key completed measures are:

- Awareness and training undertaken by the County Council amongst staff and works promoters to ensure that powers are used effectively and to make works promoters aware of their requirement to reduce traffic disruption and encourage alternative working methods that reduce peak period working/disruption on County Council managed roads;
- Upgrade and optimisation of traffic signals within the AQMA;
- Personalised travel planning undertaken with residents in areas adjoining the AQMA and along the NET route which could impact on people travelling through the AQMA which resulted in a 5% reduction of journeys to work by car amongst participants;
- Personalised travel planning travel clinics undertaken at major workplaces within the AQMA, including at the County Council;
- School travel plans developed by the County Council at schools in the borough;
- Eco-driver training amongst County Council employees;
- The introduction of advisory 20mph speed limits outside all schools in the borough and the introduction of mandatory area-wide 20mph speed limits in two areas of West Bridgford to encourage more people to walk and/or cycle;
- NET tram extensions to the south and west of the city (the line travelling to the south travels through part of West Bridgford which could potentially reduce vehicle journeys through the AQMA);
- The introduction of enhanced rail services which serve populations that may potentially otherwise have to travel through the Trent Bridge and Stragglethorpe AQMAs;
- Eco-Stars programme which ceased to be delivered when the Local Sustainable Transport Fund funding ceased (a total of 51 members had joined the scheme when LSTF funding expired);
- Review and upgrade of County Council fleet vehicles;
- Major transport scheme improvements such as the A453 trunk road and the A6514 ring road improvements.

Rushcliffe Borough Council expects the following measures to be completed over the course of the next reporting year: the implementation of a £1m strategic cycle network in West Bridgford; and a subsequent review of cycle maps in the area to help reduce short car journeys. Rushcliffe Borough Council's priorities for the coming year are predominantly through measures to make the best use of the transport networks and through smarter travel measures that will encourage people to travel more sustainably. These include:

- Traffic control and information provision to minimise disruption and delay on County Council managed roads (including the roads within the AQMA) such as contingency planning, the effective co-ordination of works and the provision of real-time travel information;
- Parking enforcement on County Council managed roads to ensure that the traffic keeps moving;
- Further investigation on the optimisation of traffic signals on A60/A6011 junction (south approach) utilising the AQ monitoring data from the permanent monitor installed on Trent Bridge during 2016/17;
- Travel planning such as personalised travel planning undertaken at major workplaces within the AQMA, travel planning at the County Council, and the development of new travel plans at businesses across the county through planning conditions;
- Measures to reduce the need to travel at peak times such as the provision and encouragement of flexible working arrangements;
- The facilitation of smarter travel behaviour such as the provision of a car sharing scheme, small scale sustainable transport improvements (e.g. cycle parking facilities, cycling network enhancements) on County Council managed roads, and integrated and concessionary ticketing schemes;
- The encouragement of smarter travel behaviour such as the marketing and promotion of passenger transport, walking and cycling, provision of cycling and walking route maps, cycle training programmes, web-based journey planners;
- The encouragement of the uptake of low-emission vehicles through the delivery of the Nottingham Go Ultra Low City bid funding;
- Enhancements to the local cycling network to improve links to local employment, training, shops, services and to link to wider cycling networks in Nottingham City.

The principal challenges and barriers to implementation that Rushcliffe Borough Council anticipates facing are:

- The location of AQMA 1 (on the approaches to Lady Bay and Trent bridges) and the site constraints makes it difficult to remedy the problems with small-scale infrastructure improvements and therefore smarter choices measures (such as travel planning, and marketing and promotion of alternatives to the car) are more likely to provide improvements. Measures that facilitate and encourage walking, cycling and bus use will therefore be the priority actions in the foreseeable future.
- The County Council has concerns about potential cumulative impacts of proposed future development on the Trent Bridge AQMA as the Local Development documents have identified areas around the district for significant growth which may potentially impact on the AQMAs, and traffic growth will be above those that are forecast without the development occurring. Objection to such growth may be difficult and section 38, 278 and 106 planning obligations will be used to mitigate localised traffic impacts of individual developments as far as is possible and seek to ensure sustainable development takes place; rather than the impacts further afield.
- There is currently only planned mitigation of the cumulative traffic growth from proposed development on the strategic road network and the planning authority also has no plans to undertake air quality modelling of the cumulative impacts (particularly on the AQMAs) of the proposed developments. Without significant sustainable transport measures being introduced and maintained at the developments (funded through the development control process) the cumulative impacts of developments will, however, impact on the AQMA on Trent Bridge. The planning authority does not currently have any planned mitigation of the traffic growth at AQMA locations as part of the development proposals. Without significant mitigation at development locations to specifically address their impacts on the AQMAs (e.g. significant sustainable transport improvements), any measures subsequently included within an AQMA action plan would be very unlikely to mitigate this planned growth.
- Ensuring funding is allocated to the above measures to continue their delivery. The top-slicing of 43% of the integrated transport block from 2015/16 onwards by the government and allocating it to the Local Growth Fund means that from 2015/16 the integrated transport funding allocated to Nottinghamshire County Council reduced by approximately £3.5m; significantly reducing the funding available for transport improvements that will deliver air quality improvements.

Progress on the following measures has been slower than expected due to:

- Park and ride sites due to the lack of revenue funding available for undertaking the feasibility studies for such measures (and revenue running costs to support their implementation); as well as the lack of major scheme funding available for the delivery of such measures.
- Introduction of a car club in the county as this will only be introduced once the club in the City proves consistently successful/self-sufficient over a period of time (the Nottingham City car club was only introduced in April 2014).
- Expansion of the cycle hire scheme due to the lack of revenue funding available for such schemes. The County Council is currently working with Nottingham City Council to investigate potential methods of delivering a self-sufficient scheme which would not require revenue support by the authorities.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Rushcliffe Borough Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of AQMA 1 and AQMA 1/2011.

Table 2.2 – Progress on Measures to Improve Air Quality

	Measure	EU Category	EU classification	Organisations Involved and Funding source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in pollutant/emission from measure	Progress to date	Estimated/Actual completion date	Comments/barriers to implementation
1	Traffic control and information	Traffic management	UTC, congestion management, traffic reduction	Nottinghamshire County Council (NCC)/Via EM Ltd/Nottingham City Council (NCiC):NCC and NCiC revenue funding	N/A	Ongoing	Restrain average journey times in the morning peak to a 1% increase per year	*See table footnote	Implementation ongoing	Ongoing	Potential Barrier: lack of future revenue funding
2	Contingency planning, and effective event and incident management	Traffic management	UTC, congestion management, traffic reduction	NCC/Via EM/NCiC/Highways England (HE): NCC, NCiC, HE revenue funding	N/A	Ongoing	Restrain average journey times in the morning peak to a 1% increase per year	*See table footnote	Implementation ongoing	Ongoing	
3	Co-ordination of streetworks	Traffic management	UTC, congestion management, traffic reduction	NCC/Via EM/NCiC: NCC and NCiC revenue funding	N/A	Ongoing	Restrain average journey times in the morning peak to a 1% increase per year	*See table footnote	Implementation ongoing	Ongoing	

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4	Traffic signal upgrades	Traffic management	Strategic highway improvements, re-prioritising road space away from cars, including access management, selective vehicle priority, bus priority, high vehicle occupancy lane	NCC/Via EM:integrated transport block funding	N/A	2012/13	Restrain average journey times in the morning peak to a 1% increase per year	*See table footnote	SCOOT/MOVA installed at signals within AQMA. A60/Bridgford Road signals upgraded	2012/13	
5	Traffic signal re-phasing	Traffic Management	Strategic highway improvements, re-prioritising road space away from cars, including access management, selective vehicle priority, bus priority, high vehicle occupancy lane	NCC/Via EM:integrated transport block funding	Ongoing	Ongoing	Restrain average journey times in the morning peak to a 1% increase per year	*See table footnote	Signals within AQMA rephased. 24hr monitor installed in 2016/17 will be used to further inform signal modifications	Ongoing	Potential barrier – lack of future funding
6	Real time travel information	Public information	Other	NCC/Via EM Ltd: NCC revenue funding	Ongoing	Ongoing	Restrain average journey times in the morning peak to a 1% increase per year	Public surveys to determine success of the use of real time travel information	Information conveyed by all forms of media (press, radio, website, social media etc). Implementation ongoing.	Ongoing	Potential barrier – lack of future funding
7	Civil Parking Enforcement	Traffic management	Workplace parking levy, parking enforcement on highway	NCC: NCC revenue funding	Pre 2008	Ongoing	Manage parking to improve journey time reliability	Number of parking enforcement fines issued and improvements in parking within key areas.	CPR introduced in 2008. Implementation ongoing	Ongoing	

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8	Pocket park and ride	Alternatives to private vehicle use	Bus based park & ride	NCC: integrated transport block funding	2008-2010	2010	Increased public transport	Aim to increase the use of park and ride	Schemes were introduced along the A46 and A52 corridors in 2010.	Complete 2010; implementation ongoing	
9	Park & ride site to the east of Nottingham	Alternatives to private vehicle use	Bus based park & ride; rail based park and ride	NCC – no funding source secured	2016-2021	Not known scheme progress dependent on determining a business case for any proposal, feasibility findings and securing necessary funding	Increased public transport patronage /	Not known yet	Consultants commissioned to look at potential improvements along A52 including most suitable general locations for park and ride	Not known at this current time	Scheme dependent on business case for any proposals. Identifying appropriate site and securing funding
10	East Midlands Parkway station	Alternatives to private vehicle use	Rail based park and ride	Network Rail/ East Midlands Trains		2007-2009	Restrain average journey times in the morning peak to a 1% increase per year	Continue to increase the use of the rail based park and ride	In December 2007 the construction of the East Midlands Parkway station on the A453 with adjoining park and ride site started and the station opened in January 2009 In 2014/15 304,000 passengers (combined total arriving and departing) an 8% increase from 2012/13.	Complete 2009	
11	Nottingham City workplace parking levy (WPL)	Traffic management	Workplace Parking Levy, parking enforcement on highway	NCiC	Pre-2012	2012 and ongoing	Restrain average journey times in the morning peak to a 1% increase per year	Aim to increase uptake of public transport	NCiC introduced WPL within the city in 2012 and have used funding to make passenger transport improvements in the city	Introduced in 2012 and ongoing	

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12	NCC travel plan	Promoting travel alternatives	Workplace travel planning	NCC; integrated transport block funding	N/A	Ongoing	Restrain average journey times in the morning peak to a 1% increase per year	Aim to increase alternative modes of travel specifically in areas where air quality is poor	PTP travel clinics held at NCC buildings within the AQMA during 2016/17	Ongoing – operational for nearly 20 years	
13	Workplace travel plans	Promoting travel alternatives	Workplace travel planning	Rushcliffe Borough Council (RBC) planning, NCC : integrated transport block funding, businesses/ developers	N/A	Ongoing	Restrain average journey times in the morning peak to a 1% increase per year	To encourage businesses and employees to travel to work in ways that will help improve air quality	Workplace travel plans are developed with businesses as part of planning conditions and through voluntary arrangements.	Ongoing	
14	Personalised travel planning	Promoting travel alternatives	Personalised travel planning;	NCC/AECOM ; integrated transport block/ access fund funding	2015/16	2015/16 and 2018/19	Restrain average journey times in the morning peak to a 1% increase per year	To encourage ways of travel that will help improve air quality	PTP undertaken in 2016/17. Access fund secured to undertake PTP during 2018/19	March 2019	

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15	School travel plans	Promoting travel alternatives	School travel planning	NCC: DfT funding		2000-2011	Restrain average journey times in the morning peak to a 1% increase per year	To encourage staff and pupils to travel to school in ways that will help improve air quality	<ul style="list-style-type: none"> School travel plans have been developed and approved at all the schools in Rushcliffe 	Complete March 2011	
16	Flexible working arrangements	Promoting travel alternatives	Encourage / facilitate home-working	NCC/RBC		Ongoing	Restrain average journey times in the morning peak to a 1% increase per year	Reduce the need for car journeys	<ul style="list-style-type: none"> Flexible working arrangements for staff are operated by the County Council including provision of equipment to allow them to work from home. All office-based County Council employees are able to work from home or from 'touch down' offices nearer to home and are provided with remote access facilities. Arrangements remain in place and are ongoing Rushcliffe Borough Council has moved to a new site, where all staff are expected to incorporate Remote Working into their way of working. Therefore, a reduction in vehicle use within the AQMA's (and the Borough) and subsequent reduction in emissions. 	Ongoing	
17	Eco-driver training sessions	Vehicle fleet efficiency	Driver training and ECO driving aids	NCC	2012	2012	Improve air quality within the AQMA	Number of NCC staff obtaining eco driver training *See table footnote	<ul style="list-style-type: none"> Eco-driver training sessions to enable County Council employees to drive more efficiently and sustainably have been provided free to NCC staff. 	Complete 2012	
18	NCC car pool vehicles	Alternatives to private vehicle use	Car clubs	NCC		2016/17	Restrain average journey times in the morning peak to 1% increase per year	*See table footnote	<ul style="list-style-type: none"> NCC upgraded its pool vehicles to lower emission diesel vehicles 	2016	

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19	Car sharing scheme	Alternatives to private vehicle use	Car & lift sharing schemes	NCC	Pre 2006	Ongoing	Restrain average journey times in the morning peak to a 1% increase per year	490kg NOx reduction during 2016 through the car share activities	<ul style="list-style-type: none"> A car sharing scheme at NCC and throughout the county (nottinghamshare.com) was launched in April 2006 and continues to be promoted across the county. Whilst Nottinghamshare is promoted throughout the year additional activities and promotion was held during liftshare week including features in the local press and other publications. <p>The number of current registered users on the website has increased to 2,999 in 2017 (an increase of 211 from 2016).</p>	Ongoing	
20	Introduction of car club	Alternatives to private vehicle use	Car clubs	NCC	2014-2017	Dependant on success of Nottingham City scheme	Restrain average journey times in the morning peak to a 1% increase per year	*See table footnote	<ul style="list-style-type: none"> A car club was introduced in Nottingham City in April 2014. The scheme was funded through the Local Sustainable Transport Fund and the Nottingham City workplace parking levy. The contract for the scheme allows for the expansion of the car club in to the county at a later date if the club proves consistently successful over a period of time. 	Dependant on monitoring of Nottingham scheme	Potential barrier – funding for implementation
21	Cycle parking facilities	Transport planning and infrastructure	Cycle network	NCC: integrated transport block funding	2014	2015	Increases in cycle trips	Increase in cycling as an alternative to driving	<ul style="list-style-type: none"> Cycle parking facilities are provided at various locations throughout West Bridgford and elsewhere in the county and city to encourage cycling for short journeys Additional secure cycle parking was installed in West Bridgford in April 2015 to provide better integration for cyclists to make longer distance journeys by bus. These facilities will be accessible by bus smartcard. The Cycle Hub which is accessible by bus smartcard is located on the main bus route into Nottingham City as well as to outlying villages/towns elsewhere. 	Ongoing	Complete 2015

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22	West Bridgford strategic cycling network	Transport planning and infrastructure	Cycle network	NCC: integrated transport block funding/Local Growth fund/developer contributions	2015-2017	2017-2018	Increases in cycling trips	Increase in cycling in the West Bridgford area as opposed to driving	LGF secured in December 2016. Construction started in 2017	2018	
23	Cycle maps	Promoting travel alternatives	Promotion of cycling	NCC	Ongoing	Ongoing	Increases in cycle trips	Increase in cycling as an alternative to driving	Cycle maps of Greater Nottingham area have been produced and are updated when required. Maps continue to be distributed throughout the county, and are available as a hard copy and on-line. These will be reviewed once the West Bridgford Network is complete	2018	
24	Cycle training	Promoting travel alternatives	Promotion of cycling	NCC	Ongoing	Ongoing	Increases in cycle trips	Increase in number of people taking up cycling as an alternative to driving	8609 people received cycle training in 2016/17. Implementation ongoing.	Ongoing	
25	Marketing of cycling	Promoting travel alternatives	Promotion of cycling	NCC	Ongoing	Ongoing	Increases in cycle trips	Increase in number of people taking up cycling as an alternative to driving	Implementation ongoing	Ongoing	
26	Marketing of walking	Promoting travel alternatives	Promotion of walking	NCC	Ongoing	Ongoing	Increases in walking trips	Increase in number of people walking as an alternative to driving	Implementation ongoing	Ongoing	

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27	Web based journey planners	Public information	Via the internet	NCC	Ongoing	Ongoing	Increased walking/cycling/passenger transport trips	Increase in the use of web based journey planners and promoting walking and cycling as opposed to driving	Implementation ongoing	Ongoing	
28	Cycle hire scheme	Transport planning and infrastructure	Public cycle hire scheme	NCC/NCiC; funding source to be determined	2017/18	2018/19 dependent on model chosen and funding implications	Increases in cycle trips	Increase in number of people taking up cycling as an alternative to driving	<ul style="list-style-type: none"> Feasibility study commissioned by NCiC for a city scheme which potentially could include parts of the county such as West Bridgford. 	2018/19 dependent on model chosen and funding implications	
29	20mph speed limits	Traffic management	Reduction of speed limits, 20mph zones	NCC; integrated transport block funding	2012/13	2013-2016	Increases in walking and cycle trips	Increase in number of pupils walking and cycling to school	<ul style="list-style-type: none"> Advisory 20mph speed limits have been introduced outside all schools in the county where feasible to improve safety around schools and to encourage more pupils to walk and cycle to school 	2016/17	
30	Area wide mandatory 20mph speed limits	Traffic management	Reduction of speed limits, 20mph zones	NCC; integrated transport block funding	2014/15	2015/16	Increases in walking and cycle trips	Increase in number of pupils walking and cycling to school	<ul style="list-style-type: none"> Two mandatory area wide 20mph limits introduced in West Bridgford 	2016/17	
31	Bus infrastructure	Transport planning and infrastructure	Public transport improvements - interchanges stations and services	NCC; integrated transport block funding	ongoing	Ongoing	Increased bus patronage	*See table footnote	Annual programme developed/delivered. Implementation ongoing	Ongoing	

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32	Light rail tram infrastructure	Transport planning and infrastructure	Public transport improvements - interchanges stations and services	NCiC/NCC; DfT/WPL funding		2013-2016	Increased passenger transport patronage	*See table footnote	<ul style="list-style-type: none"> NET Phase 2 extends the tram system to incorporate two new lines to the south and west of Nottingham city centre totalling 17km in length, commenced in early 2013; and opened in 2015. The line to the south of the City travels through part of West Bridgford and could potentially reduce vehicle journeys through the AQMA. 	complete 2015	
33	Marketing and promotion of passenger transport	Promoting travel alternatives	Other	NCiC/NCC/PT operators	ongoing	Ongoing	Increased passenger transport patronage	Not easily quantifiable	<ul style="list-style-type: none"> Implementation ongoing 	Ongoing	
34	Integrated ticketing	Transport planning and infrastructure	Other	NCiC/NCC/PT operators	ongoing	Ongoing	Increased passenger transport patronage	Increase in numbers using the new smartcard and Robin Hood card	<ul style="list-style-type: none"> An integrated ticketing strategy for the county was developed during 2014/15. The new smartcard platform was introduced in 2014. Robin Hood card scheme introduced in 2015. 	Ongoing	
35	Concessionary fare schemes	Transport planning and infrastructure	Other	NCiC/NCC/PT operators	ongoing	Ongoing	Increased passenger transport patronage	Increase in passengers	Implementation ongoing	Ongoing	
36	Bus service improvements	Transport planning and infrastructure	Public transport improvements - interchanges stations and services	NCC/PT operators	Ongoing	Ongoing	Increased bus patronage	Increase in passengers *See table footnote	<ul style="list-style-type: none"> Implementation ongoing. 	Ongoing	

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37	Nottingham to Lincoln rail line service improvements.	Transport planning and infrastructure	Public transport improvements - interchanges stations and services	NCC/district councils/East Midlands trains; NCC/district councils/DfT revenue and LGF funding	Pre-2015	2015/16 to 2017/18	Increased rail patronage	*See table footnote	<ul style="list-style-type: none"> Funding has been secured by the County Council from Central Government and other partners for 3 years (up to 2017/18) to increase the frequency of the service throughout the day and to enable a faster peak time service. Residents of many of the outlying villages/settlements that lie along the Nottingham-Lincoln rail line could use the rail service instead of driving if the service is quicker and more frequent The required subsidy to continue the service will be sought as part of the East Midlands rail franchise renewal. 	2018/19	
38	Encouragement of low-emission public transport fleets	Vehicle fleet efficiency	Promoting low emission public transport	NCC/NCiC/P T operators; NCT (operator) and OLEV funding	Ongoing	Ongoing	Ongoing take-up of cleaner vehicles	*See table footnote	Standard Quality Bus Partnership in place affecting all buses travelling through the AQMA. Operator NCT secured £4.4 m OLEV funding and invested a further £12.4m to upgrade its facilities to enable running of a gas fleet, including two services which travel through the AQMA	Ongoing	
39	Eco-Stars programme	Vehicle fleet efficiency	Fleet efficiency and recognition schemes	District Councils/NCC/NCiC		2013-2015		A typical van could reduce CO2 by 6 tonnes per year (http://www.ecostars-uk.com/aboutecostars/whyjoin/)	<ul style="list-style-type: none"> Eco-Stars was introduced in the Greater Nottingham area in March 2013 as part of the LSTF programme – SAFED driver training is included as part of the scheme. A total of 51 members have joined the scheme. Funding expired in March 2015 (when LSTF funding expired). Alternative funding sources are being investigated. 	2015	
40	Nottingham Go-Ultra Low City bid	Promoting low emission transport	Procuring alternative refuelling infrastructure to promote LEV, EV recharging and gas fuel recharging	NCiC/NCC; OLEV funding	2015-2016	2016-2021	Ongoing take-up of cleaner vehicles	For specific measures *See table footnote	<ul style="list-style-type: none"> Nottinghamshire County Council, in partnership with Nottingham City and Derby City Councils has been successful in securing £6.1m OLEV funding for the period April 2016. Implementation ongoing 	2021	
41	Nottingham City Clean Air Zone	Promoting low emission transport	Low emission zone (LEZ)	NCiC/DfT funding	2016-2019	2019/20		*See table footnote	<ul style="list-style-type: none"> NCiC to undertake modelling to help inform extents of proposed scheme. Modelling to take approx 18 months 	2020	

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42	Development of a supplementary planning document	Policy guidance and development control	Air quality planning and policy guidance	RBC		Sept 2016	Progress meetings with EMAQN	Aims to minimise emissions during development.	Public Health England have set up the East Midlands Air Quality Network, with the aim of producing a regional planning guide for developers in relation to Air Quality. They are also assisting with the production of a Nottinghamshire Air Quality Strategy and associated communications.	Ongoing	
43	A6514 Ring Road improvements	Traffic management	Strategic highway improvements, re-prioritising road space away from cars, including access management, selective vehicle priority, bus priority, high vehicle occupancy lane	NCiC		2013-2016	Restrain average journey times in the morning peak to 1% increase per year	*See table footnote	<ul style="list-style-type: none"> • Works commenced in summer 2013 on a £16.2m package of measures aimed at directly addressing the key problems affecting the ring road. These are based upon making the best use of the existing road network • Works to improve access for pedestrians, cyclists and to improve traffic flows were undertaken at Crown Island, Hucknall Rd roundabout, Aspley Lane, Nuthall Rd, Wilkinson St, Western Blvd, and Middleton Blvd. • Completed in 2016 	Complete 2016	
44	Engagement with Public Health England in relation to health impacts associated with poor air quality	Public Information	Other	RBC/Public Health England	2017	2017/18	Feasibility study on particulate monitoring to Align public health information on poor respiratory health	Provide information on specific areas of Rushcliffe where public health information is required	Initial information provided by Public Health England on health of population of Rushcliffe. This information will be used to determine feasibility of either carrying out PM2.5 monitoring or providing information on air quality to targeted areas in line with the health issues within the area.	ongoing	

***Footnote**

Within some of the measures identified Rushcliffe Borough Council will work with NCC to determine whether the emissions factor toolkit (EFT) published by DEFRA can be used to quantify the likely levels of reduction on NOx and PM10.

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.

Rushcliffe Borough Council is taking the following measures to address PM_{2.5}:

Rushcliffe Borough Council is working with the LTP and other stake holders to reduce transport impacts as a whole. This has a benefit not only for NO₂ but for all emissions from transport sources and CO₂. As such the current measures will lead to a reduction in PM_{2.5}.

In addition any planning applications for commercial wood/biomass burning plants are screened to determine whether an air quality assessment is required. One of the main aspects that will be considered within the air quality assessment will be the emissions of particulate matter.

Rushcliffe Borough Council are also working with Public Health England in order to consider the data on the Rushcliffe population in relation to respiratory illness in order to determine whether there is a correlation between the areas of high prevalence respiratory illness and the areas where the AQMAs are located. This work is in its infancy however will be developed over the next year. The principal application to be used will be the Strategic Health Asset Planning and Evaluation (SHAPE) tool which is a web-enabled, evidence-based application which informs and supports the strategic planning of services and physical assets across a whole health economy.

The SHAPE application:

- Links national datasets for clinical analysis, public health, primary care and demographic data with estates performance and facilities location;
- Enables interactive investigations by Local Area Teams, Providing Trusts, CCGs, GP practices and Local Authorities;
- Supports key policy initiatives such as QIPP, JSNA, Pharmaceutical Needs Assessment and Transforming Community Services;
- Provides you with a range of flexible capabilities; you drive it in the direction you want it to go.

SHAPE is available via <https://shape.phe.org.uk/>.

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.

Rushcliffe Borough Council undertook automatic (continuous) monitoring at 2 sites during 2016. Table A.1 shows the details of the sites. National monitoring results are available <https://uk-air.defra.gov.uk/>

Maps showing the location of the monitoring sites are provided in Appendix D **Error! Reference source not found.** 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

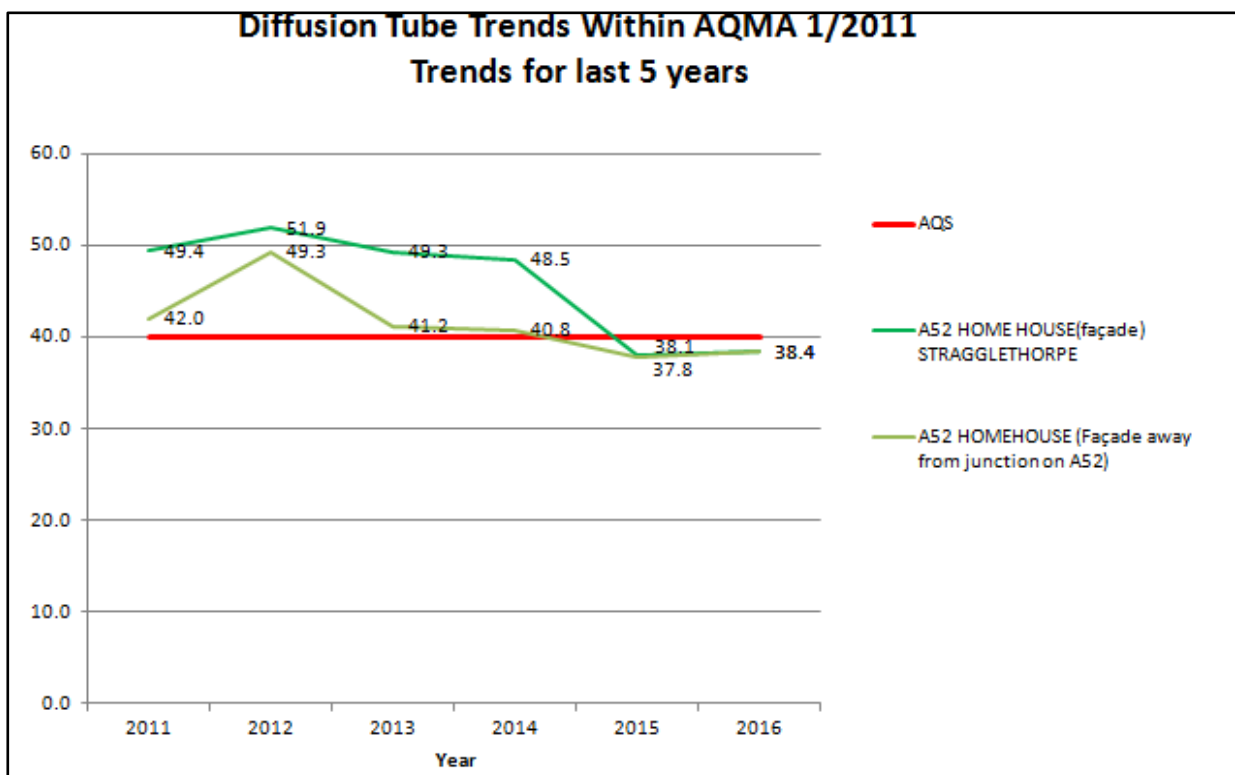
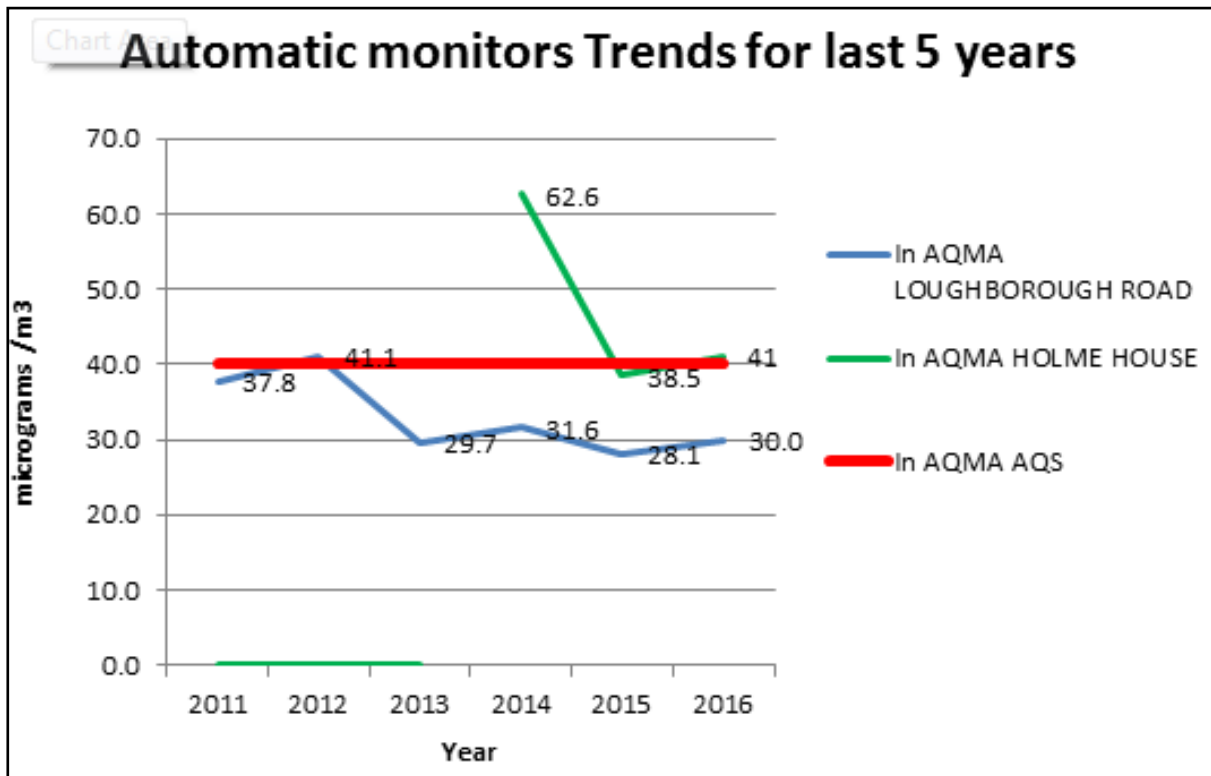
Rushcliffe Borough Council undertook non- automatic (passive) monitoring of NO₂ at 25 sites during 2016. Table A.2 shows the details of the sites.

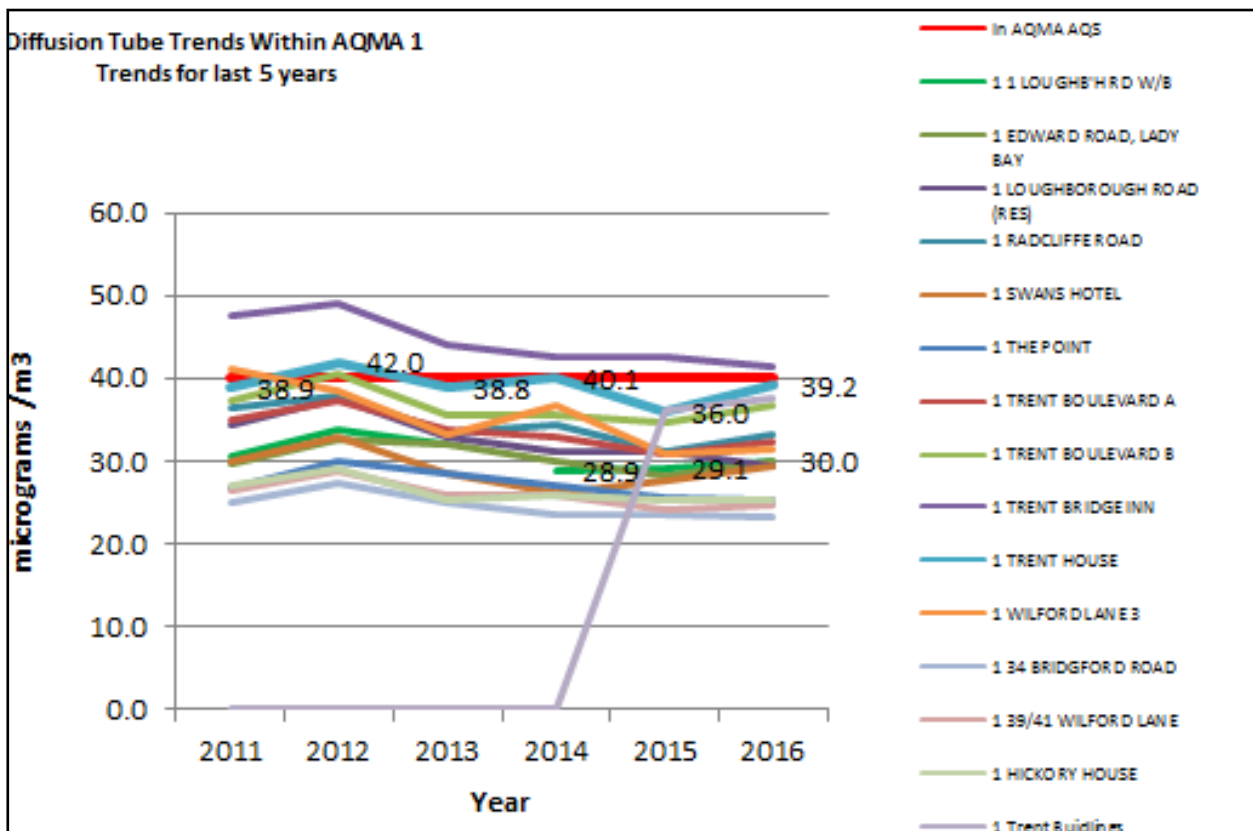
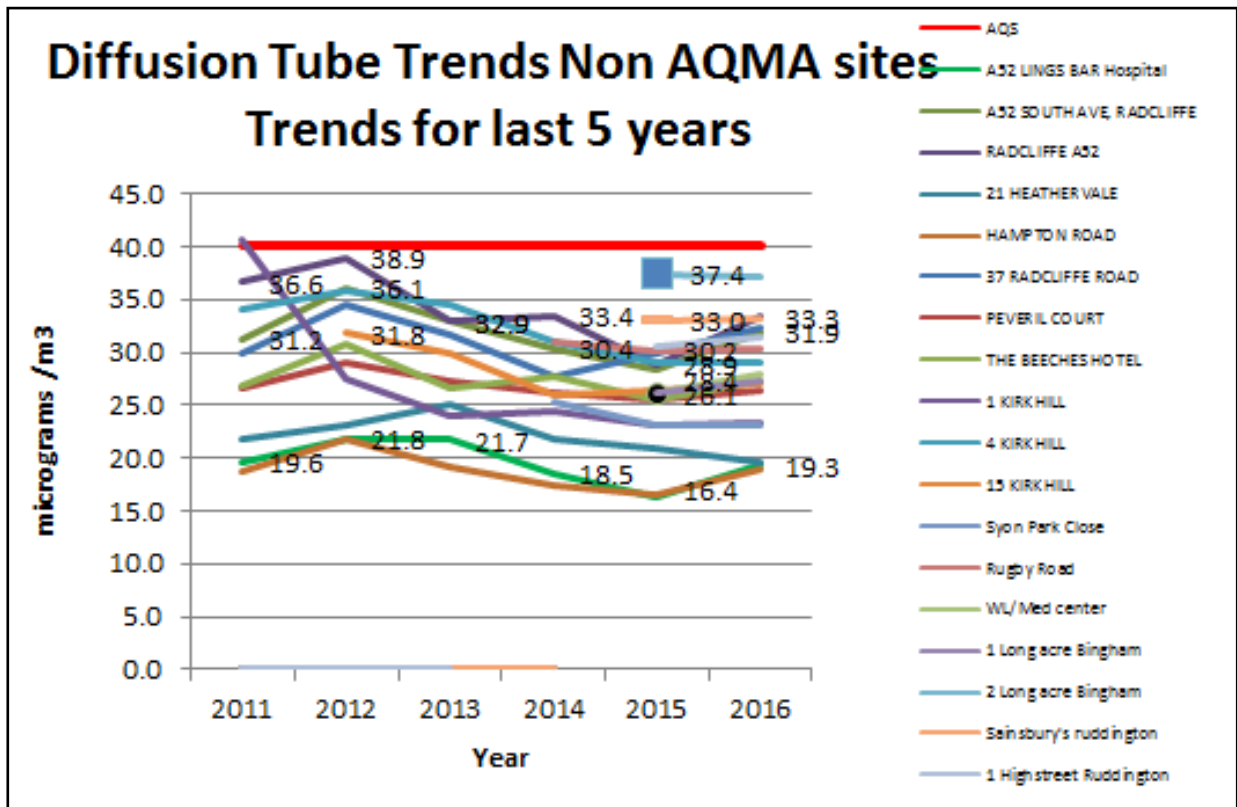
Maps showing the location of the monitoring sites are provided in Appendix D.

Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in **Error! Reference source not found.**Appendix

3.2 Individual Pollutants

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





The trends charts above indicate that some pollution levels at the monitoring sites have continued in a downward direction however there are slight increases in other areas. There is no indication of sites outside of the current AQMA's likely to be a concern at this time.

Sites in the AQMA are showing a downward trend however there has been an increase in the Trent Bridge area.

3.2.1 Nitrogen Dioxide (NO₂)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

For diffusion tubes, the full 2016 dataset of monthly mean values is provided in Appendix B.

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

There have been no exceedances of the 200µg/m³ at any site in the borough.

All other sites in this reporting period when bias adjusted, corrected for distance to receptor and annualised (where appropriate) are shown to be below the AQS for the relevant receptor.

3.2.2 Particulate Matter (PM₁₀)

There has been no PM₁₀ monitoring in 2016.

3.2.3 Particulate Matter (PM_{2.5})

There has been no PM_{2.5} monitoring in 2016.

3.2.4 Sulphur Dioxide (SO₂)

There has been no SO₂ monitoring in 2016.

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)
Loughborough Road	Loughborough Road, West Bridgford AQMA1	Roadside	458174	337772	NO2	Y(AQMA1)	Chemiluminescent	Y (0m)	5m	1.8
Holme House	Holme House, A52 Stragglethorpe Junction, Radcliffe on Trent	Road Side/facade	463005	338208	NO2	Y (AQMA4)	Chemiluminescent	Y (0m)	7.5m	1.5

Notes:

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

(2) N/A if not applicable.

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

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
NA1	1 LOUGHB'H RD W/B	Façade	458174	337772	NO ₂	1	0	5	Y	2.2
NA2	1 LOUGHB'H RD W/B	Façade	458174	337772	NO ₂	1	0	5	Y	2.2
NA3	1 LOUGHB'H RD W/B	Façade	458174	337772	NO ₂	1	0	5	Y	2.2
HV	22 HEATHERVALE	Façade	456893	336768	NO ₂	no	0	16	N	2.1
BR	34 BRIDGFORD ROAD	Façade	458501	337854	NO ₂	no	0	10	N	2.2
WLR/2	39/41 WILFORD LANE	Façade	457873	337426	NO ₂	no	0	9	N	2.2

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GLB HOS	A52 LINGS BAR Hospital	Façade	460663	336514	NO ₂	no	0	26	N	2.3
A52/S A	A52 SOUTH AVE, RADCLIFFE	RS	465929	339543	NO ₂	no	0	4.2	N	2.9
NK	A60/A52 JUNCTION (Nott Knight)	RS	457612	334813	NO ₂	Y2	15	1.8	N	2.1
CL	CLOVERLA NDS	Façade	457223	335033	NO ₂	Y2	0	16.3	N	2.5
HR	HAMPTON ROAD	UB	458326	336714	NO ₂	no	0	5.4	N	2.1
HH	HICKORY HOUSE	Façade	458049	337340	NO ₂	no	0	10.5	N	2
ER	EDWARD ROAD, LADY BAY	Façade	458716	338238	NO ₂	Y1	0	10.5	N	2.8
LR	LOUGHBOR OUGH ROAD (RES)	Façade	458126	337727	NO ₂	Y1	0	8.9	N	1.9
37RR	RADCLIFFE ROAD	Façade	458457	338215	NO ₂	no	-3.3	13.8	N	4

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PM10 (centenary house)	centenary house former pm10 site	Façade	458090	337527	NO ₂	Y1	2.5	7.3	N	1.6
PC	PEVERIL COURT	Façade	458399	337172	NO ₂	no	0	8	N	2
A52/R T	RADCLIFFE A52	RS	464644	338730	NO ₂	no	5.2	3.3	N	2
RR	RADCLIFFE ROAD	Façade	458284	338150	NO ₂	Y1	0	4	N	2.3
SH	SWANS HOTEL.	Façade	458919	338120	NO ₂	Y1	0	10	N	2.1
BH	THE BEECHES HOTEL	Façade	457701	337342	NO ₂	no	0	9.7	N	2.1
POINT	THE POINT	Façade	458114	337518	NO ₂	Y1	0	7.4	N	2.1
TBLA	TRENT BOULEVAR D A	Façade	458752	338278	NO ₂	Y1	0	7.1	N	2
TBLB	TRENT BOULEVAR D B	Façade	458756	338267	NO ₂	Y1	0	3.4	N	2.4
TBI	TRENT BRIDGE INN	Façade	458274	338117	NO ₂	Y1	0	6.6m RR (8m LR)	N	2.6
THF	TRENT HOUSE	Façade	458227	338197	NO ₂	Y1	0	3.2	N	5
THF2	TRENT HOUSE	Façade	458227	338197	NO ₂	Y1	0	3.2	N	5

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THF3	TRENT HOUSE	Façade	458227	338197	NO ₂		0	4.2	N	5
WL3	WILFORD LANE 3	RS	458134	337581	NO ₂	Y1	5.2	2.1	N	2.9
WW	WINDYWAY S	Façade	457651	334840	NO ₂	Y2	0	12	N	1.8
WW2	WINDYWAY S	Façade	457651	334840	NO ₂		0	12	N	1.8
A52/H HF1	A52 HOME HOUSE(façade) STRAGGLE THORPE	Façade	463011	338213	NO ₂	Y4	0	6	Y	2.5
A52/H HF2	A52 HOME HOUSE(façade) STRAGGLE THORPE	Façade	463011	338213	NO ₂	Y4	0	6	Y	2.5
A52/H HF3	A52 HOME HOUSE(façade) STRAGGLE THORPE	Façade	463011	338213	NO ₂	Y4	0	6	Y	2.5
SR	STRAGGLE THORPE ROAD	Façade	463005	338204	NO ₂	Y4	0	5.5m(A52 12.3m)	N	2.2
A52/H HF4	A52 HOME HOUSE(façade) STRAGGLE THORPE	Façade	463040	338232	NO ₂	Y4	0	6.4	N	2.4

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1KH	1 KIRKHILL BINGHAM	Façade	470205	340020	NO ₂	No	0	1.37	N	2.4
4KH	4 KIRKHILL BINGHAM	RS	470220	340051	NO ₂	No	0	2	N	2.4
15KH G	15 Kirkhill Gardens	RS	470202	340092	NO ₂	No	0	2	N	2.4
SPC	Syon Park Close	RS	458132	336462	NO ₂	No	6.5	2.5	N	2.4
RuRo	Rugby Road	RS	457507	336343	NO ₂	No	-0.5	3.5	N	2.4
WL/Me dC	Wilford Lane Medical Centre	RS	457541	337241	NO ₂	No	6.7	2.1	N	2.2
Trent B	Trent buildings	Façade	458249	338167	NO ₂	Y1	0	3.6	N	2.5
1 LA	1 long acre, Bingham	RS	470234	339846	NO ₂	no	4	2.5	N	2.6
2 LA	2A Long Acre, Bingham	Façade	470248	339834	NO ₂	no	0	1.2	N	2.6
Sains	sainsburys Wilford Road, Rudd	Façade	457303	333214	NO ₂	no	0	2.2	N	2.6
1 HS	1 High Street, Rudd	Façade	457323	333124	NO ₂	no	0	2.8	N	2.6

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property). (2) N/A if not applicable.

Table A.3 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2016 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2012	2013	2014	2015	2016
LOUGHBOROUGH ROAD	Roadside	Automatic	97.8	97.8	41.1	29.7	31.6	28.1	30
HOLME HOUSE	Façade/Road side	Automatic	99.8	99.8	N/a	n/a	62.6 c	38.5	41
1 LOUGHB'H RD W/B	Façade	diffusion tube	100	100	33.9	32	28.9	29.10	30.1
EDWARD ROAD, LADY BAY	RS	diffusion tube	100	100	32.7	32.1	30.1	28.12	29.9
LOUGHBOROUGH ROAD (RES)	Façade	diffusion tube	100	100	37.6	32.8	31.1	31.11	29.3
RADCLIFFE ROAD	Façade	diffusion tube	92	92	37.9	33.5	34.5	31.03	33.3
SWANS HOTEL	Façade	diffusion tube	100	100	33	28.5	26.1	27.72	29.3
THE POINT	Façade	diffusion tube	100	100	30.1	28.5	27.1	25.66	25.2

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TRENT BOULEVARD A	Façade	diffusion tube	100	100	37.2	33.7	32.9	30.98	32.4
TRENT BOULEVARD B	Façade	diffusion tube	92	92	40.4	35.5	35.5	34.58	36.8
TRENT BRIDGE INN	Façade	diffusion tube	100	100	48.9	44	42.6	42.60	41.5
TRENT HOUSE	Façade	diffusion tube	100	100	42	38.8	40.1	35.98	39.2
WILFORD LANE 3	RS	diffusion tube	100	100	38.6	33.2	36.7	30.90	31.5
A60/A52 JUNCTION (Nott Knight)	RS	diffusion tube	100	100	44.3	47.4(33.0 at receptor)	44.5	30.30 (at receptor)	30.3
CLOVERLANDS(Façade)	Façade	diffusion tube	100	100	34.3	32	29.2	29.81	29
WINDYWAYS	Façade	diffusion tube	75	75	39.1	36.8	36.2	34.31	34.6
A52 LINGS BAR Hospital	Façade	diffusion tube	100	100	21.8	21.7	18.5	16.41	19.3
A52 SOUTH AVE, RADCLIFFE	RS	diffusion tube	100	100	36.1	32.9	30.4	28.42	31.9
RADCLIFFE A52	RS	diffusion tube	100	100	38.9	32.9	33.4	28.90	29.2
A52 HOME HOUSE(façade) STRAGGLETHORPE	Façade	diffusion tube	100	100	51.9	49.3	48.5	38.07	38.4

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A52 HOMEHOUSE (Façade away from junction on A52)	Façade	diffusion tube	100	100	49.3	41.2	40.8	37.83	-
STRAGGLETHORPE ROAD	Façade	diffusion tube	100	100	34.6	34.1	33.1	31.98	32.2
21 HEATHERVALE	Façade	diffusion tube	100	100	23.1	25	21.8	20.87	19.7
34 BRIDGFORD ROAD	Façade	diffusion tube	100	100	27.4	24.9	23.4	23.50	23.2
39/41 WILFORD LANE	Façade	diffusion tube	100	100	28.9	25.8	26	24.14	26
HAMPTON ROAD	UB	diffusion tube	100	100	21.8	19.2	17.5	16.51	18.9
HICKORY HOUSE	Façade	diffusion tube	100	100	29.1	25.2	25.9	25.24	25.3
37 RADCLIFFE ROAD	Façade	diffusion tube	92	92	34.6	31.7	27.8	30.00	32.3
PEVERIL COURT	Façade	diffusion tube	100	100	29	27.3	26.2	25.41	26.4
THE BEECHES HOTEL	Façade	diffusion tube	100	100	30.7	26.5	27.6	25.51	27.3
1 KIRKHILL	Façade	diffusion tube	92	92	27.5	24	24.5	23.20	23.3
4 KIRKHILL	RS	diffusion tube	100	100	35.9	34.6	30.9	29.12	29

15 KIRKHILL	RS	diffusion tube	100	100	31.8	29.8	25.9	26.37	27
Syon Park Close	RS	diffusion tube	100	100	n/a	n/a	25.4	23.00	23.1
Rugby Road	RS	diffusion tube	100	100	n/a	n/a	31	30.20	30.4
WL/Med center	RS	diffusion tube	100	100	n/a	n/a	n/a	26.10	28
Trent Buidlings	RS	diffusion tube	100	100	n/a	n/a	n/a	36.07	39.9
1 Long acre Bingham	RS	diffusion tube	100	100	n/a	n/a	n/a	26.10	27.2
2 Long acre Bingham	RS	diffusion tube	100	100	n/a	n/a	n/a	37.41	37.1
Sainsbury's ruddington	RS	diffusion tube	100	100	n/a	n/a	n/a	33.04	33.1
1 Highstreet Ruddington	RS	diffusion tube	92	92	n/a	n/a	n/a	30.47	31.5

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

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

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

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

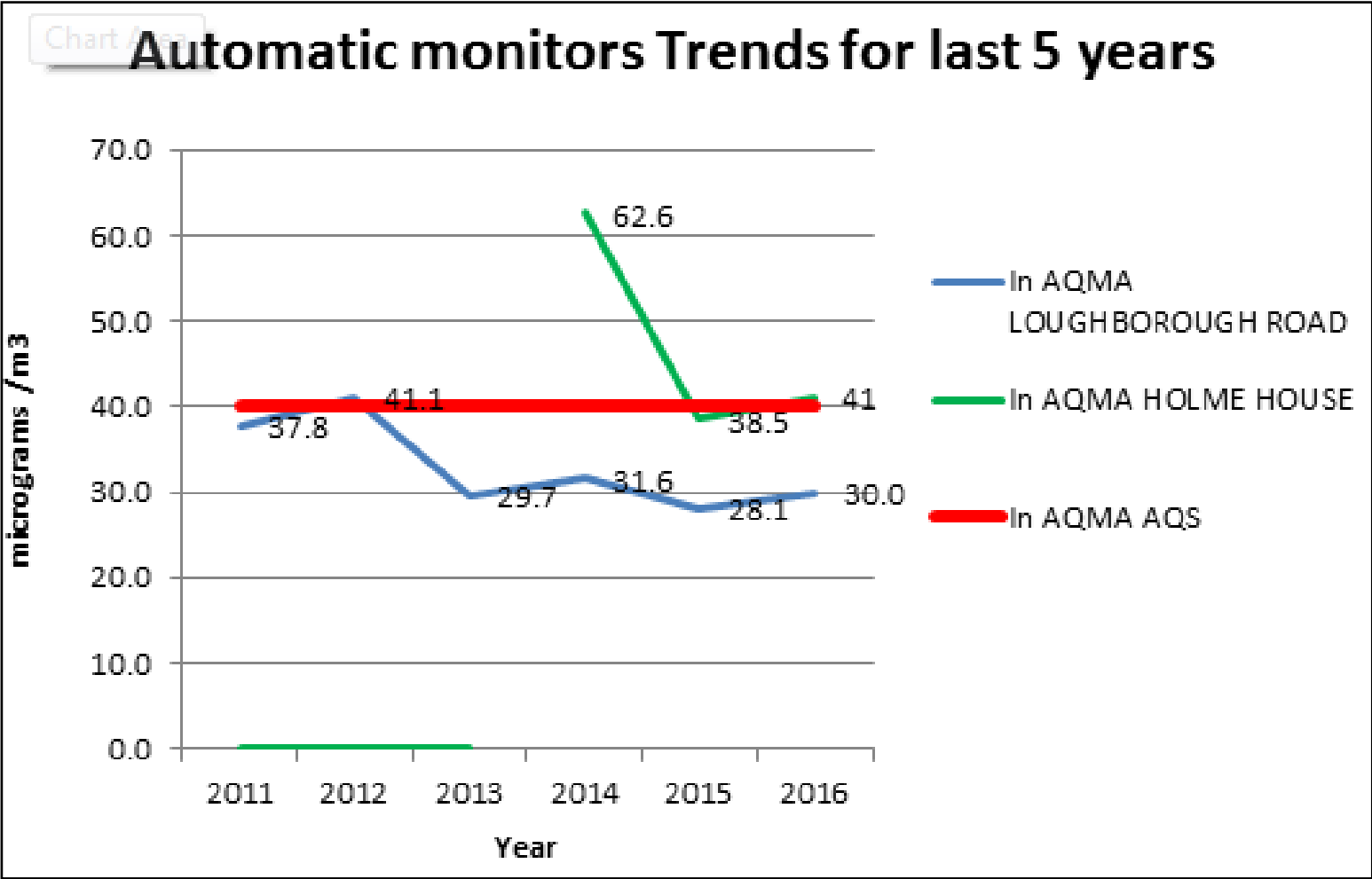
(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Technical Guidance LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

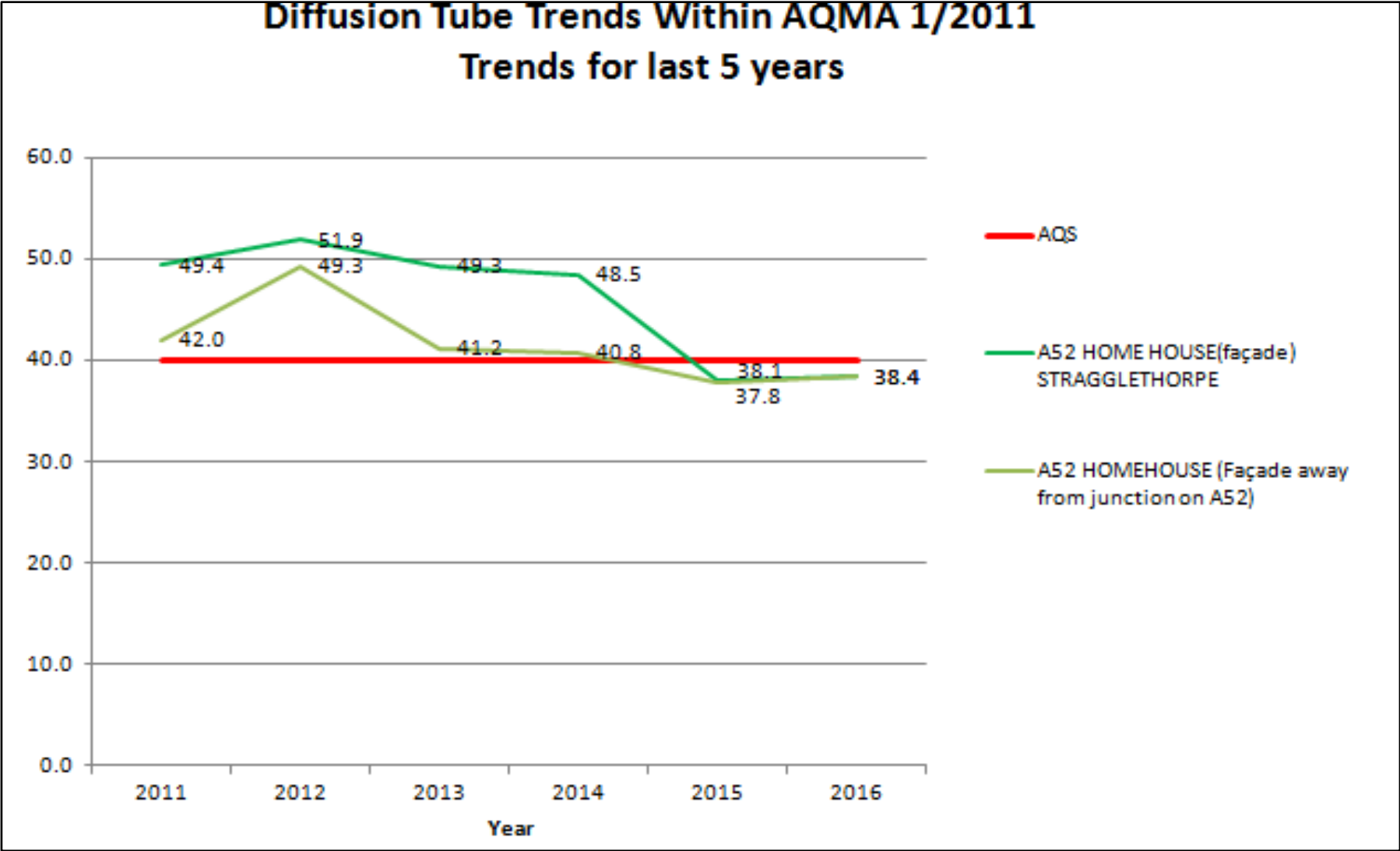
X Diffusion tube data has been bias corrected

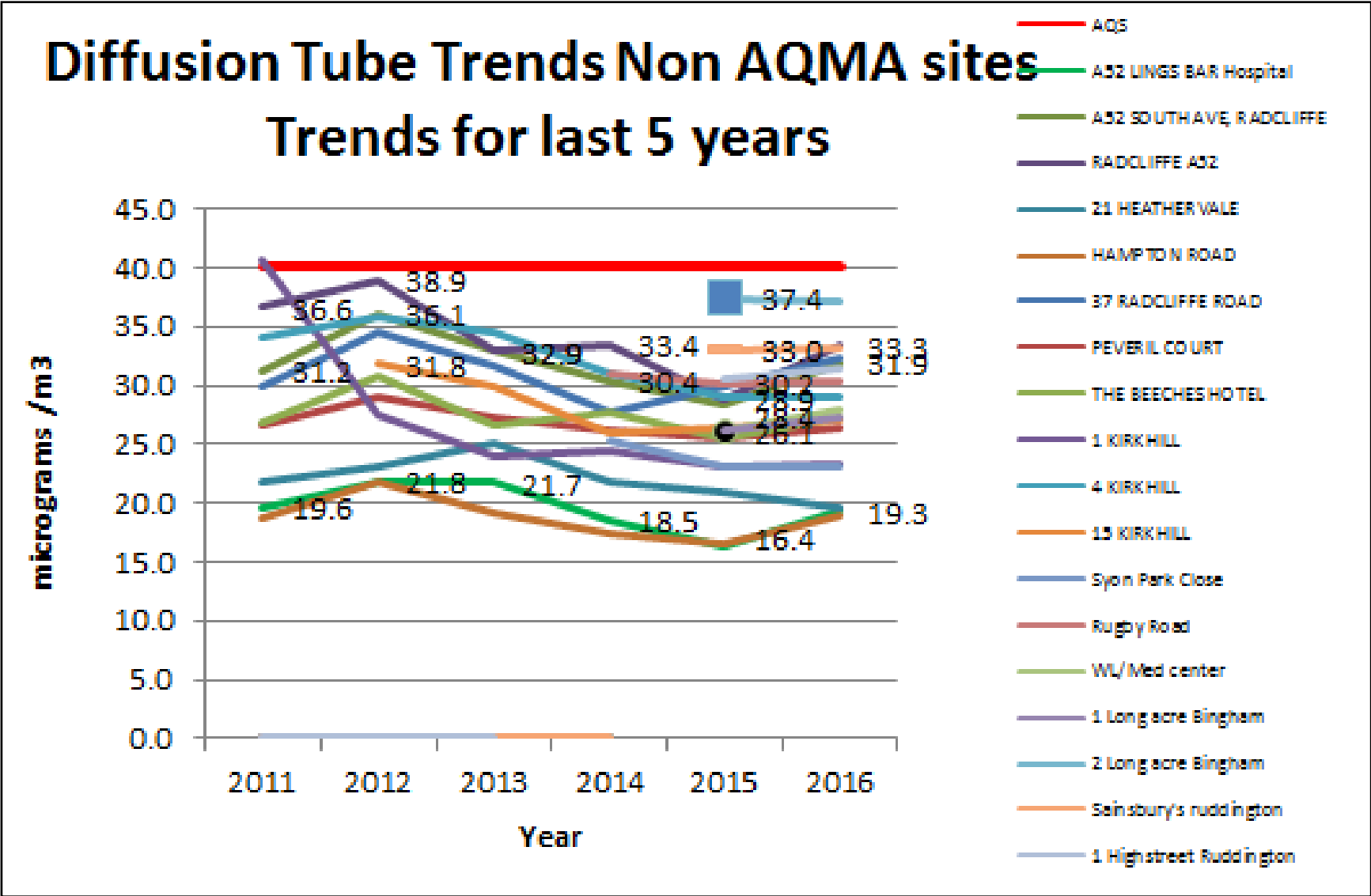
X Annualisation has been conducted where data capture is <75%

X If applicable, all data has been distance corrected for relevant exposure

Figure A.1 – Trends in Annual Mean NO₂ Concentrations







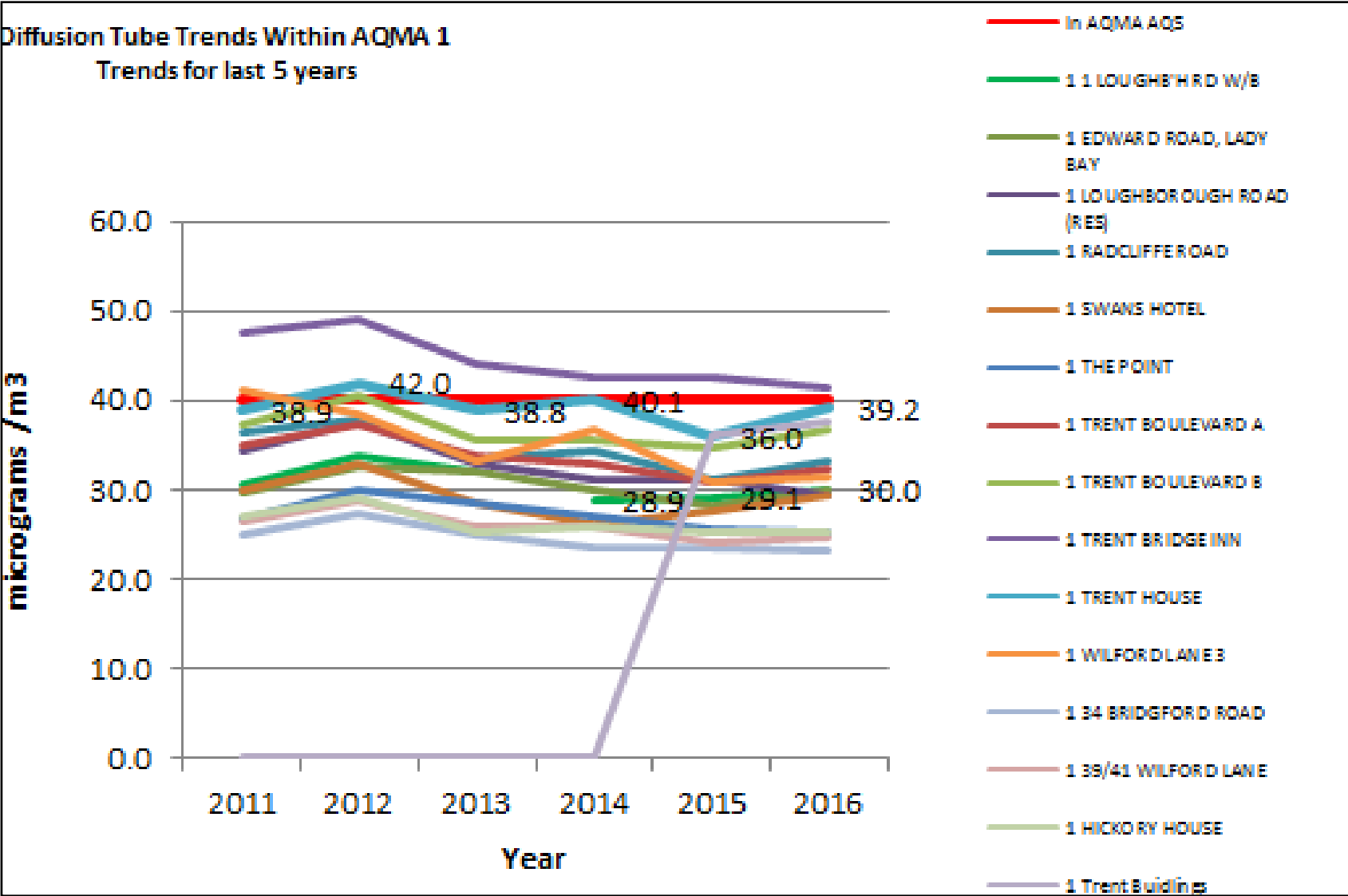


Table A.4 – 1-Hour Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2016 (%) ⁽²⁾	NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾				
					2012	2013	2014	2015	2016
Loughborough Road	Roadside	Automatic	97.8	97.8	0 (136.3µg/m ³)	0 (102.7µg/m ³)	0 (103.6µg/m ³)	0 (110µg/m ³)	0 (117µg/m ³)
Holme House/Stragglethorpe Rad	Road Side/facade	Automatic	99.8	99.8	N/A	N/A	1 (159.5µg/m ³)	0 (117µg/m ³)	0 (159µg/m ³)

Notes:

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

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

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

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

Figure A.4 – Trends in Number of NO₂ 1-Hour Means > 200µg/m³

No trends identified as the number of NO₂ 1 hour means > 200µg/m³ remains 0.

Table A.5 – Annual Mean PM₁₀ Monitoring Results

There are no PM10 monitoring results to report.

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

There are no PM10 monitoring results to report.

Table A.7 – PM_{2.5} Monitoring Results

There are no pm2.5 monitoring results to report.

Table A.8 – SO₂ Monitoring Results

There are no SO₂ monitoring results to report.

Appendix B: Full Monthly Diffusion Tube Results for 2016

Table B.1 – NO₂ Monthly Diffusion Tube Results - 2016

Site ID	NO ₂ Mean Concentrations (µg/m ³)													Annual Mean	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted ⁽¹⁾	
	NA1	32.40	38.68	35.04	29.21	31.91	29.20	25.77	24.27	29.95	29.54	41.94			39.70
NA2	28.47	38.50	35.12	27.60	29.38	26.91	26.84	22.48	28.45	29.77	33.50	40.02	30.59	-	
NA3	34.44	35.91	32.46	28.80	28.26	26.03	25.02	24.75	31.68	26.91	44.27	43.93	31.87	-	
HV	22.78	28.45	25.88	21.24	22.05	19.72	16.11	12.78	3.66	25.84	30.55	28.54	21.47	19.7	
BR	29.53	29.21	27.01	23.60	23.19	18.47	20.31	19.49	22.30	24.27	32.38	33.32	25.26	23.2	
WLR/2	30.22	32.95	30.38	28.51	27.93	26.29	19.56	19.15	23.49	28.27	35.00	37.82	28.30	26	
GLB HOS	21.31	23.71	22.86	20.55	21.22	18.02	11.96	12.46	19.85	24.30	27.42	27.88	20.96	19.3	
A52/SA	32.64	39.64	37.93	33.77	29.31	33.81	25.84	27.88	31.14	38.70	42.80	42.71	34.68	31.9	

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NK	41.36	54.69	49.43	45.11	44.47	47.19	43.99	35.80	46.24	44.56	49.01	61.90	46.98	30.3
CL	35.88	40.28	26.38	29.25	30.96	22.16	28.42	22.30	31.74	24.58	40.31	46.46	31.56	29
HR	37.93	20.76	21.06	17.79	15.06	14.28	13.66	13.24	17.13	18.48	25.87	30.90	20.51	18.9
HH	31.44	32.20	30.51	23.01	23.67	22.56	19.68	18.83	26.26	27.90	32.81	41.09	27.50	25.3
ER	35.60	38.39	30.01	33.64	29.96	29.07	23.00	21.86	30.46	34.80	43.25	40.41	32.54	29.9
LR	31.37	33.88	33.74	31.26	30.51	31.05	25.70	22.66	32.80	31.87	38.12	39.71	31.89	29.3
37RR	39.10	54.55	28.30	28.91	33.12	30.50	21.86	19.33	missing	29.92	39.36	43.86	33.53	32.3
PC	31.29	31.91	29.53	29.40	25.88	24.85	22.79	18.62	29.05	24.14	38.93	37.73	28.68	26.4
A52/RT	39.86	46.76	35.42	35.09	32.29	24.86	30.06	24.61	32.95	30.03	40.49	57.87	35.86	29.2
RR	n/a	36.07	38.72	36.24	35.43	37.18	29.35	25.63	38.24	36.87	40.44	44.13	36.21	33.3
SH	34.51	35.53	37.02	29.46	28.15	28.95	20.83	19.73	27.96	31.92	42.19	45.93	31.85	29.3
BH	31.20	33.68	30.49	27.91	27.18	25.42	24.97	21.24	28.38	29.34	38.63	37.54	29.67	27.3
POINT	31.09	31.59	27.82	26.12	24.69	24.53	20.14	17.32	26.20	30.73	32.20	36.25	27.39	25.2
TBLA	41.88	40.54	33.64	32.20	32.90	26.99	33.97	28.52	32.28	29.74	43.03	46.29	35.17	32.4
TBLB	41.71	44.07	39.01	39.98	38.63	37.37	n/a	28.70	37.59	39.96	46.34	46.71	40.01	36.8
TBI	49.78	45.96	43.02	47.83	45.57	40.44	40.42	36.45	44.03	40.04	54.24	53.63	45.12	41.5
THF	43.74	44.02	39.88	37.00	36.11	38.37	33.87	28.06	38.49	39.26	45.22	53.03	39.75	39.2

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THF2	50.42	47.90	41.29	40.92	40.12	40.27	33.23	28.00	66.79	45.84	47.02	67.19	45.75	-
THF3	46.40	47.60	41.66	43.82	42.19	36.81	30.77	29.31	42.73	44.09	47.83	55.23	42.37	-
WL3	41.16	48.40	42.46	35.38	33.80	32.23	37.23	27.52	43.11	35.54	53.80	53.52	40.35	31.5
WW	40.06	41.68	37.04	30.40	34.95	31.79	n/a	31.32	n/a	n/a	42.34	53.95	38.17	34.6
WW2	41.60	41.22	37.05	30.74	33.48	29.53	38.90	28.94	n/a	n/a	41.06	48.80	37.13	-
A52/HHF1	45.79	46.05	45.45	44.62	43.49	36.84	32.07	27.67	41.09	43.65	43.12	47.69	41.46	38.4
A52/HHF2	41.12	46.17	43.35	45.91	46.04	35.27	31.37	31.53	40.22	43.26	44.98	45.53	41.23	-
A52/HHF3	44.69	45.96	46.66	51.48	45.11	39.68	30.86	30.17	41.90	44.78	43.58	45.63	42.54	-
SR	29.41	37.33	44.22	44.29	22.78	37.26	26.80	27.35	36.40	40.71	35.66	38.19	35.03	32.2
A52/HHF4	44.97	46.67	48.60	46.74	41.84	38.73	46.76	36.13	46.26	39.38	45.23	44.89	43.85	-
1KH	29.97	28.06	29.05	n/a	23.29	23.01	17.68	15.20	26.18	15.30	32.18	38.41	25.30	23.3
4KH	33.75	34.95	32.65	28.46	28.98	30.08	22.18	20.94	34.09	32.77	35.32	44.50	31.56	29
15KHG	29.73	30.82	33.09	27.04	25.68	23.23	25.38	19.60	29.76	26.34	39.58	42.12	29.36	27
SPC	26.05	34.35	27.60	22.40	24.81	25.54	19.79	15.93	27.39	29	36.86	41.14	27.57	23.1
RuRo	35.39	36.38	34.04	31.63	30.83	26.87	22.77	22.23	32.47	34.04	38.82	44.03	32.46	30.4
WL/MedC	46.93	36.89	38.55	38.15	33.26	30.44	26.10	24.39	33.14	36.58	42.7	46.21	36.11	28

Rushcliffe Borough Council

Trent B	46.00	40.72	46.15	45.89	47.03	41.13	33.84	33.56	41.14	44.43	49.5	50.42	43.32	39.9
1 LA	37.76	35.17	35.27	29.22	31.86	25.46	27.69	21.35	31.98	30.84	41.38	43.01	32.58	27.2
2 LA	51.16	42.31	40.21	38.18	37.39	32.49	37.36	27.97	37.67	35.54	47.83	55.52	40.30	37.1
Sains	36.82	37.08	36.96	33.39	37.83	30.49	26.18	21.64	35.26	40.61	47.92	47.83	36	33.1
1 HS	34.92	n/a	31.51	33.73	29.71	29.49	27.7	23.58	32.68	31.96	40.64	42.75	32.61	31.5

(1) See Appendix C for details on bias adjustment

x Local bias adjustment factor used

x National bias adjustment factor used

x Annualisation has been conducted where data capture is <75%

Notes:

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

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

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

(2) Distance corrected to nearest relevant public exposure.

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

Air quality operators

All monitoring and data management is undertaken by fully trained in house employees who have several years experience in air quality monitoring and data management. Any new personnel will undertake appropriate supervised training in line with the service's competency scheme prior to any unsupervised monitoring, calibration or data management. Currently two personnel are trained and competent to undertake such work this includes, Martin Hickey EHO and Peter Anderson, Technical Officer.

Nitrogen Dioxide Diffusion Tube Monitoring

Rushcliffe BC use Gradko diffusion tubes prepared using 20%Triethanolamine (TEA) in water to measure nitrogen dioxide at a number of sites in the borough. The diffusion tubes are stored in an airtight bag in a refrigerator upon receipt in the post and are used within 6 weeks of the preparation date displayed on the label.

Tube batches are exposed at selected sites to the atmosphere for approximately 4 weeks with the changeover date aiming to be +/- 1 day of the publicised diffusion tube change over date for the month to allow comparison with other Local Authority studies if necessary. The locations are reviewed periodically and all tubes are mounted using spacer brackets and grommets supplied through Gradko.

Each tube is labelled with a bar code and unique identification number. Each batch is supplied with a data collection form to record the location, date and time each tube is exposed in that period. The exposure period is calculated using an Excel spread sheet and in addition Gradko recheck the calculated exposure period for each tube on receipt at the laboratory.

On the day of collection, the tubes are sent in an airtight bag to Gradko International Limited for analysis, together with a control blank that is stored unexposed in the sample fridge. The diffusion tubes are analysed within the scope of Gradko International Ltd Laboratory Quality Control Procedures utilising in-house method GLM7. Gradko is a UKAS accredited laboratory and undertakes diffusion tube monitoring on the same basis for a number of other local authorities and Environmental Consultants and now undertakes the monitoring for all local authorities in the Nottinghamshire Pollution Working Group.

Nitrogen dioxide absorbed as nitrite by triethanolamine (TEA) is determined by spectrophotometric measurement at 540 nanometers. Nitrite reacts with an added reagent to form a reddish purple azo dye and the optical density of this complex is measured using a Camspec UV/Visible Spectrophotometer. The concentrations of nitrogen dioxide are then calculated from a pre-calibrated response factor and exposure times. The values are not blank corrected using the blank "control" diffusion tube provided by Rushcliffe Borough Council.

Rushcliffe Borough Council

The accuracy of the measurements made by Gradko are also monitored by participation in an external laboratory measurement proficiency scheme, the 'Workplace Analysis Scheme for Proficiency' (WASP), implemented by the Health and Safety Laboratory, Sheffield. The results of the WASP analysis are shown below. Gradko scored 100% in 2015. See [http://laqm.defra.gov.uk/documents/LAQM-WASP-Rounds-121--124-and-AIR-PT-Rounds-1-3-4-6-\(April-2013--February-2015\)-NO2-report.pdf](http://laqm.defra.gov.uk/documents/LAQM-WASP-Rounds-121--124-and-AIR-PT-Rounds-1-3-4-6-(April-2013--February-2015)-NO2-report.pdf)

Data ratification

All diffusion tube data is checked on a monthly basis to identify any spurious data and compared with other local monitoring sites to further identify any suspect data. Diffusion tube monitoring data reported in this document have been ratified and bias adjusted using the correction factor as stated which is either derived from the most up to date national bias factor.

NOx Continuous Analysers

Description of Analyser

The NOx continuous analyser is located at the façade of 43 Loughborough Road, West Bridgford and is a permanent site. The site is non residential but provides a good assessment of NO₂/NO_x close to the main road along the building line. It is a ML9841B single chamber Chemiluminescence analyser and is approved by TUV, US EPA and NETCEN. A second analyser was installed in a Kaizen enclosure in early 2014 to the AQMA4 location at the A52/Stragglethorpe Road junction.

The analysers have a resolution of 0.001ppm and a reported lower detectable limit of <0.5ppb. The linearity error of the analyser is $\pm 1\%$ of the full scale (from best line fit), and the precision is 0.5ppb or 1% of concentration reading (whichever is the greater).

Instruments Checks and Calibration of the Analyser

Daily automatic calibration

Zero air is generated by passing air through scrubbers and passed through the reaction cell. Span gas is generated by a permeation tube and passed to the reaction chamber to give the span calibration response. The daily automatic calibrations are used as a check on the instrument performance and drift.

Analyser inspection and manual calibration

The analysers were covered by a service and maintenance contract which is now with ET. The service and maintenance contract covers calibration checks, flow and leak checks, cleaning of components, analyser diagnostic checks, replacement of faulty components and consumables and fault call out.

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Manual calibration checks are carried out by RBC staff on a fortnightly basis using scrubbed zero air derived from the integrated scrubber column and a certificated NO/NO_x calibration gas is supplied by BOC Gases. The BOC gas is changed when the certification expires.

The analyser is taken out of service and the inlet filter is changed prior to connecting the calibration gases. The zero air and NO/NO_x gases are run through the analyser and the responses noted together with the instrument gain factor. The output of the analyser (e.g. the gain) is only reset or altered following equipment service or repair or if drift occurs necessitating a change of the gain setting. The calibration zero values, span values and gas certified values are used to rescale the raw data received from the analyser using a proprietary software package, Envista.

Data Handling and Ratification

Data handling

From early 2016 the data handling has been contracted to Geoff Broughton of Air Quality Data Management (AQDM) who is working closely with Envitec who provides the software platform for the data. See <http://www.aqdm.co.uk/>. Fortnightly data calibration checks are undertaken by RBC officers and this information is used by AQDM to scale and validate the data.

However, for 2015 the data handling is as per previous years data handling procedure which is: Raw data is downloaded via a modem connection automatically every 24hours into the Envista Arm remote server database. This data can be viewed by all the Nottinghamshire Local Authorities who are part of the network; however, only data can be manipulated in the database that belongs to the respective LA. Data is currently being maintained under contract by the software supplier Envitec – Europe and hosted by Nottingham City Council, and data integrity and security is part of this contract arrangement. In addition the data, both raw and ratified is published on the following air quality web page <http://www.nottinghamaqm.net/Default.htm>

Data is downloaded in PPB and µgm-3 and visually inspected for negative values, missing data sets and spurious results.

Initial scaling factors are determined for NO and NO_x using the following formulas based on the fortnightly calibration checks.

$$\text{Scaling Factor "A"} = \frac{\text{Expected (Known) Cylinder Concentration}}{\text{Measured Concentration} - \text{Measured Zero}}$$

$$\text{Scaling Factor "B"} = \quad - \text{Measured Zero Value}$$

To rescale the NO value the “A” scaling factor for the fortnightly period in question is multiplied to each 15 minute data set for NO in the database (on the PPB channel). Subsequently the “B” scaling factor is added to the same period of data to address any zero drift noted at the calibration check.

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If any zero values, negative values are still present the data block is further rescaled to remove any zero values. Any values added to the NO channel are applied to the NO_x channel. This ensures no change in the NO₂ outcome.

The same procedure is then carried out with the NO_x data using calculated “A” and “B” factors for NO_x over the same periods.

To calculate the rescaled NO₂ 15 min values a calculation is then run on the PPB data base using the following equation:

NO₂ concentration (PPB) = NO_x concentration (PPB) - NO concentration. (PPB)

These calculations are undertaken in PPB before any conversion to micrograms. NO₂ and NO_x are converted to µgm-3 by a conversion factor of 1.91. NO is converted to µgm-3 by a conversion factor of 1.25.

Once data on the PPB channels is determined to be satisfactory the µgm-3 channels are re-calculated from the PPB channels to enable analysis in micrograms.

Data ratification

All raw data is examined for consistency and the existence of any spurious results. Negative values are examined and either removed or rescaled further and high values are interrogated to see if the readings are consistent with expectations or an equipment error may have occurred. Data, during calibration checks is automatically excluded from the database by a software service switch on the instrument panel which is used during calibration checks.

If any doubts exist as to the satisfactory status of any data the data is excluded from the data base calculations, although the Envista Arm software allows the data to remain in the database and marked as ‘not used’ enabling recovery of any excluded data should that be considered necessary. Each data set that is excluded must have annotated against it a reason for the data exclusion to allow for traceability of data ratification. The most common reason for data being excluded is monitor breakdown leading to consistently low or very high readings. However, power failure can also be a cause as well as any specific events noted by officers during visits, e.g. trucks being run next to the monitor for maintenance of the building façade or similar.

Information from the other analysers on the system can also be accessed to compare any data that may be experiencing high or low readings to enable a decision to be made on the status of any data highlighted. This includes the AURN monitors operated by the Nottingham City.

Envista has built in reports that enable a number of parameters to be determined on the ratified or raw datasets as required. Three new channels were added to the data base to enable display of the results directly in µgm-3. Data ratification and recalculation will take place on the ppb channels as described above with final data being calculated from these ppb channels and converted using the published conversion factors in TG (09).

Discussion of Choice of Factor to Use

Whilst we had the option to use either own Local factor derived from co-location studies with the NOx analyser or the National Bias Adjustment Factor, due to the fact that there were data quality issues with previous years data and data capture has been generally below the 90% recommended in TG(16) Box 7.11 the national factor has been used for diffusion tube bias adjustment. Also the site is not typical of the locations in the diffusion tube study. Also the previous R&A reports have mostly used the national factor and continuing to use this factor will provide a consistent approach to bias adjustment year on year.

The bias factor used in this report is 0.92. This is derived from the national bias figure for Gradko tubes, 20% TEA in water as shown in the screen clipping below.

National Diffusion Tube Bias Adjustment Factor Spreadsheet						Spreadsheet Version Number: 06/17					
Follow the steps below in the correct order to show the results of relevant co-location studies										This spreadsheet will be updated at the end of September 2017	
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods										Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet	
This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.										LAQM Helpdesk Website	
The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.						Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.					
Step 1:		Step 2:		Step 3:		Step 4:					
Select the Laboratory that Analyses Your Tubes from the Drop-Down List		SELECT A Preparation Method from the Drop-Down List		SELECT A Year from the Drop-Down List		Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor shown in blue at the foot of the final column.					
If laboratory is not chosen, we have no data for this laboratory.		If preparation method is not chosen, we have no data for this method at this laboratory.		If year is not chosen, we have no data.		If you have your own co-location study then see footnote 1. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327353					
Analysed By ¹	Method ²	Year ³	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m ³)	Automatic Monitor Mean Conc. (Cm) (µg/m ³)	Bias (B)	Tube Precision ⁴	Bias Adjustment Factor (A) (Cm/Dm)	
Gradko	20% TEA in water	2016	R	Gateshead Council	12	29	26	10.5%	G	0.90	
Gradko	20% TEA in water	2016	R	Gateshead Council	11	35	37	-6.0%	G	1.06	
Gradko	20% TEA in water	2016	R	Gateshead Council	12	37	31	19.0%	G	0.84	
Gradko	20% TEA in water	2016	R	Wokingham Borough Council	11	45	41	9.0%	G	0.92	
Gradko	20% TEA in water	2016	R	Wokingham Borough Council	11	37	34	9.5%	G	0.91	
Gradko	20% TEA in water	2016	R	Cheshire West and Chester	12	37	39	-5.3%	G	1.06	
Gradko	20% TEA in water	2016	R	Thurrock Borough Council	12	29	26	11.0%	G	0.90	
Gradko	20% TEA in water	2016	R	Borough Council of King's Lynn & West Norfolk	11	30	25	18.2%	G	0.85	
Gradko	20% TEA in water	2016	UB	Eastleigh Borough Council	11	29	30	-4.7%	G	1.05	
Gradko	20% TEA in water	2016	R	Eastleigh Borough Council	12	44	42	2.9%	G	0.97	
Gradko	20% TEA in water	2016	R	Brighton & Hove City Council	12	52	48	8.8%	G	0.92	
Gradko	20% TEA in water	2016	R	Eastleigh Borough Council	11	29	37	-22.0%	G	1.28	
Gradko	20% TEA in water	2016	KS	Marglebone Flood Intercomparison	12	99	79	25.2%	G	0.80	
Gradko	20% TEA in water	2016	R	Monmouthshire County Council	11	39	34	16.6%	G	0.86	
Gradko	20% TEA in water	2016	R	Preston City Council	10	30	27	10.0%	G	0.91	
Gradko	20% TEA in water	2016	R	Dudley MBC	12	37	34	11.0%	G	0.90	
Gradko	20% TEA in water	2016	UB	Dudley MBC	12	26	22	18.6%	G	0.84	
Gradko	20% TEA in water	2016	R	Dudley MBC	11	43	38	12.4%	G	0.89	
Gradko	20% TEA in water	2016	R	Dudley MBC	12	51	54	-5.8%	G	1.06	
Gradko	20% TEA in water	2016	B	LB Waltham Forest	12	31	30	2.3%	G	0.98	
Gradko	20% TEA in water	2016	R	NOTTINGHAM CITY COUNCIL	12	37	39	-5.4%	G	1.06	
Gradko	20% TEA in water	2016	R	LB Hounslow	9	75	58	28.0%	G	0.78	
Gradko	20% TEA in water	2016	UB	LB Hounslow	9	33	33	0.1%	G	1.00	
Gradko	20% TEA in water	2016	R	Lisburn & Castlereagh City Council	12	39	26	46.4%	G	0.68	
Gradko	20% TEA in water	2016	B	Pembrokeshire Council	11	4	3	27.5%	G	0.78	
Gradko	20% TEA in water	2016	R	Cheltenham Borough Council	11	32	32	-0.3%	G	1.01	
Gradko	20% TEA in water	2016	R	Lancaster City Council	11	33	32	2.8%	G	0.97	
Gradko	20% TEA in water	2016		Overall Factor⁵ (27 studies)					Use	0.92	

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

Figure 1 Detailed Map of AQMA 1 Boundaries

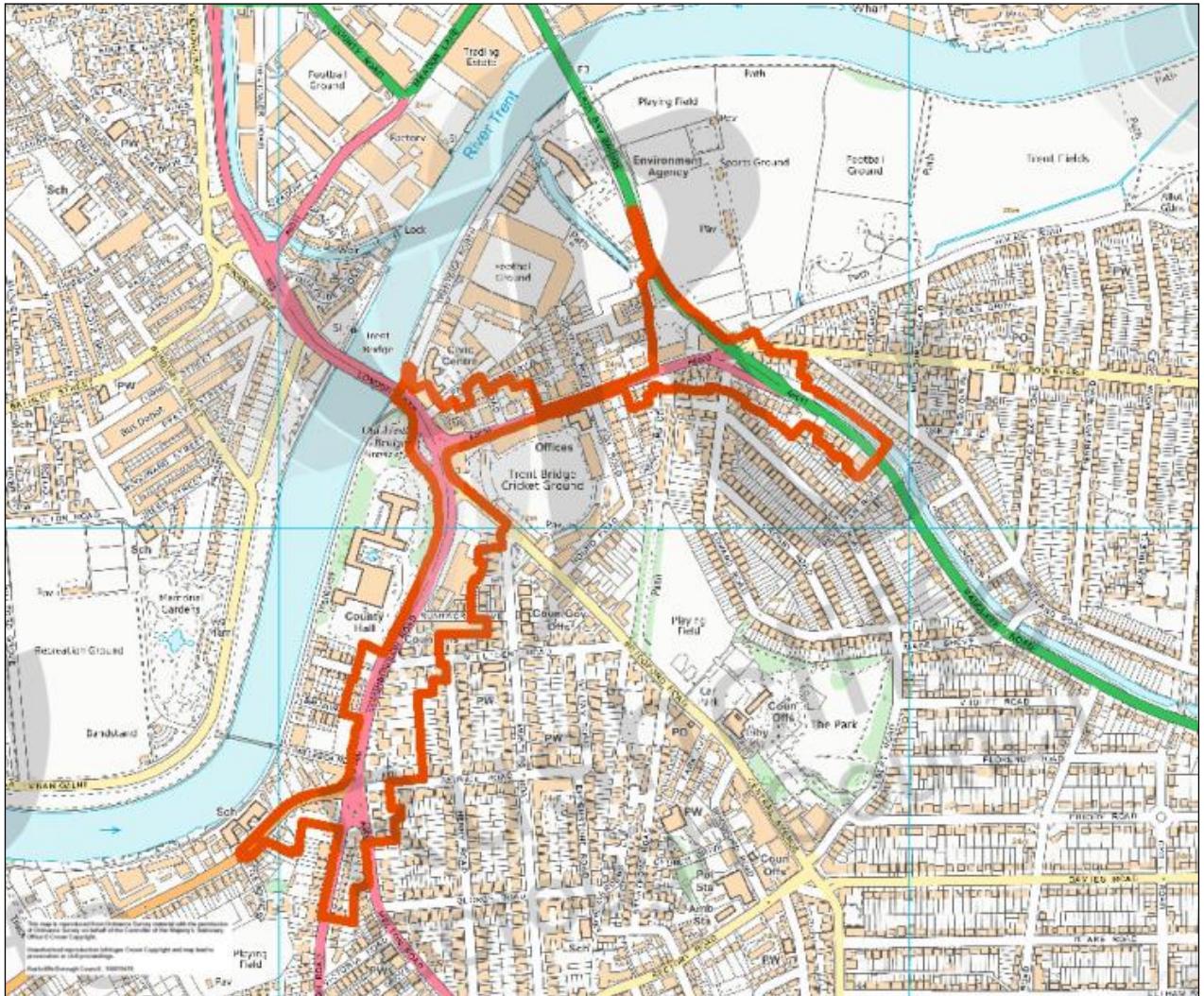


Figure 2 Map of AQMA1/2011 Boundaries



Figure 3 – Map of Automatic Monitoring Site, Loughborough Road

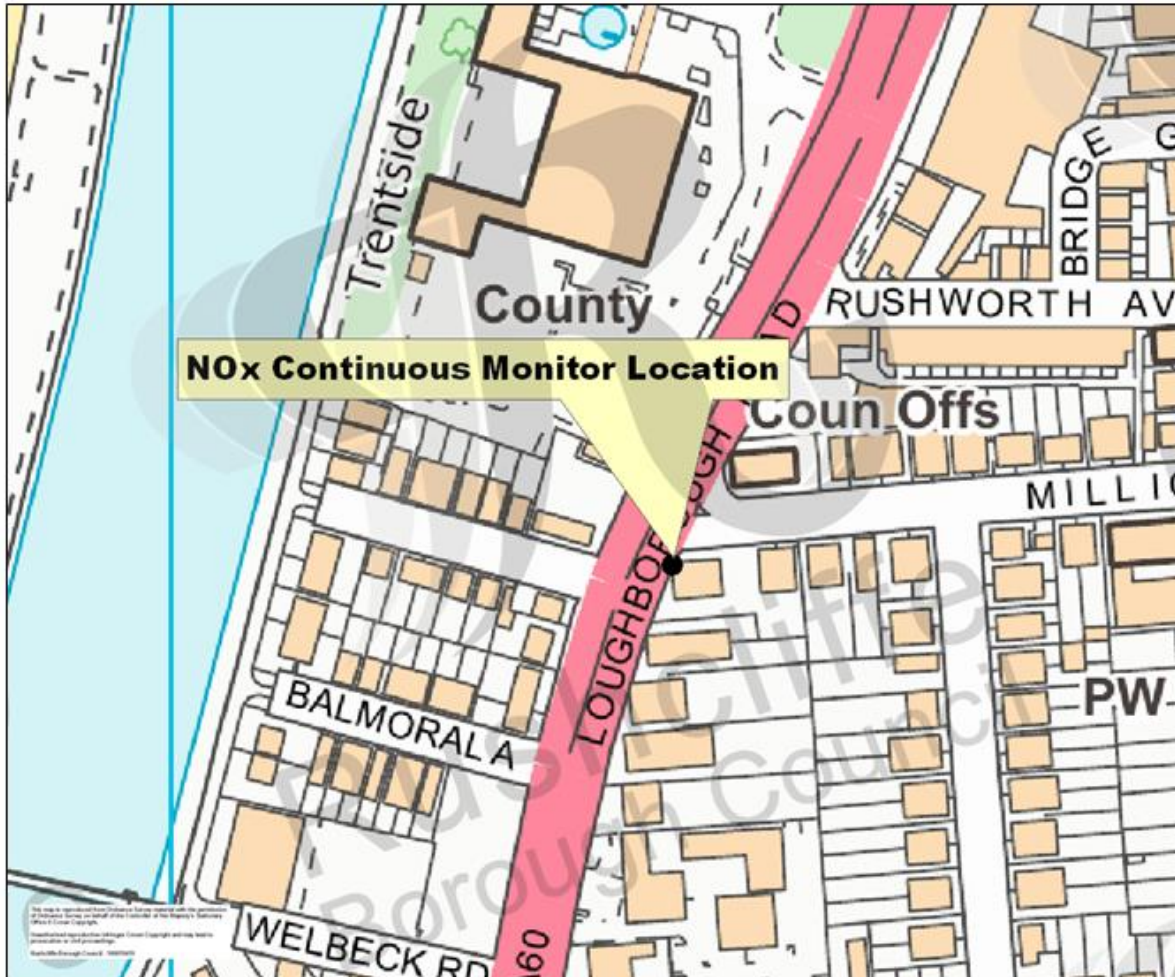


Figure 4 – Photograph of NOx Analyser, Loughborough Road



Figure 5 Map of Automatic Monitoring Site Nox Analyser A52/Stragglethorpe Junction

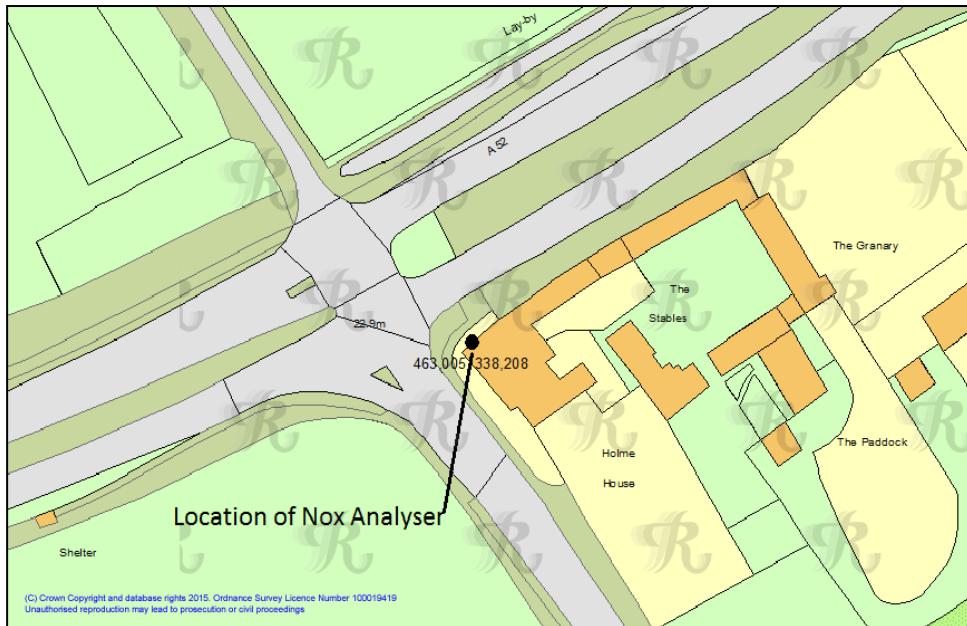


Figure 6 Photographs of the NOX analyser and triplicate diff tube location at the A52/Stragglethorpe Junction



Figure 7 AQMA1 Diffusion Tube locations Loughborough Road West Bridgford

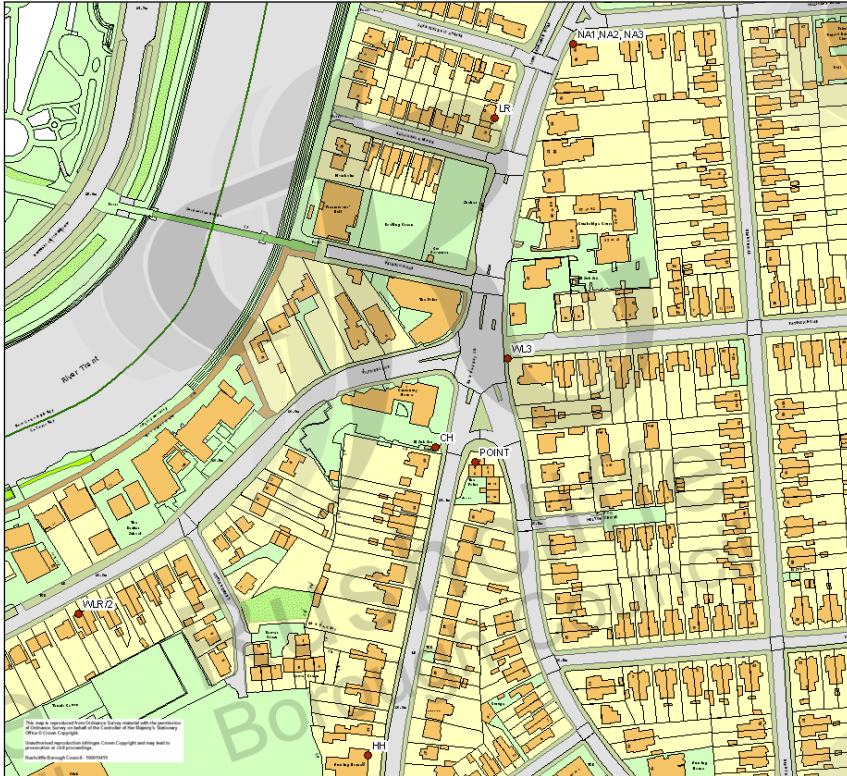


Figure 8 Diffusion Tube Locations Wilford Lane West Bridgford

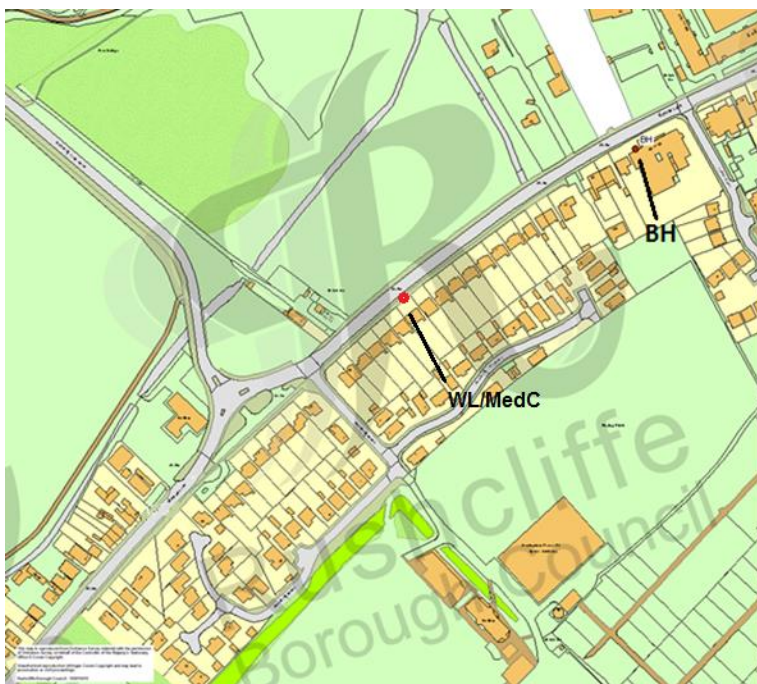


Figure 9 Diffusion Tube Location Rugby Road West Bridgford

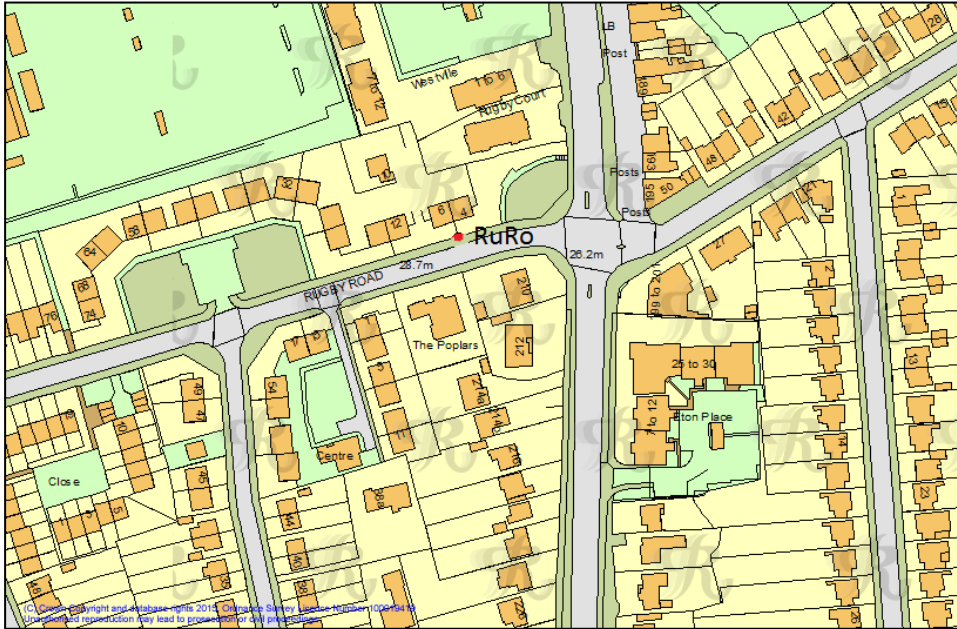


Figure 10 Diffusion Tube Location Syon Park, off Rugby Road West Bridgford



Figure 11 Diffusion Tube Location Heathervale West Bridgford

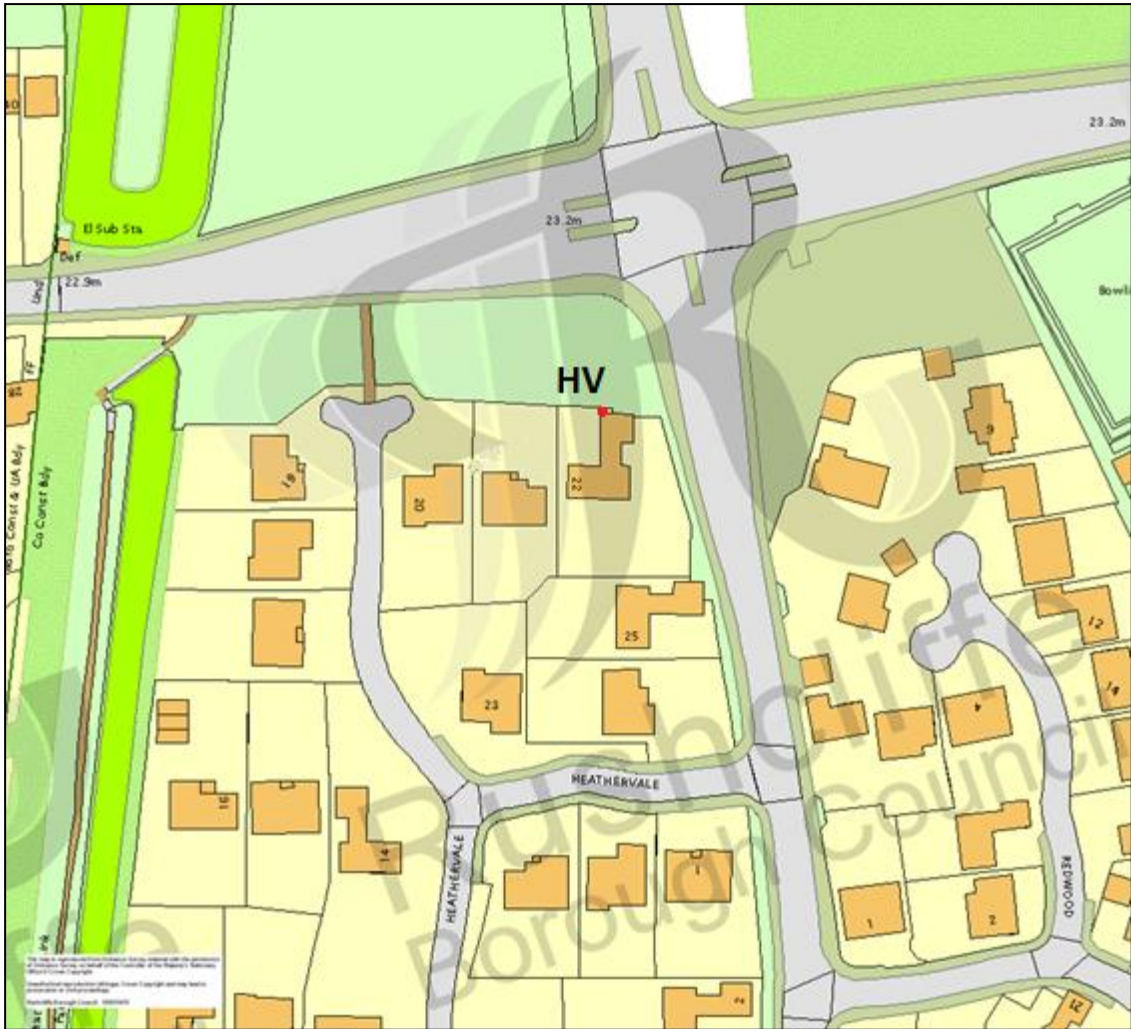


Figure 12 Diffusion Tube locations AQMA1 Radcliffe Road West Bridgford

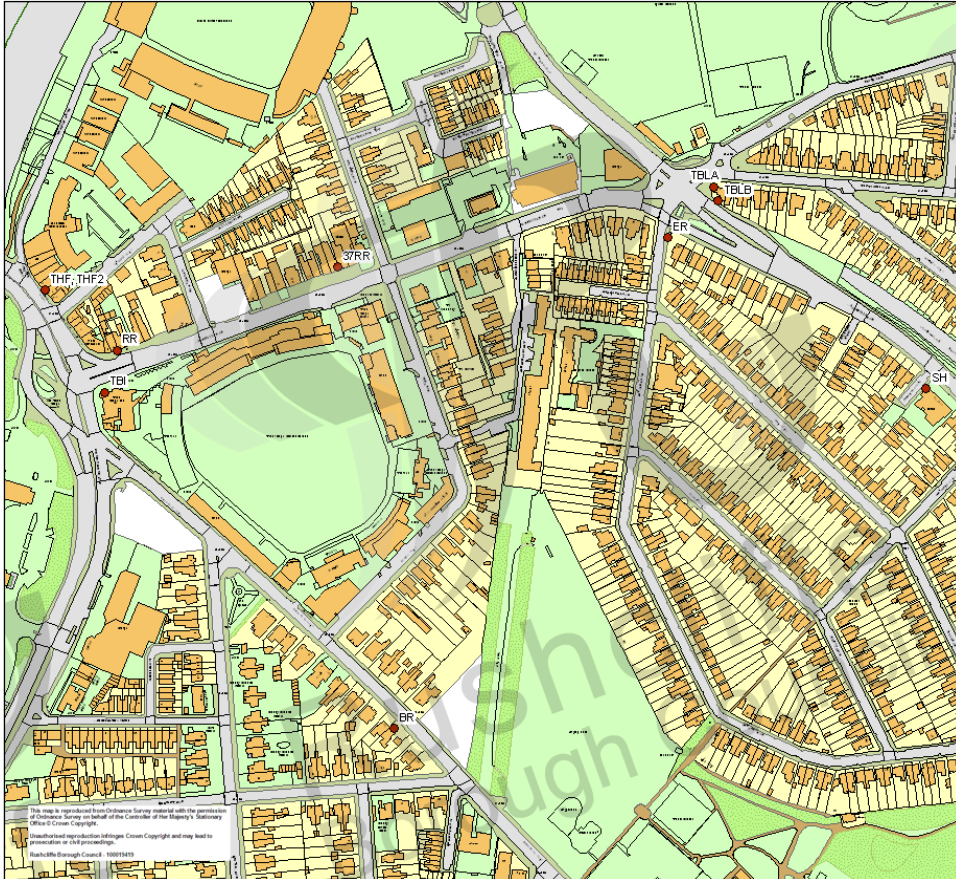


Figure 13 Diffusion Tube locations AQMA1 Close up of Radcliffe Road/THF West Bridgford



Figure 14 Diffusion Tube Locations AQMA 2

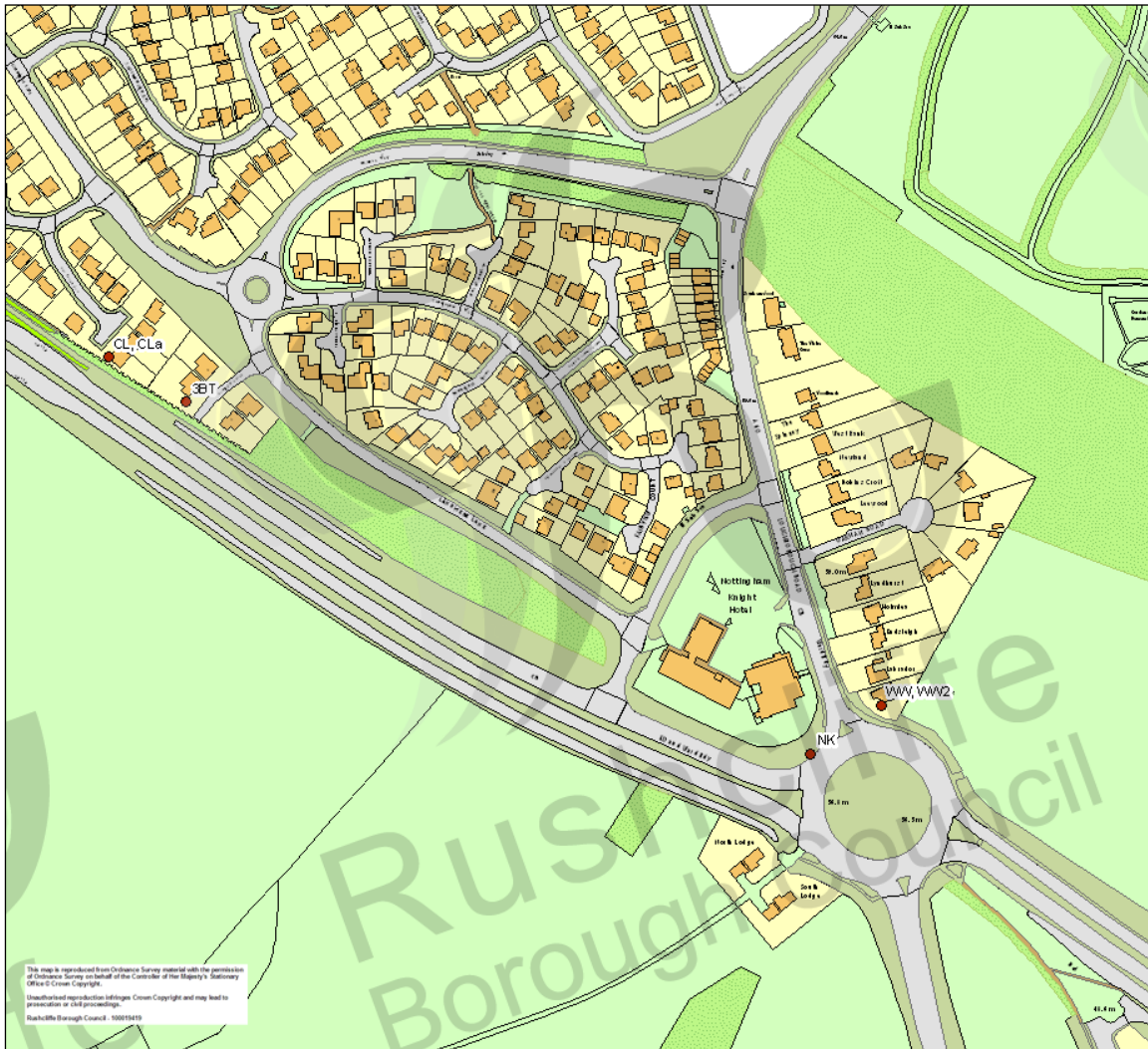


Figure 16 Diffusion Tube Location Lings Bar Gamston

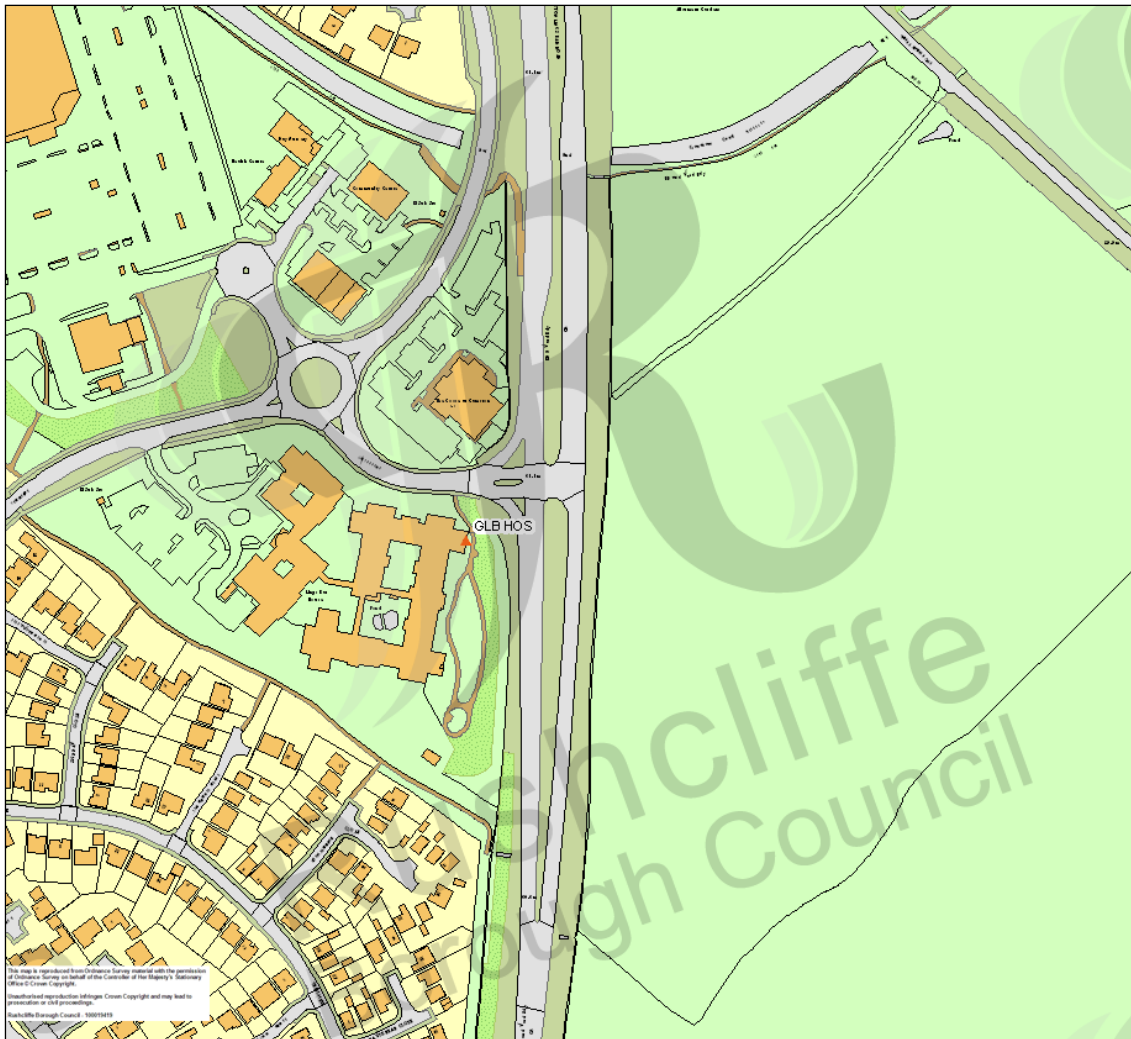


Figure 17 Diffusion Tube Location Hampton Road West Bridgford (Background Site)

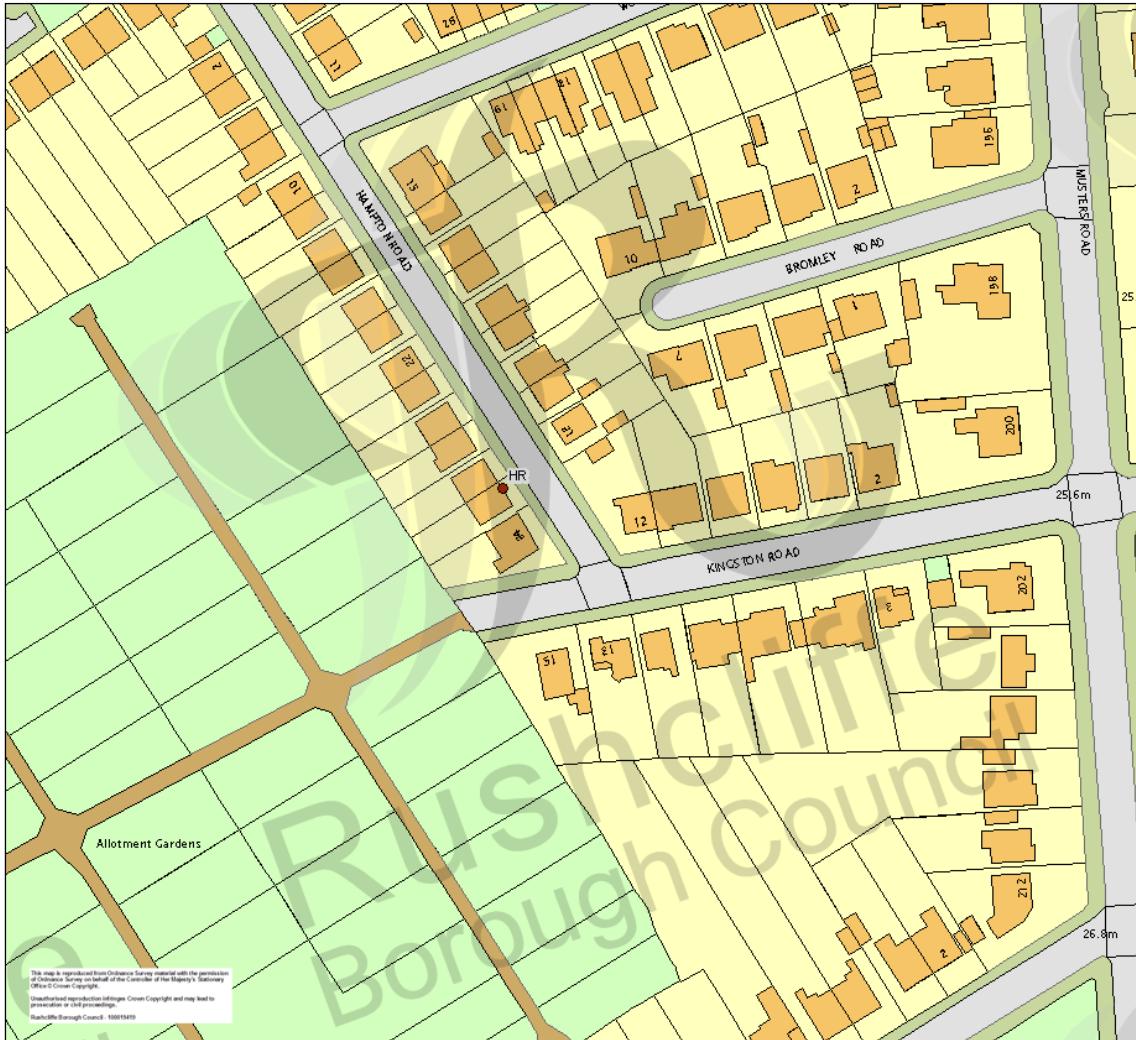


Figure 18 Diffusion Tube Location A52 Radcliffe on Trent

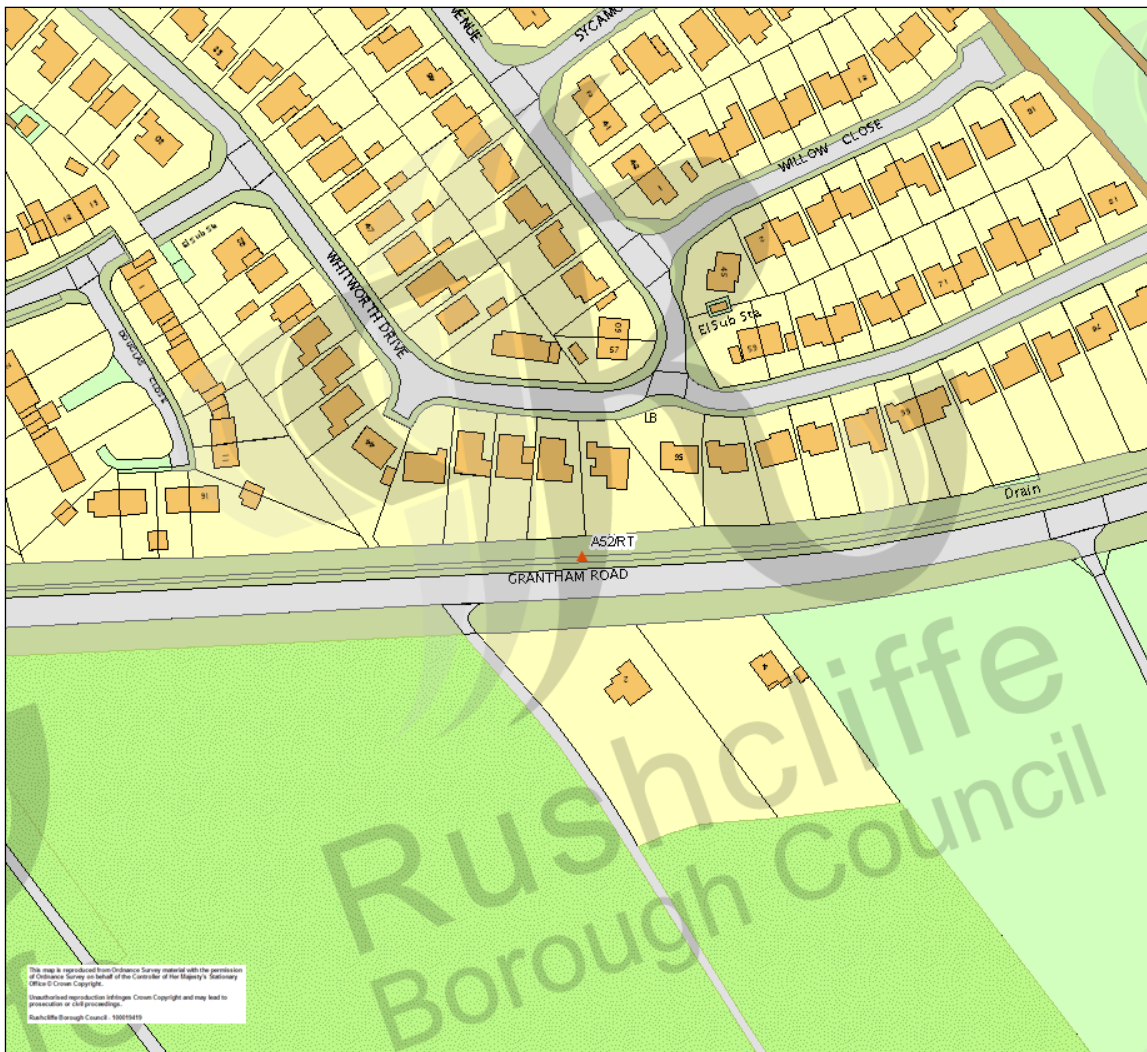


Figure 20 Diffusion Tube location, Kirkhill, Bingham



Figure 21 Diffusion Tube Location A52 Radcliffe on Trent junction with Stragglethorpe Road (AQMA 2011/1 AKA AQMA4)

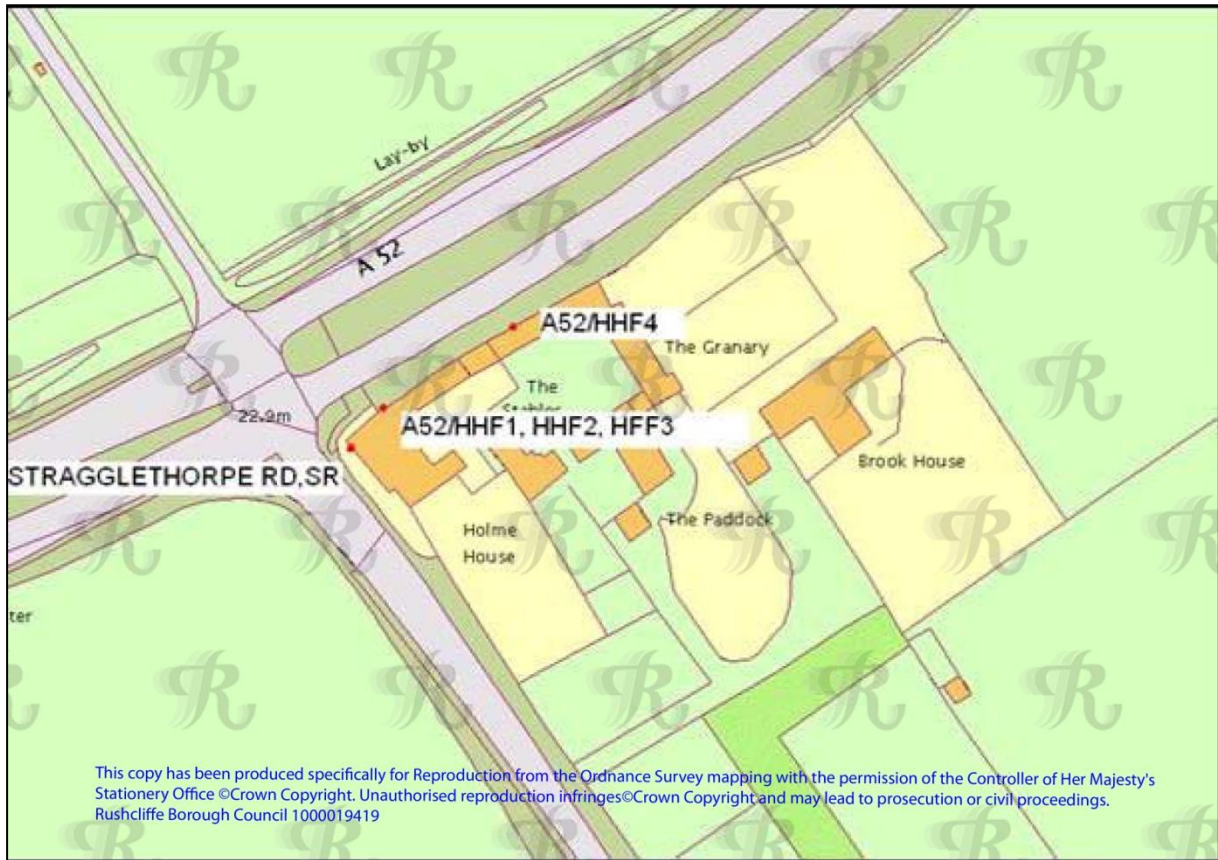
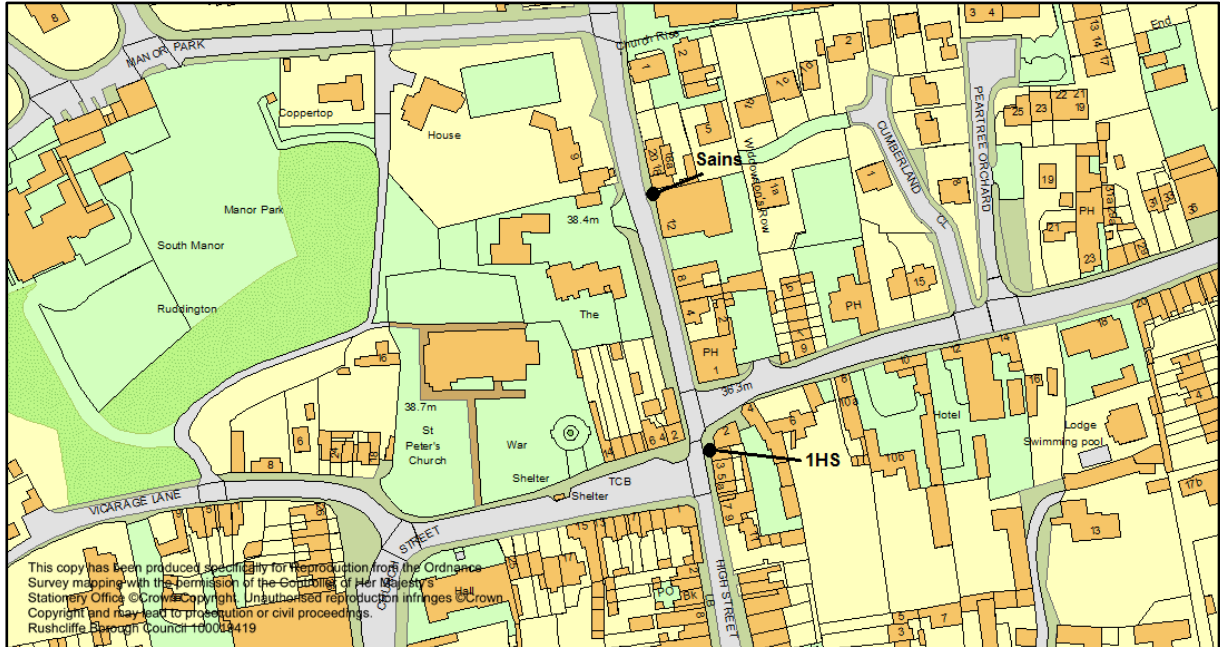


Figure 22 - Diffusion Tube Location 1LA and 2 LA (Long Acre Bingham)



Figure 23 - Diffusion Tube Location Sains and 1 HS Ruddington (Sainsbury's store and 1 High Street)



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

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

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

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

Highways Agency's Design Manual for Roads and Bridges (DMRB), Volume 11, Section 3, Part 1 Air Quality, May 2007, and accompanying spreadsheet DMRB Screening Method V1,03.xls. July 2007

Local Air Quality Management Technical Guidance LAQM.TG(16). 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland

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Local Air Quality Management Updating and Screening Assessment Report 2009 Rushcliffe Borough Council

Local Air Quality Management, Progress with AQAP Report 2009 Rushcliffe Borough Council

Local Air Quality Management, Annual Progress Report 2007 Rushcliffe Borough Council

Rushcliffe Borough Council 2007, Local Air Quality Management Air Quality Action Plan 2007

Rushcliffe Borough Council 2010, Local Air Quality Management update of Air Quality Action Plan 2007,

LDF, Local Development Framework

Local Transport Plan for Nottingham, 2006-2011, Nottinghamshire County Council

LTP3, 3rd Local Transport Plan for Nottingham, 20011-2026, Nottinghamshire County Council

Congestion Delivery Plan, Nottinghamshire County Council 2007

Air Quality Considerations for Developers, Rushcliffe Borough Council, 2010

GLM7, Gradko Laboratories NO2 Laboratory Method

BSEN 123412, EC reference Method, British Standard

MDHS 14/2, General methods for the sampling and gravimetric analysis of respirable and total inhalable dust, HSE

Policy G1, Non statutory Local Plan, Rushcliffe Borough Council

PPG 13, planning policy guidance 13, transport, Communities and Local Government (formerly OPDM)

PPS 23, Planning policy statement 23, Planning and pollution control, Communities and Local Government (formerly OPDM)

Policy 36 East Midlands Regional Plan, East Midlands Regional Assembly, 2006

LDF, Local Development Framework, Rushcliffe Development Framework - Core Strategy Option for Consultation. (Consultation document)

'Updating and screening assessments' and 'progress reports' for all years, Rushcliffe Borough Council published documents are available from www.Rushcliffe.gov.uk. Air quality reports are located on page <http://www.rushcliffe.gov.uk/environmentalhealth/pollution/airquality/>