



***North Kesteven District Council
Annual Status Report 2021***

Bureau Veritas

December 2021



Move Forward with Confidence


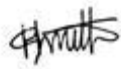


Document Control Sheet

Identification	
Client	North Kesteven District Council
Document Title	North Kesteven 2021 Annual Status Report
Bureau Veritas Ref No.	10807329/UK/v2.0

Contact Details		
Company Name	Bureau Veritas UK Limited	North Kesteven District Council
Contact Name	Hannah Smith	Ayeisha Kirkham
Position	Principle Consultant	Environmental Protection Team Manager
Address	66 Prescott Street, Whitechapel, London E1 8HG	1 Kesteven Street Sleaford Lincolnshire NG34 7EF

Configuration				
Version	Date	Author	Reason for Issue/Summary of Changes	Status
1.0	02/07/2021	R Spencer / A Smith	Draft for comment	Draft
2.0	16/12/2021	A Smith	Update following appraisal	Final

	Name	Job Title	Signature
Prepared By	A Smith	Graduate Consultant	
Reviewed By	H Smith	Principal Consultant	

Commercial In Confidence

© Bureau Veritas UK Limited

The copyright in this work is vested in Bureau Veritas UK Limited, and the information contained herein is confidential. This work, either in whole or in part, may not be reproduced or disclosed to others or used for any purpose, other than for internal client evaluation, without Bureau Veritas' prior written approval.

Bureau Veritas UK Limited, Registered in England & Wales, Company Number: 01758622
Registered Office: Suite 206 Fort Dunlop, Fort Parkway, Birmingham B24 9FD

Disclaimer

This Report was completed by Bureau Veritas on the basis of a defined programme of work and terms and conditions agreed with the Client. Bureau Veritas confirms that in preparing this Report it has exercised all reasonable skill and care taking into account the project objectives, the agreed scope of works, prevailing site conditions and the degree of manpower and resources allocated to the project.

Bureau Veritas accepts no responsibility to any parties whatsoever, following the issue of the Report, for any matters arising outside the agreed scope of the works.

This Report is issued in confidence to the Client and Bureau Veritas has no responsibility to any third parties to whom this Report may be circulated, in part or in full, and any such parties rely on the contents of the report solely at their own risk.

Unless specifically assigned or transferred within the terms of the agreement, the consultant asserts and retains all Copyright, and other Intellectual Property Rights, in and over the Report and its contents.

Any questions or matters arising from this Report should be addressed in the first instance to the Project Manager.

Bureau Veritas UK Limited

Telephone: +44 (0) 207 6610700

Registered Office

5th Floor, 66 Prescott Street

Fax: +44 (0) 207 6610741

Suite 206 Fort Dunlop

London

Registered in England 1758622

Fort Parkway

E1 8HA

www.bureauveritas.co.uk

Birmingham B24 9FD



2021 Air Quality Annual Status Report (ASR)

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

Date: December, 2021

Bureau Veritas UK Limited
5th Floor, 66 Prescott Street
London
E1 8HA

Telephone: +44 (0) 207 6610700
Fax: +44 (0) 207 6610741
Registered in England 1758622
www.bureauveritas.co.uk

Registered Office
Suite 206 Fort Dunlop
Fort Parkway
Birmingham B24 9FD

Information	North Kesteven Details
Local Authority Officer	Bohdan Dawyd
Department	Environmental Health
Address	1 Kesteven Street Sleaford Lincolnshire NG34 7EF
Telephone	01529 414155
E-mail	ehteam@n-kesteven.gov.uk
Report Reference Number	2021 Annual Status Report
Date	December 2021

Executive Summary: Air Quality in Our Area

Air Quality in North Kesteven

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, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas^{1,2}.

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages³, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017⁴.

The main source of air pollution within North Kesteven is road traffic emissions from the expansive road network across the District; notably the A15, A17 and the A46. In addition, there are over 40 industrial processes located within the District that are permitted under the Environmental Permitting (England and Wales) Regulations 2010⁵.

Historically, air quality within North Kesteven has consistently complied with the UK Air Quality Standard (AQS) objectives. Over the past five years there have been no exceedances of the annual mean NO₂ AQS objective. With continued levels of development being experienced across the District, an emphasis on air quality is important to ensure areas of poor air quality are identified and acted upon. Across the District air quality continues to be assessed through the monitoring network whereby any areas of poor air quality would be identified.

¹ Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

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

³ Defra. Air quality appraisal: damage cost guidance, July 2020

⁴ Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

⁵ <https://www.gov.uk/government/publications/environmental-permitting-guidance-core-guidance--2>

2020 monitoring data has shown that compliance continues to be achieved, with the maximum reported annual mean NO₂ concentration being 28.5µg/m³ reported at the Camwick monitoring location.

Due to the consistent compliance of the AQS objective across the district, no Air Quality Management Areas (AQMAs) have been declared and therefore the council has not published an Air Quality Action Plan (AQAP). The council continues to review their annual NK-Plan, including introducing the Our Environment corporate priority in 2018, alongside declaring a climate emergency in 2019 and formally adopting the Climate Emergency Strategy and Action Plan in 2020 so that greenhouse gas emissions reductions remains one of the key environmental strategies within the district

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades and will continue to improve due to national policy decisions, there are some areas where local action is needed to improve air quality further.

The 2019 Defra Clean Air Strategy sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero, published by the Department for Transport in 2018, sets out the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of AQMAs across the UK are designated due to elevated concentrations heavily influenced by transport emissions.

Historically, air quality within North Kesteven has consistently complied with the UK AQS objectives. Over the past five years there have been no exceedances of the annual mean NO₂ AQS objective. With continued levels of development being experienced across the District, an emphasis on air quality is important to ensure areas of poor air quality are identified and acted upon. Across the District air quality continues to be assessed through the monitoring network whereby any areas of poor air quality would be identified. Due to the consistent compliance of the AQS objective across the district, no AQMAs have been declared and therefore the council have not published an AQAP.

Conclusions and Priorities

Currently North Kesteven District Council does not have any AQMAs and monitoring continues to report compliance with the NO₂ annual objective. There remains no need to declare any AQMA in the District.

The air quality within North Kesteven is considered good, therefore a priority for the council is to seek opportunities to reduce further the District's pollutant levels and ensure that there continues to be no areas of exceedance throughout the District. The Council continues to review the effectiveness of its monitoring and will implement some further changes in 2021 to ensure that it continues to be relevant to the risks of poor air quality. The focus continues to be on NO₂, with no planned particulate monitoring within the district.

Local Engagement and How to get Involved

The council has Our Environment as a corporate priority, Full Council unanimously declared a climate emergency and the authority is delivering its Climate Emergency Strategy and Action Plan which was subsequently approved by Executive Board. Our approach to environmental damage follows the doughnut economics model, therefore we recognise that air pollution is one of the earth's boundaries that must not be breached.

As a result of our commitments, action to tackle air pollution has included the purchase of certified 100% renewable energy for all council controlled buildings, telemetrics systems for our diesel waste/recycling vehicles including the ability to monitor fuel efficiency and idling, electric vehicle charging points, and an air pollution monitor which provides detailed air quality measurements in real time to help us identify pollution hot spots.

Our Climate Emergency Action Plan has resulted in a Passivhaus net zero carbon housing standard being approved for the council's new build programme, and options to retrofit our existing properties are under consideration. Following the formal adoption of our Cycling Strategy, officers have consulted with Town and Parish Councils to identify potential local infrastructure projects that will encourage residents to cycle more. The organisation is becoming agile by design, staff have the ability to work from home and attend meetings/events virtually, reducing commuter and business travel by car. We are working with the Central Lincolnshire Local Plan Partnership on a new draft zero carbon Local Plan which is scheduled for formal public consultation. Overall, our commitments aim to reduce air pollution from its key sources and as part of our target to reach net-zero corporate and district carbon emissions by 2030.

Table of Contents

Executive Summary: Air Quality in Our Area	ii
Air Quality in North Kesteven.....	ii
Actions to Improve Air Quality	iii
Conclusions and Priorities	iv
Local Engagement and How to get Involved.....	iv
1 Local Air Quality Management	1
2 Actions to Improve Air Quality	2
2.1 Air Quality Management Areas	2
2.2 Progress and Impact of Measures to address Air Quality in North Kesteven District Council	3
2.3 PM _{2.5} – Local Authority Approach to Reducing Emissions and/or Concentrations	5
3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance	6
3.1 Summary of Monitoring Undertaken.....	6
3.1.1 Automatic Monitoring Sites	6
3.1.2 Non-Automatic Monitoring Sites	6
3.2 Individual Pollutants.....	6
3.2.1 Nitrogen Dioxide (NO ₂)	6
Appendix A: Monitoring Results	8
Appendix B: Full Monthly Diffusion Tube Results for 2020	15
Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC	17
3.3 New or Changed Sources Identified Within North Kesteven District Council During 2020 17	
3.4 Additional Air Quality Works Undertaken by North Kesteven During 2020	17
3.5 QA/QC of Diffusion Tube Monitoring.....	17
Diffusion Tube Bias Adjustment Factors	18
NO ₂ Fall-off with Distance from the Road.....	20
Appendix D: Map(s) of Monitoring Locations and AQMAs	22
Appendix E: Summary of Air Quality Objectives in England	31
Appendix F: Impact of COVID-19 upon LAQM	32
3.6 Impacts of COVID-19 on Air Quality within North Kesteven District Council.....	33
3.7 Opportunities Presented by COVID-19 upon LAQM within North Kesteven District Council 33	
3.8 Challenges and Constraints Imposed by COVID-19 upon LAQM within North Kesteven District Council	33
Glossary of Terms	36
References	37

Figures

Figure D.1 – Diffusion Tube Monitoring Sites: Overview	22
Figure D.2 – Diffusion Tube Monitoring Sites: Heckington.....	23
Figure D.3 - Diffusion Tube Monitoring Sites: Navenby	24
Figure D.4 - Diffusion Tube Monitoring Sites: North Hykeham	25
Figure D.5 – Diffusion Tube Monitoring Sites: North of the District	26
Figure D.6 - Diffusion Tube Monitoring Sites: Ruskington	27
Figure D.7 - Diffusion Tube Monitoring Sites: Harmston.....	28
Figure D.8 - Diffusion Tube Monitoring Sites: Waddington, Metheringham, Aubourn	29
Figure D.9 - Diffusion Tube Monitoring Sites: Witham St Hughs	30

Tables

Table A.1 – Details of Non-Automatic Monitoring Sites	8
Table A.2 – Annual Mean NO ₂ Monitoring Results: Non-Automatic Monitoring (µg/m ³)	11
Table B.1 – NO ₂ 2020 Diffusion Tube Results (µg/m ³)	15
Table C.1 – Bias Adjustment Factor	19
Table E.1 – Air Quality Objectives in England	31
Table F 1 – Impact Matrix	35

1 Local Air Quality Management

This report provides an overview of air quality in North Kesteven District Council during 2020. 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 North Kesteven District Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England are presented in Table E.1.

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 should prepare an Air Quality Action Plan (AQAP) within 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

Currently North Kesteven District Council does not have any AQMAs.

Based upon the NO₂ monitoring data in 2019, and in previous years being consistently below the relevant AQS objectives (see monitoring section, Appendix A), there remains no need for the Council to declare an AQMA.

2.2 Progress and Impact of Measures to address Air Quality in North Kesteven District Council

Defra's appraisal of the 2020 ASR concluded that the report is well structured, detailed, and provides the information specified in the Guidance following the latest reporting template.

Additionally, the following comments were made:

1. Monitoring results continue to demonstrate compliance with the national air quality objective for annual mean NO₂ at all 22 diffusion tube sites in 2019.
2. It is encouraging to see that the Council have continued to take an active approach in reviewing and updating their monitoring programme and make changes where appropriate. This should be continued.
3. Maps are provided for monitoring sites; however, it would also be beneficial for the Council to include a map which covers the entire area under the Council's jurisdiction which displays all monitoring locations. This way the reader can understand how the monitoring locations are in relation to one another and spatial/geographical trends in pollutant concentrations can be easily identified.
4. The Council have correctly applied the national bias adjustment factor, and this is accepted. However, attention should be drawn to the colocation studies used to generate the national bias adjustment factor. All colocation sites in Figure A.2, except for Falkirk, are within London; an urban area. As North Kesteven is regarded as a predominately rural area the Council could take into consideration that the bias adjustment factor may not be fully representative of North Kesteven. As a suggestion, the Council may wish to compare their national bias adjustment factor to nearby authorities (or those similar to North Kesteven) which have local adjustment factors to see how these factors differ. From this the Council can decide whether the national factor (derived from largely London studies) represents North Kesteven.
5. It is encouraging to see that the Council have purchased new handheld monitors and have deployed these at local schools. The Council have indicated that should the use of the monitors be successful they intend to widen their monitoring network to include further schools. This is fully supported.

6. In general, the report is considered acceptable, meeting the required technical standards throughout.

North Kesteven District Council continues to review and update the monitoring networking, making changes where appropriate. The monitoring network did not change in 2020, remaining at the current number of 22 individual diffusion tube monitoring locations (inclusive of a triplicate site). Additional maps have however been added in this year's ASR to display the overall extent of the Council's monitoring network.

Although the North Kesteven is a rural area, the national bias adjustment factor is applied as there currently is no local co-location studies carried out where a local bias adjustment factor can be applied. Further discussion with regards to how representative the national factor being applied is has been included.

Air quality measures are inextricably linked to measures contained within the Council's "[Climate Emergency Strategy and Action Plan](#)", which was formally approved and adopted in July 2020. Although this focuses on reducing CO₂ emissions to net zero, many of the measures to achieve this will also have a positive impact on the air quality within the district by reducing emissions from the combustion of fossil fuels.

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.

There is currently no ongoing monitoring of PM₁₀ or PM_{2.5} within the District, and currently no specific measures in place to address PM_{2.5} concentrations. Background concentrations within the District assessed using the Defra background maps (2018 reference year) continue to be low; the highest concentration of PM_{2.5} within the 2020 dataset was recorded as 10.2µg/m³, which is well below the 2020 annual mean objective target of 25 ug/m³. This concentration is reported to be within the 1km grid square x491500, y370500; which is an area encompassing Doddington and the A46.

The Public Health Outcomes Framework data tool compiled by Public Health England quantifies the mortality burden of PM_{2.5} within England on a county and local authority scale. The 2019 fraction of mortality attributable to PM_{2.5} pollution across England is 5.1%, with North Kesteven region reporting 5.2%. As is seen for NO₂ emissions, traffic emissions are the main cause of anthropogenic particulate (both PM₁₀ and PM_{2.5}) emissions within the District, and as such, the implementation of the transport measures associated to the Climate Emergency and Strategy Action Plan- should help reduce PM_{2.5} concentrations experienced across the District.

There are currently two Smoke Control Areas designated by North Kesteven District Council, both located in North Hykeham. Further information, alongside maps of these designations, can be accessed on the [Council's website](#). It is an offence to have bonfires or to burn unauthorised fuels within these areas. North Kesteven District Council continues to respond to any nuisance complaints with regards to odours and smoke.

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

This section sets out the monitoring undertaken within 2020 by North Kesteven District Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2016 and 2020 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

North Kesteven District Council did not carry out any automatic (continuous) monitoring for any pollutants during 2020.

3.1.2 Non-Automatic Monitoring Sites

North Kesteven District Council undertook non-automatic (i.e. passive) monitoring of NO₂ at 22 sites during 2020. Table A.1 in Appendix A presents the details of the non-automatic sites.

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

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

Table A.2 in Appendix A compare the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of 40µg/m³. Note that

the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2020 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

There were no changes to the diffusion tube monitoring network in 2020. All sites reported concentrations well below the annual mean NO₂ AQS objective of 40µg/m³, with the maximum being 28.5µg/m³ reported at Camwick. As such, distance correction was not required to any sites not located at locations of relevant exposure. One diffusion tube site (Sleaford) had a data capture for 2020 that was less than 75%, therefore annualisation was completed for this monitoring site. Holdingham 2 has a time-weighted data capture of 74.1%, however tubes were deployed at this site for 9 out of 12 months, therefore having an annual data capture of 75% and does not require annualisation. Full details of the annualisation process is presented in Appendix C.

A reduction in concentrations was reported at the majority of monitoring locations in 2020, with the exception of B and Camwick, whereby concentrations had increased. Despite an increase being observed, there is currently no risk of the AQS objective being exceeded. Reported annual mean NO₂ concentrations during 2020 on average reduced by over 15% when compared to 2019 annual mean concentrations. This decrease is largely expected to be as a result of the impact of the COVID-19 pandemic, whereby the UK Government enforced lockdowns and provided guidance for people to stay local and work from home where possible. This resulted in a drop in traffic levels observed across the country, and it is believed that there was a reduction in up to 30% of NO_x emissions during the first lockdown. Further information relating to this can be found in Appendix F.

In general, there is a slight overall decrease in annual mean NO₂ concentrations observed over the past 5 years, with some sites remaining more stable than others.

There are no sites where the NO₂ annual mean is greater than 60µg/m³, therefore in accordance with Defra LAQM.TG(16) there are no sites likely to be at risk of exceeding the 1-hour mean AQS objective.

Appendix A: Monitoring Results

Table A.1 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA ? Which AQMA ?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
A	Newark Road / Station Road, North Hykeham	Roadside	493845	366567	NO2	NO	7.5	4.0	NO	2.5
B	Asda/ Newark Road, North Hykeham	Roadside	495050	367421	NO2	NO	14.9	0.6	NO	2.1
C	9 Dore Avenue, North Hykeham	Roadside	494829	366698	NO2	NO	7.8	2.7	NO	2.2
D	St Hughs Drive, North Hykeham	Roadside	494159	367115	NO2	NO	6.3	22.6	NO	2.3
Ruskington	Winchelsea Road	Roadside	508316	350447	NO2	NO	0.0	1.0	NO	2.5
Canwick	Heighington Road	Roadside	498561	369494	NO2	NO	39.0	0.0	NO	2.5
BH (1,2,3)	Bracebridge Heath, Sleaford Road	Roadside	498000	367544	NO2	NO	7.0	1.0	NO	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA ? Which AQMA ?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
Waddington	A607 Grantham Road	Roadside	497718	363898	NO2	NO	7.0	1.0	NO	2.5
Sleaford	Southgate, Sleaford	Roadside	506835	345684	NO2	NO	1.4	1.4	NO	2.3
Holdingham 1	Walnut Cottage	Urban Background	505704	347269	NO2	NO	64.4	1.5	NO	1.9
Holdingham 2	A15 (south) Junction	Urban Background	505985	347343	NO2	NO	1.8	6.1	NO	1.8
Westbanks	Westbanks, Sleaford	Roadside	506507	345744	NO2	NO	0.0	1.0	NO	2.5
Grantham Road	12-14 Grantham Road, Sleaford	Roadside	506601	345300	NO2	NO	0.0	1.0	NO	2.2
Sleaford 1	Pedestrian Area of Town	Urban Background	506753	506753	NO2	NO	0.0	46.2	NO	2.0
Waddington 1	A607 Grantham Road	Roadside	496425	496425	NO2	NO	7.5	1.0	NO	2.5
Branston	251/253 Lincoln Road	Rural	499012	369017	NO2	NO	0.0	2.9	NO	2.6
Aubourn	Aubourn	Kerbside	492630	362640	NO2	NO	4.2	1.8	NO	1.8
Witham St Hughs	Witham St Hughs	Kerbside	489199	361790	NO2	NO			NO	1.8
Harmston	Harmston	Kerbside	497006	497006	NO2	NO	6.2	1.2	NO	1.8

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA ? Which AQMA ?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
Metheringham	Metheringham	Urban Background	506126	506126	NO2	NO	66.5	1.2	NO	1.8
Navenby	Navenby	Kerbside	498841	357758	NO2	NO	7.0	1.6	NO	1.8
Heckington	Heckington	Kerbside	514514	343906	NO2	NO	2.9	1.5	NO	1.8

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 – Annual Mean NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
A	493845	366567	Roadside	100.0	100.0	36.6	33.4	33.0	32.2	25.8
B	495050	367421	Roadside	90.1	90.1	25.9	21.7	25.0	14.1	18.2
C	494829	366698	Roadside	100.0	100.0	14.1	14.7	15.3	15.4	11.7
D	494159	367115	Roadside	85.7	85.7	14.0	16.6	11.9	16.1	9.3
Ruskington	508316	350447	Roadside	100.0	100.0		10.6	14.7	13.3	10.7
Camwick	498561	369494	Roadside	100.0	100.0		34.4	34.0	19.8	28.5
BH1, BH2, BH3	498000	367544	Roadside	100.0	100.0		27.2	32.0	27.9	21.5
Waddington	497718	363898	Roadside	90.6	90.6		10.6	15.2	11.9	10.7
Sleaford	506835	345684	Roadside	59.2	59.2	25.6	24.0	27.3	24.2	17.9
Holdingham 1	505704	347269	Urban Background	100.0	100.0			22.0	19.0	14.1
Holdingham 2	505985	347343	Urban Background	74.1	74.1			19.0	18.0	12.5
Westbanks	506507	345744	Roadside	91.2	91.2			18.6	17.0	13.1
Grantham Road	506601	345300	Roadside	83.5	83.5			17.5	17.5	13.6

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
Sleaford 1	506601	345300	Urban Background	91.7	91.7	16.6	11.9	16.1	13.9	10.6
Waddington 1	497718	363898	Roadside	82.9	82.9		10.6	15.2	11.9	9.8
Branston	499012	369017	Rural	100.0	100.0	17.9	15.1	18.8	20.6	17.2
Aubourn	492630	362640	Kerbside	100.0	100.0				13.9	10.9
Witham St Hughs	489199	361790	Kerbside	100.0	100.0				11.2	9.2
Harmston	489199	361790	Kerbside	100.0	100.0				15.0	12.5
Metheringham	497006	362368	Urban Background	100.0	100.0				11.3	9.8
Navenby	498841	357758	Kerbside	100.0	100.0				22.0	13.1
Heckington	514514	343906	Kerbside	100.0	100.0				17.3	14.6

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.

Diffusion tube data has been bias adjusted.

Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction.

Notes:

The annual mean concentrations are presented as $\mu\text{g}/\text{m}^3$.

Exceedances of the NO₂ annual mean objective of 40 $\mu\text{g}/\text{m}^3$ are shown in **bold**.

NO₂ annual means exceeding 60 $\mu\text{g}/\text{m}^3$, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

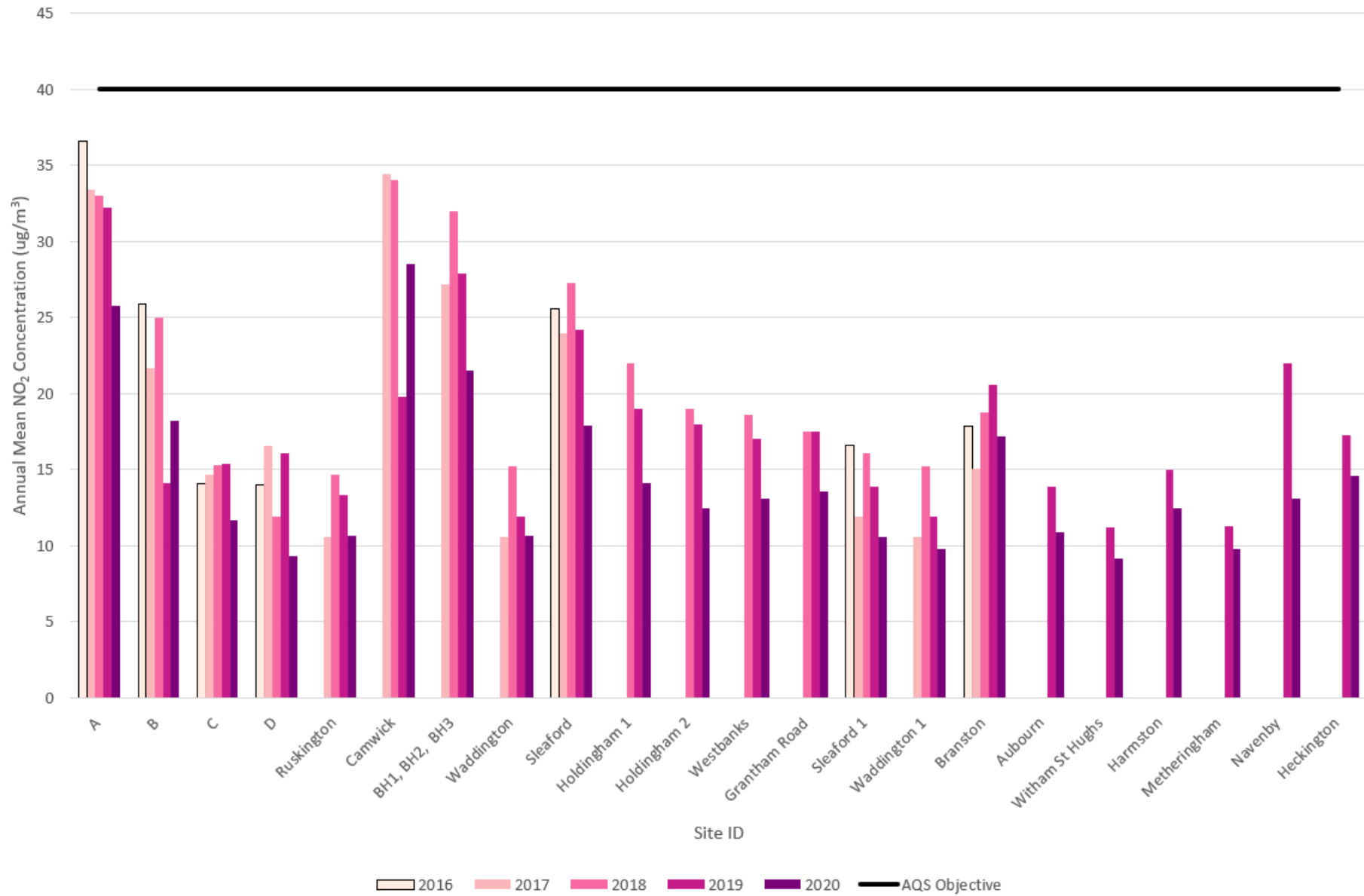
Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(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%).

Figure A.1 – Trends in Annual Mean NO₂ Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO₂ 2020 Diffusion Tube Results (µg/m³)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (SOCOTEC Didcot 0.77 & Gradko 0.82)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
A	493845	366567	41.6	37.1	34.3	20.8	23.2	28.4	25.6	29.9	31.9	32.1	41.6	33.6	31.7	25.8	-	
B	495050	367421	31.1	21.7	23.2	14.3	17.1	19.2	19.9	19.5	25.4	25.4	29.1		22.3	18.2	-	
C	494829	366698	22.3	15.6	15.0	9.3	9.6	9.4	10.4	10.4	13.7	13.9	19.7	22.2	14.3	11.7	-	
D	494159	367115			13.1	8.4	8.3	8.2	8.8	8.9	10.8	13.6	18.1	16.4	11.5	9.3	-	
Ruskington	508316	350447	17.9	13.6	14.3	11.0	9.4	11.5	7.9	10.0	9.9	12.8	19.8	19.3	13.1	10.7	-	
Camwick	498561	369494	29.8	35.8	35.4	23.6	32.7	42.5	41.5	45.4	34.3	28.7	39.4	30.8	35.0	28.5	-	
BH1	498000	367544	26.9		25.8	22.6	25.7	27.8	22.6	28.9	30.2	29.2	32.0	28.6	27.3	-	-	Triplicate Site with BH1 , BH2 and BH3 - Annual data provided for BH3 only
BH2	498000	367544	27.0		22.8	21.4	24.5	29.1	23.2	30.3	29.1	27.0	28.8	24.5	26.2	-	-	Triplicate Site with BH1 , BH2 and BH3 - Annual data provided for BH3 only
BH3	498000	367544	26.6	21.3	29.3	21.3	24.8	30.3	21.8	29.1	24.9	27.9	32.4		26.3	21.5	-	Triplicate Site with BH1 , BH2 and BH3 - Annual data provided for BH3 only
Waddington	497718	363898	16.7	9.5	14.3	9.1	10.0	12.9	8.7		10.8	11.7	20.4	20.3	13.1	10.7	-	
Sleaford	506835	345684		20.3	24.5	17.7	18.9				19.7	21.5		29.9	21.8	17.9	-	
Holdingham 1	505704	347269	18.7	14.0	20.5	14.9	18.2	17.2	13.6	17.0	16.0	16.2	17.8	23.1	17.3	14.1	-	
Holdingham 2	505985	347343	17.7	14.7	18.3	14.6	13.8	13.7	13.7			6.5		25.1	15.4	12.5	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (SOCOTEC Didcot 0.77 & Gradko 0.82)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
Westbanks	506507	345744	19.9	19.7	18.8	11.5	12.1	11.3	11.7	11.3	14.6		22.8	22.7	16.0	13.1	-	
Grantham Road	506601	345300	23.5	19.0		12.9	12.3	12.2		11.6	15.3	14.5	22.6	22.1	16.6	13.6	-	
Sleaford 1	506601	345300	18.2	11.9	14.0	9.2	10.7	10.1	8.1	9.1		11.2	21.7	19.3	13.0	10.6	-	
Waddington 1	497718	363898	18.1	10.0	12.3	7.2	7.3		8.3		10.2	10.6	19.7	16.5	12.0	9.8	-	
Branston	499012	369017	33.8	23.2	24.9	14.1	16.8	16.0	21.8	19.7	23.0	19.6	23.5	16.7	21.1	17.2	-	
Aubourn	492630	362640	16.8	15.0	16.0	9.9	9.0	12.6	11.3	10.8	12.4	11.8	19.3	15.7	13.4	10.9	-	
Witham St Hughs	489199	361790	21.0	9.8	10.9	7.1	7.4	8.0	7.9	8.2	10.7	12.3	17.1	14.9	11.3	9.2	-	
Harmston	489199	361790	17.5	10.6	16.9	11.4	13.7	16.1	12.3	13.0	14.4	13.2	17.2	27.3	15.3	12.5	-	
Metheringham	497006	362368	20.4	13.7	12.8	8.0	8.0	7.7	8.7	8.0	10.6	10.5	19.8	15.9	12.0	9.8	-	
Navenby	498841	357758	21.3	13.8	19.0	12.2	11.9	14.0	9.9	15.3	12.7	14.2	25.6	23.5	16.1	13.1	-	
Heckington	514514	343906	22.3	21.0	18.3	12.7	13.6	16.2	14.8	14.7	16.8	17.8	22.4	24.0	17.9	14.6	-	

All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.1.

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.

Local bias adjustment factor used.

National bias adjustment factor used.

Where applicable, data has been distance corrected for relevant exposure in the final column.

North Kesteven District Council confirm that all 2020 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

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**.

See Appendix C for details on bias adjustment and annualisation.

The diffusion tube supplier and analyser changed to SOCOTEC Didcot for the month of March ONLY, therefore a weighted bias adjustment factor combining both the Gradko and SOCOTEC Didcot national bias adjustment factors has been utilised.

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

3.3 New or Changed Sources Identified Within North Kesteven District Council During 2020

North Kesteven District has not identified any new sources relating to air quality within the reporting year of 2020.

3.4 Additional Air Quality Works Undertaken by North Kesteven During 2020

North Kesteven District has not completed any additional works within the reporting year of 2020.

3.5 QA/QC of Diffusion Tube Monitoring

The diffusion tubes for the year 2020 were supplied and analysed by Gradko International Ltd for the majority of the year, with SOCOTEC Didcot providing the tubes in May whilst Gradko's labs were closed as a result of the COVID-19 pandemic. All tubes were prepared using the 50% TEA in acetone preparation method. All results have been bias adjusted before being presented in Table B.1.

Both Gradko International Ltd and SOCOTEC Didcot are UKAS accredited laboratories and participate in the AIR-PT Scheme (a continuation of the former Workplace Analysis Scheme for Proficiency (WASP)) for NO₂ tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO₂ concentrations reported are of a high calibre. The labs follow the procedures set out in the Harmonisation Practical Guidance. In the 2020 AIR-PT results, AIR-PT AR036 (January – February 2020) and AR040 (September – October 2020) Gradko scored 75%, and SOCOTEC scored 100%. The AIR-PT rounds AR037 (May – June 2020), AR039 (July – August 2020) were cancelled due to the COVID-19 pandemic. The percentage score reflects the results deemed to be satisfactory based upon the z-score of $< \pm 2$.

Additionally, the precision of the NO₂ diffusion tubes supplied by Gradko International Ltd has been classified as 'good' for all but one observation during 2020, whereas SOCOTEC Didcot have been classified as 'good' for all observations in 2020. This precision reflects the laboratory's performance and consistency in preparing and analysing the tubes, as well as the subsequent handling of the tubes in the field. Further information on the precision summary results can be found on the [LAQM website](#).

Diffusion Tube Annualisation

Annualisation is required for any site with data capture less than 75% but greater than 25%. Annualisation was required at one non-automatic monitoring sites in 2020 – Sleaford. This site had an annual data capture of less than 75%, whereby monthly results were only available for 7 out of 12 months. Annualisation was carried out using version 1.1 of the diffusion tube data processing tool, with the details of the calculation method provided in Table C.2.

Holdingham 2 has a time-weighted annual data capture of 74.1%, however results are available for 9 out of 12 months. This therefore means that the site would not require annualisation, due to having a non-time-weighted annual data capture of 75%.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2020 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO₂ continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

North Kesteven District Council have applied a national bias adjustment factor of 0.82 (based on 14 studies) to the 2020 monitoring data, with the exception of May 2020 where a factor of 0.77 (based on 22 studies) has been applied. This is because SOCOTEC Didcot was used to supply and analyse the May tubes whilst the Gradko labs were closed as a result of the COVID-19 pandemic. The application of two bias adjustment factors is followed in accordance with Box 7.14 of the [LAQM.TG\(16\)](#) and the [LAQM COVID-19 Supplementary Guidance](#). Both labs supplied tubes prepared using the 50%

Triethanolamine (TEA) in water preparation method. A summary of bias adjustment factors used by West Lindsey District Council over the past five years is presented in Table C.1.

It is important to note that both Gradko and SOCOTEC Didcot co-location studies include several urban sites alongside some more rural/background sites, whereas North Kesteven is a predominantly rural district. Therefore, the national factor may not be entirely representative of the conditions within North Kesteven. Despite this, as no local co-location studies are carried out within North Kesteven, a local bias adjustment factor cannot be derived and the national factor has to be used in this instance.

Both national bias adjustment factors were taken from the [National Diffusion Tube Bias Adjustment Factor Spreadsheet](#) (v03_21), and are shown in Figure C.1.

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	National	03/21	0.82 (Gradko) & 0.77 (SOCOTEC Didcot – applied to May only)
2019	National	03/20	0.87
2018	National	03/19	0.92
2017	National	03/18	0.97
2016	National	06/17	1.01

Figure C.1 – National Diffusion Tube Bias Adjustment Factor Spreadsheet version 03_21

National Diffusion Tube Bias Adjustment Factor Spreadsheet						Spreadsheet Version Number: 03/21					
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 June 2021					
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods						LAQM Helpdesk Website					
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet						Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.					
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.											
Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List		Step 2: Select a Preparation Method from the Drop-Down List		Step 3: Select a Year from the Drop-Down List		Step 4:					
If a 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		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.					
Analysed By ¹		Method		Year		Site Type		Local Authority			
Gradko		50% TEA in acetone		2020				Overall Factor ² (14 studies)			
SOCOTEC Didcot		50% TEA in acetone		2020				Overall Factor ² (22 studies)			
						Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m ³)	Automatic Monitor Mean Conc. (Cm) (µg/m ³)	Bias (B)	Tube Precision ³	Bias Adjustment Factor (A) (Cm/Dm)
									Use	0.82	
									Use	0.77	

NO₂ Fall-off with Distance from the Road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure should be estimated using the Diffusion Tube Data Processing Tool/NO₂ fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO₂ concentrations corrected for distance are presented in Table B.1.

Table C.2 – Annualisation Summary (concentrations presented in $\mu\text{g}/\text{m}^3$)

Site ID	Annualisation Factor Nottingham Centre	Annualisation Factor Chesterfield Loundsley Green	Annualisation Factor Immingham Woodlands Avenue	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
Sleaford	1.0196	0.9971	1.0175	1.0114	21.8	17.9	

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

Figure D.1 – Diffusion Tube Monitoring Sites: Overview

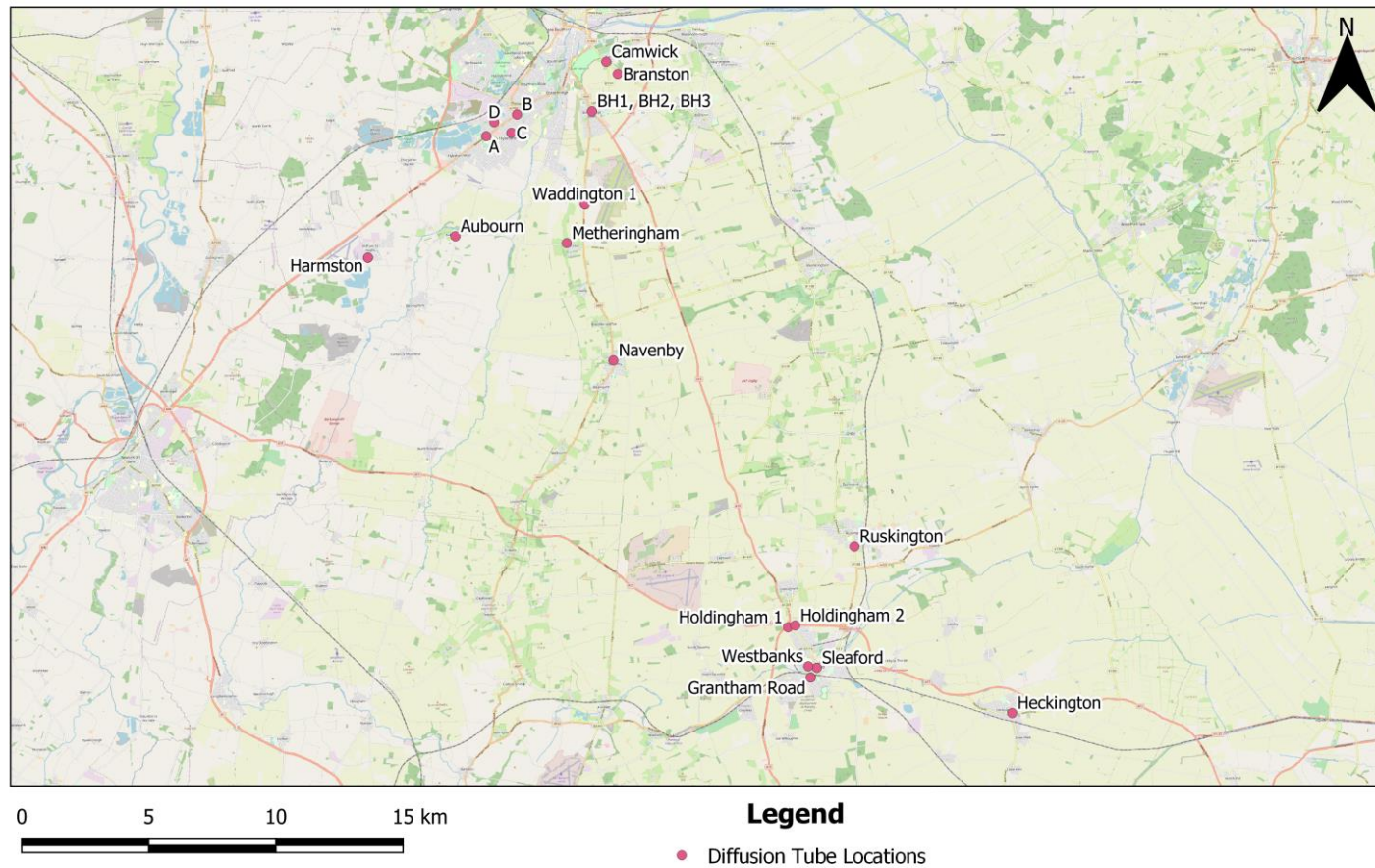


Figure D.2 – Diffusion Tube Monitoring Sites: Heckington

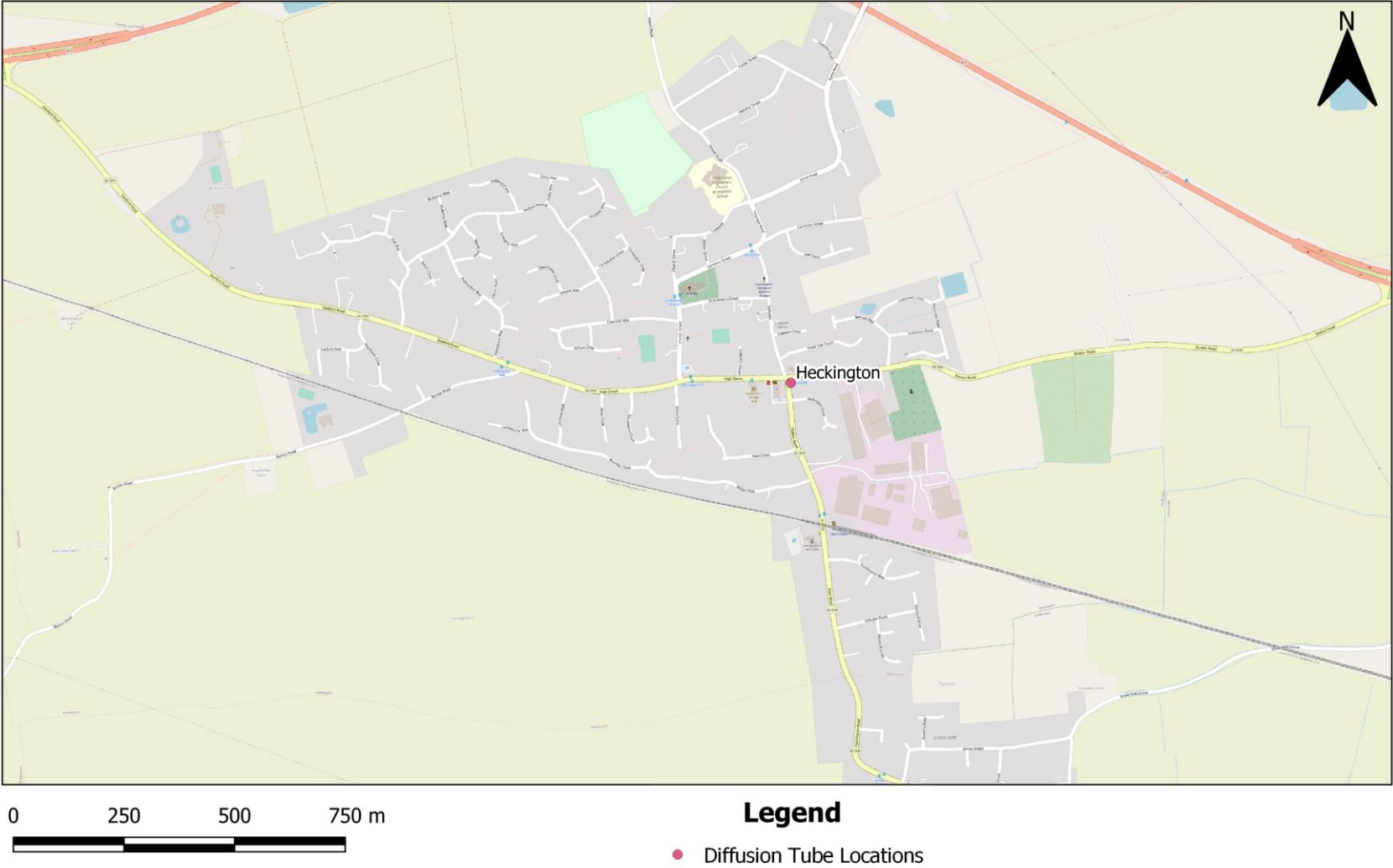


Figure D.3 - Diffusion Tube Monitoring Sites: Navenby



Figure D.4 - Diffusion Tube Monitoring Sites: North Hykeham

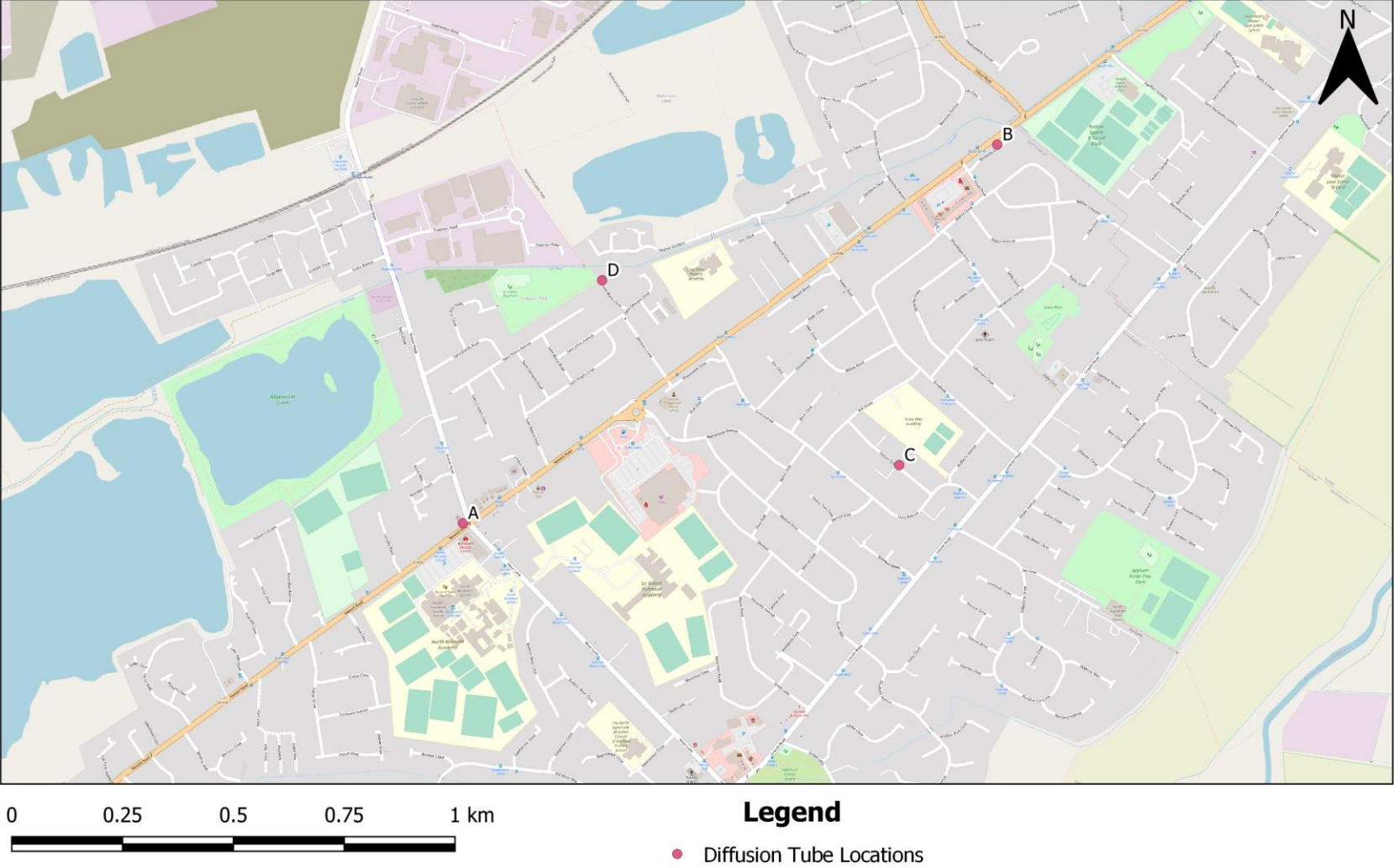


Figure D.5 – Diffusion Tube Monitoring Sites: North of the District

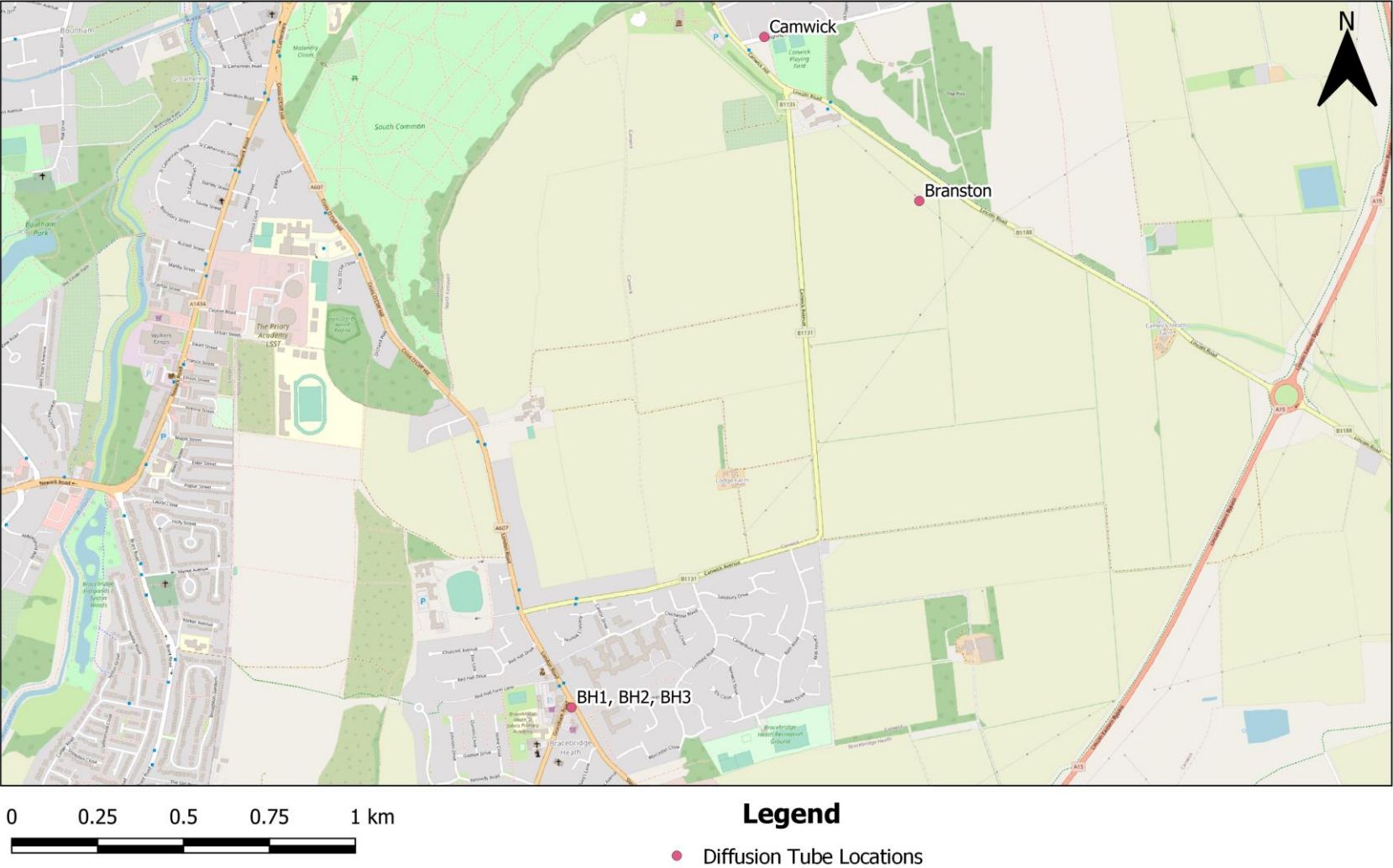


Figure D.6 - Diffusion Tube Monitoring Sites: Ruskington

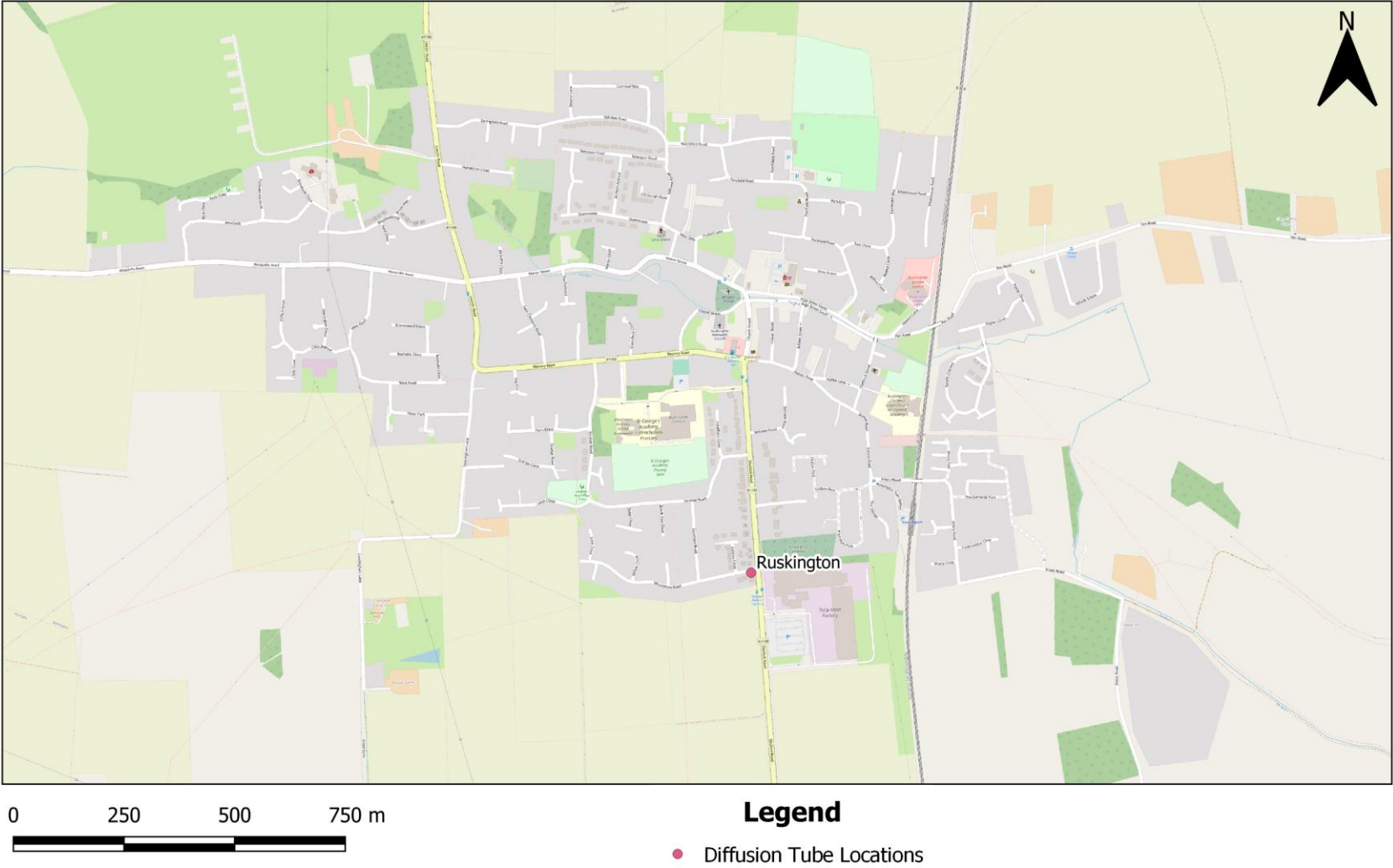


Figure D.7 - Diffusion Tube Monitoring Sites: Harmston

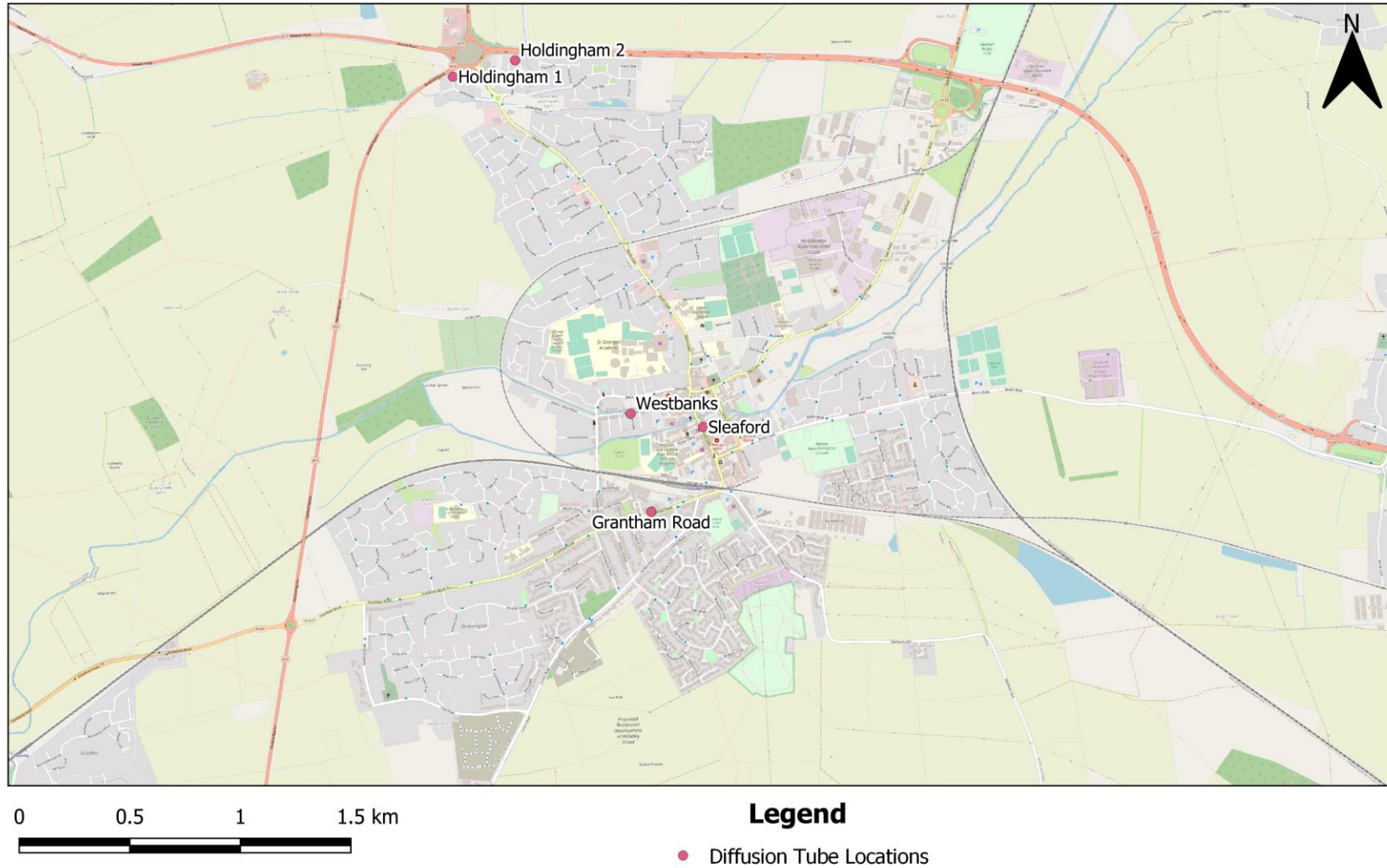
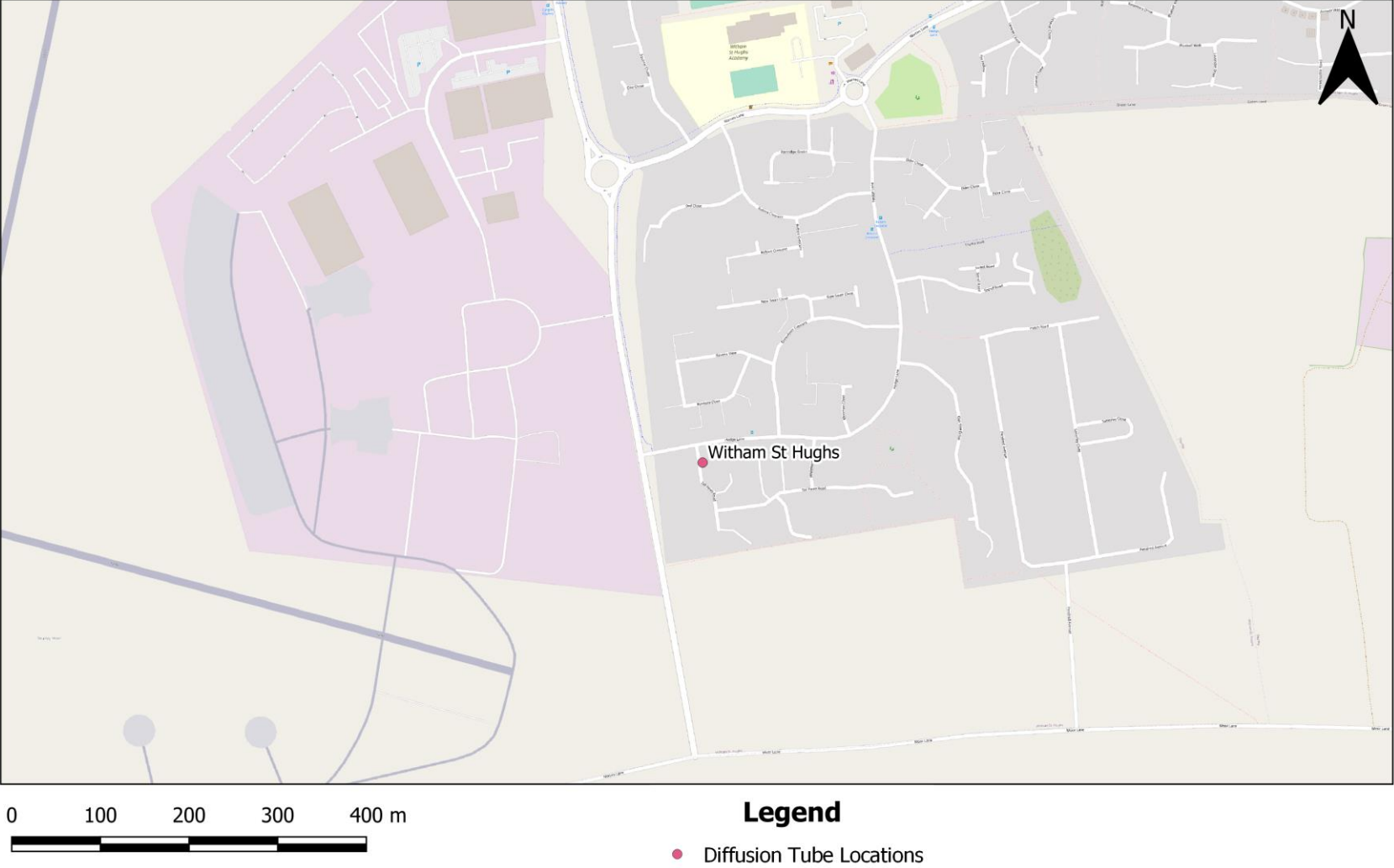


Figure D.8 - Diffusion Tube Monitoring Sites: Waddington, Metherringham, Aubourn



Figure D.9 - Diffusion Tube Monitoring Sites: Witham St Hughs



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England⁶

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

⁶ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Appendix F: Impact of COVID-19 upon LAQM

COVID-19 has had a significant impact on society. Inevitably, COVID-19 has also had an impact on the environment, with implications to air quality at local, regional and national scales.

COVID-19 has presented various challenges for Local Authorities with respect to undertaking their statutory LAQM duties in the 2021 reporting year. Recognising this, Defra provided various advice updates throughout 2020 to English authorities, particularly concerning the potential disruption to air quality monitoring programmes, implementation of Air Quality Action Plans (AQAPs) and LAQM statutory reporting requirements. Defra has also issued supplementary guidance for LAQM reporting in 2021 to assist local authorities in preparing their 2021 ASR. Where applicable, this advice has been followed.

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention, most notably in relation to emissions of air pollutants arising from road traffic. The vast majority (>95%) of AQMAs declared within the UK are related to road traffic emissions, where attainment of the annual mean objective for nitrogen dioxide (NO₂) is considered unlikely. On 23rd March 2020, the UK Government released official guidance advising all members of public to stay at home, with work-related travel only permitted when absolutely necessary. During this initial national lockdown (and to a lesser extent other national and regional lockdowns that followed), marked reductions in vehicle traffic were observed; Department for Transport (DfT) data⁷ suggests reductions in vehicle traffic of up to 70% were experienced across the UK by mid-April, relative to pre COVID-19 levels.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. nitrous oxides (NO_x), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)⁸ has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO₂ annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which

⁷ Prime Minister's Office, COVID-19 briefing on the 31st of May 2020

⁸ Air Quality Expert Group, Estimation of changes in air pollution emissions, concentrations and exposure during the COVID-19 outbreak in the UK, June 2020

represents an absolute reduction of between 10 to 20µg/m³ if expressed relative to annual mean averages. During this period, changes in PM_{2.5} concentrations were less marked than those of NO₂. PM_{2.5} concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have detailed that PM_{2.5} concentrations during the initial lockdown period are of the order 2 to 5µg/m³ lower relative to those that would be expected under business-as-usual conditions.

As restrictions are gradually lifted, the challenge is to understand how these air quality improvements can benefit the long-term health of the population.

3.6 Impacts of COVID-19 on Air Quality within North Kesteven District Council

The impacts of COVID-19 generally saw a decrease in monitored NO₂ in April and May 2020, started to rise towards typical pre-lockdown measurements in June and July. By the time most restrictions had eased in August, NO₂ was typical for that time of year.

3.7 Opportunities Presented by COVID-19 upon LAQM within North Kesteven District Council

Opportunities that have developed included an internal agile by design:

- Supporting more working from home NKDC staff in the future and therefore reducing NO emissions from commuting to the office.

3.8 Challenges and Constraints Imposed by COVID-19 upon LAQM within North Kesteven District Council

The challenges and constraints imposed by COVID-19 upon LAQM duties within North Kesteven are as follows:

- Gradko International Ltd. closed their labs in May due to the COVID-19 pandemic. This meant that an alternative lab and tube supplier had to be sourced. SOCOTEC Didcot was chosen as this alternative. As a result of this, the April tubes were returned to the Gradko labs with non-standard caps but were sealed tightly with tape to ensure there are no air gaps. Despite this, there was no deviation from the

LAQM Diffusion Tube Calendar, and all tubes were returned to the labs and analysed within their shelf-life of 4 months from preparation. Additionally, two separate bias adjustment factors have had to be utilised when adjusting the diffusion tube data. **No Impact**

- Environmental Health Officers (EHOs) were required to carry out COVID-19 related work, as Covid Wardens had limited powers. Any formal action had to be carried out by the EHOs. There is limited work carried out on LAQM in general as North Kesteven experiences good air quality, so did not cause much disruption to LAQM duties. **No Impact**

The impacts as presented above are aligned with the criteria as defined in Table F 1, with professional judgement considered as part of their application.

Table F 1 – Impact Matrix

Category	Impact Rating: None	Impact Rating: Small	Impact Rating: Medium	Impact Rating: Large
Automatic Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Automatic Monitoring – QA/QC Regime	Adherence to requirements as defined in LAQM.TG16	Routine calibrations taken place frequently but not to normal regime. Audits undertaken alongside service and maintenance programmes	Routine calibrations taken place infrequently and service and maintenance regimes adhered to. No audit achieved	Routine calibrations not undertaken within extended period (e.g. 3 to 4 months). Interruption to service and maintenance regime and no audit achieved
Passive Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Passive Monitoring – Bias Adjustment Factor	Bias adjustment undertaken as normal	<25% impact on normal number of available bias adjustment colocation studies (2020 vs 2019)	25-50% impact on normal number of available bias adjustment studies (2020 vs 2019)	>50% impact on normal number of available bias adjustment studies (2020 vs 2019) and/or applied bias adjustment factor studies not considered representative of local regime
Passive Monitoring – Adherence to Changeover Dates	Defra diffusion tube exposure calendar adhered to	Tubes left out for two exposure periods	Tubes left out for three exposure periods	Tubes left out for more than three exposure periods
Passive Monitoring – Storage of Tubes	Tubes stored in accordance with laboratory guidance and analysed promptly.	Tubes stored for longer than normal but adhering to laboratory guidance	Tubes unable to be stored according to be laboratory guidance but analysed prior to expiry date	Tubes stored for so long that they were unable to be analysed prior to expiry date. Data unable to be used
AQAP – Measure Implementation	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP
AQAP – New AQAP Development	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP

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	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 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

- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- North Kesteven District Council 2017 Annual Progress Report.
- North Kesteven District Council 2018 Annual Progress Report.
- North Kesteven District Council 2019 Annual Progress Report.
- North Kesteven District Council 2020 Annual Progress Report and associated Appraisal.
- National Diffusion Tube Bias Adjustment Factor Spreadsheet, version 03/21 published in March 2021