North East Lincolnshire Council

Annual Status Report 2021

Bureau Veritas

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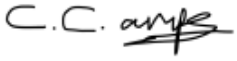
Prepared By	C Darien-Campbell	Graduate Consultant	
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2021 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

Date: June, 2021

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Executive Summary: Air Quality in Our Area

Air Quality in North East Lincolnshire 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, 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 ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

North East Lincolnshire Council (the Council) is situated on the east coast of England, at the mouth of the River Humber. It covers 192 km^2, is home to 160,000 people and incorporates the towns of Grimsby, Immingham and Cleethorpes. The main sources of air pollution within the Council is from road traffic and local background sources including domestic, institutional, and commercial space heating.

North East Lincolnshire Council has one Air Quality Management Area (AQMA) located at Cleethorpe Road in Grimsby (https://uk-air.defra.gov.uk/aqma/details). The AQMA was declared in 2010 and a subsequent Air Quality Action Plan (AQAP) was produced initially in 2012. In July 2020, the Council adopted a new AQAP, detailing new measures to reduce NO_2 concentrations within the AQMA.

During 2020, there has been a reduction in NO_2 annual mean concentrations both across the diffusion tube network and at automatic monitoring sites. This reduction is in line with national trends. This reduction is expected due to the Covid-19 pandemic causing large

[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

reductions in road traffic. Consequently, reductions in road traffic emissions have been observed on road links across the UK.

Actions to Improve Air Quality

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

The 2019 Clean Air Strategy[5] sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero[6] sets out the approach to reduce vehicle emissions through a number of mechanisms; this is extremely important given that the majority of AQMAs within the UK are designated due to elevated NO_2 concentrations heavily influenced by transport emissions.

During 2020, North East Lincolnshire Council had limited community engagement due to the Covid-19 pandemic. A number of measures relating to car sharing and public transport were discouraged by national guidance during the pandemic and had to be placed on hold.

Despite Covid-19's impact on a number of the Council's measures, the Council have still managed to acknowledge Clean Air Day through their social media campaign and have produced a new Air Quality Strategy, which will be adopted in 2021. The Council have adopted three travel plans during 2020 and in addition have worked with more than 20 locations to enhance cycle parking throughout the year. The Council have also applied for the DfT All Electric Bus Town fund but unfortunately were unsuccessful.

Although there has been a reduction in NO_2 annual mean concentrations during 2020, it's not possible to attribute accurately the reduction to any measures being implemented by the Council. This is because it is difficult to confirm how much the Covid-19 lockdowns affected road traffic and NO_2 concentrations without any traffic data.

[5] Defra. Clean Air Strategy, 2019

[6] DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

Conclusions and Priorities

During 2020, no exceedances of the NO_2 annual mean objective were identified within the existing AQMA or outside of the AQMA. All monitoring results within the AQMA were below the air quality objectives as they have been since 2018. During 2020, NO_2 annual mean concentrations recorded at all diffusion tube sites were below being within 10% of the NO_2 annual mean objective. This is the first time since the declaration of the Cleethorpe Road AQMA in 2010 that no NO_2 annual mean concentrations have come within 10% of the annual mean objective. The gradual decline in NO_2 annual mean concentrations at automatic and non-automatic sites over the past few years is a good indication that the measures North East Lincolnshire Council are implementing are reducing NO_2 concentrations.

North East Lincolnshire Council updated their Air Quality Action Plan during 2020. The key priorities for the Council in addressing air quality are as follows:

- Priority 1: Transport – Provision of additional transport infrastructure; changes to road layout or operation; formulation of traffic plans with the aim being to encourage the use of greener modes of transport, and/or reduce congestion and associated vehicle emissions;
- Priority 2: Public Health – Encouragement of wider behavioural changes in local population with respect to their travel choices, raise awareness and educate members of the public on the impact of air pollution;
- Priority 3: Planning and Infrastructure – Mitigate potential air quality impacts effectively by being involved in decision making early on for future developments required to support the growth of NEL;
- Priority 4: Strategies and Policy Guidance – Working with partners and stakeholders to direct the use of legislation and targeted enforcement to control air pollution; and
- Priority 5: Air Quality Monitoring (Evidence for Improvement) – Ensure satisfactory air quality monitoring data is available to track outcomes of the implemented AQAP measures.

During 2020, the Environmental Protection department consulted on over 450 planning applications, of which 15 significant planning applications have been approved from new developments. These developments range from individual small detached dwellings, to 297 residential units and a 90-bed care facility.

Local Engagement and How to get Involved

Everyone contributes to the release of air pollution, and localised behavioural changes can help to reduce local concentrations or air pollutants on a wider scale. Many of the possible measures will save money and improve general fitness through increased exercise.

- Where possible walk, cycle or use public transport in a safe manner. A modal shift in transportation decreases the number of cars on the road, reducing congestion, overall traffic movements and the amount of pollutant emissions;
- Driving economically by turning your engine off when stationary saving fuel and reducing emissions; and
- Keeping your vehicle good working order, having well-inflated tyres means your car will be more efficient and use less fuel.

More resources relating to air quality and how to get involved can be found at https://www.nelincs.gov.uk/.

Clean Air Day is a chance to find out more about air pollution, share information with others and help make the environment and air quality cleaner for everyone. Clean Air Day took place in October 2020 and the Council promoted the day through its social media channels. Further details on the Clean Air Day can be found at https://www.cleanairday.org.uk/.

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1 Local Air Quality Management

This report provides an overview of air quality in North East Lincolnshire 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 East Lincolnshire 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.

A summary of AQMAs declared by North East Lincolnshire Council can be found in Table 2.1. The table presents a description of the single AQMA that is currently designated within North East Lincolnshire. The Cleethorpe Road AQMA was declared in 2010 for exceedances of the annual mean NO_2 objective.

Appendix D: Maps of Monitoring Locations and AQMAs provides maps of AQMA and also the air quality monitoring locations in relation to the AQMA.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
AQMA Cleethorpe Road	Sep-10	NO_2 Annual Mean	Cleethorpe Road between Freeman Street and Nacton Street	NO	48.4	32.7	Action Plan July 2020 Cleethorpe Road Grimsby	https://www.nelincs.gov.uk/assets/uploads/2021/01/Air-Quality-Action-Plan-2020.pdf

☒ **North East Lincolnshire Council confirm the information on UK-Air regarding their AQMA(s) is up to date.**

☒ **North East Lincolnshire Council confirm that all current AQAPs have been submitted to Defra.**

2.2 Progress and Impact of Measures to address Air Quality in North East Lincolnshire Council

Defra's appraisal of last year's ASR concluded

- *"The Council commenced automatic monitoring of NO_2 at Cleethorpe Road in 2019. Whilst data capture was insufficient for calculation of a local bias adjustment factor for 2019, this is encouraged in future years. Should this be calculated, full details of local factor derivation should be provided."* The local bias adjustment factor has been calculated for 2020, however, due to automatic data capture being <90%, the data capture was deemed poor overall. This has led to the national bias adjustment factor being used.
- *"The Council are commended on the development of their new AQAP, which is due for adoption in September 2020. It is anticipated that a detailed discussion and full progress update on the implementation of actions within this AQAP is included in next year's ASR. Additionally, the Council are advised to consider $PM_{2.5}$ specific measures within their new AQAP given the well-documented adverse health impacts of exposure."* The Council's new AQAP was published during 2020. Measures have been developed in response to the pollutant that is current exceeding the relevant objective, NO_2 annual mean objective.
- *"The Council continue to show compliance with the annual mean objective for NO_2, however the maximum NO_2 concentration within the AQMA continues to be within 10% of the AQO. The Council have acknowledged that until continued compliance can be demonstrated, a revocation order cannot be supported. The Council are confident that the measures proposed within their new AQAP will help to achieve the necessary reductions in annual mean NO_2 concentrations to satisfy revocation of the AQMA."* No NO_2 concentrations for 2020 came within 10% of the annual mean objective.

North East Lincolnshire Council has taken forward a number of direct measures during the current reporting year of 2020 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. 19 measures are included within Table 2.2, with the type of measure and the progress North East Lincolnshire Council have made during the reporting year of 2020 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in their respective Action Plans. Key completed measures are:

- Improve signage for the Port of Grimsby to ensure that HGV's do not travel through the AQMA; and
- Updating the North East Lincolnshire Air Quality Strategy.

North East Lincolnshire Council's priorities for the coming year are:

- Improve public transport services, bus stop/train infrastructure & information and interchange facilities

Progress on the following measures has been slower than expected:

- M1: Improving public transport services, bus stop/train infrastructure & information and interchange facilities;
- M6: Encouraging residents and visitors to North East Lincolnshire to use car share and public transport;
- M7: Encouraging the uptake of Employer and School Travel Plans within the Borough; and
- Progress on these measures has been slower than expected due to the pandemic and a consequential decline in public transport usage.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Improve public transport services, bus stop/train infrastructure & information and interchange facilities	Transport Planning and Infrastructure	Public transport improvement - interchanges stations and services	2016	2022	NELC & Service Provider	NELC & Service Provider	NO	Not Funded	£50k - £100k	Implementation	Reduced vehicle emissions	Increase in use of public transport based on average numbers of people using the services	The 21/22 Local Transport Plan Capital Programme includes bus stop infrastructure and public transport information improvements. The programme will be delivered by 31 March 2022.	Implications of the pandemic, & decline in public transport usage, more difficult moving forward
2	Encourage Council Travel Plan opportunities and seek to facilitate uptake of sustainable modes of transport	Promoting Travel Alternatives	Workplace Travel Planning	2016	On-going	NELC & ENGIE	NELC & ENGIE	NO	Not Funded	£10k - 50k	Implementation	Reduced vehicle emissions	% modal shift to car share/public transport/walking/cycling	Travel Plan not progressed during the pandemic due to prevalence of home working. Opportunities to be explored as staff return to office.	Homeworking is the Council Travel Plan: Care Share/Public Transport/Cycling/Walking
3	Bus fleet upgrades	Promoting low emission transport	Public vehicle procurement – prioritising uptake of low emission vehicles	2017	On-going	NELC & Stagecoach	NELC & Stagecoach	NO	Not Funded	£1 million - £10 million	Implementation	Reduced vehicle emissions	Number of low/zero emission buses	NELC is considering whether to submit an Expression of Interest to the Department for Transport Zero Emission Bus Regional Areas scheme – 2021/22	Vehicle upgrades are continuing to happen.
4	Improve signage for the Port of Grimsby	Transport Planning and Infrastructure	Other	2012	2021	NELC & ABP	NELC & ABP	NO	Not Funded	£10k - 50k	Completed	Reduced vehicle emissions	A reduced number of HGV's approaching the AQMA	Signage to the port is very good, directs HGV's off at Lockhill Roundabout and doesn't progress through the AQMA.	Completed
5	Continue to promote and facilitate cycling as for both transportation and leisure purposes	Promoting Travel Alternatives	Promotion of cycling	2016	On-going	NELC & ENGIE	NELC & ENGIE	NO	Not Funded	£50k - £100k	Implementation	Reduced vehicle emissions	Uptake of cycling incentives and bike purchases	Number of projects delayed due to COVID pandemic, Doctor Bike (cycle maintenance) events continue to run with over 300 cycles repaired during 2020.	Promotion of Active Travel plans. Super Cycle Highway
6	Encouraging residents and visitors to North East Lincolnshire to use car share	Alternatives to private vehicle use	Car & lift sharing schemes	2016	On-going	NELC & ENGIE	NELC & ENGIE	NO	Not Funded	< £10k	Implementation	Reduced vehicle emissions	% modal shift to car share/public transport	Car share and public transport have been discouraged during the pandemic by	Not progress during the pandemic

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
	and public transport													national guidance. NELC have supported efforts to encourage safe use of public transport with appropriate information being advertised at bus stops and onboard vehicles	
7	Encourage the uptake of Employer and School Travel Plans within the Borough	Promoting Travel Alternatives	School Travel Plans	2018	On-going	NELC & ENGIE	NELC & ENGIE	NO	Not Funded	< £10k	Implementation	Reduced vehicle emissions	No. travel plans in place	Three travel plans adopted in 2020. in addition, Transport Team have worked with more than 20 locations to enhance cycle parking during the year.	Implications of the pandemic, & decline in public transport usage, more difficult moving forward
8	Public Air Quality Information including promotion of fuel saving measures, residential and commercial buildings	Public Information	Via the Internet	2017	On-going	NELC	NELC	NO	Not Funded	£10k - 50k	Planning	Reduced vehicle emissions	Number of hits on upgraded website per annum	Design of air quality specific website discussed with IT department. Quote was sourced but due funding restraint no further progress to date.	Funding needed for website development
9	Report on air quality, including making details of the Action Plan measures and Annual Progress Reports available on the Website and inclusion of an Air Quality update in the Corporate Annual Report	Public Information	Via the Internet	2000	Updated annually after DEFRA approval of ASR.	NELC	NELC	NO	Not Funded	< £10k	Implementation	Public information	Availability of recently published reports online	2020 Annual Status Report is available on NELC website.	Progressing as normal
10	Ensure that air quality is taken into account in the planning process when located in or close to the AQMAs or in areas marginally	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2015	On-going	NELC	NELC	NO	Not Funded	< £10k	Implementation	Ensure developments don't have a negative impact on AQ	Number of planning applications with air quality conditions/assessments	Environmental Protection Team review of planning applications weekly for adverse effects of AQ	Progressing as normal

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
	below air quality objectives														
11	Work together with developers to improve sustainable transport links serving new developments	Transport Planning and Infrastructure	Other	2015	On-going	NELC & Developer	NELC & Developer	NO	Not Funded	< £10k	Implementation	Ensure developments don't have a negative impact on AQ	% modal shift to public transport	Continuing working on this issue with the requirements for Travel Plans in major planning apps which are assessed by Highways colleagues	Measure progressing
12	Work together with developers to promote the inclusion of electric charging points for electric/hybrid vehicles at new development sites	Promoting Low Emission Transport	Producing alternative refuelling infrastructure to promote low emissions vehicles, EV recharging, gas fuel recharging	2016	On-going	NELC &ENGIE	NELC &ENGIE	NO	Not Funded	< £10k	Implementation	Ensure developments don't have a negative impact on AQ	Number of planning applications where charging points have been secured	Environmental Protection Team review of planning applications weekly for adverse effects of AQ	Measure progressing
13	Consideration of measures to improve air quality in all new strategies when a Strategy is reviewed or updated	Policy Guidance and development control	Other policy	2017	On-going	NELC & ENGIE	NELC & ENGIE	NO	Not Funded	< £10k	Implementation	-	Air Quality a key topic in released strategy documents	Air Quality Steering Group meets quarterly to discuss AQ issues council wide	Measure progressing
14	NELC Vehicle Procurement	Promoting Low Emission Transport	Company Vehicle Procurement -Prioritising uptake of low emission vehicles	2016	On-going	NELC	NELC	NO	Not Funded	£1 million - £10 million	Planning	Reduced vehicle emissions	Number of vehicles replaced (in addition to normal fleet turnover)	Currently replaced 27 small diesel vehicles with 27 full electric vehicles (15% of fleet). Currently plan to replace an additional minimum of 4 vehicles with full EV in 2021/22, possibly up to 6 vehicles. This will be minimum 31 EV's out of a fleet of 180 vehicles (17%).	Measure progressing
15	Produce Air Quality Strategies setting out their plans to reduce emissions	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	On-going	NELC & ABP	NELC & ABP	NO	Not Funded	< £10k	Planning	Reduce port emissions	Not quantifiable	Quarterly meetings held with ABP Environmental Team to ensure AQ matters are considered.	Measure progressing

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
	across the port estate including ship and shore activities.														
16	Local air quality monitoring within the Borough to ensure a high standard of data is achieved	Public information	Other	2000	On-going	NELC	NELC	NO	Not Funded	£10k - 50k	Implementation	LAQM	Number of monitoring locations	2 real-time monitors/34 Diffusion tubes	Progressing as normal
17	Declared Climate Emergency in September 2019	Policy Guidance and Development Control	Other policy	2019	2050	NELC & ENGIE	NELC & ENGIE	NO	Not Funded	£1 million - £10 million	Planning	Carbon reduction	Carbon Neutral by 2050	Members meet regularly to discuss planned measures for The Carbon Reduction Plan	Measure progressing
18	Updating the Air Quality Strategy	Policy Guidance and development control	Air Quality Planning & Policy Guidance	2015	On-going	NELC	NELC	NO	Not Funded	< £10k	Completed	NELC Policy	Not quantifiable	Revised strategy to be completed by the end of 2021	Measure progressing
19	Supplementary Planning Guidance document	Policy Guidance and development control	Air Quality Planning & Policy Guidance	N/A	On-going	NELC	NELC	NO	Not Funded	< £10k	Planning	Ensure developments don't have a negative impact on AQ	Number of planning applications with air quality conditions/assessments	Currently liaising with the Planning Department, investigating the option of procuring a consultant to undertake this piece of work.	Measure progressing

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.

For NELC, the fraction of mortality attributable to air pollution is 5.2%, which is similar to the national average of 5.3%. When combined with age standardised mortality rates per 100,000 in North East Lincolnshire given by the office of national statistics, an estimate of approximately 57 deaths per 100,000 per year is attributable to air pollution. It should be noted that this figure only accounts for one pollutant ($PM_{2.5}$) for which stronger scientific evidence on links with mortality exist, and not NO_2, for which the AQMA is declared, so the true figure is possibly even higher.

There are a number of measures outlined in Table 2.2 that have been implemented to reduce NO_2 emissions but will subsequently reduce $PM_{2.5}$ concentrations. Some major sources of $PM_{2.5}$ are; road traffic from exhaust emissions, brake and tyre wear, the re-suspension of existing particles on the road. Thus, by reducing vehicle use and introducing more efficient/less polluting vehicles, the concentrations of $PM_{2.5}$ will be reduced.

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 East Lincolnshire 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 East Lincolnshire Council undertook automatic (continuous) monitoring at two sites during 2020. Table A.1 in Appendix A shows the details of the automatic monitoring sites. North Lincolnshire automatic monitoring results are available through the UK-Air website Data Selector Tool - Defra, UK.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

North East Lincolnshire Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 30 sites during 2020. Table A.2 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 (NO_2)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. 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 2020 dataset of monthly mean values is provided in Appendix B. Due to the Covid-19 pandemic, diffusion tube data is only available for a maximum of four months of 2020. Therefore all diffusion tube data has been annualised in line with the methodology detailed within LAQM.TG16. There were no exceedances of the NO_2 annual mean objective during 2020. This is the third year in a row that there have been no exceedances in the Cleethorpe Road AQMA. A maximum annual mean concentration of 32.7µg/m^3 was recorded at the 112 Cleethorpe Road co-located tube site.

Table A.5 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year. There has not been any 1-hour means greater than 200µg/m^3 over the past five years.

During 2020, no diffusion tube annual mean concentrations were greater than 60µg/m^3 therefore it is unlikely that the 1-hour mean objective has been exceeded at any diffusion tube monitoring sites in 2020.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
AURN	Woodlands Avenue, Immingham	Urban Background	518277	415116	NO_2	NO	Chemiluminescent	10	4	3
Cleethorpe Road	Cleethorpes Road	Roadside	527767	410414	NO_2	YES	Serinus 40 Oxides	0	2	2
Peaks Parkway	Peaks Parkway	Kerbside	527540	408080	NO_2	NO	Serinus 40 Oxides	20	1.5	2

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

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)
NEL 1	Victoria Street West, The Friary PH	Kerbside	526838	409261	NO_2	NO	5.0	2.0	NO	2.0
NEL 2	8 Town Hall Street	Roadside	527095	409367	NO_2	NO	5.0	2.0	NO	2.0
NEL 3	1 Town Hall Street	Roadside	527100	409400	NO_2	NO	10.0	2.0	NO	2.0
NEL 4	Fryston House, Grimsby AQM Station	Roadside	526583	408047	NO_2	NO	50.0	3.0	NO	2.0
NEL 5	192 Littlecoates Road, Bradley roundabout	Roadside	524350	407765	NO_2	NO	13.0	2.0	NO	2.0
NEL 6	Toll Bar Roundabout, A16 New Waltham	Roadside	527748	404396	NO_2	NO	31.0	2.0	NO	2.0
NEL 8	Peaks Parkway & Welholme Road, Grimsby	Kerbside	527403	408666	NO_2	NO	8.0	1.0	NO	2.0
NEL 9	76 Freeman Street, Grimsby	Kerbside	527665	410164	NO_2	NO	0.0	2.0	NO	2.0
NEL 10	Aylesby Road Grimsby	Roadside	523284	409883	NO_2	NO	0.0	2.0	NO	2.0
NEL 11/12/13	112 Cleethorpe Road, Grimsby	Roadside	527761	410425	NO_2	YES	0.0	2.0	YES	2.0
NEL 14	113 Cleethorpe Road, Grimsby	Kerbside	527754	410445	NO_2	YES	5.0	<1	NO	2.0

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)
NEL 15	123 Cleethorpe Road, Grimsby	Kerbside	527789	410438	NO_2	YES	5.0	<1	NO	2.0
NEL 16	6 Freeman St, Riby Square	Kerbside	527693	410413	NO_2	YES	0.0	1.5	NO	2.0
NEL 17	Park Street	Roadside	528725	410102	NO_2	NO	0.0	3.0	NO	2.0
NEL 18	Victor Street	Kerbside	528171	410338	NO_2	NO	7.0	1.0	NO	2.0
NEL 19	Victoria Street North, Victoria Mills A	Kerbside	527165	409995	NO_2	NO	0.0	2.0	NO	2.0
NEL 20	Victoria Street North, Victoria Mills B	Kerbside	527182	410092	NO_2	NO	0.0	2.0	NO	2.0
NEL 21	9 Pyewipe Road, Grimsby	Roadside	526077	410124	NO_2	NO	0.0	2.0	NO	2.0
NEL 22	Great Cotes Road/Yarborough Rd	Roadside	524666	408814	NO_2	NO	5.0	2.0	NO	2.0
NEL 23	Kings Road, Immingham AQM Station	Roadside	519193	415279	NO_2	NO	20.0	1.0	NO	2.0
NEL 24	Bluestone, Immingham	Kerbside	517543	414312	NO_2	NO	10.0	1.0	NO	2.0
NEL 25	St Margret/Pelham Ave, Immingham	Kerbside	518108	414533	NO_2	NO	29.0	0.5	NO	2.0
NEL 26	Love Lane Corner, Grimsby	Roadside	528891	408078	NO_2	NO	14.0	2.0	NO	2.0

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)
NEL 27	Hewitts Circus, Cleethopres	Roadside	529532	406835	NO_2	NO	6.0	2.0	NO	2.0
NEL 28	Toll Bar Roundabout, New Waltham	Kerbside	527716	404516	NO_2	NO	13.0	2.0	NO	2.0
NEL 29	Louth Road & Waltham Road, Grimsby	Roadside	526465	406334	NO_2	NO	3.0	2.0	NO	2.0
NEL 30	Victoria Street South	Roadside	527181	409513	NO_2	NO	0.0	2.0	NO	2.0
NEL 31	Lampost Magistrates Court	Kerbside	527183	409647	NO_2	NO	3.0	2.0	NO	2.0
NEL 32	Drainpipe Pink Butterfly	Kerbside	527189	409621	NO_2	NO	0.0	2.0	NO	2.0
NEL 7/33/34	Weelsby Road AQ Station C	Roadside	527540	408080	NO_2	NO	20.0	2.0	YES	2.0

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.3 – Annual Mean NO_2 Monitoring Results: Automatic Monitoring (µg/m^3)

Site 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
AURN	518277	415116	Urban Background	94.6	94.6	-	16.9	13.9	13.5	11
Cleethorpe Road	527761	410425	Roadside	99.6	99.6	**41.6**	35.9	-	32	26
Peaks Parkway	527540	408080	Kerbside	97.6	87.8	-	-	-	-	20

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

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

Notes:

The annual mean concentrations are presented as µg/m^3.

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

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%).

Table A.4 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

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
NEL 1	526838	409261	Kerbside	75	23.1	29.7	31.9	30.3	28.9	26.3
NEL 2	527095	409367	Roadside	100	32.7	39.8	36.9	33.6	33.3	30.3
NEL 3	527100	409400	Roadside	100	32.7	38.4	33.6	32.0	30.4	25.7
NEL 4	526583	408047	Roadside	75	23.1	27.7	27.1	25.1	26.1	22.9
NEL 5	524350	407765	Roadside	100	32.7	-	-	-	22.1	20.1
NEL 6	527748	404396	Roadside	100	32.7	-	-	-	17.4	12.0
NEL 8	527403	408666	Kerbside	100	32.7	31.9	30.8	28.8	28.5	23.6
NEL 9	527665	410164	Kerbside	100	32.7	21.8	21.3	21.4	21.1	16.4
NEL 10	523284	409883	Roadside	100	32.7			21.2	19.9	16.4
NEL 11/12/13	527761	410425	Roadside	100	32.7	**45.2**	**47.3**	38.0	37.8	32.7
NEL 14	527754	410445	Kerbside	100	32.7	37.3	34.7	33.3	31.6	28.2
NEL 15	527789	410438	Kerbside	100	32.7	35.7	37.3	32.9	31.0	28.0
NEL 16	527693	410413	Kerbside	100	32.7	33.1	35.2	30.9	28.9	28.4
NEL 17	528725	410102	Roadside	100	32.7	30.1	32.8	30.6	29.6	26.4
NEL 18	528171	410338	Kerbside	100	32.7	29.5	36.4	33.6	32.4	30.9
NEL 19	527165	409995	Kerbside	100	32.7	34.2	34.7	29.8	29.6	27.0
NEL 20	527182	410092	Kerbside	75	23.1	37.3	37.4	33.1	32.9	29.7
NEL 21	526077	410124	Roadside	100	32.7	33.2	30.6	26.9	25.2	22.5
NEL 22	524666	408814	Roadside	100	32.7	28.6	27.0	24.3	23.8	19.2
NEL 23	519193	415279	Roadside	100	32.7	33.3	28.5	26.6	24.5	21.1
NEL 24	517543	414312	Kerbside	100	32.7	-	-	-	16.5	12.5
NEL 25	518108	414533	Kerbside	100	32.7	-	-	-	19.1	16.0
NEL 26	528891	408078	Roadside	100	32.7	24.4	22.9	21.0	20.7	15.1
NEL 27	529532	406835	Roadside	75	23.1	22.1	23.0	19.8	22.5	19.1
NEL 28	527716	404516	Kerbside	75	25.0	27.7	30.2	24.9	23.9	20.6
NEL 29	526465	406334	Roadside	100	32.7	25.0	23.7	22.5	22.4	18.9
NEL 30	527181	409513	Roadside	100	32.7	-	-	29.4	27.0	22.6
NEL 31	527183	409647	Kerbside	100	32.7	28.3	29.8	29.5	27.2	20.6
NEL 32	527189	409621	Kerbside	100	32.7	29.5	29.2	29.1	26.6	22.3
NEL 7/33/34	527540	408080	Roadside	83	32.7	-	-	-	-	20.0

☒ **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 µg/m^3.

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

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

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 NO_2 Concentrations in Grimsby

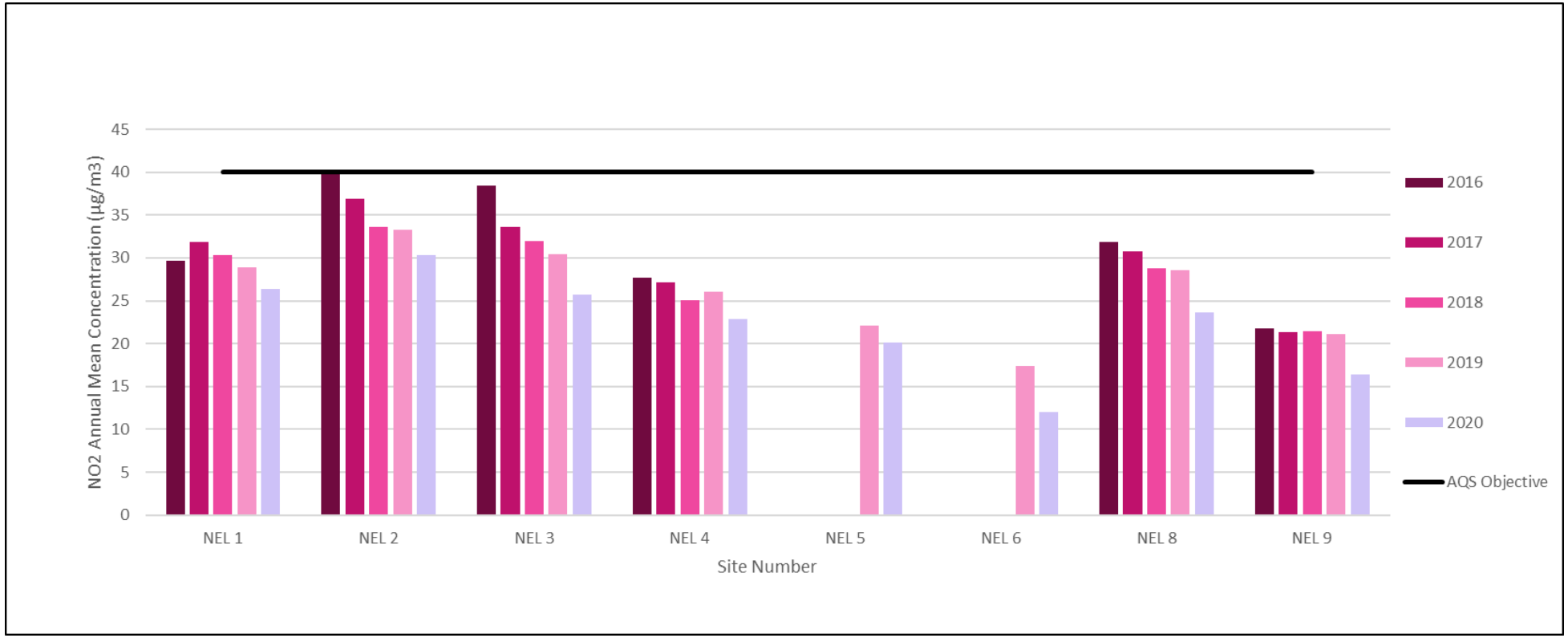


Figure A.2 – Trends in Annual Mean NO_2 Concentrations in Grimsby

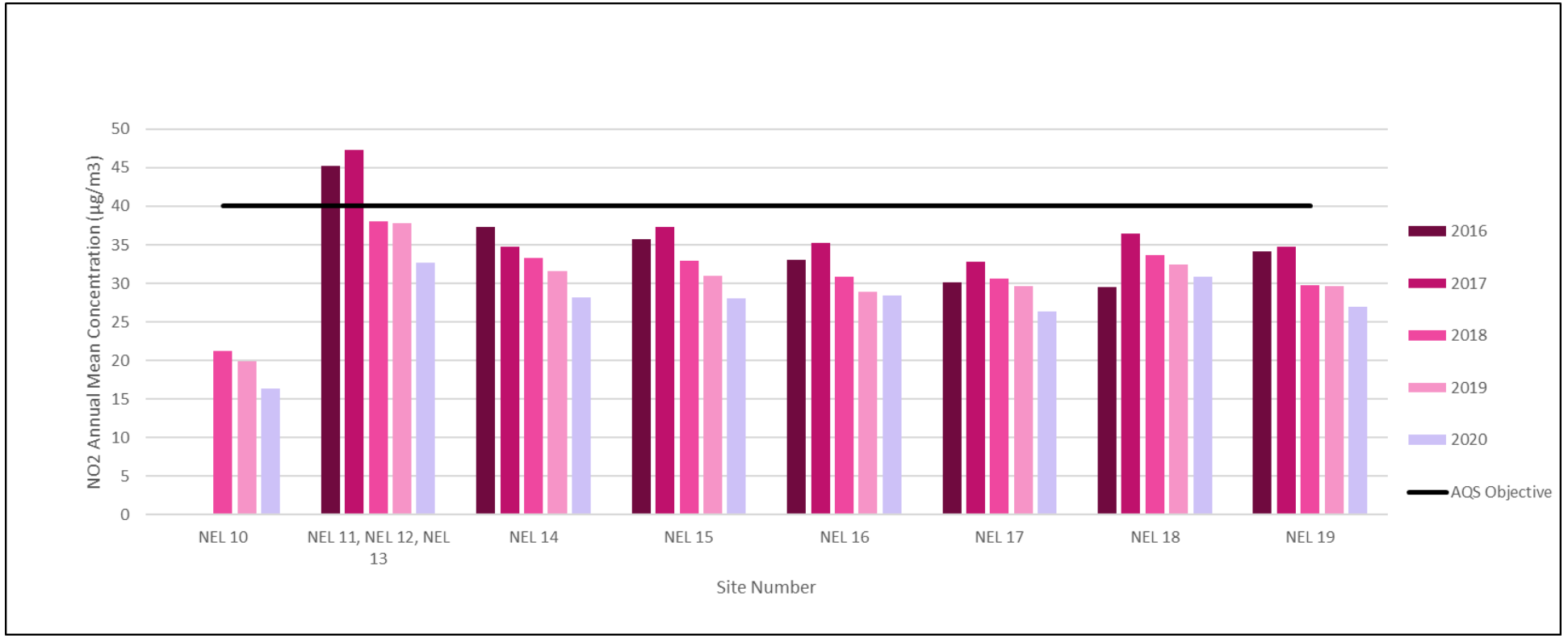


Figure A.3 – Trends in Annual Mean NO_2 Concentrations in Grimsby and Immingham

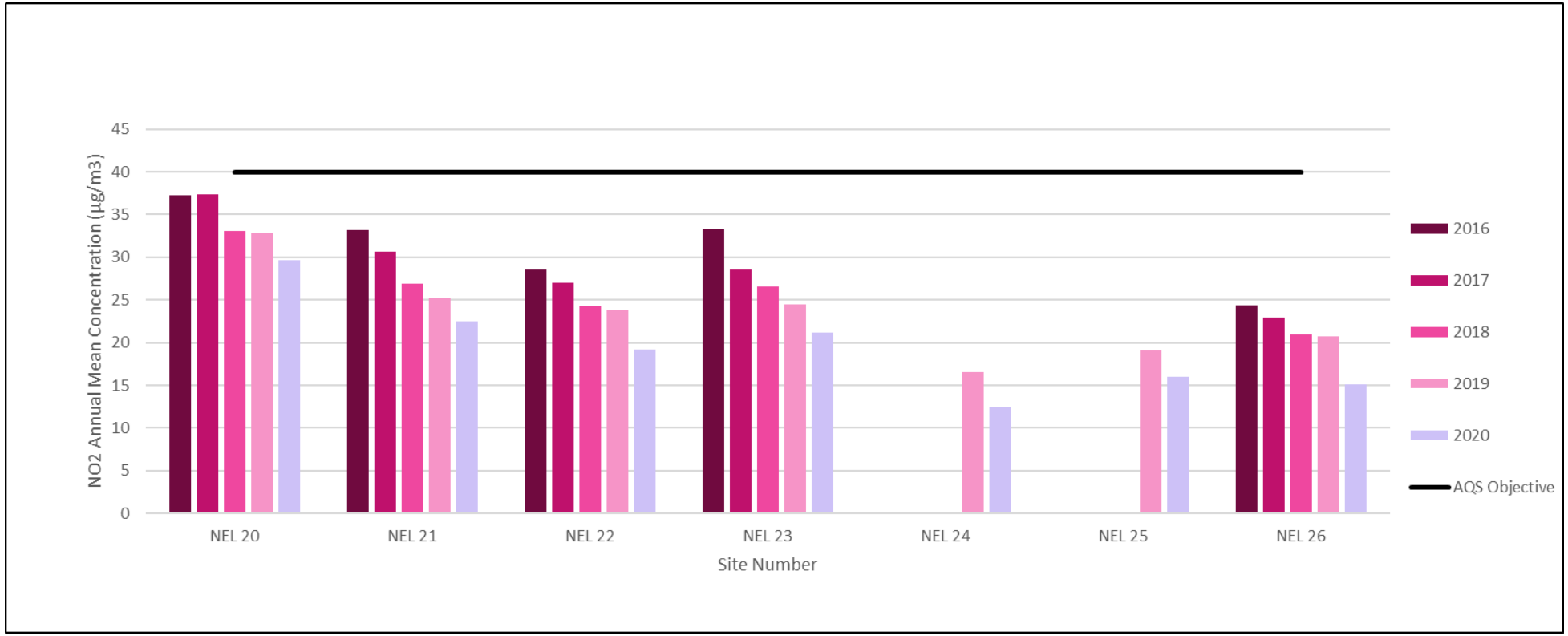


Figure A.4 – Trends in Annual Mean NO_2 Concentrations in Grimsby

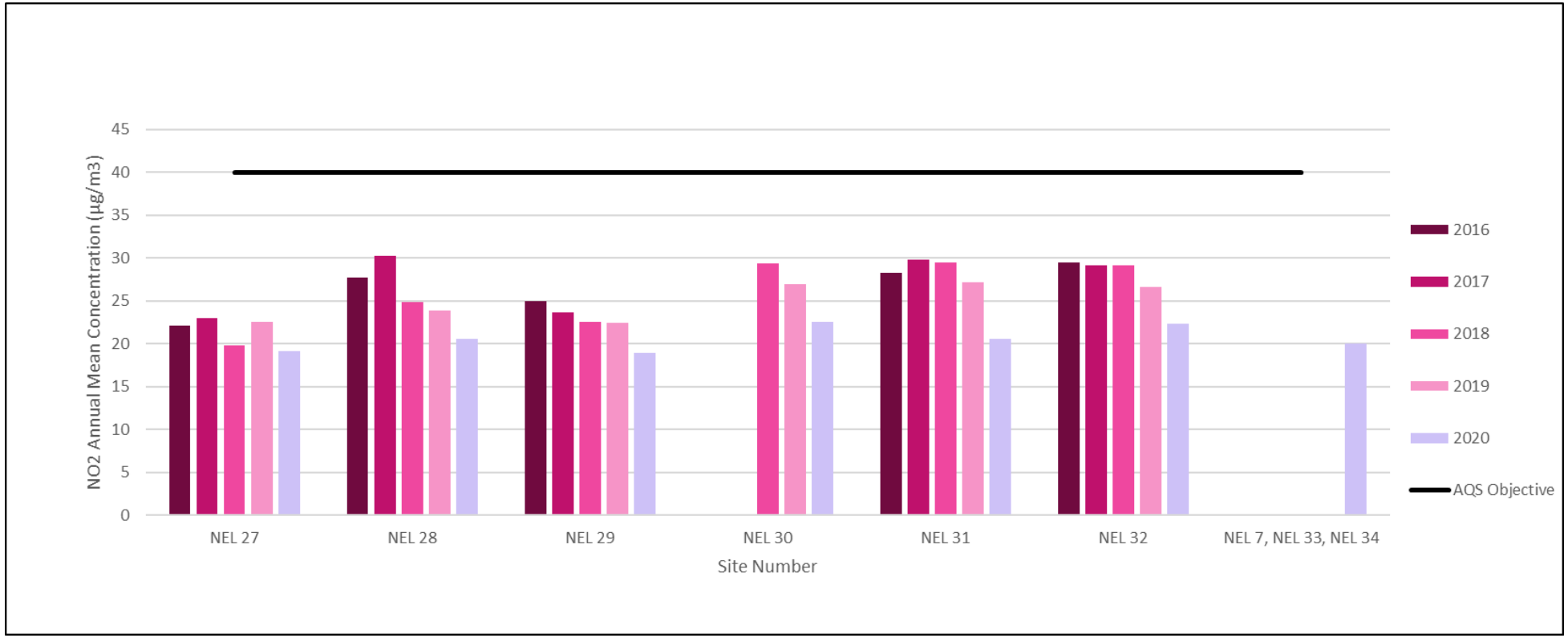


Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site 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
AURN	518277	415116	Urban Background	94.6	94.6	-	0 (56.8)	0 (27.5)	0	0
Cleethorpes	527761	410425	Roadside	99.6	99.6	0	0 (54.6)	-	0	0
Peaks Parkway	527540	408080	Kerbside	97.6	87.8	-	-	-	-	0

Notes:

Results are presented as the number of 1-hour periods where concentrations greater than 200µg/m^3 have been recorded.

Exceedances of the NO_2 1-hour mean objective (200µg/m^3 not to be exceeded more than 18 times/year) are shown in **bold**.

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

(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%).

Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO_2 2020 Diffusion Tube Results (µg/m^3)

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 (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
NEL 1	526838	409261	49.5	38.3							34.3				40.7	26.3	-	
NEL 2	527095	409367	45.9	44.0						36.0	42.2				42.0	30.3	-	
NEL 3	527100	409400	42.7	34.5						31.1	34.6				35.7	25.7	-	
NEL 4	526583	408047	42.1	30.6							33.5				35.4	22.9	-	
NEL 5	524350	407765	39.7	25.8						21.9	24.2				27.9	20.1	-	
NEL 6	527748	404396	16.7	12.8						19.8	17.3				16.7	12.0	-	
NEL 7	527540	408080	33.8	28.0						25.4	22.7				-	-	-	Triplicate Site with NEL 7, NEL 33 and NEL 34 - Annual data provided for NEL 34 only
NEL 8	527403	408666	40.5	30.6						29.1	30.9				32.8	23.6	-	
NEL 9	527665	410164	30.2	22.4						19.3	19.3				22.8	16.4	-	
NEL 10	523284	409883	31.8	18.3						19.4	21.5				22.8	16.4	-	
NEL 11	527761	410425	64.3	45.8						40.5	42.5				-	-	-	Triplicate Site with NEL 11, NEL 12 and NEL 13 - Annual data provided for NEL 13 only
NEL 12	527761	410425	51.3	44.5						41.9	40.7				-	-	-	Triplicate Site with NEL 11, NEL 12 and NEL 13 - Annual data provided for NEL 13 only
NEL 13	527761	410425	55.5	39.5						38.6	40.2				45.4	32.7	-	Triplicate Site with NEL 11, NEL 12 and NEL 13 - Annual data provided for NEL 13 only
NEL 14	527754	410445	47.5	34.5						36.2	38.4				39.2	28.2	-	
NEL 15	527789	410438	49.6	33.8						35.1	37.2				38.9	28.0	-	
NEL 16	527693	410413	50.9	40.9						34.5	31.4				39.4	28.4	-	
NEL 17	528725	410102	44.6	34.0						32.9	34.9				36.6	26.4	-	
NEL 18	528171	410338	52.5	46.5						31.0	41.7				42.9	30.9	-	
NEL 19	527165	409995	48.7	39.1						26.8	35.2				37.5	27.0	-	
NEL 20	527182	410092	57.1	43.2							37.5				45.9	29.7	-	
NEL 21	526077	410124	40.6	30.1						24.8	29.5				31.3	22.5	-	
NEL 22	524666	408814	35.0	28.5						20.7	22.4				26.7	19.2	-	
NEL 23	519193	415279	36.2	26.6						27.0	27.6				29.4	21.1	-	
NEL 24	517543	414312	20.4	16.3						15.2	17.6				17.4	12.5	-	
NEL 25	518108	414533	25.3	21.6						18.9	23.2				22.3	16.0	-	
NEL 26	528891	408078	29.6	18.8						12.8	22.6				21.0	15.1	-	
NEL 27	529532	406835	39.6	24.4							24.6				29.5	19.1	-	
NEL 28	527716	404516	40.6	28.0						19.3					29.3	20.6	-	
NEL 29	526465	406334	32.9	26.5						21.8	23.8				26.3	18.9	-	
NEL 30	527181	409513	41.4	28.0						29.6	26.3				31.3	22.6	-	
NEL 31	527183	409647	41.2	26.9						23.7	22.5				28.6	20.6	-	
NEL 32	527189	409621	38.5	27.2						26.5	31.8				31.0	22.3	-	
NEL 33	527540	408080		24.0						26.6	25.2				-	-	-	Triplicate Site with NEL 7, NEL 33 and NEL 34 - Annual data provided for NEL 34 only
NEL 34	527540	408080		29.5						26.8	24.1				27.8	20.0	-	Triplicate Site with NEL 7, NEL 33 and NEL 34 - Annual data provided for NEL 34 only

☒ **All erroneous data has been removed from the NO_2 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 East Lincolnshire Council confirm that all 2020 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

Notes:

Reduced data capture during 2020 was due to Covid-19 restrictions.

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

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within North East Lincolnshire Council During 2020

The Environmental Protection department reviewed over 450 planning applications during 2020, of which 11 of were deemed significant in terms of air quality therefore required an air quality assessment (AQA) to be completed as part of their application. One approved application requested an AQA, however to date this has not been undertaken. A further two developments are pending, one site is awaiting decision and one has been refused. Additionally, there have been no significant new industrial process or biomass boilers in North East Lincolnshire.

Additional Air Quality Works Undertaken by North East Lincolnshire Council During 2020

During 2020 there was little progress on a number of measures related to car sharing and public transport as the use of public transport was discouraged due to Covid-19 and car sharing was not advised. Two measures were completed during 2020, including the Air Quality Strategy, which has been updated and improved signage for the Port of Grimsby but won't be adopted until 2021. The signage in the port has been amended to direct HGV's off at Lockhill Roundabout so that they don't continue through the Cleethorpe Road AQMA.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes for the year 2020 were supplied and analysed by Socotec, the tubes were prepared using the 50% TEA in acetone preparation method.

Socotec are a UKAS accredited laboratory and analyse their diffusion tubes in line with their Standard Operating Procedure ANU/SOP/1015 that meets the guidelines set out in

Defra's best practice guidance[7]. In addition, Socotec participate in the AIR-PT Scheme for NO_2 tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO_2 concentrations reported are of a high calibre. In the latest available AIR-PT Socotec scored 100% results. The percentage score reflects the results deemed to be satisfactory based upon the z-score of $< \pm 2$.

Diffusion Tube Annualisation

North East Lincolnshire Council carried out non-automatic (diffusion tube) monitoring for four months of 2020, therefore data capture for all sites was <75% and >25% at most sites. This meant that all diffusion tube sites required annualisation to calculate the 2020 annual mean concentrations. Annualisation was performed by calculating an average annualisation factor using continuous background monitoring data from the four closest background automatic sites to North East Lincolnshire. This average was then used to calculate an annualised annual mean value for the sites which required annualisation. The Defra Diffusion Tube Data Processing Tool was used to process all diffusion tube results in 2020, therefore the annualisation has been completed in line with LAQM.TG16. Annualisation data can be found in Table C.2.

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/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

North East Lincolnshire Council have applied a national bias adjustment factor of 0.77 (based on twenty-two studies) to the 2020 monitoring data. The council have two co-located tube locations; the Peaks Parkway and Cleethorpes Road automatic monitoring

[7] Diffusion Tubes for Ambient NO_2 Monitoring : Practical Guide for Laboratories and Users, AEA Energy & Environment, 2008

sites. A combined local bias adjustment factor of 0.70 has been calculated for 2020. The overall continuous monitoring data capture at Peaks Parkway has been deemed poor, as the data capture is <90%. This is because monitoring at this site commenced on February 7th, therefore there was no data prior to this at the Peaks Parkway site. As the automatic monitoring data capture was <90% for the Peaks Parkway site, and only three months of diffusion tube monitoring data was available for comparison in 2020, the national bias adjustment factor has been used, which only differs to the local factor by 0.07. This selection is in line with the previous five years of bias adjustment, it is hoped that data capture will be compliant in 2021 and a comparison between a local factor and the relevant national factor can be completed. A summary of bias adjustment factors used by North East Lincolnshire Council over the past five years is presented in Table C.1.

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	National	03/21	0.77
2019	National	03/20	0.75
2018	National	03/19	0.76
2017	National	03/18	0.77
2016	National	03/17	0.77

Figure C.1 – 2020 National Diffusion Tube Bias Adjustment Factor Spreadsheet

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
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 spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of June 2021
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[3] shown in blue at the foot of the final column.								
If a laboratory is not shown, we have no data for this laboratory.	If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data[2]	If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953								
Analysed By[1]	Method	Year[5]	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[6]	Bias Adjustment Factor (A) (Cm/Dm)
SOCOTEC Didcot	50% TEA in acetone	2020		Overall Factor[3] (22 studies)				Use		0.77

NO_2 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 NO_2 concentration at

the nearest location relevant for exposure should be estimated using the Diffusion Tube Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website.

There were no diffusion tube NO_2 monitoring locations within North East Lincolnshire Council that required distance correction during 2020.

QA/QC of Automatic Monitoring

Air quality measurements from the automatic instruments are validated and ratified by Air Quality Data Management (AQDM) to the standards described in the LAQM.TG16.

Regular calibrations with certified gas standards are used to measure the zero and sensitivity.

Ratification generally operates at three, six. or twelve-month intervals, however, unexpected faults can be identified during the instrument routine services or independent audits which are often at 6-monthly interval.

Automatic Monitoring Annualisation

All automatic monitoring locations within North East Lincolnshire Council recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data.

NO_2 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 NO_2 concentration at the nearest location relevant for exposure should be estimated using the NO_2 fall-off with distance calculator available on the LAQM Support website.

There were no automatic NO_2 monitoring locations within North East Lincolnshire Council that required distance correction during 2020.

Table C.2 – Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Immingham Woodlands Avenue	Annualisation Factor Hull Freetown	Annualisation Factor Sheffield Tinsley	Annualisation Factor Sheffield Devonshire Green	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
NEL 1	0.9369	0.7767	0.7717	0.8743	0.8399	40.7	34.2	
NEL 2	1.0140	0.8930	0.8733	0.9609	0.9353	42.0	39.3	
NEL 3	1.0140	0.8930	0.8733	0.9609	0.9353	35.7	33.4	
NEL 4	0.9369	0.7767	0.7717	0.8743	0.8399	35.4	29.7	
NEL 5	1.0140	0.8930	0.8733	0.9609	0.9353	27.9	26.1	
NEL 6	1.0140	0.8930	0.8733	0.9609	0.9353	16.7	15.6	
NEL 7	1.0140	0.8930	0.8733	0.9609	0.9353	-	-	*Triplicate Site with NEL 7, NEL 33 and NEL 34 - Annual data provided for NEL 34 only*
NEL 8	1.0140	0.8930	0.8733	0.9609	0.9353	32.8	30.7	
NEL 9	1.0140	0.8930	0.8733	0.9609	0.9353	22.8	21.3	
NEL 10	1.0140	0.8930	0.8733	0.9609	0.9353	22.8	21.3	
NEL 11	1.0140	0.8930	0.8733	0.9609	0.9353	-	-	*Triplicate Site with NEL 11, NEL 12 and NEL 13 - Annual data provided for NEL 13 only*
NEL 12	1.0140	0.8930	0.8733	0.9609	0.9353	-	-	*Triplicate Site with NEL 11, NEL 12 and NEL 13 - Annual data provided for NEL 13 only*
NEL 13	1.0140	0.8930	0.8733	0.9609	0.9353	45.4	42.5	*Triplicate Site with NEL 11, NEL 12 and NEL 13 - Annual data provided for NEL 13 only*
NEL 14	1.0140	0.8930	0.8733	0.9609	0.9353	39.2	36.6	
NEL 15	1.0140	0.8930	0.8733	0.9609	0.9353	38.9	36.4	
NEL 16	1.0140	0.8930	0.8733	0.9609	0.9353	39.4	36.9	
NEL 17	1.0140	0.8930	0.8733	0.9609	0.9353	36.6	34.2	
NEL 18	1.0140	0.8930	0.8733	0.9609	0.9353	42.9	40.1	

Site ID	Annualisation Factor Immingham Woodlands Avenue	Annualisation Factor Hull Freetown	Annualisation Factor Sheffield Tinsley	Annualisation Factor Sheffield Devonshire Green	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
NEL 19	1.0140	0.8930	0.8733	0.9609	0.9353	37.5	35.0	
NEL 20	0.9369	0.7767	0.7717	0.8743	0.8399	45.9	38.6	
NEL 21	1.0140	0.8930	0.8733	0.9609	0.9353	31.3	29.2	
NEL 22	1.0140	0.8930	0.8733	0.9609	0.9353	26.7	24.9	
NEL 23	1.0140	0.8930	0.8733	0.9609	0.9353	29.4	27.5	
NEL 24	1.0140	0.8930	0.8733	0.9609	0.9353	17.4	16.3	
NEL 25	1.0140	0.8930	0.8733	0.9609	0.9353	22.3	20.8	
NEL 26	1.0140	0.8930	0.8733	0.9609	0.9353	21.0	19.6	
NEL 27	0.9369	0.7767	0.7717	0.8743	0.8399	29.5	24.8	
NEL 28	1.0101	0.8539	0.8495	0.9375	0.9127	29.3	26.7	
NEL 29	1.0140	0.8930	0.8733	0.9609	0.9353	26.3	24.6	
NEL 30	1.0140	0.8930	0.8733	0.9609	0.9353	31.3	29.3	
NEL 31	1.0140	0.8930	0.8733	0.9609	0.9353	28.6	26.7	
NEL 32	1.0140	0.8930	0.8733	0.9609	0.9353	31.0	29.0	
NEL 33	1.0140	0.8930	0.8733	0.9609	0.9353	-	-	*Triplicate Site with NEL 7, NEL 33 and NEL 34 - Annual data provided for NEL 34 only*
NEL 34	1.0140	0.8930	0.8733	0.9609	0.9353	27.8	26.0	*Triplicate Site with NEL 7, NEL 33 and NEL 34 - Annual data provided for NEL 34 only*

Table C.3 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2	Local Bias Adjustment Input 3	Local Bias Adjustment Input 4	Local Bias Adjustment Input 5
Periods used to calculate bias	3	4			
Bias Factor A	0.78 (0.58 - 1.21)	0.64 (0.55 - 0.76)			
Bias Factor B	27% (-17% - 72%)	57% (31% - 82%)			
Diffusion Tube Mean (µg/m^3)	25.8	45.4			
Mean CV (Precision)	6.2%	6.6%			
Automatic Mean (µg/m^3)	20.3	29.0			
Data Capture	93%	100%			
Adjusted Tube Mean (µg/m^3)	20 (15 - 31)	29 (25 - 35)			

Notes:

The local bias adjustment factor of 0.70 has not been used to bias adjust the 2020 diffusion tube results.

Appendix D: Maps of Monitoring Locations and AQMAs

Figure D.1 – Map of Monitoring Locations: Immingham

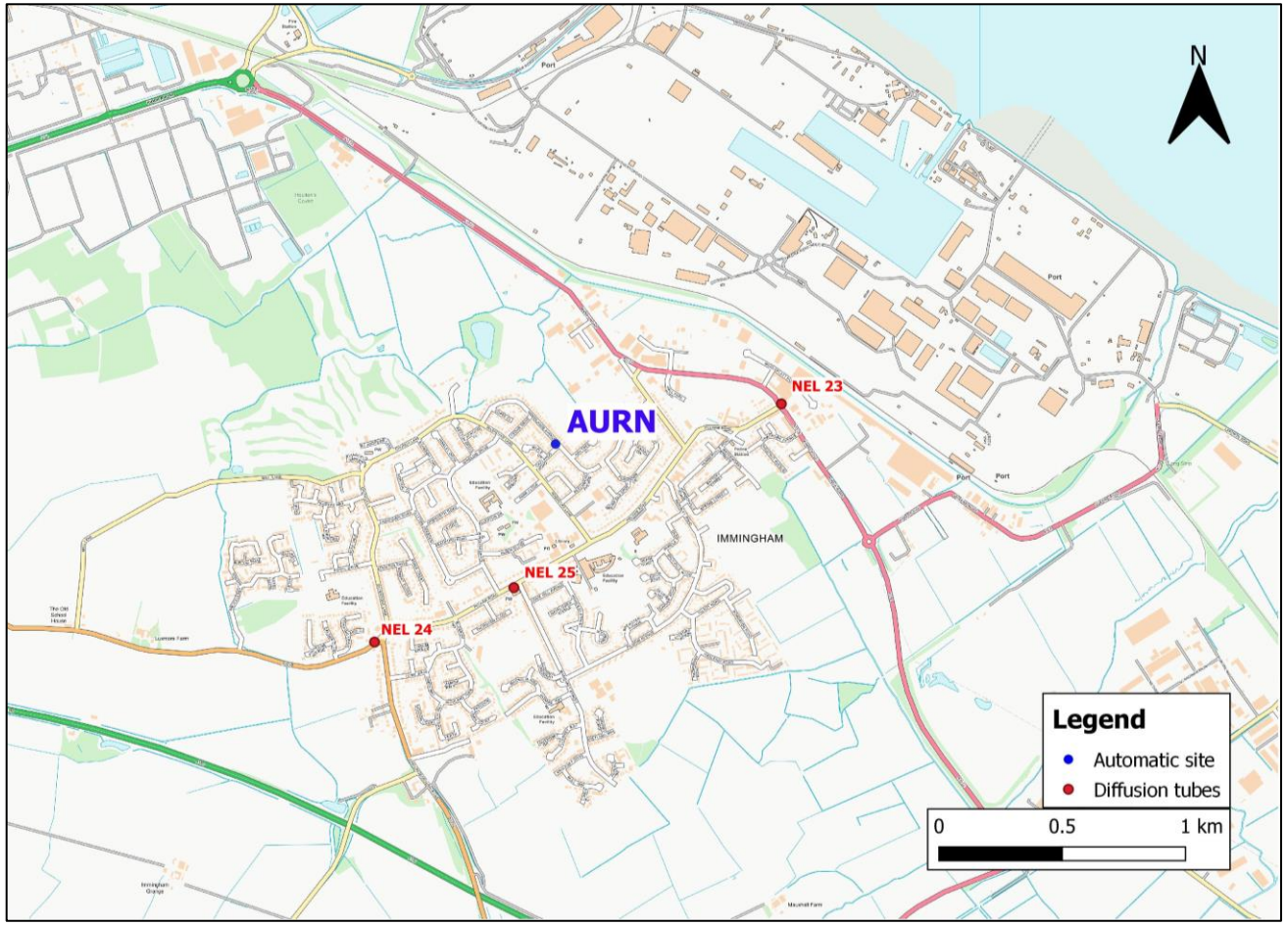


Figure D.2 – NO_2 Diffusion Tube Monitoring Locations: Grimsby, Yarborough

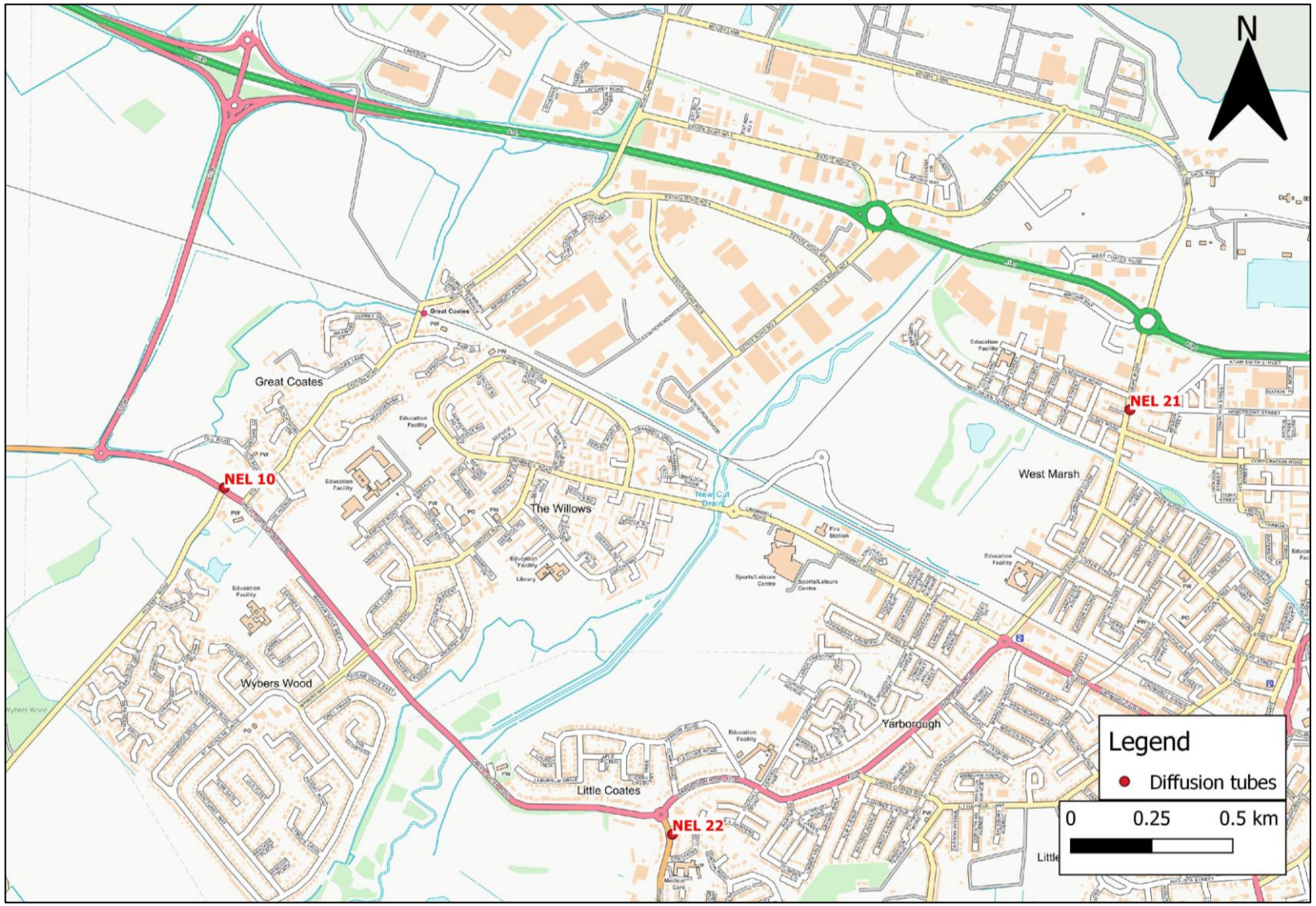


Figure D.3 – NO_2 Monitoring Locations: Grimsby North

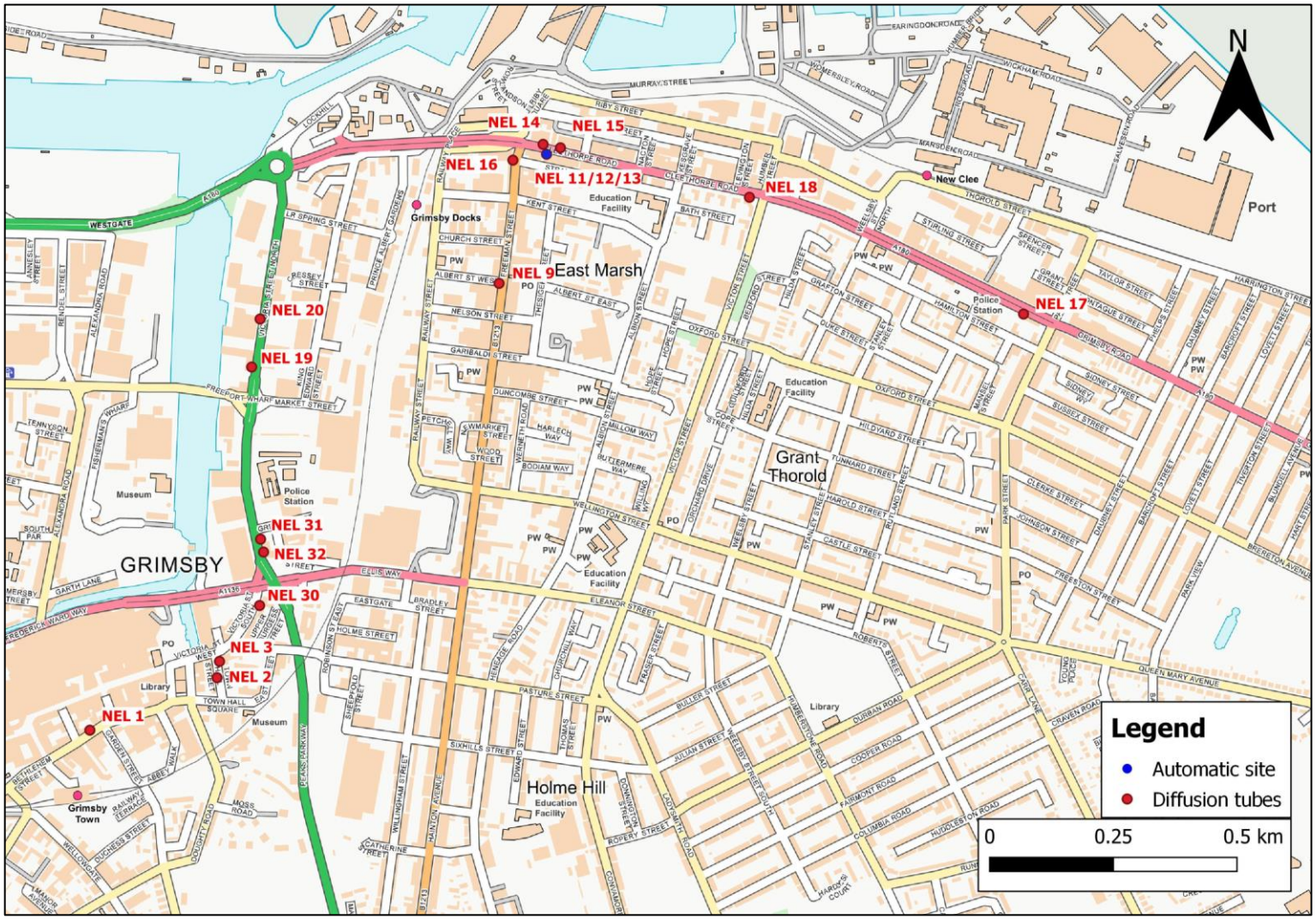
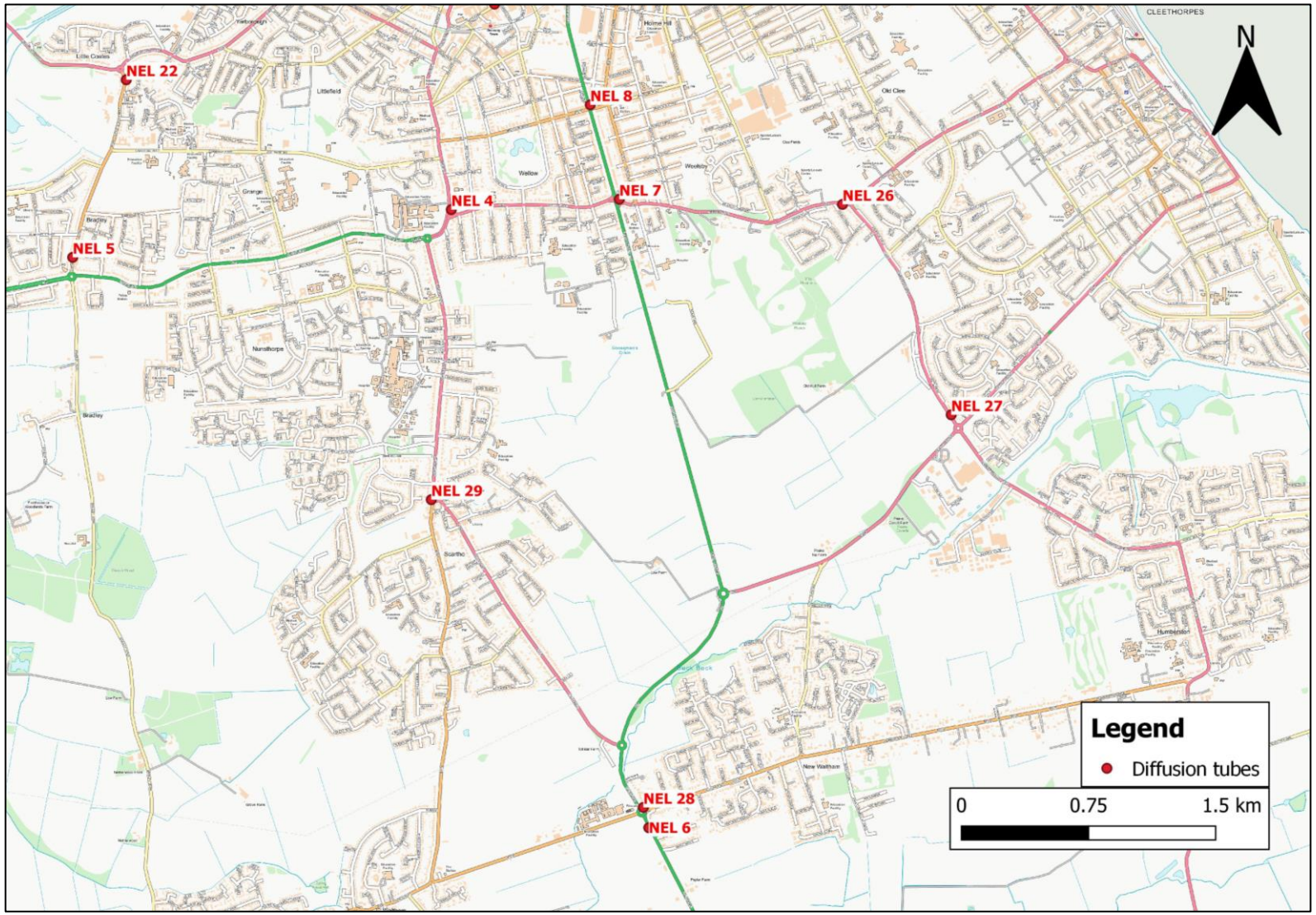


Figure D.4 – NO_2 Diffusion Tube Monitoring Locations: Grimsby South



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[8]

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

[8] The units are in microgrammes of pollutant per cubic metre of air (µg/m^3).

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 (NO_2) 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) data[9] 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)[10] has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO_2 annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which

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

[10] 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/m^3 if expressed relative to annual mean averages. During this period, changes in $PM_{2.5}$ concentrations were less marked than those of NO_2. $PM_{2.5}$ 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/m^3 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.

Impacts of COVID-19 on Air Quality within North East Lincolnshire Council

Diffusion tube monitoring significantly declined during 2020 due to Covid-19 restrictions. This resulted in the Council gathering a maximum of four months of diffusion tube data rather than 12 months. Diffusion tube data was only recorded for January, February, August and September.

Opportunities Presented by COVID-19 upon LAQM within North East Lincolnshire Council

No LAQM related opportunities have arisen as a consequence of COVID-19 within North East Lincolnshire Council.

Challenges and Constraints Imposed by COVID-19 upon LAQM within North East Lincolnshire Council

Throughout 2020, the Council have had limited community engagement as a result of the Covid-19 pandemic. A number of measures relating to car sharing and public transport were discouraged by the national guidance during the pandemic. These measures include:

- M1: Improving public transport services, bus stop/train infrastructure & information and interchange facilities;
- M6: Encouraging residents and visitors to North East Lincolnshire to use car share and public transport; and

- M7: Encouraging the uptake of Employer and School Travel Plans within the Borough.

Progress on these measures has been slower than expected due to the pandemic and a consequential decline in public transport usage. Implementation is expected to continue for these measures once national guidance changes for public transport and social distancing.

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
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.
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- North East Lincolnshire Council Annual Status Report. June 2018.
- North East Lincolnshire Council Annual Status Report. June 2019.
- North East Lincolnshire Council Annual Status Report. June 2020.
- North East Lincolnshire Council Air Quality Action Plan. July 2020.
- North East Lincolnshire Council Annual Status Report Appraisal Report. July 2020.