North East Lincolnshire Council

Annual Status Report 2020

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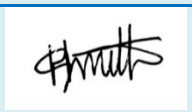
Approved By	H Smith	Senior Consultant	

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2020 Air Quality Annual Status Report (ASR)

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

June 2020

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Executive Summary: Air Quality in Our Area

Air Quality in North East Lincolnshire

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

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

The main sources of air pollution within North East Lincolnshire (the Council) is from road traffic and local background that includes sources from domestic, institutional and commercial space heating, rail, industry, aircraft and roads, point sources and other sources (ships and off-road emissions). In addition, industrial emissions arise from the industrial areas in and around the ports of Grimsby and Immingham.

The Council has one AQMA, which is located at Cleethorpe Road / Riby Square, within Grimsby. The AQMA was declared in 2010. An Air Quality Action Plan (AQAP) was produced in 2012 setting out measures aimed at reducing levels of NO_2 within the AQMA area. The 2012 AQAP is currently being updated. A revised draft AQAP was sent out for consultation in March 2020 with the adoption of the AQAP expected by August 2020. The 2019 monitoring result at NEL11/12/13 monitoring site, which is situated within the AQMA, did not exceed the annual mean NO_2 objective. However, it remained within 10% of the objective. The source apportionment study undertaken as part of the update to the AQAP found that emissions from cars is the largest contribution of local road emissions within the AQMA, followed by the emissions contribution from HGVs.

A background AURN monitoring station, operated by the Environment Agency, was installed in November 2017 in Immingham, on Woodlands Avenue. An additional Council operated real-time automatic monitoring station was installed at Cleethorpe Road in 2019 to monitor alongside the currently installed triplicate diffusion tube site

[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

DIF 11/12/13. The NO_2 concentration data reported at these monitoring stations have been provided in the report. Furthermore, NO_2 diffusion tube monitoring was completed at 30 locations throughout the borough.

The diffusion tubes DIF 5 and DIF 6 were relocated from their triplicate site to 192 Littlecoates Road, Bradley roundabout and Toll Bar Roundabout, A16 New Waltham, respectively due to the concern raised after a pre-planning application was submitted for two developments. Another further triplicate site at NEL 23 was split up, with NEL 24 and NEL 25 being moved from Kings Road to Bluestone, Immingham and St Margret/Pelham Ave, Immingham respectively. Finally site NEL 28 was relocated to a more relevant exposure point but still on Toll Bar Roundabout, New Waltham.

The national bias adjustment factor of 0.75 was used at all locations. Although the Cleethorpe Road automatic station is now co-located with the triplicate diffusion tube site DIF 11/12/13, the data capture was too low for a local bias adjustment factor to be utilised.

In 2019, all the diffusion tubes except NEL 4 and NEL 27 have seen a decrease in annual mean NO_2 concentrations when compared to the 2018 monitoring results. NEL 4 and NEL 27 reported a slight increase of 1.0 and 2.7µg/m^3 respectively.

In 2019, there were no exceedances of the annual mean NO_2 objective and there was only one location where the annual mean concentration for NO_2 was within 10% of the annual mean NO_2 objective. This is at the triplicate diffusion tubes site DIF 11/12/13, which is located within the designated Air Quality Management Area (AQMA). The location reported an annual mean NO_2 concentration of 37.8µg/m^3. The diffusion tubes are located at relevant exposure and therefore no distance correction is required for this location.

The annual mean NO_2 concentration did not exceed 60µg/m^3 at any non-automatic monitoring site. Therefore exceedances of the 1-hour mean objective are unlikely at all monitoring locations. Furthermore, there were no exceedances of the 1-hour mean NO_2 objective reported at either automatic monitoring sites.

Actions to Improve Air Quality

The Air Quality Steering Committee that was set up in 2016 has continued to meet on a quarterly basis through 2019. The meetings include representatives from the Planning, Public Health, Transport, Highways, Communications and Carbon

Reduction Teams. Feedback continues to be positive from these meetings as they provide an opportunity for all parties to share ideas and develop a collective approach towards some of the current air quality issues within the borough.

A £6 million deal to replace a fleet of vehicles, most of which are nearly 10 years old have been approved. The Council are due to replace dustbin lorries, gritters, tractors and minibuses used by the council. This will support the work being undertaken on the Electric Vehicle (EV) strategy which is expected to be continued throughout 2020 with older vehicles being upgraded to electric vehicles within the council fleet. This is North East Lincolnshire wide and will be based on demand ultra-low vehicles for up to 5 years. The policy will include resident parking, EV charging points, tourism and commercial opportunities for both NELC and Engie.

During 2019/20 the ENGIE Transport team continued to deliver the “Pedal & Stride to Economic Growth” project. The package of measures aims to encourage, enable and support people to make more short local journeys on foot, by bike or on the bus. This year the team has supported an additional 12 businesses to develop sustainable travel plans, worked with over 600 households through the Residential Travel Planning project to make long-term changes to the way in which they get about the Borough.

Work has begun on an air quality planning guidance document since the North East Lincolnshire Local Plan was adopted, and finalisation of the revised Air Quality Strategy is to be completed once a review and update of the 2012 Cleethorpe Road Air Quality Action Plan has been completed. The AQAP is due to go for Council approval in July 2020 with adoption of the plan expected in August 2020. The draft AQAP was submitted for public consultation in March 2020 and feedback from this has been largely positive.

Lastly, the Council declared a Climate Emergency in September 2019 and have set a target of becoming carbon neutral as a Borough by 2050. We have commissioned our strategic partner ENGIE to review this target, develop a carbon emissions baseline and develop a roadmap in consultation with key stakeholders. It is anticipated that this roadmap will be completed and adopted in early 2021.

Conclusions and Priorities

The monitoring results in 2019 show that there are no exceedances of the annual mean NO_2 objective, and there is only one location where the annual mean concentration was within 10% of the annual mean objective.

The following points provide a summary of conclusions and the priorities for 2020:

- The Council will continue to monitor NO_2 within the existing diffusion tube monitoring network, continually reviewing the positioning of diffusion tubes to monitor any possible hotspots in pollutant concentrations;
- The 2012 Cleethorpe Road Air Quality Action Plan has been updated and is due to be adopted in September 2020;
- The Air Quality Strategy will be finalised upon completion of the revised Cleethorpe Road Air Quality Action Plan with completion estimated in September 2020;
- The Council will continue to assess any new developments in terms of its impact upon local air quality to ensure that developments do not result in a negative impact. An air quality guidance document in the form of a Supplementary Planning Document is currently being developed with the aim for this to be completed in March 2021;
- The council have installed a continuous monitoring station at Cleethorpe Road with some success, it is noted that the target for 2020 is to achieve at least 95% data capture, opposed to 51.4% which was achieved in 2019.
- The council plan to install another continuous monitoring station is to be installed at the Junction of Peaks Parkway and Weelsby Road, Grimsby within 2020

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.

Everyday initiatives to help improve air quality:

- Where possible use public transport, walk or cycle. A modal shift in transportation decreases the number of cars on the road, reducing congestion, overall traffic movements and the amount of pollutant emissions;
- Car share to reduce the number of cars on the road, again this reduces congestion, traffic movement and therefore the amount of 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.
- Currently the council is working on a Walk to School Weeks Promotion led by the wellbeing programme lead for schools team, this has been successfully rolled out with the first Walk to School Week taking place on the 20th – 24th May 2019.

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. The is scheduled to take place in October 2020 along with a campaign run by Public Health England. Further details on the Clean Air Day can be found at https://www.cleanairday.org.uk/.

In other events, more than 900 people have attended one of the 'Doctor Bike' and 'Be Safe, Be Seen' events this year. The events provide the opportunity for residents of the borough to be able get their cycle serviced and repaired for free. The project has also provided the funds to support an additional 400 local children complete Bikeability cycle training during the last academic year.

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1 Local Air Quality Management

This report provides an overview of air quality in North East Lincolnshire during 2019. 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 can be found in Table E.1 in Appendix E.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

A summary of the AQMA declared by North East Lincolnshire can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=175. Alternatively, see Appendix D: Maps of Monitoring Locations and AQMAs, which provides maps of air quality monitoring locations in relation to the AQMA.

The Council has one AQMA, which is located at Cleethorpe Road / Riby Square, within Grimsby. The AQMA was declared in 2010. The 2012 Air Quality Action Plan (AQAP) is currently being updated and a revised AQAP will be issued later this year. During 2019 the highest NO_2 annual mean concentration within the AQMA was recorded as 37.8µg/m^3. This was recorded at the triplicate diffusion tube site (NEL 11/12/13).

The measures within the previous 2012 AQAP were completed in 2015. The updated AQAP and the proposed measures are currently being reviewed and consulted on and is expected to be adopted in September 2020 with submittal to DEFRA in June 2020.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure) At Declaration	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure) Now	Action Plan: Name	Action Plan: Date of Publication	Action Plan: Link
AQMA Cleethorpe Road	Sep-10	NO_2 Annual Mean	Grimsby	Cleethorpe Road between Freeman Street and Nacton Street	NO	48.4µg/m^3 (2011) (1)	37.8 µg/m^3	Action Plan 2012 Cleethorpe Road Grimsby	Oct-12	(1)

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

(1) https://www.nelincs.gov.uk/environment-and-community-safety/environmental-health/air-quality/air-quality-management-areas/

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

Defra's appraisal of last year's ASR concluded that the Council is encouraged to review their AQAP, with the aim of assigning objective KPIs and reduction targets, alongside having more of an emphasis on progress and barriers to implementing measures.

Key actions were completed on measures within 2019:

- Quarterly Air Quality Steering Committee meetings have been held to discuss the measures to be included in the AQAP. The meetings include members from the Planning, Public Health, Transport, Highways, Communications and Carbon Reduction Teams; and
- The Council have maintained their electric vehicle fleet to now include 25 vehicles.
- During 2019/20 the ENGIE Transport team continued to deliver the "Pedal & Stride to Economic Growth" project. The package of measures aims to encourage, enable and support people to make more short local journeys on foot, by bike or on the bus. This year the team has supported an additional 12 businesses to develop sustainable travel plans, worked with over 600 households through the Residential Travel Planning project to make long-term changes to the way in which they get about the Borough.
- The Council declared a Climate Emergency in September 2019 and have set a target of becoming carbon neutral as a Borough by 2050. We have commissioned our strategic partner ENGIE to review this target, develop a carbon emissions baseline and develop a roadmap in consultation with key stakeholders. It is anticipated that this roadmap will be completed and adopted in early 2021.

North East Lincolnshire Council is currently reviewing the AQAP and the measures set out in Table 2.2 are proposed in the draft AQAP.

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

- Complete the update of the AQAP;

- Encourage residents and visitors to North East Lincolnshire to use car share and public transport;
- Encourage the uptake of Employer and School Travel Plans within the Borough;
- Ensure that air quality is taken into account in the planning process when located in or close to the AQMAs or in areas marginally below air quality objectives;
- Work together with developers to improve sustainable transport links serving new developments; and
- Undertake local air quality monitoring within the Borough to ensure a high standard of data is achieved.

The principal challenges and barriers to implementation that the Council anticipates facing are surrounding the COVID-19 pandemic that is currently taking place. It is possible that a number of measures may progress slower than expected as a consequence. Furthermore, the 2020 monitoring data will likely not reflect the true concentrations as a result of the reduction in vehicles on the roads during the lockdown period.

North East Lincolnshire Council anticipates that the measures in Table 2.2 will achieve compliance and enable the revocation of Cleethorpe Road AQMA. This is eligible to be put forward when the mean annual concentrations are below the annual limit for several consecutive years. This has not been achieved thus far, however concentrations are already below the objective, but still within 10%.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Date Measure Introduced	Organisations involved	Funding Source	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Improve public transport services, bus stop/train infrastructure & information and interchange facilities	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2016	NELC & Service Provider	NELC & Service Provider	Increase in use of public transport based on average numbers of people using the services	NO_2 Emission Reduction	Annual public engagement	On-going	
2	Encourage Council Travel Plan opportunities and seek to facilitate uptake of sustainable modes of transport	Promoting Travel Alternatives	Workplace Travel Planning	2016	NELC & ENGIE	NELC & ENGIE	% modal shift to car share/public transport/walking/cycling	NO_2 Emission Reduction	Discussions on progress made at Internal Steering Group	April 2021	
3	Bus fleet upgrades	Promoting low emission transport	Public vehicle procurement – prioritising uptake of low emission vehicles	2017	NELC & Stagecoach	NELC & Stagecoach	Number of low/zero emission buses	NO_2 Emission Reduction	Continual upgrading of vehicles. Quarterly meeting with NELC & Stagecoach	On-going	Reducing emissions contribution from buses (and cars if bus uptake improves)
4	Improve signage for the Port of Grimsby	Transport Planning and Infrastructure	Other	2012	NELC& ABP	NELC& ABP	A reduced number of HGV's approaching the AQMA	NO_2 Emission Reduction	Signage discussed at meeting with NELC & ABP in May 2019	April2021	

5	Continue to promote and facilitate cycling as for both transportation and leisure purposes	Promoting Travel Alternatives	Promotion of cycling	2016	NELC & ENGIE	NELC & ENGIE	Uptake of cycling incentives and bike purchases	NO_2 Emission Reduction	Promotional events undertaking by ENGIE on a regular basis	On-going	
6	Encouraging residents and visitors to North East Lincolnshire to use car share and public transport	Alternatives to private vehicle use	Car & lift sharing schemes	2016	NELC & ENGIE	NELC & ENGIE	% modal shift to car share/public transport	NO_2 Emission Reduction	'Travel Links' information on NELC webpages	On-going	Information on NELC website: https://www.nelincs.gov.uk/roads-parking-transport/travel-and-public-transport/car-share/
7	Encourage the uptake of Employer and School Travel Plans within the Borough	Promoting Travel Alternatives	School Travel Plans	2018	NELC & ENGIE	NELC & ENGIE	No. travel plans in place	NO_2 Emission Reduction	The council is currently working on a Walk to School Scheme with the well being programme lead	On-going	
8	Public Air Quality Information including promotion of fuel saving measures, residential and commercial, buildings	Public Information	Via the Internet	2017	NELC	NELC	Number of hits on upgraded website per annum	Not quantifiable	Design of air quality specific website discussed with IT department. Quote was sourced but due funding restraint no further	2022	Information on Clean Air day /current air quality level, Considering AQ grant application funding,

									progress to date.		
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	NELC	NELC	Availability of recently published reports online	NO_2 Emission Reduction	2019 Annual Status Report is available on NELC website: https://www.nelincs.gov.uk/wp-content/uploads/2018/10/NE-Lincs-2019-ASR.pdf	Updated annually after DEFRA approval of ASR.	
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 below air quality objectives	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2015	NELC	NELC	Number of planning applications with air quality conditions/assessments	NO_2 Emission Reduction	On-going	March 2021	Planning policy under review. Part of the continued efforts of NELC Environmental Protection.
11	Work together with developers to improve sustainable transport	Transport Planning and Infrastructure	Other	2015	NELC & Developer	NELC & Developer	% modal shift to public transport	NO_2 Emission Reduction	On-going	On-going	Working with developers at the early stage to influence design to

	links serving new developments										ensure sustainable transport is factored into the plans
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	NELC &ENGIE	NELC &ENGIE	Number of planning applications where charging points have been secured	NO_2 Emission Reduction	On-going	On-going	Part of continued efforts of NELC Environmental Protection.
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	NELC & ENGIE	NELC & ENGIE	Air Quality a key topic in released strategy documents	NO_2 Emission Reduction	On-going	On-going	Wider acceptance within the council required to acknowledge the importance of air quality
14	NELC Vehicle Procurement	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	2016	NELC	NELC	Number of vehicles replaced (in addition to normal fleet turnover)	Reducing emissions from all council owned vehicles	On-going	On-going	
15	Port Authority to produce Air Quality Strategies setting out	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	NELC &ABP	NELC &ABP	Not quantifiable	NO_2 Emission Reduction from Port	Quarterly meetings held	October 2020	

	their plans to reduce emissions 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	NELC	NELC	Number of monitoring locations	NO_2 Emission Reduction	1 Monitor installed at Cleethorpes road in May 2019	On-going	Decision to be made on the location/use of the other purchased monitor in 2020
17	Declared Climate Emergency in September 2019	Policy Guidance and development control	Air Quality Planning and Policy Guidance	2019	NELC & ENGIE	NELC & ENGIE	Carbon Neutral by 2050	CO_2 emission reduction	On-Going	2050	
18	Updating the Air Quality Strategy	Policy Guidance and development control	Air Quality Planning & Policy Guidance	2015	NELC	NELC	Not quantifiable	NO2 Emission Reduction	Revised strategy to be completed by the end of 2020	December 2020	
19	Supplementary Planning Guidance document	Policy Guidance and development control	Air Quality Planning & Policy Guidance	N/A	NELC	NELC	Number of planning applications with air quality conditions/assessments	NO2 Emission Reduction	Currently liaising with the Planning department	March 2021	

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.

Currently there is no monitoring of $PM_{2.5}$ completed within North East Lincolnshire.

The current Defra 2019 background maps[4] for North East Lincolnshire Council (2017 based) show that all background concentrations of $PM_{2.5}$ are well below the 2020 annual mean objective for $PM_{2.5}$. The highest concentration is predicted to be 9.2µg/m^3 within the 1 x 1km grid square with the centroid grid reference of 528500, 409500. This grid square encompasses Cleethorpe Road, where the AQMA is declared, the A180 and the A16.

The Public Health Outcomes Framework data tool[5] compiled by Public Heath England quantifies the mortality burden of $PM_{2.5}$ within England on a county and local authority scale. 2017 adult mortality attributable to $PM_{2.5}$ pollution for North East Lincolnshire is presented in Table 2.3.

It can be seen from Table 2.3 that in 2018 (data is not yet available for 2019) the percentage of adult mortality attributable to $PM_{2.5}$ pollution within North East Lincolnshire was 0.5% higher than the average fraction for the Yorkshire and Humber region, however was 0.2% lower than the average fraction for England.

Table 2.3 – 2018 Adult Mortality Attributable to $PM_{2.5}$ Pollution

Area	North East Lincolnshire	Yorkshire and the Humber	England
% of Adult Mortality	5.0%	4.5%	5.2%

[4] Defra Background Mapping data for local authorities (2017-based), available online at https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2015

[5] Public Health Outcomes Framework, Public Health England data tool (2018 data), available online at http://www.phoutcomes.info/public-health-outcomes-framework

Although not initially developed to reduce concentrations of $PM_{2.5}$, a number of measures outlined in Table 2.2 that are related to vehicles will help reduce concentrations. A major source of $PM_{2.5}$ is from road traffic, from exhaust emissions, brake and tyre wear, and the re-suspension of existing particles on the road. Therefore, by the reduction of vehicle use, and the introduction of 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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

North East Lincolnshire Council installed an automatic monitoring location at Cleethorpe Road, Grimsby in 2019. The station is situated in the same location as the current triplicate diffusion tube site DIF 11/12/13. An AURN monitoring station which is run by the Environment Agency, was also installed on Woodlands Avenue in Immingham in November 2017. Table A.1 in Appendix A shows the details of the site. National monitoring results are available at https://uk-air.defra.gov.uk/networks/.

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 (passive) monitoring of NO_2 at 30 sites during 2019. Table A.2 in Appendix A shows the details of the sites.

The diffusion tubes DIF 5 and DIF 6 were relocated from their triplicate to 192 Littlecoates Road, Bradley roundabout and Toll Bar Roundabout, A16 New Waltham, respectively due to the concern raised after pre-planning application were submitted for two developments. Another triplicate site at NEL 23 was split up, with NEL 24 and NEL 25 being move from Kings Road to Bluestone, Immingham and St Margret/Pelham Ave, Immingham respectively.

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[6], "annualisation" (where the data capture falls below 75%), and distance correction[7]. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3. Note that the concentration data presented in Table A.3 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 2019 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.

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

The national bias adjustment factor of 0.75 was used at all locations. Although the Cleethorpe Road automatic station is now co-located with the triplicate diffusion tube site DIF 11/12/13, the data capture was too low for a local bias adjustment factor to be utilised.

In 2019 there were no exceedances of the NO_2 annual mean objective and there was only one location where the annual mean concentration was within 10% of the annual mean NO_2 objective. This is at the triplicate diffusion tube location DIF 11/12/13 within the designated AQMA. The diffusion tube reported an annual mean NO_2 concentration of 37.8µg/m^3. The monitoring location is representative of relevant exposure for the annual mean objective, therefore distance correction is not required.

The annual mean NO_2 concentration did not exceed 60µg/m^3 at any non-automatic monitoring site. Therefore exceedances of the 1-hour mean objective are unlikely at all

[6] https://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html
[7] Fall-off with distance correction criteria is provided in paragraph 7.77, LAQM.TG(16)

monitoring locations. Furthermore, there were no exceedances of the 1-hour mean NO_2 objective reported at either of the continuous monitoring stations.

Figure A.1, Figure A.2, Figure A.3 and Figure A.4 present trends in the measured annual mean NO_2 concentrations over the past five years for the NO_2 monitoring completed across North East Lincolnshire. In 2019, all the diffusion tubes except NEL 4 and NEL 27 have seen a decrease in annual mean NO_2 concentrations when compared to the 2018 monitoring results. NEL 4 and NEL 27 reported a slight increase of 1.0 and 2.7µg/m3 respectively.

3.2.2 Particulate Matter (PM_{10})

No monitoring for PM_{10} was undertaken in 2019 within the Council area. However, in 2017 PM_{10} was monitored by Beta Attenuation Particulate Monitors (BAMs) at two different sites within the borough; Fryston House in Grimsby (CM1) and Kings Road in Immingham (CM2). There were no exceedances of the annual mean objective at either of the monitoring sites, nor was the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 times a year) exceeded therefore this was terminated.

3.2.3 Particulate Matter ($PM_{2.5}$)

North East Lincolnshire currently do not monitor $PM_{2.5}$. The current Defra 2019 background maps[8] for North East Lincolnshire Council (2017 based) show that all background concentrations of $PM_{2.5}$ are well below the 2020 annual mean objective for $PM_{2.5}$. The highest concentration is predicted to be 9.2µg/m^3 within the 1 x 1km grid square with the centroid grid reference of 528500, 409500 that is set within Grimsby.

3.2.4 Sulphur Dioxide (SO_2)

North East Lincolnshire does not carry out any routine monitoring of SO_2 within its area.

[8] Defra Background Mapping data for local authorities (2017-based), available online at https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2015

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?	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	112 Cleethorpes Road	Roadside	527761	410425	NO_2	YES	Serinus 40 Oxides	0	2	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

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
NEL 1	Victoria Street West, The Friary PH	Kerbside	526838	409261	NO2	NO	5	2	NO	2
NEL 2	8 Town Hall Street	Roadside	527095	409367	NO2	NO	5	2	NO	2
NEL 3	1 Town Hall Street	Roadside	527100	409400	NO2	NO	10	2	NO	2
NEL 4	Fryston House, Grimsby AQM Station	Roadside	526583	408047	NO2	NO	50	3	NO	2
NEL 5	192 Littlecoates Road, Bradley roundabout	Roadside	524350	407765	NO2	NO	13	2	NO	2
NEL 6	Toll Bar Roundabout, A16 New Waltham	Roadside	527748	404396	NO2	NO	31	2	NO	2
NEL 7	Peaks Parkway & Weelsby Road, Grimsby	Kerbside	527574	408108	NO2	NO	10	2	NO	2
NEL 8	Peaks Parkway & Welholme Road, Grimsby	Kerbside	527403	408666	NO2	NO	8	1	NO	2
NEL 9	76 Freeman Street, Grimsby	Kerbside	527665	410164	NO2	NO	0	2	NO	2
NEL 10	Aylesby Road Grimsby	Roadside	523284	409883	NO2	NO	0	2	NO	2
NEL 11/12/13	112 Cleethorpe Road, Grimsby	Roadside	527761	410425	NO2	YES	0	2	NO	2

NEL 14	113 Cleethorpe Road, Grimsby	Kerbside	527754	410445	NO2	YES	5	<1	NO	2
NEL 15	123 Cleethorpe Road, Grimsby	Kerbside	527789	410438	NO2	YES	5	<1	NO	2
NEL 16	6 Freeman St, Riby Square	Kerbside	527693	410413	NO2	YES	0	1.5	NO	2
NEL 17	Park Street	Roadside	528725	410102	NO2	NO	0	3	NO	2
NEL 18	Victor Street	Kerbside	528171	410338	NO2	NO	7	1	NO	2
NEL 19	Victoria Street North, Victoria Mills A	Kerbside	527165	409995	NO2	NO	0	2	NO	2
NEL 20	Victoria Street North, Victoria Mills B	Kerbside	527182	410092	NO2	NO	0	2	NO	2
NEL 21	9 Pyewipe Road, Grimsby	Roadside	526077	410124	NO2	NO	0	2	NO	2
NEL 22	Great Cotes Road/Yarborough Rd	Roadside	524666	408814	NO2	NO	5	2	NO	2
NEL 23	Kings Road, Immingham AQM Station	Roadside	519193	415279	NO2	NO	20	1	NO	2
NEL 24	Bluestone, Immingham	Kerbside	517543	414312	NO2	NO	10	1	NO	2
NEL 25	St Margret/Pelham Ave, Immingham	Kerbside	518108	414533	NO2	NO	29	0.5	NO	2
NEL 26	Love Lane Corner, Grimsby	Roadside	528891	408078	NO2	NO	14	2	NO	2
NEL 27	Hewitts Circus, Cleethopres	Roadside	529532	406835	NO2	NO	6	2	NO	2
NEL 28	Toll Bar Roundabout, New Waltham	Kerbside	527716	404516	NO2	NO	13	2	NO	2

NEL 29	Louth Road & Waltham Road, Grimsby	Roadside	526465	406334	NO2	NO	3	2	NO	2
NEL 30	Victoria Street South	Roadside	527181	409513	NO2	NO	0	2	NO	2
NEL 31	Lampost Magistrates Court	Kerbside	527183	409647	NO2	NO	3	2	NO	2
NEL 32	Drainpipe Pink Butterfly	Kerbside	527189	409621	NO2	NO	0	2	NO	2

In January 2019, the triplicate location at 4,5,6 and 23,24,25 were disbanded and relocated to the alternative locations above

In January 2019 site NEL 28 was relocated to location above

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO_2 Monitoring Results NO_2 Annual Mean Concentration (µg/m^3) [3]

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2019 (%) [2]	2015	2016	2017	2018	2019
AURN	518277	415116	Urban Background	Automatic Monitoring	95.3	95.3	-	-	16.9[4]	13.9	13.5
Cleethorpe Road [6]	527761	410425	Roadside	Automatic Monitoring	51.4	51.4	46.5	41.6	35.9	-	32
NEL 1	526838	409261	Kerbside	Diffusion Tube	92	92	28.5	29.7	31.9	30.3	28.9
NEL 2	527095	409367	Roadside	Diffusion Tube	100	100	39.0	39.8	36.9	33.6	33.3
NEL 3	527100	409400	Roadside	Diffusion Tube	100	100	34.6	38.4	33.6	32.0	30.4
NEL 4	526583	408047	Roadside	Diffusion Tube	92	92	26.0	27.7	27.1	25.1	26.1
NEL 5	524350	407765	Roadside	Diffusion Tube	92	92	-	-	-	-	22.1
NEL 6	527748	404396	Roadside	Diffusion Tube	58	58	-	-	-	-	17.4
NEL 7	527574	408108	Kerbside	Diffusion Tube	92	92	31.6	31.6	33.5	29.1	28.3
NEL 8	527403	408666	Kerbside	Diffusion Tube	100	100	31.0	31.9	30.8	28.8	28.5
NEL 9	527665	410164	Kerbside	Diffusion Tube	100	100	20.2	21.8	21.3	21.4	21.1
NEL 10	523284	409883	Roadside	Diffusion Tube	100	100	0.0	0.0	0.0	21.2	19.9
NEL 11/12/13[5]	527761	410425	Roadside	Diffusion Tube	100	100	42.7	**45.2**	**47.3**	38.0	37.8
NEL 14	527754	410445	Kerbside	Diffusion Tube	100	100	34.7	37.3	34.7	33.3	31.6
NEL 15	527789	410438	Kerbside	Diffusion Tube	100	100	30.8	35.7	37.3	32.9	31.0
NEL 16	527693	410413	Kerbside	Diffusion Tube	100	100	28.8	33.1	35.2	30.9	28.9
NEL 17	528725	410102	Roadside	Diffusion Tube	100	100	27.5	30.1	32.8	30.6	29.6
NEL 18	528171	410338	Kerbside	Diffusion Tube	100	100	24.6	29.5	36.4	33.6	32.4

NEL 19	527165	409995	Kerbside	Diffusion Tube	92	92	31.7	34.2	34.7	29.8	29.6
NEL 20	527182	410092	Kerbside	Diffusion Tube	100	100	34.7	37.3	37.4	33.1	32.9
NEL 21	526077	410124	Roadside	Diffusion Tube	100	100	31.2	33.2	30.6	26.9	25.2
NEL 22	524666	408814	Roadside	Diffusion Tube	92	92	26.0	28.6	27.0	24.3	23.8
NEL 23	519193	415279	Roadside	Diffusion Tube	100	100	30.0	33.3	28.5	26.6	24.5
NEL 24	517543	414312	Kerbside	Diffusion Tube	100	100	-	-	-	-	16.5
NEL 25	518108	414533	Kerbside	Diffusion Tube	100	100	-	-	-	-	19.1
NEL 26	528891	408078	Roadside	Diffusion Tube	100	100	21.0	24.4	22.9	21.0	20.7
NEL 27	529532	406835	Roadside	Diffusion Tube	100	100	24.2	22.1	23.0	19.8	22.5
NEL 28	527716	404516	Kerbside	Diffusion Tube	83	83	27.2	27.7	30.2	24.9	23.9
NEL 29	526465	406334	Roadside	Diffusion Tube	100	100	23.9	25.0	23.7	22.5	22.4
NEL 30	527181	409513	Roadside	Diffusion Tube	100	100	-	-	-	29.4	27.0
NEL 31	527183	409647	Kerbside	Diffusion Tube	100	100	-	28.3	29.8	29.5	27.2
NEL 32	527189	409621	Kerbside	Diffusion Tube	100	100	-	29.5	29.2	29.1	26.6

☒ **Diffusion tube data has been bias corrected**

☒ **Annualisation has been conducted where data capture is <75%**

Notes:

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

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

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

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

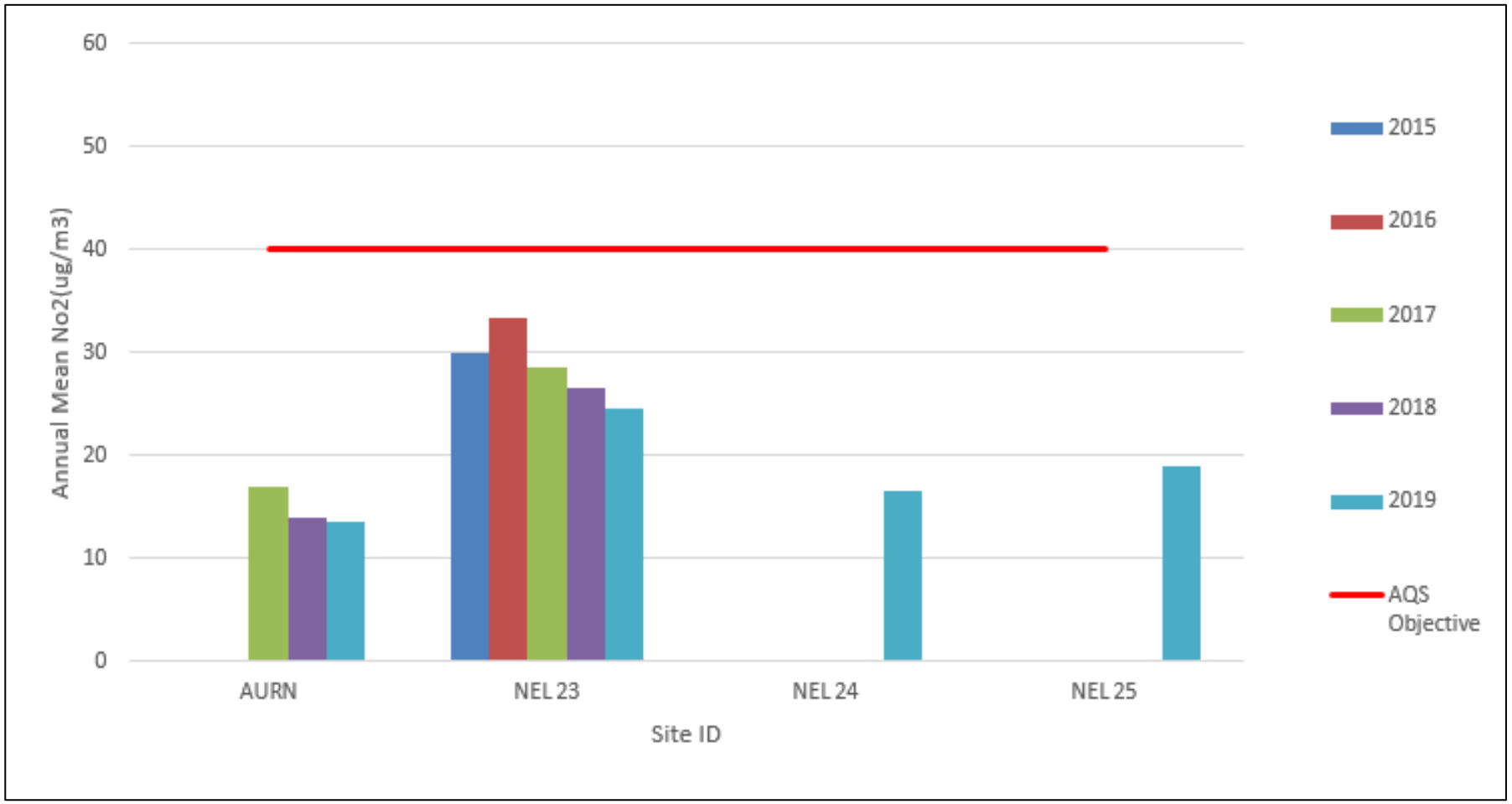
(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(4) Data capture is less than 3 months

(5) Diffusion tube relocated 5m away from the road in 2018 to the façade of the closest building

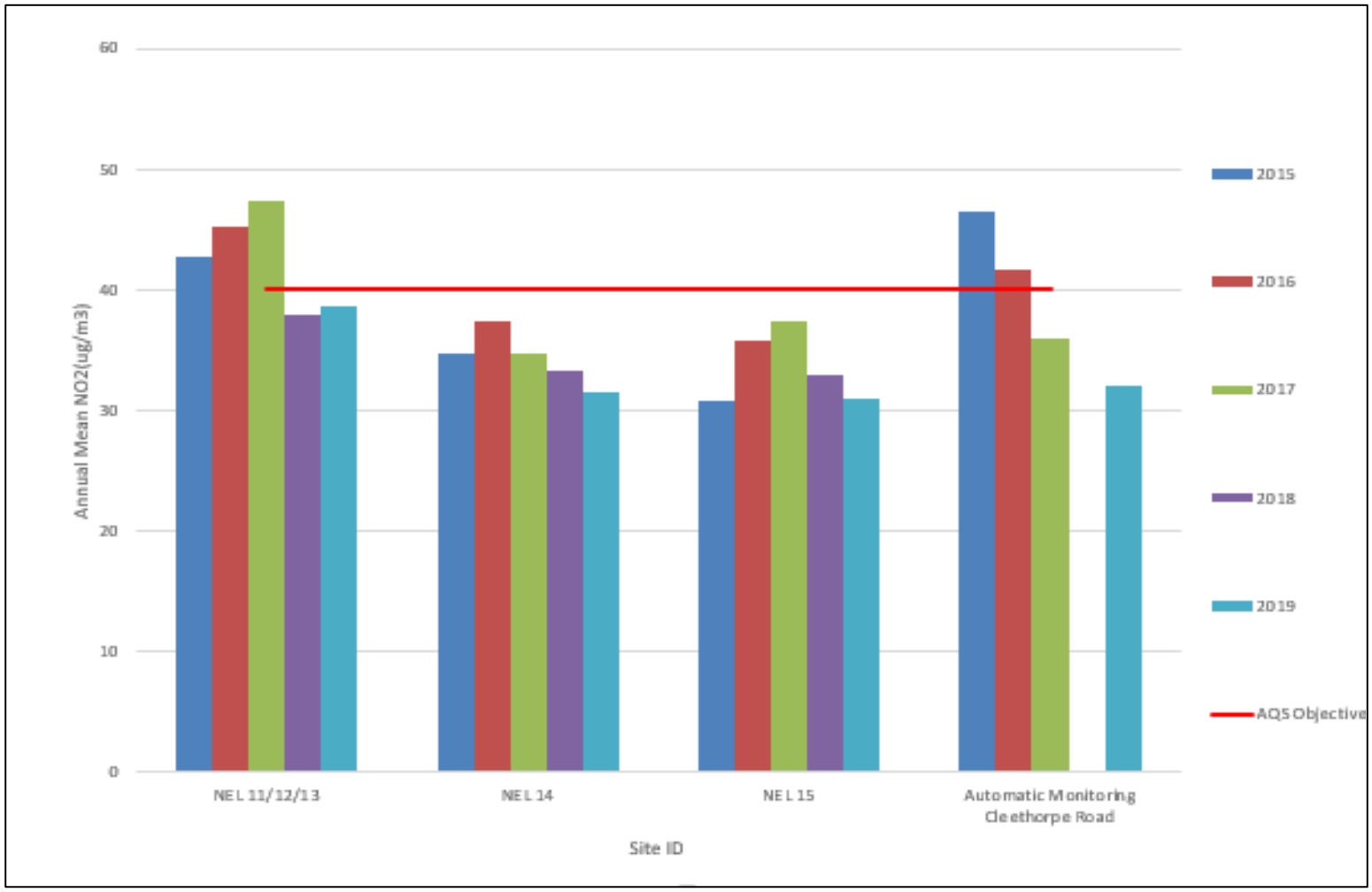
(6) Cleethorpe Road Automatic Monitoring was replaced in 2019 and shifted 5m away from the road to the façade of the closest building

Figure A.1 – Trends in Annual Mean NO_2 Concentrations: Immingham



Note: The triplicate diffusion tube DNEL 23/24/25 was separated and placed in 3 locations in 2019. The new locations are detailed in Table A.2.

Figure A.2 – Trends in Annual Mean NO_2 Concentrations: Cleethorpe Road AQMA



Note: The triplicate diffusion tube DIF11/12/13 was relocated in 2018 to the façade of a residential property, approximately 5m further away from the road than the previous location. The Cleethorpe Road Automatic Monitoring was replaced in 2019 and shifted 5m away from the road to the façade of the closest building.

Figure A.3 – Trends in Annual Mean NO_2 Concentrations: Grimsby North

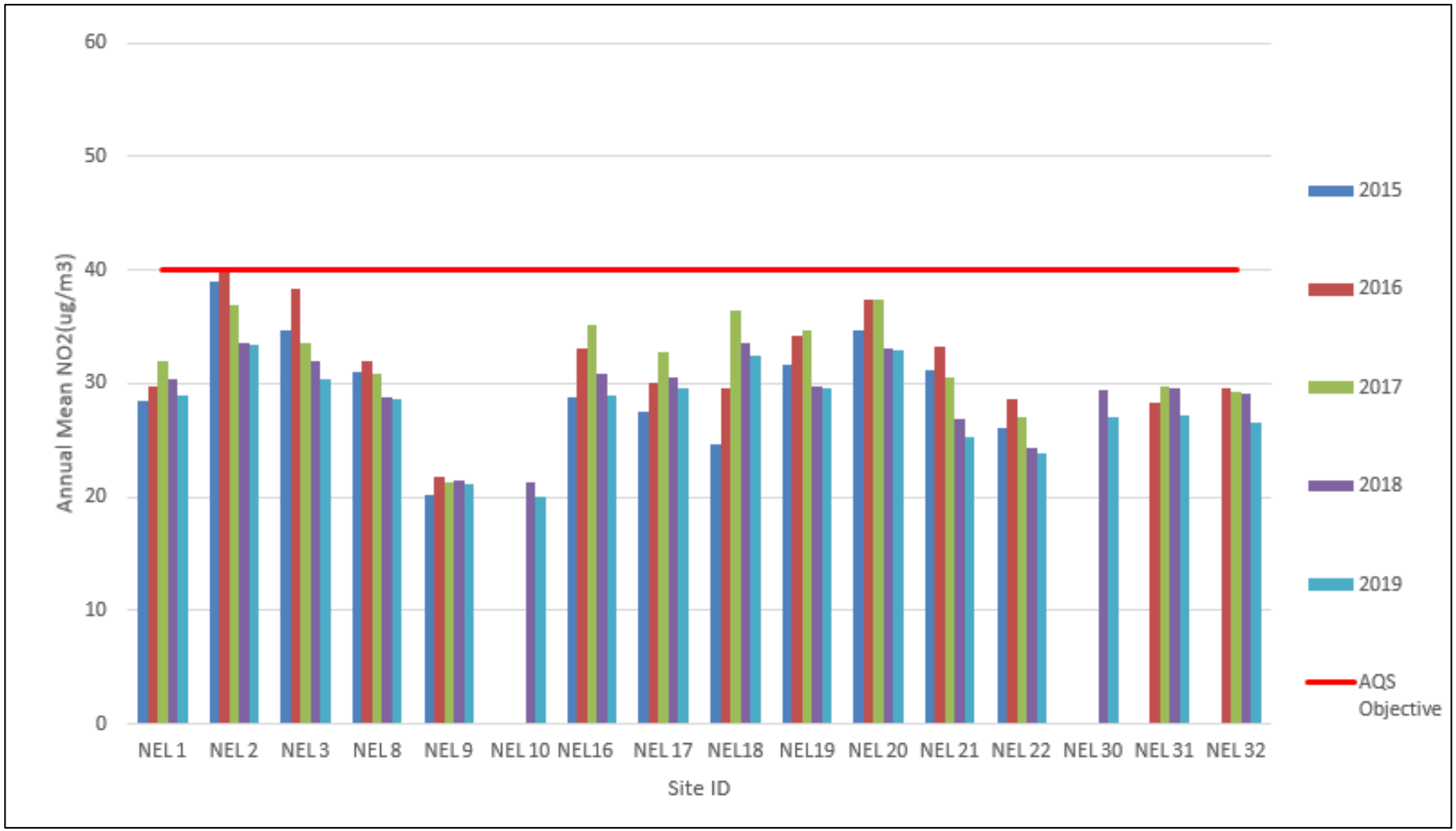
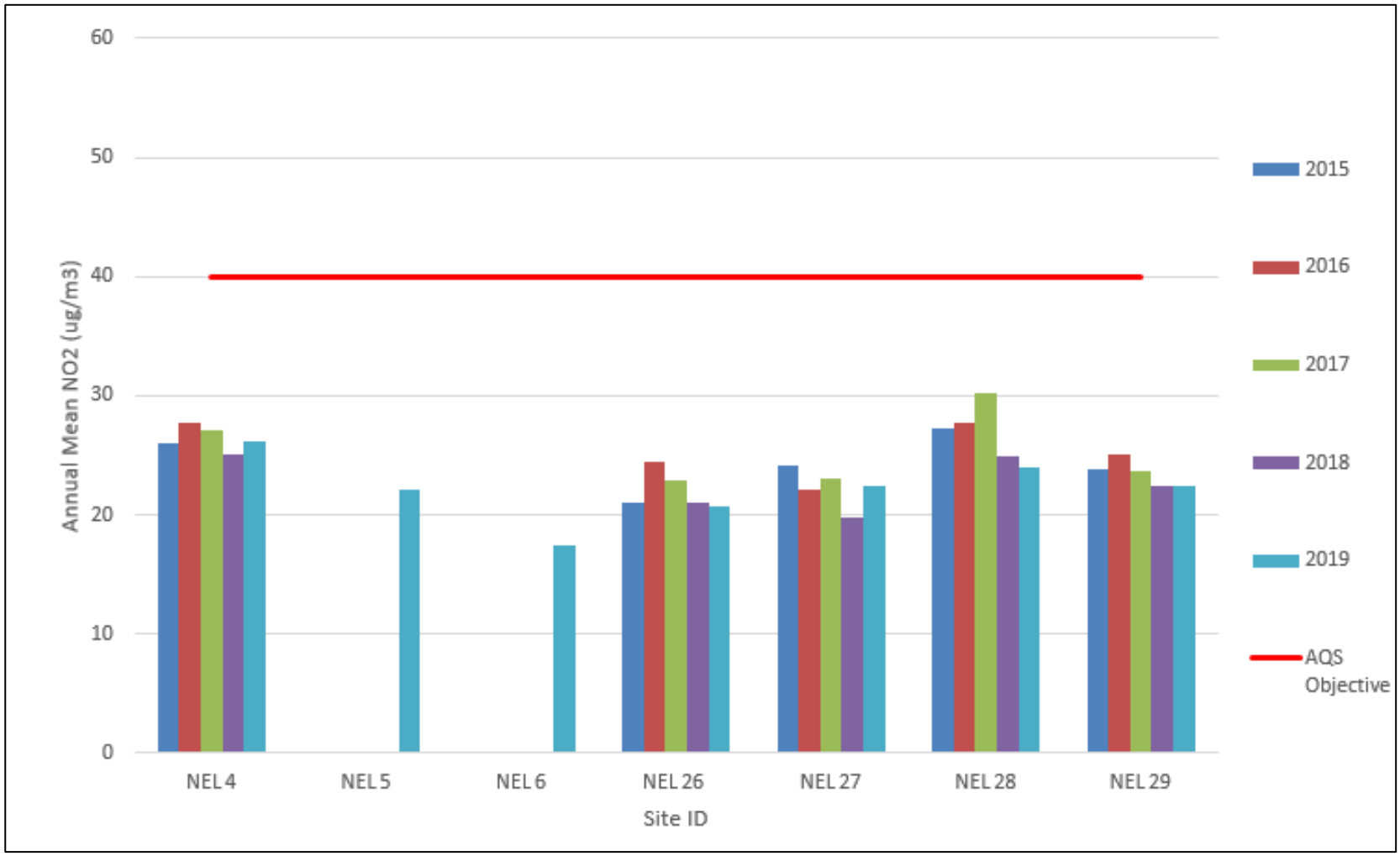


Figure A.4 – Trends in Annual Mean NO_2 Concentrations: Grimsby South



Note: The NEL 28 diffusion tube was relocated in 2019 and the triplicate NEL4/5/6 was separated into 3 sites. The new locations are detailed in Table A.2.

Table A.4 – 1-Hour Mean NO_2 Monitoring Results > 200µg/m^3 (3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	2015	2016	2017	2018	2019
AURN	**518277**	**415116**	**Urban Background**	**Automatic Monitoring**	95.3	95.3	-	-	0 (56.8)	0 (27.5)	0
Cleethorpe Road (4)	**527761**	**410425**	**Roadside**	**Automatic Monitoring**	51.4	51.4	0	0	0 (54.6)	-	0

Notes:

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

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

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

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

(4) Cleethorpe Road Automatic Monitoring was replaced in 2019 and shifted 5m away from the road to the façade of the closest building

Appendix B: Full Monthly Diffusion Tube Results for 2019

Table B.1 – NO_2 Monthly Diffusion Tube Results – 2019 NO_2 Mean Concentrations (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean Raw Data	Annual Mean Bias Adjusted (0.75) and Annualised (1)	Annual Mean Distance Corrected to Nearest Exposure (2
NEL 1	526838	409261	47.5	41.1	40.6	29.8	32.1	32.9	35.7	35.8	35.3	40.4	52.0		38.5	28.9	-
NEL 2	527095	409367	56.5	49.3	45.6	25.5	38.5	39.5	42.2	40.0	44.2	48.0	54.6	49.1	44.4	33.3	-
NEL 3	527100	409400	45	45.2	38.3	38.3	37.9	36.2	35.1	32.3	36.6	43	52.9	44.9	40.5	30.4	-
NEL 4	526583	408047	26.3	46.6	37.5	25.9	27.8	29.2		28.2	34	39.4	45.7	42.4	34.8	26.1	-
NEL 5	524350	407765		37.9	28.3	24.6	27.2	24.8	24.5	23.5	23.6	34.5	41.2	33.7	29.4	22.1	-
NEL 6	527748	404396						21.7	18	13.1	19.6	25.1	39.6	20.3	22.5	17.4	-
NEL 7	527574	408108	45.6	44.9	42.1	33.1	33.2	31.1	33.6	34.3	36.6	41	39.8		37.8	28.3	-
NEL 8	527403	408666	46.3	47.6	36.7	28.1	31.9	32.7	33.9	32.6	35.7	39.5	45.8	45.8	38.1	28.5	-
NEL 9	527665	410164	40.6	35.5	45.9	21.8	23.4	17.4	20.9	18.7	21.9	26.8	34.4	30.9	28.2	21.1	-
NEL 10	523284	409883	38.9	32.5	27.9	18.9	22.2	20.3	23.5	16.1	28.3	28.5	36.5	25.3	26.6	19.9	-
NEL 11	527761	410425	60.2	57.1	55.3	42.3	43.2	44.9	48.4	51.8	49.5	54.2	60.5	50.7	51.5	38.6	-
NEL 12	527761	410425	57.3	57	54.3	39.5	42.1	44.6	47	49.5	48	50.6	59.1	54.7	50.3	37.7	-
NEL 13	527761	410425	61.1	52.3	52.5	43.6	43.3	43	46.6	47.7	46.2	50.8	56.6	51.1	49.6	37.2	-
NEL 14	527754	410445	57.1	41.1	33.4	39.1	43.8	34.1	38.1	34.4	38	44.6	57.7	44.1	42.1	31.6	-
NEL 15	527789	410438	49.5	40.2	43.9	39.9	39.5	38	38.7	30.5	39.3	44.2	53.9	38.5	41.3	31.0	-
NEL 16	527693	410413	52.8	44	29.1	28.5	35	33.1	38.9	32.3	39.2	40.8	50.8	37.3	38.5	28.9	-

NEL 17	528725	410102	47.2	38.8	41.2	31.9	31.9	34.2	38.9	40.1	37	43.9	46.7	41.6	39.5	29.6	-
NEL 18	528171	410338	65	46.4	40.7	32.3	41.5	33.4	43.1	36.3	40.1	38.8	54.3	46.1	43.2	32.4	-
NEL 19	527165	409995	56.8		42.8	26.9	33	31.7	36.4	31.1	36	41.5	49.8	48.1	39.5	29.6	-
NEL 20	527182	410092	55.3	55.6	40	32.3	34	38.7	37	32.9	37.9	45.2	54	62.7	43.8	32.9	-
NEL 21	526077	410124	53.2	41.2	32.5	29.6	28	28.3	29.7	22.1	31.3	38.4	29.2	40.1	33.6	25.2	-
NEL 22	524666	408814	39	36.8	31.6	20.8	28.1	24.6	26.6		29.7	33.5	43.4	34.4	31.7	23.8	-
NEL 23	519193	415279	43.7	37.9	34.4	29.2	27.4	26.7	28.9	24.7	30	34.4	45	29.4	32.6	24.5	-
NEL 24	517543	414312	35.6	23.5	17.9	23.4	19.1	17.7	17.1	16.2	19	18.1	34.6	21.6	22.0	16.5	-
NEL 25	518108	414533	49.5	26.4	21.5	24.9	24.4	18.8	19.2	16.7	20.9	25.2	32.8	24.6	25.4	19.1	-
NEL 26	528891	408078	37.2	26.8	28.2	25.1	26.6	20.3	23.4	20.8	27.4	28.3	38.5	28.7	27.6	20.7	-
NEL 27	529532	406835	36.5	41.3	31.7	19.2	21.9	23.6	25.2	23.1	29.4	31.4	39.2	37	30.0	22.5	-
NEL 28	527716	404516		38.6	34		28.9	25.5	25.7	26.4	26.9	34.4	40.3	38.2	31.9	23.9	-
NEL 29	526465	406334	38.9	33.8	30.2	22.9	25.1	22.1	22.4	23.1	28.1	35.3	41.4	35.6	29.9	22.4	-
NEL 30	527181	409513	45.4	38.6	32.9	36.4	35.7	32.1	32.1	28.5	29.4	40.8	45	35.8	36.1	27.0	-
NEL 31	527183	409647	42	44.7	39.9	26.2	30	27.4	27.9	27.8	34.4	40.6	48.6	45.5	36.3	27.2	-
NEL 32	527189	409621	41.5	40.1	32.3	30.4	32.8	28.8	30.3	26.7	34.3	39.6	52.4	36.4	35.5	26.6	-

☐ **Local bias adjustment factor used**

☒ **National bias adjustment factor used**

☒ **Annualisation has been conducted where data capture is <75%**

☒ **Where applicable, data has been distance corrected for relevant exposure**

Notes:

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

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

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

(2) Distance corrected to nearest relevant public exposure.

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

Diffusion Tube Bias Adjustment Factors

It is stated within the LAQM section of https://uk-air.defra.gov.uk/ that diffusion tubes are affected by several sources of interference which can cause substantial under or overestimation (bias) compared to a chemiluminescent analyser (the reference method). This can prove to be a problem in any situation where diffusion tube results are compared with the AQS objectives. As a result, local authorities are required to quantify the bias of their diffusion tube measurements and apply an appropriate bias adjustment factor if required.

The bias adjustment factor, which is an estimate of the difference between diffusion tube concentration and continuous monitoring, the latter assumed to be a more accurate method of monitoring has been used to factor the results. LAQM.TG(16) 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.

With regard to the application of a bias adjustment factor for diffusion tubes, the Defra Technical Guidance LAQM.TG(16) and the LAQM Helpdesk[9] recommend the use of a local bias adjustment factor where available and relevant to diffusion tube sites.

There is a continuous monitor operated by Environmental Agency within the North East Lincolnshire Council area in 2019, however, a co-location study is not available at this site. North East Lincolnshire Council installed an additional automatic monitoring location at Cleethorpe Road, Grimsby in 2019. The station is situated in the same location as the current triplicate diffusion tube site DIF 11/12/13. However, data capture at the automatic station was too low for a local bias factor to be derived in 2019. As a result, the national bias adjustment factor spreadsheet[10] has been used.

[9] Laqm.defra.gov.uk
[10] National Diffusion Tube Bias Adjustment Factor Spreadsheet, version 03/20 published in March 2020

The diffusion tubes used by North East Lincolnshire Council are supplied and analysed by Socotec (previously Environmental Scientific Group, ESG) and were prepared using the 50% TEA in acetone preparation method. The 2019 national bias adjustment factor for Socotec 50% TEA in water is 0.75, based on twenty four studies, as derived from the national bias adjustment factor spreadsheet[11] as presented in Figure C.1.

Figure C.1 – Socotec (ESG) 2019 National Bias Adjustment Factor

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/20

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 spreadsheet 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 2020
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: Select the Laboratory that Analyses Your Tubes from the Drop-Down List

If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List

If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List

If a year is not shown, we have no data[2]

Step 4: 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 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@uk.bureauveritas.com or 0800 0327953

Analysed By[1]	Method (To make your selection, choose (All) from the pop-up list)	Year[2] (To make your selection, choose (All))	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[4]	Bias Adjustment Factor (A) (Cm/Dm)
Socotec Didcot	50% TEA in acetone	2019	UB	Kingston upon Hull City Council	12	30	23	32.2%	G	**0.76**
Socotec Didcot	50% TEA in acetone	2019	O	Kingston upon Hull City Council	11	32	26	19.1%	G	**0.84**
Socotec Didcot	50% TEA in acetone	2019	R	Vale of Glamorgan	11	40	24	68.0%	G	**0.60**
Socotec Didcot	50% TEA in acetone	2019	R	Watford Borough Council	12	35	30	16.8%	S	**0.86**
Socotec Didcot	50% TEA in acetone	2019	R	Dumfries & Galloway Council	13	35	31	11.9%	G	**0.89**
Socotec Didcot	50% TEA in acetone	2019	KS	Marylebone Road Intercomparison	12	92	65	40.5%	G	**0.71**
Socotec Didcot	50% TEA in acetone	2019	UB	City of York Council	12	22	16	35.6%	G	**0.74**
Socotec Didcot	50% TEA in acetone	2019	R	City of York Council	12	33	26	26.8%	G	**0.79**
Socotec Didcot	50% TEA in acetone	2019	R	City of York Council	9	32	23	37.2%	G	**0.73**
Socotec Didcot	50% TEA in acetone	2019	R	City of York Council	11	40	28	43.4%	G	**0.70**
Socotec Didcot	50% TEA in acetone	2019	R	Ipswich Boorough council	11	34	26	34.1%	G	**0.75**
Socotec Didcot	50% TEA in acetone	2019	R	Swale BC	12	51	39	31.7%	G	**0.76**
Socotec Didcot	50% TEA in acetone	2019	R	Swale BC	12	33	27	23.9%	G	**0.81**
Socotec Didcot	50% TEA in acetone	2019	R	Swale BC	12	40	31	26.7%	G	**0.79**
Socotec Didcot	50% TEA in acetone	2019	R	Wrexham County Borough Council	10	20	16	22.2%	G	**0.82**
Socotec Didcot	50% TEA in acetone	2019	R	City of Wolverhampton Council	12	39	27	48.4%	G	**0.67**
Socotec Didcot	50% TEA in acetone	2019	R	North Herts DC	12	59	46	28.5%	G	**0.78**
Socotec Didcot	50% TEA in acetone	2019	R	Horsham District Council	12	30	24	24.5%	G	**0.80**
Socotec Didcot	50% TEA in acetone	2019	R	Horsham District Council	11	31	22	44.5%	G	**0.69**
Socotec Didcot	50% TEA in acetone	2019	R	Horsham District Council	11	32	24	34.4%	G	**0.74**
Socotec Didcot	50% TEA in acetone	2019	B	Medway Council	10	21	13	59.5%	P	**0.63**
Socotec Didcot	50% TEA in acetone	2019	R	Medway Council	12	33	24	35.1%	G	**0.74**
Socotec Didcot	50% TEA in acetone	2019	R	Waverley Borough Council	10	38	30	27.5%	G	**0.78**
Socotec Didcot	50% TEA in acetone	2019	R	Waverley Borough Council	12	35	24	44.7%	G	**0.69**
SOCOTEC Didcot	50% TEA in acetone	2019		**Overall Factor[3] (24 studies)**				**Use**		**0.75**

QA/QC of Diffusion Tube Monitoring

The diffusion tubes for the year 2019 were supplied and analysed by Socotec, the tubes were prepared using the 50% TEA in acetone preparation method. All results have been bias adjusted and annualised where required before being presented in Figure C.1.

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[12]. In addition Socotec participate in the AIR-PT Scheme (a continuation of the Workplace Analysis Scheme for Proficiency (WASP)) for NO_2 tube analysis and the Annual Field Inter-Comparison Exercise. These provide

[11] National Diffusion Tube Bias Adjustment Factor Spreadsheet version 03/20 available at https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html
[12] Diffusion Tubes for Ambient NO_2 Monitoring : Practical Guide for Laboratories and Users, AEA Energy & Environment, 2008

strict performance criteria for participating laboratories to meet, thereby ensuring NO_2 concentrations reported are of a high calibre. The lab follows the procedures set out in the Harmonisation Practical Guidance. In the latest available AIR-PT results, AIR-PT AR 0030 (January to February 2019) was 87.5%, AIR-PT AR031 (April to May 2019), AIR-PT AR033 (July to August 2019) and AIR-PT AR034 (September to October 2019) Socotec scored 100% results. The percentage score reflects the results deemed to be satisfactory based upon the z-score of < ± 2.

Short-term to Long-term Data Adjustment

The automatic monitoring location at Cleethorpe Road had a data capture lower than 75% in 2019. Therefore, annualisation was required at this site and has been completed in line with Defra Technical Guidance LAQM.TG(16) Box 7.9 and full working details are provided in Table C.1.

All but one diffusion tube monitoring site had a data capture greater than 75% in 2019, therefore annualisation was only required at site NEL 6. With data provide in Table C.2.

In completing the annualisation procedure, data has been taken from two automatic monitoring stations that are within 50 miles of the sites to be annualised: York Bootham and Sheffield Tinsley. These sites form part of the national AURN network and are background monitoring sites. As such, they are not influenced by local sources of air pollution, such as road traffic emissions at roadside monitoring sites.

Table C.1 – Annualisation for Automatic Monitoring Site

Site ID	Unadjusted Annual Mean (µg/m^3)	AF York Bootham	AF Sheffield Tinsley	Average AF	Annualised Concentration (µg/m^3)
Cleethorpe Road	31.0	1.03	1.04	10.3	32

Table C.2 – Annualisation for Diffusion Tube NEL6

Site ID	Unadjusted Annual Mean (µg/m^3)	AF York Bootham	AF Sheffield Tinsley	Average AF	Annualised and bias adjusted Concentration (µg/m^3)
NEL 6	22.5	1.02	1.04	1.03	17.4

Planning Application

Application Ref Number	Address	Proposal	AQA Undertaken	EV Recommended	Status
DM/1070/18/ FUL	South Humber Bank Power Station, South Marsh Road, Stallingborough, Grimsby	Construction of an energy from waste facility of up to 49.9MWe gross capacity including emissions stack(s	Yes	No	Approved
DM/0107/19/ SCR	Immingham Railfreight Terminal, Scandinavian Way, Stallingborough, Grimsby.	Environmental Impact Assessment: Screening request for the siting of 10 x 2MW flexible gas generation plant (total of 20MW)	EIA to be undertaken	No	EIA development
DM/0108/19/ SCR	Immingham Railfreight Terminal, Scandinavian Way, Stallingborough, Grimsby.	Environmental Impact Assessment: Screening request for the siting of 10 x 2MW flexible gas generation plant (total of 20MW)	EIA to be undertaken	No	EIA development
DM/0110/19/ SCR	Immingham Railfreight Terminal, Scandinavian Way, Stallingborough, Grimsby.	Environmental Impact Assessment: Screening request for the siting of 10 x 2MW flexible gas generation plant (total of 20MW)	EIA to be undertaken	No	EIA development
DM/0111/19/ SCR	Immingham Railfreight Terminal, Scandinavian Way, Stallingborough, Grimsby.	Environmental Impact Assessment: Screening request for the siting of 10 x 2MW flexible gas generation plant (total of 20MW)	EIA to be undertaken	No	EIA development
DM/0118/19/ PREAPP	Land at Louth Road, New Waltham	Residential development (of up to 400 dwellings) including the provision of a small corner shop, open space and associated infrastructure.	Received	Yes	Pending
DM/0191/19/ PREAPP	Energy Park Way, Grimsby	Pyrolysis permitted site	Requested	No	Pending

Application Ref Number	Address	Proposal	AQA Undertaken	EV Recommended	Status
DM/0664/19/ FUL	Land South of Hobson Way, Immingham	Waste to Fuel project (Altalto)	Yes	No	Pending
DM/0696/19 FUL L	Land at Midfield Road, Humberston	Erection of 225 dwellings	Requested	Yes	Pending
DM/0862/19/ FUL	Site 1 Land Off Europa Way Stallingborough North East Lincolnshire	Erection of 20MW gas fuelled embedded energy generation compound and associated external works to include 10 generators	Yes	No	Approved
DM/0863/19/ FUL	Site 2 Land Off Europa Way Stallingborough North East Lincolnshire	Erection of 20MW gas fuelled embedded energy generation compound and associated external works to include 10 generators	Yes	No	Approved
DM/0864/19/ FUL	Land West Of Netherlands Way Stallingborough North East Lincolnshire	Erection of 20MW gas fuelled embedded energy generation compound and associated external works to include 10 generators	Yes	No	Approved
DM/0865/19/ FUL	Land West Of Netherlands Way Stallingborough North East Lincolnshire	Erection of 20MW gas fuelled embedded energy generation compound and associated external works to include 10 generators	Yes	No	Approved
Traffic and Highways	Cambridge/Littlecoates Road Grimsby	Installation of kerbed roundabout	Requested	No	Approved
DM/0094/18/ FUL	Stallingborough Link Road	Construction and modifications of a single carriageway highway link with shared cycle & footway from Moody Lane/Woad Lane junction (to the south east) to Hobson Way Roundabout	Yes	No	Approved

Appendix D: Maps of Monitoring Locations and AQMAs

Figure D.1 – Monitoring Locations: Immingham

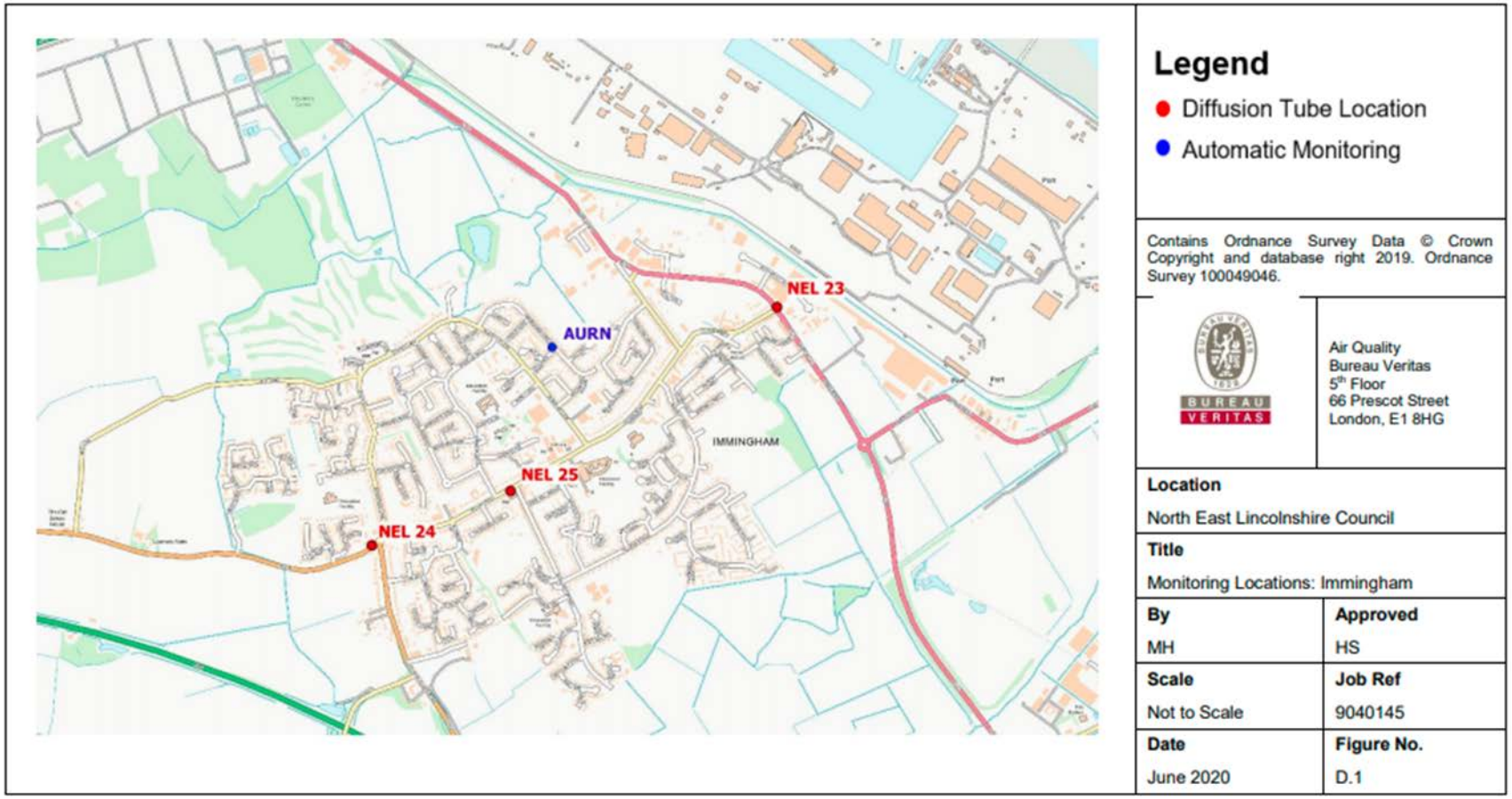


Figure D.2 – NO_2 Diffusion Tube Monitoring Locations: Grimsby, Yarborough

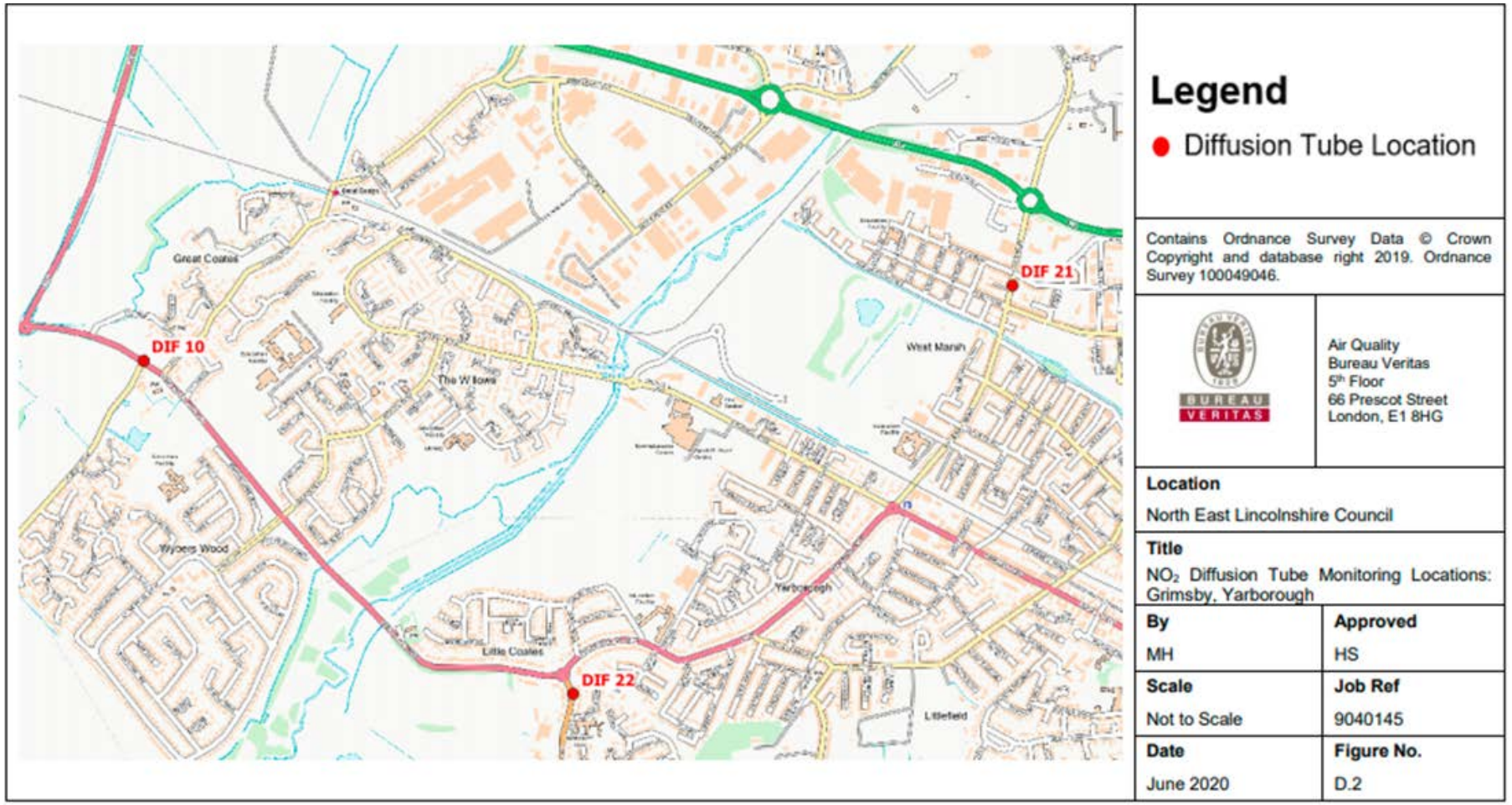
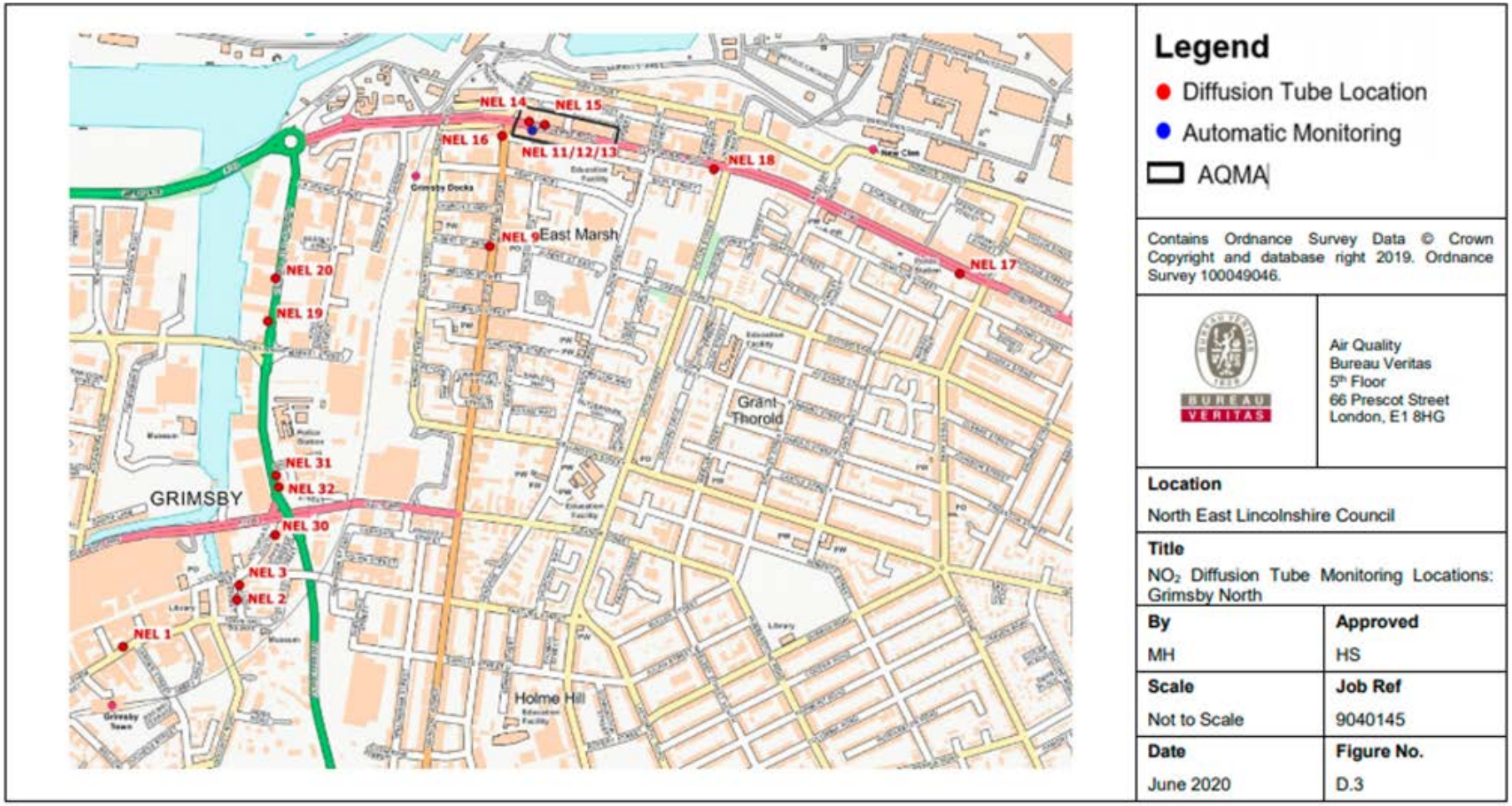
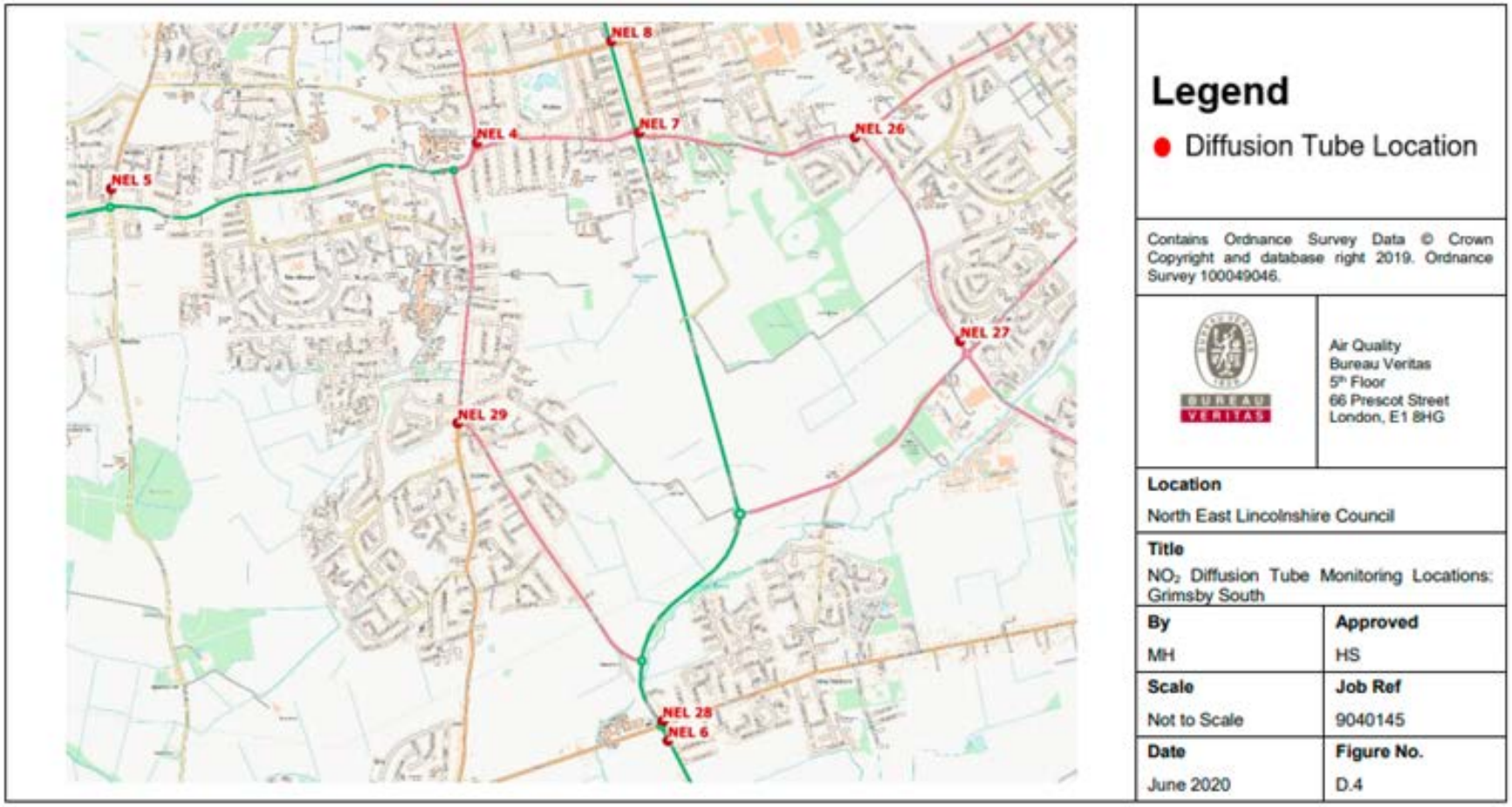


Figure D.3 – NO_2 Diffusion Tube Monitoring Locations: Grimsby North



Note: Location of NEL/11/12/13 is the same location as the Cleethorpe Road Automatic Station

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

Pollutant	Air Quality Objective[13] Concentration	Air Quality Objective[14] Measured as
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO_2)	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM_{10})	40 µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO_2)	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO_2)	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

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

Glossary of Terms

Abbreviation	Description
AIR-PT Scheme	AIR NO_2 Proficiency Testing Scheme
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
AURN	Automatic Urban and Rural Network
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
EV	Electric Vehicle
ESG	Environmental Scientific Group
FDMS	Filter Dynamics Measurement System
HGVs	Heavy Good Vehicles
LAQM	Local Air Quality Management
NELC	North East Lincolnshire Council
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less

QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide
TEA	Triethanolamine
UKAS	United Kingdom Accreditation Service
WASP	Workplace Analysis Scheme for Proficiency

References

- Local Air Quality Management Technical Guidance LAQM.TG(16). February 2018. 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.PG(16). May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- North East Lincolnshire Council Air Quality Action Plan, October 2012.
- North East Lincolnshire Council 2019 Annual Status Report.
- North East Lincolnshire Council 2018 Annual Status Report.
- National Diffusion Tube Bias Adjustment Factor Spreadsheet, version 03/20 published in March 2020.
- North East Lincolnshire Council, Air Quality Strategy 2015-2017.