2025 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995 Local Air Quality Management, as amended by the Environment Act 2021

Date: June 2025

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Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of Kingston upon Hull City Council with the support and agreement of the following officers and departments:

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This ASR has been approved and signed off by a Director of Public Health:

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Executive Summary: Air Quality in Our Area

Measured concentrations of all pollutants achieve the air quality objectives throughout the Authority Area, with a general trend of year-on-year improvement.

Kingston upon Hull City Council is keen to ensure that this not only continues but improves further in future years. To enable that, The Air Quality Strategy and Integral Action Plan was produced in 2017, and a progress report is presented to the Full Cabinet on an annual basis.

Air Quality in Kingston upon Hull

Breathing in polluted air affects our health and costs the NHS and our society billions of pounds each year. Air pollution is recognised as a contributing factor in the onset of heart disease and cancer and can cause a range of health impacts, including effects on lung function, exacerbation of asthma, increases in hospital admissions and mortality.

Air pollution particularly affects the most vulnerable in society, children, the elderly, and those with existing heart and lung conditions. Low-income communities are also disproportionately impacted by poor air quality, exacerbating health and social inequalities.

Table ES 1 provides a brief explanation of the key pollutants relevant to Local Air Quality Management and the kind of activities they might arise from.

Table ES 1 - Description of Key Pollutants

Pollutant	Description
Nitrogen Dioxide (NO_2)	Nitrogen dioxide is a gas which is generally emitted from high-temperature combustion processes such as road transport or energy generation.
Sulphur Dioxide (SO_2)	Sulphur dioxide (SO_2) is a corrosive gas which is predominantly produced from the combustion of coal or crude oil.
Particulate Matter (PM_{10} and $PM_{2.5}$)	Particulate matter is everything in the air that is not a gas. Particles can come from natural sources such as pollen, as well as human made sources such as smoke from fires, emissions from industry and dust from tyres and brakes. PM_{10} refers to particles under 10 micrometres. Fine particulate matter or $PM_{2.5}$ are particles under 2.5 micrometres.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, there are some areas where local action is needed to protect people and the environment from the effects of air pollution.

Conclusions and Priorities

No exceedances of the air quality objectives were reported at any monitoring locations within the 2024 monitoring period, either within or outside the AQMA and the significant trend of the data is one of year on year improvement. Due to several years of compliance, the Council is now preparing to revoke the AQMA in the near future, by implementing additional monitoring within and around the AQMA to provide further confidence in the data.

There are some locations on major strategic roads that have shown a small increase on the 2023 data. These are primarily around the travel interchange at Ferensway; along the docks at Hedon Road, and along Beverley Road. It is anticipated that the major road improvements and several emergency closures of key routes throughout the year may have contributed to an intensification of traffic, and therefore emissions, on these routes. However, only 2 locations around Ferensway have results greater than 2022, showing the general trend is still one of improvement. Additional monitoring via a Zephyr is planned for Ferensway.

How to get Involved

Members of the public can help improve air quality in the City by travelling using sustainable transport options, such as walking, running, cycling and public transport. More information on air quality can be found on Kingston upon Hull City Council's website's air quality pages: http://www.hull.gov.uk/environment/pollution/air-quality

It can be seen in this report that we take every opportunity to engage with key stakeholders and decision makers.

Members of the public are also encouraged to sign up to the local Oh Yes! Net Zero campaign for information about local initiatives to reduce carbon emissions as well as advice on actions individuals can take to make small changes every day that will help Hull and the Humber towards a net zero future, which will have a number of co-benefits for air quality:

https://www.ohyesnetzero.co.uk/

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1 Local Air Quality Management

This report provides an overview of air quality in Kingston upon Hull during 2024. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), 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 order to achieve and maintain the objectives and the dates by which each measure will be carried out. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Kingston upon Hull 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 18 months. The AQAP should specify how air quality targets will be achieved and maintained, with target dates.

A summary of AQMAs declared by Kingston upon Hull City Council can be found in Table 2.1. The table presents a description of the AQMA that is currently designated within Kingston upon Hull. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of the AQMA and also the air quality monitoring locations in relation to the AQMA. The air quality objective pertinent to the current AQMA designation are as follows:

- NO_2 annual mean

Since 2020 there has been a major project from National Highways to improve the section of the A63 that travels through the centre of Hull, and coincidentally, through part of the declared AQMA. As this project progressed, it led to alterations to the road infrastructure especially around Castle Street where non-automatic monitoring sites were located.

The decision was taken to stop monitoring in three locations – Site ID 13 (Princes Dock Side); 14 (Castle Street Road); and 15 (Castle Street Wall) – due to the limitations resulting from the extensive roadworks on accessibility, feasibility, and in addition to the data from the tubes not being representative of the area whilst the works are ongoing.

It was planned to reinstate non-automatic monitoring sites in comparative locations once the works are completed, and this has been actioned with the addition and reinstatement of several non-automatic monitoring sites within and adjacent to the AQMA, with the data available in the next ASR monitoring period.

The current Site IDs that fall within the AQMA during the 2024 monitoring period are: 9 (HRI); 10 (Ice House Road); 11 (Daltry Street); 12 (Cambridge Street); 13 (Aelaide); and 47 (Blanket Row). Of these, 11 (Daltry Street) was chosen to report the NOx readings within the AQMA due to its proximity to the A63, and therefore was more representative than the other sites.

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	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
Hull AQMA 1 (A)	01/08/2005	NO_2 Annual Mean	An area of the City centre, bordered to the west by Coltman St, Hessle Rd and Strickland St and to the north by Anlaby Rd, Carr Ln, Whitefriargate, Scale Ln and Silver St and to the east by the River Hull and the south by the Humber Estuary.	YES	64		5 years	Hull Air Quality Action Plan. Incorporated into the Hull City Council Air Quality Strategy	Air Quality Strategy (hull.gov.uk) www.hull.gov.uk/downloads/file/1945/Air_Quality_Strategy.pdf

☒ **Kingston upon Hull City Council confirm the information on UK-Air regarding their AQMA(s) is up to date.**

☒ **Kingston upon Hull City Council confirm that all current AQAPs have been submitted to Defra.**

2.2 Progress and Impact of Measures to address Air Quality in Kingston upon Hull

Defra's appraisal of last year's ASR concluded:

The report provides some of the information specified in the Guidance. The following comments are designed to help inform future reports:

1. There are inconsistencies across Table A.5 and Table A.6 regarding valid data capture at CM3 automatic monitor. PM_{10} data capture at CM3 should be reviewed, justified and amended, where appropriate, prior to publication of the 2024 ASR.

Response:

Acknowledged.

2. Whilst Table 2.2 (Progress on Measures to Improve Air Quality) has been completed, this has been inserted as a series of images. The ASR is a public facing document, which is required to follow the annual template to comply with accessibility regulations. It is required that the 2025 ASR follows the template.

Response:

Noted and addressed in this report.

3. In the revised ASR, a national bias adjustment factor of 0.78 has been used which is correct for tubes supplied by SOCOTEC Didcot using 50% TEA in acetone. The council should ensure that future submissions also use the correct factor from the most recently available adjustment spreadsheet.

Response:

Acknowledged and addressed in this report.

4. The Council are encouraged to update their AQAP as it is now outdated.

Response:

Acknowledged and addressed in this report.

5. The following comment relates to formatting and inconsistencies within the text:

   a. The figures appear to show a good level of detail. However, the current resolution makes the figures quite difficult to read. Clearer images should be provided.

Response:

Acknowledged and different base maps used in this report.

6. A comparison of monitored concentrations against the relevant objectives has been undertaken, which highlights that air quality within the city is generally good. The Council have provided good discussion on those areas which may be at risk of exceedance, such as areas surrounding the major roadworks.

Response:

Acknowledged.

7. The Council have provided excellent detail regarding measures to reduce $PM_{2.5}$ emissions. This includes a discussion on the Public Health Outcomes Framework D01 indicator. The Council should continue to add this level of detail in future reports.

Response:

Acknowledged.

Kingston upon Hull City Council has taken forward a number of direct measures during the current reporting year of 2024 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2 with the type of measure and the progress Kingston upon Hull City Council has made during the reporting year of 2024 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

Kingston upon Hull City Council anticipates that the measures stated above will achieve compliance in Hull AQMA 1 when National Highways complete their works.

A Report is submitted each year to the Cabinet to provide them with information on the annual submission with the most recent report presented in November 2024, details of which can be found in Appendix F.

Kingston upon Hull City Council expects the following priority measures to be progressed over the course of the next reporting year:

1. A redeployment of 4 Zephyr real time analysers to key locations which will provide further detailed information of the status of the air quality within Hull and specifically within the AQMA, enabling the comparison of data before and after the road works to the A63, and to aid in the justification of the future revocation of the AQMA.
2. The implementation of plans to create a Park & Ride scheme at Dunswell Roundabout. This will help reduce the number of vehicles travelling into Hull's centre, whether for work or leisure, reducing emissions by reducing the number of vehicles and helping create better flow of residual traffic.
3. The revocation of the AQMA is expected to begin early 2026, on the basis that the measured data continues to show a pattern of continual improvement once the traffic flow is restored to full capacity following the completion of the A63 Highway improvements. This will go hand in hand with a renewed Air Quality Strategy for Hull, both aiming at refreshing and refocussing the direction of actions to maintain and improve further the air quality within Kingston upon Hull.

The principal challenge and barrier to implementation that Kingston upon Hull City Council has faced is the recruitment of a new Air Quality Officer, with the post being vacant most of 2024.

Now that the new officer is in post, the focus during the next reporting year will be on building working relationships with the other stakeholders that impact on Air Quality to enable more measures to be progressed and actioned. This will primarily involve working with the Climate Change team and the Public Health team, the latter of which, there are plans to renew the Air Quality Health Needs Assessment within the near future.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	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	Redeployment of Zephyr air quality Monitors	Policy Guidance and Development Control	Other Policy	2025	2027	Kingston upon Hull City Council Environmental Health	Internal	Funded	£20	Implementation	Increase real time data on NO2 and PM2.5 to allow strategic plans to reduce these emissions further	Completion of the redeployment of 4 Zephyr units	The new contract has been set up with Earthsense to run for 2 years	The zephyrs were previously managed by a different council department but It was considered the Environmental Health Department would be able to make better use of them
2	Dunswell Park & Ride	Alternatives to private vehicle use	Bus based park & ride	2025	2030	East Riding of Yorkshire Council, Highways	External	n/k	> £10 million	Planning	Reduced emissions from reduced number of car journeys	Completion of and implementation of scheme. Traffic count	Plans submitted and progressing through planning process	Hull City Council Planning have objected to part of the plans which may delay the project.
3	Revocation of the AQMA	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2025	2026	Kingston upon Hull City Council, DEFRA	Internal	Funded	< £10k	Planning	n/a	Successful revocation of the AQMA	The Environmental Health team have increased data collection of air quality within the AQMA to ensure it is appropriate to revoke	The 1 year delay of the completion of the roadworks to the A63 has delayed the revocation of the AQMA due to needing data once the traffic flow is back at full capacity
4	Update the Air Quality Strategy	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2025	2026	Kingston upon Hull City Council Environmental Health	Internal	Funded	<£10k	Planning	Reduced emissions from strategic planning	Publication of an updated Air Quality Strategy	Work on the new Air Quality Strategy is due to begin imminently	An interim draft update of the Air Quality Strategy will be produced first, and a full update will be published to coincide with the revocation of the AQMA
5	Smoke Control and Public Service Requests	Public Information	Other	2025	n/a	Kingston upon Hull City Council Environmental Health	Internal	Funded	n/k	Implementation	Reduced emissions from inappropriate burning	Number of service requests regarding smoke complaints; number of notices served	In the reporting year 2024, the Environmental Health reactive team dealt with 160 service requests including 149 smoke from bonfires, 14 smoke from chimneys, and 7 smoke from permitted processes	The Environmental Health reactive team issued 0 notices in reporting year 2024 regarding smoke, due to the proactive, educate and encourage approach leading to positive behaviour change without the need to enforce
6	District Heating	Promoting Low Emission Plant	Other Policy	2025	2030	Kingston upon Hull City Council, Private companies	Green Heat Network Fund and Levelling Up Grant and National Wealth Fund	Funded	> £10 million	Planning	Reduced emissions from fewer combustion powered heating systems	Completion and implementation of the scheme	Plans submitted and progressing through planning process	
7	Low Emission Bus Fleet	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	2014	2026	Kingston upon Hull City Council, Private companies	ZEBRA	Partially Funded	n/k	Implementation	Reduced emissions from replacing combustion engine buses with EV buses	Completion of phase out of combustion engine buses		Both bus companies operating in Kingston Upon Hull have a full fleet EV target.
8	Installation of street EV charging points and in HCC owned car parks	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2025	2030	Kingston upon Hull City Council	Internal	funded	n/k	Implementation	Reduced emissions from promoting uptake of private EV use	Completion of installation of charging points	Ongoing	Part of the Local Electric Vehicle Infrastructure Strategy
9	Decarbonisation of Council owned housing stock	Policy Guidance and Development Control	Regional Groups co-ordinating programmes to develop area wide strategies to reduce emissions and improve air quality	2025	2030	Kingston upon Hull City Council	Internal	Funded	n/k	Implementation	Reduced emissions from improved energy efficiency and use of Air Source Heat Pumps (ASHP) instead of combustion boilers	Completion of scheme	Ongoing	Commenced on several new developments including installation of 99 ASHPs at Danepark Road housing development. Insulation and ASHP retrofitted to existing stock.
10	EV pool car	Alternatives to private vehicle use	Car & lift sharing schemes	2025	2030	Kingston upon Hull City Council	Internal	n/k	n/k	Implementation	Reduced emissions from use of EV pool cars	Replacement of journeys in combustion engine cars with EV pool cars	Ongoing	HCC continue to grow electric pool car fleet
11	Decarbonisation of council fleet vehicles	Promoting Low	Company Vehicle Procurement –	2025	2030	Kingston upon Hull City Council	Internal	n/k	n/k	Implementation	Reduced emissions from the uptake of EV and hydrogen powered fleet vehicles	Completion of phase out of combustion engine fleet vehicles	Ongoing	Limited to where technology currently exists

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
		Emission Transport	Prioritising uptake of low emission vehicles											
12	Promotion of cycle to work scheme	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2025	2030	Kingston upon Hull City Council	Internal	n/k	n/k	Implementation	Reduced emissions from reduction in journeys from combustion engine vehicles	Replacement of journeys in combustion engine cars with active travel alternatives	Ongoing	Increase in infrastructure at council buildings including cycle parking / showers / lockers. Promotion of cycle to work scheme
13	Review of Permitted Process fees	Environmental Permits	Introduction / increase of environmental charges through permit systems and economic instruments	2025	2030	Kingston upon Hull City Council, DEFRA	External	n/k	n/k	Planning	Reduced emissions from improved processes from economic incentives	Compliance statistics	Pre-implementation	DEFRA are proposing a significant uplift in subsistence fees for permitted processes linked to their environmental impact
14	IPPC Permitted activities reviews	Environmental Permits	Measures to reduce pollution IPPC Permits going beyond BAT	2024	2030	Kingston upon Hull City Council, DEFRA	Internal	n/k	n/k	Implementation	Reduced emissions from improved environmental requirements	Compliance with new guidance	Timber treatments completed. Galvanizing to be implemented late 2025-2026	IPPC Permits are going through a structured review due to updated / tightened sector guidance
15	Permitted Process Inspection regime	Environmental Permits	Other measure through permit systems and economic instruments	2025	2030	Kingston upon Hull City Council, DEFRA	External	n/k	n/k	Implementation	Reduced emissions from compliance with current standards and continual improvement	Inspection data. Compliance with standards	Ongoing	Environmental Health team regularly meets 100% inspection requirements. Continued performance depends on maintenance of staff resource.
16	Traffic Flow Model	Traffic Management	Other	2025	2027	Kingston upon Hull City Council	n/k	n/k	n/k	Planning	Reduced emissions from being able to take targeted action to improve traffic flow	A reduction in measured emissions	Currently in the planning phase	More action is required to progress this measure and improve communication between departments
17	Off Road Cycle Lane Scheme East Hull	Promoting Travel Alternatives	Promotion of Cycling	2024	2026	Kingston upon Hull City Council	Active Travel England's Active Travel Fund	Funded	£1 million - £10 million	Planning	Reduced emissions from reduced car journeys	Installation of the cycle lanes	The scheme is currently open to public consultation	
18	New Local Cycling and Walking Infrastructure Plan	Promoting Travel Alternatives	Promotion of Cycling	2025	2035	Kingston upon Hull City Council, Public	n/k	n/k	n/k	Planning	Reduced emissions from reduced car journeys	Increased uptake in active travel	The Plan is currently open to public consultation	
19	WOW Walk to school challenge	Promoting Travel Alternatives	Promotion of Walking	2024	2030	Kingston upon Hull City Council, Public	Active Travel England	Funded	n/k	Implementation	Reduced emissions from reduced car journeys	Increased uptake in active travel	Following a successful trial at Chiltern Primary School, a further 10 schools in Hull have signed up	Between October 2024 and April 2025, 185,000 journeys were logged by pupils taking part, a 33% increase in active travel
20	Installation of a new PM2.5 monitors	Policy Guidance and Development Control	Other Policy	2024	2025	DEFRA	External	n/k	n/k	Implementation	Increase real time data on PM2.5 to allow strategic plans to reduce these emissions further	Installation of both the new PM2.5 real time monitor, and upload of data on UK-Air website	Planning permission was approved for the new installation early 2025	A PM2.5 analyser was added to the existing AQMS Holderness Road in November 2024. The standalone PM2.5 monitor is due to be installed in 2025.
21	Update Supplementary Planning Document (SPD) 3 – Environmental Quality as part of Local Plan review	Policy Guidance and Development Control	Air Quality Planning and policy Guidance	2025	2026	Kingston upon Hull City Council	Internal	Funded	<£10k	Planning	Reduced emissions from strategic planning	Publication of an updated SPD 3 and implementation by planning applicants	Work on the new SPD 3 is due to begin imminently	The updated SPD 3 will be published alongside the Air Quality Strategy and will provide clearer information to developers, ensuring air quality remains well considered even after the revocation of the AQMA
22	Planning Development Control consultation	Policy Guidance and Development Control	Air Quality Planning and policy Guidance	2025	2030	Kingston upon Hull City Council	Internal	n/k	n/k	Implementation	Reduced emissions through implementation of appropriate air quality controls	Consultation on all appropriate applications and discharge of conditions included in decision records	Ongoing	Environmental Health team regularly achieves 100% target for providing consultation comments. Continued performance depends on maintenance of staff resource.

2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG22 (Chapter 8) and the Air Quality Strategy[1], local authorities are expected to work towards reducing emissions and/or concentrations of fine particulate matter ($PM_{2.5}$)). There is clear evidence that $PM_{2.5}$ (particulate matter smaller 2.5 micrometres) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Kingston upon Hull City Council is taking the following measures to address $PM_{2.5}$:

$PM_{2.5}$ has been monitored at one site in Kingston upon Hull since the 27th of August 2008. A new $PM_{2.5}$ monitor has been installed into the second existing AQMS at the end of 2024 and will provide data for the 2025 monitoring period onwards. A third stand alone $PM_{2.5}$ monitor is due to be installed at a separate background location, providing further data. The finer particulates are targeted instead of PM_{10} to align more closely with reports from Public Health England and health interests of the Joint Strategic Needs Assessment.

Kingston upon Hull City Council is taking forward measures within the Air Quality Strategy, which incorporates the Action Plan, which will help to address $PM_{2.5}$ concentrations. The measures which focus on behavioural change should also reduce $PM_{2.5}$ emissions from transport, as well as the improvements on the A63 Trunk Road and the changes to the traffic light system, which will help reduce fuel usage to some extent (by smoothing traffic flow), and hence $PM_{2.5}$ emissions.

As mentioned in the previous reports, Kingston upon Hull City Council continues to work with Public Health colleagues to prioritise action on air quality in their local area to help reduce the health burden from air pollution. The Public Health Outcomes Framework (PHOF) is a Department of Health data tool for England, intended to focus public health action on increasing healthy life expectancy and reducing differences in life expectancy between communities. The PHOF includes an indicator, based on the effect of particulate matter ($PM_{2.5}$) on mortality. The approach used in partnership with Public Health colleagues includes the encouragement of active travel, which will also have wider public health benefits captured in other indicators such as increased physical activity (indicator 2.13) and reducing

[1] Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

excess weight at various ages (indicators 2.6 & 2.12). NICE guidance on air pollution and health is in draft at this current time. When this has been adopted the measures suggested by the NICE guidance on control and reduction of $PM_{2.5}$ emissions will be adopted.

We have also previously collaborated with colleagues in Public Health to investigate the apparent anomaly, where despite measuring relatively good concentrations for air quality, the health data suggests that there are a larger than average number of people presenting at health centres with ailments that can be attributed to poor air quality. We have previously produced an Air Quality Health Needs Assessment, and are now planning to review it, as well as looking at options to utilise PhD or Master's students to investigate the findings.

Transport is a significant source of local $PM_{2.5}$. Kingston upon Hull Local Transport Plan 2011 sets out a number of measures by which it aims to improve air quality in Kingston upon Hull that will have an effect on the levels of $PM_{2.5}$. For example, Chapter 11 of the plan looks at Air Quality, and states that:

- The Council already has a network of 52 electric vehicle charging points, 14 of which are located in George Street multi-storey and the rest are at Council buildings and depots. The charging points were installed when the Council had an electric vehicle fleet five years ago before the manufacturer withdrew from the market.

  The Council was part of a Yorkshire bid for funding from the Plugged in Places initiative to develop a network of charging points throughout Yorkshire including up to 70 additional charging points in 37 locations throughout the City. Unfortunately, the bid was unsuccessful but the Council is still looking for alternative sources of funding to progress this initiative.

- The Council is currently purchasing 10 electric vehicles a year as part of the decarbonising of its fleet and has added a number of electric pool vehicles for use by staff.

- Investigations into reducing tyre wear are ongoing.

Kingston upon Hull City Council's Electric Vehicle Strategy states that in 2021 Hull City Council with East Riding of Yorkshire Council and support from the North East Energy Hub appointed Jacobs to undertake an electric vehicle study. This to increase both authorities' understanding of charging infrastructure requirements and how the ownership of electric vehicles might grow.

In 2023, Hull got funding from government under the Local Electric Vehicle Infrastructure Capability Fund. This was to develop an Electric Vehicle Infrastructure Strategy and Delivery

Plan for the city. There is a particular focus on homes without off street parking. The Strategy and Delivery Plan are being developed.

By continuing to work alongside Highways department, Local Transport, and National Highways, it is aimed that efforts to ease congestion in the city will also contribute to improvements in air quality.

The Carbon Neutral Strategy supports Hull City Council's Air Quality Strategy by seeking to increase modal shift to more sustainable transport options and support the adoption of electric vehicles though an expanded charging infrastructure. It also supports a variety of measures, such as alternative fuels to diesel, and options for fuelling heavier vehicles to enable a net zero transition. Through the Oh yes Net Zero programme the council with partners supports the achievement of net zero emissions across the business sector support and enabling activity that will deliver air quality benefits.

The latest published Carbon Emissions Report April 2022- March 2023 reported total emissions have decreased in Kingston upon Hull by 18.18% from the previous period.

Air Quality is a key element in the Local Plan for Kingston upon Hull, which is currently under review and the reduction of $PM_{2.5}$ will be considered within this.

The planning system is inevitably focussed on addressing issues within the AQMA declared for NO_2. However, it is important that measures to address NO_2 do not inadvertently increase $PM_{2.5}$ concentrations. One example of this may be through giving centralised energy plant consent without fully assessing the impacts on PM_{10} and $PM_{2.5}$ concentrations. An Environmental Quality Supplementary Planning Document was produced and adopted as part of the Local Plan 2018. We continue to apply the requirements of this when commenting on planning applications and ensure that they meet the requirements of Hull City Council's Air Quality Strategy. The aim is to minimise emissions to protect health.

The existing 25 Smoke Control Orders in force in the City, were enacted between 1959 and 1992, and were the cause of some confusion. An order was made for these to be revoked, and replaced by a single, clearer Smoke Control Order covering the whole of the City. This came into force in June 2020. This continues to provide us with opportunities to raise awareness of the issues around solid fuel combustion and fine particulate, and work with residents to educate users of solid fuel burners on how to use their appliances within the guidelines, thus minimising the likelihood for the need for enforcement action.

We are also assisting the local University in studies relating to air quality, which could provide additional detail on the make-up of fine particulate.

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

This section sets out the monitoring undertaken within 2024 by Kingston upon Hull City Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2020 and 2024 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Kingston upon Hull City Council undertook automatic (continuous) monitoring at 2 sites that form part of a national network managed on behalf of Defra during 2024. Table A.1 in Appendix A shows the details of the automatic monitoring sites, with automatic monitoring results also available through the UK-Air website .

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

Kingston upon Hull City Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 70 sites during 2024. 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 full 2024 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.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 have been no measured exceedances of the NO_2 annual mean or hourly mean objectives over the period 2020 to 2024.

3.2.2 Particulate Matter (PM_{10})

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past five years with the air quality objective of 40µg/m^3.

Table A.7 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past five years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year.

There have been no measured exceedances of the PM_{10} annual mean or daily mean objectives over the period 2012 to 2024.

3.2.3 Particulate Matter ($PM_{2.5}$)

Table A.8 in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past five years.

$PM_{2.5}$ is currently monitored at Hull Freetown AURN site, and values have shown very little variation since 2011 and are generally below the WHO value of 10µg/m^3, sitting at around 8µg/m^3 for the past few years.

3.2.4 Sulphur Dioxide (SO_2)

Table A.9 in Appendix A compares the ratified continuous monitored SO_2 concentrations for 2024 with the air quality objectives for SO_2.

SO_2 is monitored at the Hull Freetown AURN site and shows no exceedances.

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? (1)	Monitoring Technique	Distance to Relevant Exposure (m) (2)	Distance to kerb of nearest road (m) (1)	Inlet Height (m)
CM2	Hull Freetown (AURN)	Urban background	509482	429322	NO_2; $PM_{2.5}$; SO_2; CO; O_3	N	n/a	API, FIDAS	0	2	2.5
CM3	Hull Holderness Rd (AURN)	Roadside	511794	430511	NO_2; PM_{10}	N	n/a	API, FDMS	3	3	2.5

Notes:

(1) N/A if not applicable

(2) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

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)
1	Plimsoll Way	Roadside	510721	428732	NO_2	Not in AQMA	3.0	1.0	No	2.5
2	Hessle Rd	Roadside	508140	427802	NO_2	Not in AQMA	0.0	3.0	No	2.5
3	269 Hessle Rd	Kerbside	507972	427770	NO_2	Not in AQMA	3.0	1.0	No	2.5
4	Calvert Station	Kerbside	506018	428892	NO_2	Not in AQMA	3.0	2.0	No	2.5
5	Calvert Lane	Kerbside	505914	429362	NO_2	Not in AQMA	4.0	2.0	No	2.5
6	Granville St	Kerbside	507331	428719	NO_2	Not in AQMA	3.0	3.0	No	2.5
7	Anlaby Road	Kerbside	507345	428738	NO_2	Not in AQMA	3.0	1.0	No	2.5
8	261, Anlaby Rd	Kerbside	508149	428670	NO_2	Not in AQMA	3.0	1.0	No	2.5
9	HRI	Kerbside	508413	428659	NO_2	Hull AQMA 1	3.0	2.0	No	2.5
10	Ice House Road	Kerbside	508905	428502	NO_2	Hull AQMA 1	0.0	3.0	No	2.5
11	Daltry St	Roadside	508489	427986	NO_2	Hull AQMA 1	0.0	2.0	No	2.5
12	Cambridge St	Roadside	508921	428659	NO_2	Hull AQMA 1	3.0	1.0	No	2.5
13	Adelaide	Roadside	508665	428180	NO_2	Hull AQMA 1	0.0	3.0	No	2.5
14	Princes Ave / Springbank	Roadside	508178	429636	NO_2	Hull AQMA 1	4.0	0.0	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
15	Hymers	Kerbside	508071	429589	NO_2	Hull AQMA 1	0.0	10.0	No	2.5
16	Lowgate	Kerbside	510039	428687	NO_2	Not in AQMA	2.0	0.0	No	2.5
17	Francis Street (AQMS)a	Urban Background	509482	429322	NO_2	Not in AQMA	0.0	2.0	Yes	2.5
18	Francis Street (AQMS)b	Urban Background	509482	429322	NO_2	Not in AQMA	0.0	2.0	Yes	2.5
19	Francis Street (AQMS)c	Urban Background	509482	429322	NO_2	Not in AQMA	0.0	2.0	Yes	2.5
20	Francis St	Kerbside	509465	429281	NO_2	Not in AQMA	3.0	3.0	No	2.5
21	Portland Pl	Kerbside	509125	429228	NO_2	Not in AQMA	2.0	1.0	No	2.5
22	Paragon Square (Road)	Kerbside	509273	428811	NO_2	Not in AQMA	3.0	0.5	No	2.5
23	Paragon Square (Cenotaph)	Roadside	509299	428797	NO_2	Not in AQMA	3.0	3.0	No	2.5
24	St Stephens Crossing	Roadside	509186	428904	NO_2	Not in AQMA	4.0	0.5	No	2.5
25	Brook St	Kerbside	509198	429022	NO_2	Not in AQMA	2.0	1.0	No	2.5
26	Cherry Court	Kerbside	509134	429115	NO_2	Not in AQMA	2.0	1.0	No	2.5
27	Nero	Kerbside	509202	428944	NO_2	Not in AQMA	3.0	1.0	No	2.5
28	Pearson St	Kerbside	509102	429228	NO_2	Not in AQMA	2.0	1.0	No	2.5
29	27, Spring Bank	Kerbside	509004	429312	NO_2	Not in AQMA	3.0	1.0	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
30	72 Spring Bank	Kerbside	508865	429378	NO_2	Not in AQMA	3.0	3.0	No	2.5
31	Spring Bank	Kerbside	508819	429372	NO_2	Not in AQMA	2.0	3.0	No	2.5
32	Louis St	Kerbside	508241	429602	NO_2	Not in AQMA	3.0	2.0	No	2.5
33	Park Street/Londesborough St	Roadside	508780	428925	NO_2	Not in AQMA	3.0	0.5	No	2.5
34	Princes Ave	Kerbside	508233	429887	NO_2	Not in AQMA	3.0	1.0	No	2.5
35	Middleton St	Kerbside	508327	429572	NO_2	Not in AQMA	0.0	2.0	No	2.5
36	29, Princes Ave	Kerbside	508201	429800	NO_2	Not in AQMA	3.0	3.0	No	2.5
37	Peel St	Kerbside	508537	429492	NO_2	Not in AQMA	3.0	3.0	No	2.5
38	Park Grove	Kerbside	508258	429939	NO_2	Not in AQMA	3.0	1.0	No	2.5
39	Newland Bridge	Roadside	508276	430730	NO_2	Not in AQMA	0.0	3.0	No	2.5
40	County Rd	Roadside	506590	430671	NO_2	Not in AQMA	3.0	3.0	No	2.5
41	Inglemire Lane	Kerbside	507876	432075	NO_2	Not in AQMA	3.0	1.0	No	2.5
42	Sutton Rd	Roadside	508299	432952	NO_2	Not in AQMA	3.0	0.5	No	2.5
43	Wetherby Close	Kerbside	506972	433172	NO_2	Not in AQMA	0.0	40.0	No	2.5
44	Ashcombe Rd	Roadside	508698	434348	NO_2	Not in AQMA	4.0	3.0	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
45	Leads Rd Roundabout	Roadside	511529	433117	NO_2	Not in AQMA	3.0	1.0	No	2.5
46	Fortune Close	Kerbside	512678	432075	NO_2	Not in AQMA	3.0	8.0	No	2.5
47	Blanket Row	Kerbside	509903	428357	NO_2	Not in AQMA	3.0	3.0	Yes	2.5
48	Marfleet Lane	Kerbside	513877	430355	NO_2	Not in AQMA	3.0	1.0	No	2.5
49	Hall Rd - Marfleet Junction	Kerbside	514113	429329	NO_2	Not in AQMA	3.0	2.5	No	2.5
50	Hedon Road/Marfleet	Roadside	514129	429321	NO_2	Not in AQMA	3.0	1.0	No	2.5
51	Hedon Road/Valetta St	Roadside	514387	429162	NO_2	Not in AQMA	3.0	0.5	No	2.5
52	Diadem	Roadside	514195	432166	NO_2	Not in AQMA	25.0	0.5	No	2.5
53	171, James Reckitt Ave	Kerbside	511024	430853	NO_2	Not in AQMA	3.0	1.0	No	2.5
54	Glebe Rd	Kerbside	510317	431730	NO_2	Not in AQMA	4.0	1.0	No	2.5
55	Rivaulx Court	Kerbside	510320	431650	NO_2	Not in AQMA	3.0	3.0	No	2.5
56	Stoneferry Road	Kerbside	510380	431236	NO_2	Not in AQMA	3.0	2.0	No	2.5
57	Reservoir Rd	Kerbside	509941	431405	NO_2	Not in AQMA	3.0	3.0	No	2.5
58	Beverley Rd	Other	508603	431582	NO_2	Not in AQMA	3.0	3.0	No	2.5
59	Inglemire/Bev Rd	Kerbside	508520	431875	NO_2	Not in AQMA	3.0	1.0	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
60	Grafton St	Kerbside	508741	431050	NO_2	Not in AQMA	3.0	1.0	No	2.5
61	Adderbury Grove	Kerbside	508918	430568	NO_2	Not in AQMA	3.0	1.0	No	2.5
62	Bedford St	Kerbside	510364	430215	NO_2	Not in AQMA	3.0	1.0	No	2.5
63	229 Beverley Rd	Kerbside	508929	430340	NO_2	Not in AQMA	0.0	2.0	No	2.5
64	Spencer St	Kerbside	509155	429125	NO_2	Not in AQMA	2.0	1.0	No	2.5
65	Holderness Road AURN a	Roadside	513309	429319	NO_2	Not in AQMA	0.0	8.0	Yes	2.5
66	Holderness Road AURN b	Roadside	513309	429319	NO_2	Not in AQMA	0.0	8.0	Yes	2.5
67	Holderness Road AURN c	Roadside	513309	429319	NO_2	Not in AQMA	0.0	8.0	Yes	2.5

Notes:

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

(2) N/A if not applicable.

Table A.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 2024 (%) (2)	2020	2021	2022	2023	2024
CM2	509482	429322	Urban Background	100.0	91.2	18	18	18	17	16.8
CM3	511794	430511	Roadside	100.0	98.2	21	22	22	22.2	20.2

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

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

☒ **Where exceedances of the NO_2 annual mean objective occur at locations not representative of relevant exposure, the fall-off with distance concentration has been calculated and reported concentration provided in brackets for 2024.**

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.TG22 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 2024 (%) (2)	2020	2021	2022	2023	2024
1	510721	428732	Roadside	92.0	92.0	18.3	20.2	18.5	19.6	16.1
2	508140	427802	Roadside	100.0	100.0	23.5	25.8	27.3	22.8	21.1
3	507972	427770	Kerbside	100.0	100.0		29.1	27.1	24.2	24.2
4	506018	428892	Kerbside	100.0	100.0	17.9	20.8	20.2	15.9	15.6
5	505914	429362	Kerbside	92.0	92.0	21.1	21.5	21.7	21.2	19.0
6	507331	428719	Kerbside	92.0	92.0		27.6	28.5	26.3	27.0
7	507345	428738	Kerbside	92.0	92.0	28.1	30.9	30.7	28.3	26.6
8	508149	428670	Kerbside	67.0	67.0		30.1	31.9	29.1	30.3
9	508413	428659	Kerbside	100.0	100.0	24.3	26.2	24.2	24.1	22.1
10	508905	428502	Kerbside	100.0	100.0	17.8	17.6	16.4	15.5	15.5
11	508489	427986	Roadside	92.0	92.0	23.0	24.9	24.0	21.6	21.0
12	508921	428659	Roadside	100.0	100.0	31.2	27.0	23.8	26.5	25.0
13	508665	428180	Roadside	58.0	58.0	30.3	27.8	26.2	22.7	17.4
14	508178	429636	Roadside	71.0	42.0					24.8
15	508071	429589	Kerbside	100.0	58.0					22.3
16	510039	428687	Kerbside	100.0	100.0	24.2	25.1	26.7	25.6	23.2
17	509482	429322	Urban Background	100.0	100.0	18.9	18.4	18.7	17.7	15.7
18	509482	429322	Urban Background	100.0	100.0	18.9	18.4	18.7	17.7	16.3
19	509482	429322	Urban Background	100.0	100.0	18.9	18.4	18.7	17.7	16.2
20	509465	429281	Kerbside	100.0	100.0		24.1	25.0	23.0	22.6
21	509125	429228	Kerbside	92.0	92.0		29.2	30.7	26.1	25.3
22	509273	428811	Kerbside	100.0	100.0	32.8	31.7	33.3	30.0	29.0
23	509299	428797	Roadside	92.0	92.0	23.2	25.0	26.8	24.9	23.5
24	509186	428904	Roadside	92.0	92.0	33.2	36.6	33.0	30.5	34.2
25	509198	429022	Kerbside	83.0	83.0		27.6	30.6	27.5	33.4

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 2024 (%) [2]	2020	2021	2022	2023	2024
26	509134	429115	Kerbside	100.0	100.0		28.6	29.3	29.5	25.8
27	509202	428944	Kerbside	100.0	100.0		37.0	38.6	37.7	35.6
28	509102	429228	Kerbside	100.0	100.0		30.7	29.9	28.6	26.6
29	509004	429312	Kerbside	92.0	92.0		33.6	35.1	34.6	28.4
30	508865	429378	Kerbside	100.0	100.0		28.0	27.0	25.8	22.8
31	508819	429372	Kerbside	100.0	100.0	23.4	24.8	26.5	17.8	23.3
32	508241	429602	Kerbside	92.0	92.0		31.3	31.7	32.6	29.0
33	508780	428925	Roadside	92.0	92.0	21.3	23.3	24.4	23.0	20.5
34	508233	429887	Kerbside	100.0	100.0	23.9	25.5	27.5	26.2	23.8
35	508327	429572	Kerbside	92.0	92.0		31.3	33.6	32.0	29.6
36	508201	429800	Kerbside	100.0	100.0		33.2	38.1	37.6	35.2
37	508537	429492	Kerbside	92.0	92.0		23.7	23.3	22.2	21.8
38	508258	429939	Kerbside	100.0	100.0		28.8	29.4	29.9	26.0
39	508276	430730	Roadside	67.0	67.0	19.7	20.9	18.5	20.2	19.6
40	506590	430671	Roadside	100.0	100.0	19.4	21.6	21.0	19.6	17.4
41	507876	432075	Kerbside	100.0	100.0	13.8	13.3	14.9	13.1	12.6
42	508299	432952	Roadside	100.0	100.0	21.8	24.1	23.7	22.1	21.3
43	506972	433172	Urban Background	92.0	92.0	11.4	10.1	11.4	9.3	8.6
44	508698	434348	Roadside	92.0	92.0	15.2	16.3	19.7	16.2	12.3
45	511529	433117	Roadside	92.0	92.0	23.9	23.8	25.7	24.2	22.5
46	512678	432075	Kerbside	92.0	92.0	13.9	13.9	14.0	10.8	11.1
47	509903	428357	Kerbside	85.7	50.0					13.7
48	513877	430355	Kerbside	100.0	100.0		21.4	23.9	19.1	17.0
49	514113	429329	Kerbside	100.0	100.0	27.4	26.4	27.8	23.7	27.1
50	514129	429321	Roadside	92.0	92.0	31.9	30.5	35.8	30.5	26.6
51	514387	429162	Roadside	100.0	100.0	28.5	32.2	31.4	26.3	27.7
52	514195	432166	Roadside	92.0	92.0			31.9	28.7	25.8
53	511024	430853	Kerbside	100.0	100.0		21.6	20.3	17.3	16.1
54	510317	431730	Kerbside	83.0	83.0	32.7	33.4	33.6	34.6	30.8
55	510320	431650	Kerbside	83.0	83.0		30.6	32.2	31.8	30.4
56	510380	431236	Kerbside	100.0	100.0	29.8	27.0	30.9	26.9	27.4
57	509941	431405	Kerbside	92.0	92.0		21.3	23.0	14.6	12.8

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 2024 (%) (2)	2020	2021	2022	2023	2024
58	508603	431582	Other	75.0	75.0	26.4	27.6	29.8	25.2	25.5
59	508520	431875	Kerbside	75.0	75.0		25.8	27.8	23.3	24.1
60	508741	431050	Kerbside	83.0	83.0		28.8	30.2	23.1	25.3
61	508918	430568	Kerbside	83.0	83.0		26.7	28.4	24.6	24.9
62	510364	430215	Kerbside	92.0	92.0		24.6	26.5	22.0	21.6
63	508929	430340	Kerbside	100.0	100.0		27.0	26.3	29.5	24.9
64	509155	429125	Kerbside	100.0	100.0		28.7	30.3	28.8	27.4
65	513309	429319	Roadside	83.0	83.0	19.5	23.7	22.9	20.6	21.6
66	513309	429319	Roadside	83.0	83.0	19.5	23.7	22.9	20.6	20.7
67	513309	429319	Roadside	83.0	83.0	19.5	23.7	22.9	20.6	21.5

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☒ **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.TG22 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

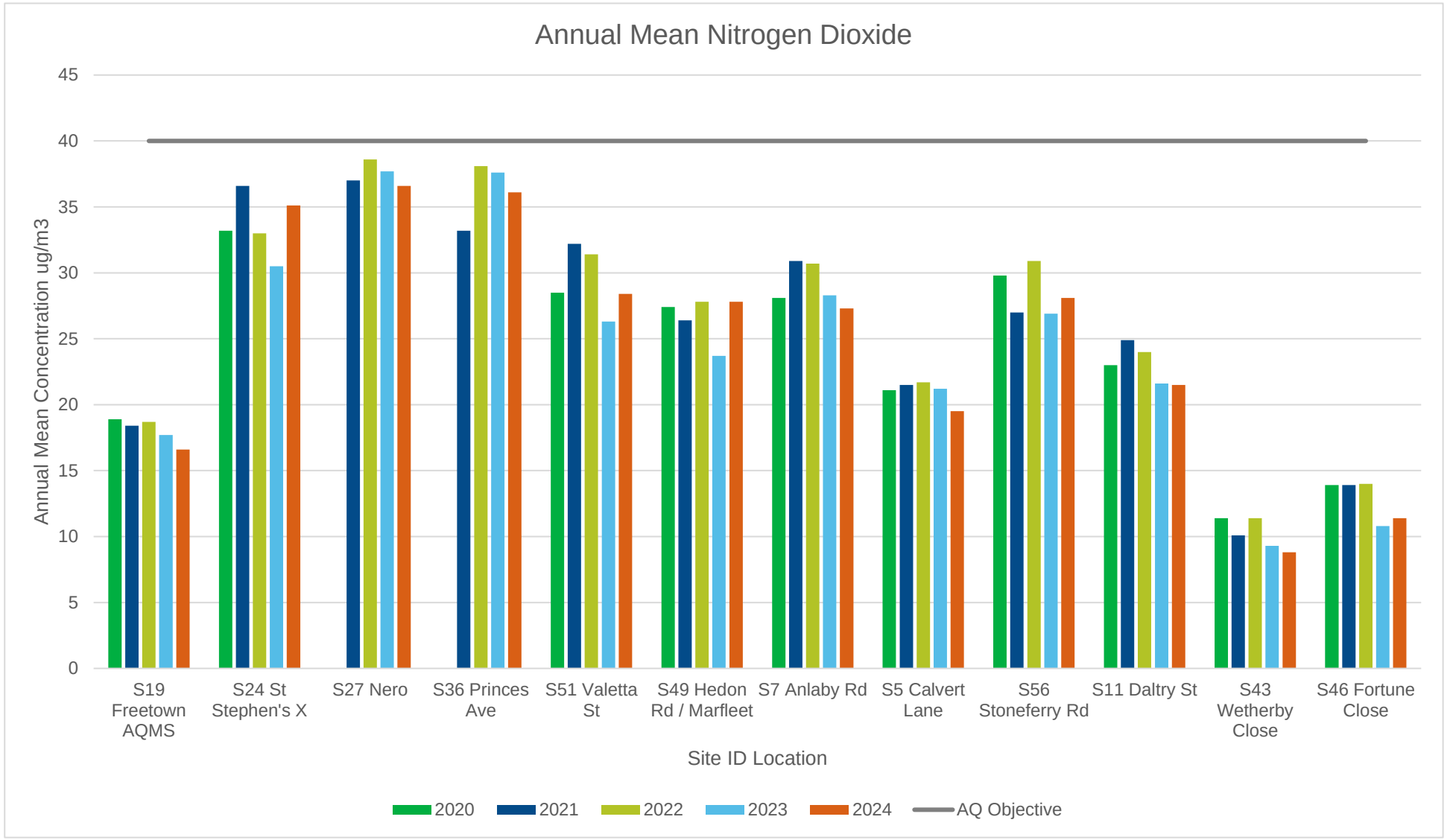


Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
CM2	509482	429322	Urban Background	100.0	91.2	0	0	**0**	**0**	0
CM3	511794	430511	Roadside	100.0	98.2	0	0	**0**	**0**	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%).

Table A.6 – Annual Mean PM_{10} Monitoring Results ($\mu g/m^3$)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
CM2	509482	429322	Urban Background	100.0	99.8	15	14	15	13	13.8
CM3	511794	430511	Roadside	100.0	90.0	20	18	19	15	17.1

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

Notes:

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

Exceedances of the PM_{10} annual mean objective of 40$\mu g/m^3$ are shown in **bold**.

All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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.2 – Trends in Annual Mean PM_{10} Concentrations

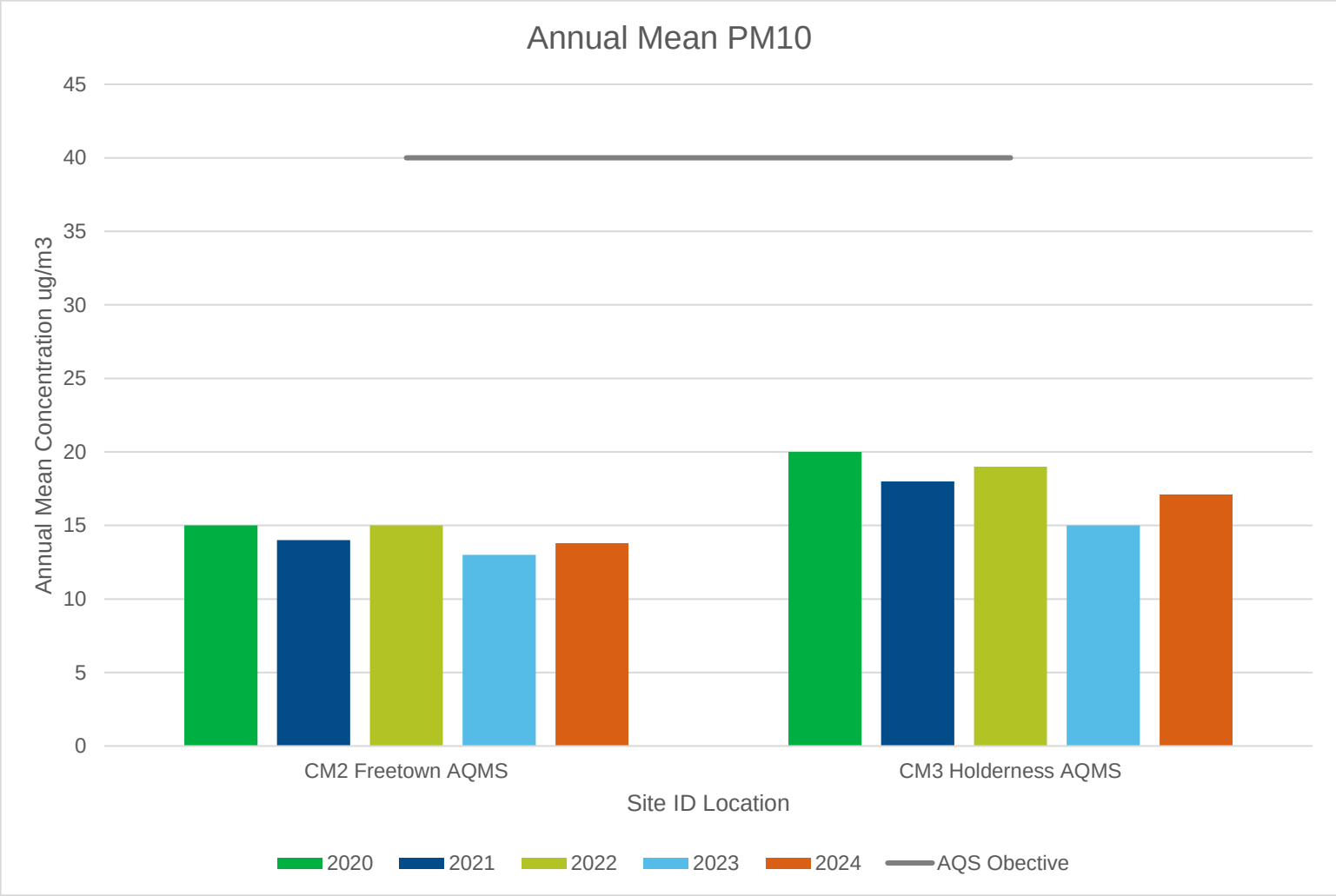


Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
CM2	509482	429322	Urban Background	100.0	99.8	0	0	0	0	2
CM3	511794	430511	Roadside	100.0	90.0	0	1	0	0	3

Notes:

Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50µg/m^3 have been recorded.

Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 90.4th percentile of 24-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%).

Table A.8 – Annual Mean $PM_{2.5}$ Monitoring Results ($\mu g/m^3$)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
CM2	509482	429322	Urban Background	100.0	99.8	9	8	9	8	7.9

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

Notes:

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

All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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.3 – Trends in Annual Mean $PM_{2.5}$ Concentrations

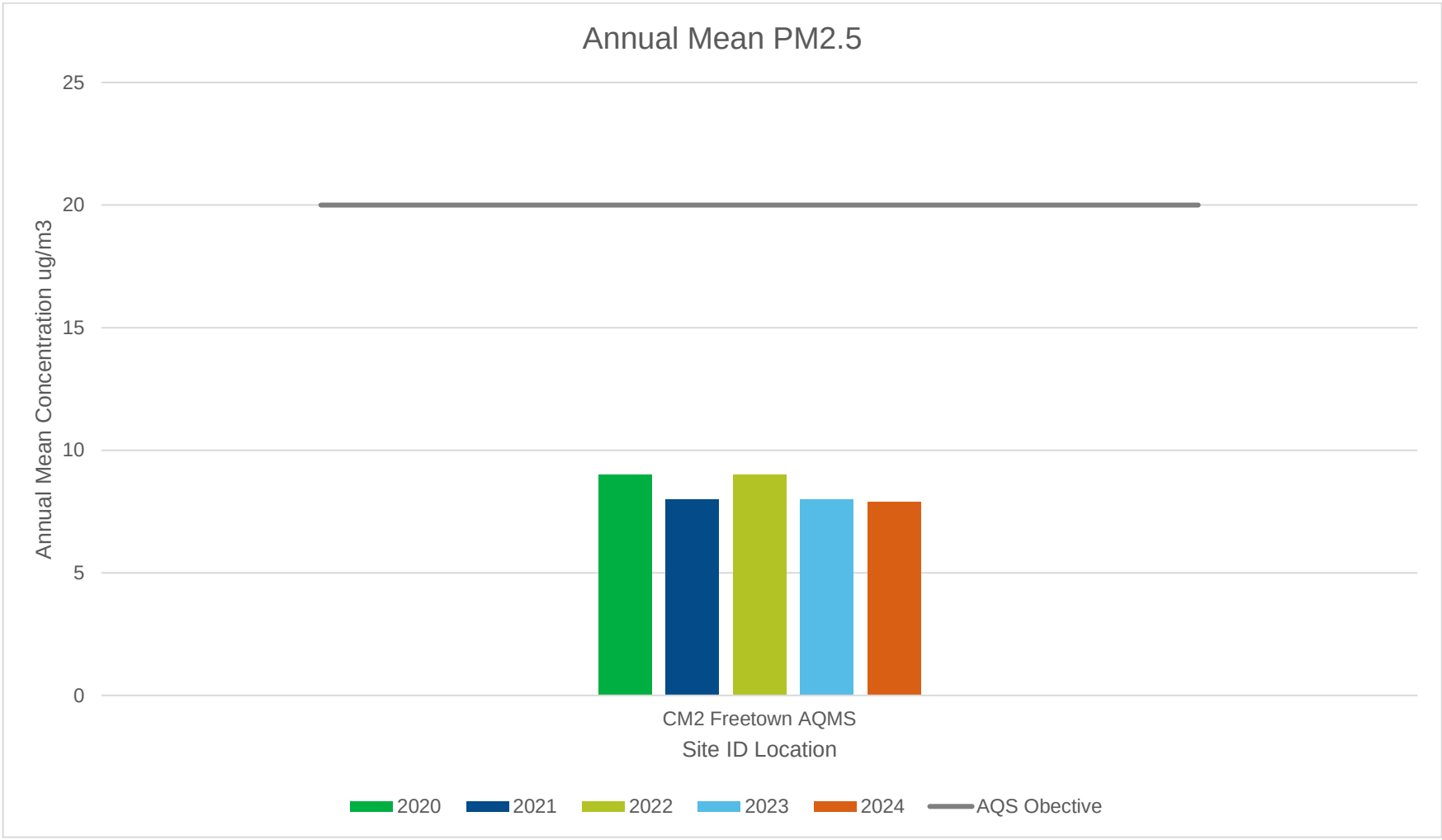


Table A.9 – SO_2 2024 Monitoring Results, Number of Relevant Instances

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	Number of 15-minute Means > 266µg/m^3	Number of 1-hour Means > 350µg/m^3	Number of 24-hour Means > 125µg/m^3
CM2	509482	429322	Urban Background	79.0	79.0	0	0	0

Notes:

Results are presented as the number of instances where monitored concentrations are greater than the objective concentration.

Exceedances of the SO_2 objectives are shown in **bold** (15-min mean = 35 allowed a year, 1-hour mean = 24 allowed a year, 24-hour mean = 3 allowed a year).

If the period of valid data is less than 85%, the relevant percentiles are 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 2024

Table B.1 – NO_2 2024 Diffusion Tube Results ($\mu g/m^3$)

DT 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: Annualised and Bias Adjusted <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
S1	510721	428732	25.7	11.3	20.5		20.9	18.8	19.1	12.0	24.2	19.2	30.8	24.7	20.2	16.1		
S2	508140	427802	31.2	34.5	28.7	23.4	28.3	25.2	25.3	26.0	25.6	32.7	18.7	25.1	26.7	21.1		
S3	507972	427770	36.8	36.0	32.5	27.3	34.4	24.9	31.9	27.1	32.1	33.7	23.5	31.6	30.5	24.2		
S4	506018	428892	25.2	23.3	24.5	18.2	23.7	14.5	17.3	15.8	13.2	26.8	20.1	18.1	19.6	15.6		
S5	505914	429362	29.3		29.2	24.6	25.4	18.5	21.6	18.3	19.4	29.0	31.4	21.9	23.9	19.0		
S6	507331	428719	32.7	39.2	36.5	25.4	33.6	30.7	35.9		35.0	39.5	40.9	31.0	34.8	27.0		
S7	507345	428738	39.0	30.3	36.4	35.4	37.5	34.5		31.6	25.1	40.3	40.9	24.7	33.7	26.6		
S8	508149	428670			38.3			34.4	37.2	37.2	38.3	41.8	42.0	33.8	37.9	30.3		
S9	508413	428659	22.1	23.0	32.4	31.4	24.4	28.5	23.5	26.7	24.8	31.3	36.8	35.2	28.9	22.1		
S10	508905	428502	28.9	23.3	19.3	17.5	18.2	13.2	15.2	13.3	18.6	23.6	26.0	22.1	19.1	15.5		
S11	508489	427986	15.7	35.5	34.1	24.9	26.5	22.6	24.5	26.5	19.7	34.5		31.3	28.0	21.0		
S12	508921	428659	44.2	36.0	32.5	32.7	31.2	24.7	24.6	23.8	31.0	32.2	35.8	36.4	31.0	25.0		
S13	509727	428473	28.4	28.4	20.5		27.4				17.9	26.1	27.1		24.6	17.4		
S14	508178	429636						28.9	31.2		29.2	33.9	36.2		31.9	24.8		New location from June 2024
S15	508071	429589						28.0	32.2	21.6	34.1	37.7	14.1	27.9	27.9	22.3		New location from June 2024
S16	510039	428687	25.0	35.6	26.7	33.8	27.5	24.9	27.4	24.0	27.9	34.5	35.9	33.4	30.1	23.2		
S17	509482	429322	27.4	19.0	26.2	17.1	19.1	14.9	18.2	18.1	12.3	22.5	27.2	20.1	19.5	15.7		
S18	509482	429322	22.9	31.1	18.3	17.7	19.2	16.6	18.2	14.4	15.8	24.8	27.4	23.7	20.7	16.3		
S19	509482	429322	28.5	23.9	25.6	17.1	18.2	16.7	16.7	17.1	15.9	25.5	20.1	23.3	20.0	16.2		
S20	509465	429281	27.1	42.9	31.4	28.5	20.8	25.5	26.7	27.3	20.6	35.6	34.6	26.0	29.1	22.6		
S21	509125	429228	31.2	38.7	35.5	28.7	32.7	45.6	30.9	29.0	27.2		31.5	25.9	32.6	25.3		
S22	509273	428811	44.2	44.1	40.4	37.0	33.0	36.1	32.8	37.9	23.2	44.0	31.4	42.4	36.6	29.0		
S23	509299	428797	39.4	33.8	27.7	27.3	24.2	29.6	27.0	28.2		22.7	36.5	35.2	29.2	23.5		
S24	509186	428904	28.5	48.8		42.3	40.2	47.7	49.3	50.5	35.4	46.4	51.7	42.0	45.4	34.2		
S25	509198	429022	41.8	23.8	93.6	33.6	29.7		62.1		34.6	34.9	36.2	38.2	43.0	33.4		
S26	509134	429115	30.8	40.6	36.6	33.3	35.3	28.9	31.1	20.3	32.5	38.7	35.1	34.4	33.3	25.8		

DT 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: Annualised and Bias Adjusted <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
S27	509202	428944	49.4	56.1	54.3	48.8	45.9	45.4	46.0	41.1	40.8	47.7	35.4	37.4	45.4	35.6		
S28	509102	429228	36.1	30.6	39.5	28.9	33.3	35.9	33.0	34.1	27.0	43.1	31.8	36.3	34.0	26.6		
S29	509004	429312	43.9		47.5	33.5	34.7	32.6	32.0	32.9	29.6	47.3	32.1	34.4	35.7	28.4		
S30	508865	429378	36.9	31.5	33.6	27.3	29.5	27.0	22.3	20.5	32.7	33.2	23.2	32.7	28.5	22.8		
S31	508819	429372	34.6	38.7	33.8	23.7	29.4	24.6	21.4	24.3	27.2	38.1	32.6	29.9	29.4	23.3		
S32	508241	429602	55.5	49.7	39.4	38.4	34.0		31.8	36.2	26.2	39.9	34.6	23.6	35.4	29.0		
S33	508780	428925	25.2	36.0	30.4	22.3	29.0	24.4	27.8		17.1	29.9	18.7	27.9	26.4	20.5		
S34	508233	429887	40.7	38.6	35.6	29.2	25.2	21.2	26.7	22.8	29.4	32.5	34.0	30.4	29.6	23.8		
S35	508327	429572	28.7	49.3	38.2	37.3	36.0	38.7	34.2	37.4	34.7	41.5	40.8		38.8	29.6		
S36	508201	429800	58.6	64.2	48.4	39.6	36.6	47.8	41.4	46.2	24.0	47.9	42.3	44.0	43.9	35.2		
S37	508537	429492	25.4	32.2	28.4		26.4	26.5	22.7	24.4	31.6	30.7	30.5	29.2	28.3	21.8		
S38	508258	429939	31.5	40.5	43.4	33.1	31.4	28.2	28.8	26.5	40.1	29.8	32.5	33.6	33.4	26.0		
S39	508276	430730	30.3		28.6	21.7	23.2	18.7		18.7			28.6	27.5	23.9	19.6		
S40	506590	430671	22.6	28.9	24.7	19.0	22.4	21.6	11.1	15.8	16.9	27.4	33.4	23.6	22.3	17.4		
S41	507876	432075	19.0	22.4	18.3	14.4	14.2	11.7	11.9	13.1	13.3	15.8	21.1	18.7	15.9	12.6		
S42	508299	432952	34.5	36.9	28.1	22.5	26.5	26.3	24.1	22.9	18.7	31.6	27.9	27.2	26.6	21.3		
S43	506972	433172	14.8	17.9	10.5	9.0	11.1	8.3	7.4	5.6	6.5	16.9		12.9	10.6	8.6		
S44	508698	434348	18.0	24.6	18.8	15.1	15.2	10.6	13.5	11.8	12.1		22.1	11.2	15.5	12.3		
S45	511529	433117		43.8	35.2	27.9	28.8	29.4	23.9	17.9	18.2	40.3	30.8	21.1	28.8	22.5		
S46	512678	432075	15.4		19.0	12.1	14.1	9.6	11.3	9.7	10.8	20.2	19.5	14.6	14.1	11.1		
S47	509903	428357						13.5	15.0	13.9		21.4	24.4	18.9	17.9	13.7		New location from June 2024
S48	513877	430355	13.1	29.5	27.1	19.1	25.6	18.6	18.4	19.9	19.2	21.7	29.4	20.2	22.6	17.0		
S49	514113	429329	32.4	37.4	36.6	26.7	24.2	33.2	38.8	33.0	30.7	53.2	31.8	39.1	35.0	27.1		
S50	514129	429321	38.9	44.9	39.3	31.4	30.1	27.2	29.1	26.0		42.6	32.8	33.3	33.7	26.6		
S51	514387	429162	36.1	39.7	42.5	35.2	28.8	27.9	27.1	31.6	33.4	40.9	37.9	44.8	35.4	27.7		
S52	514195	432166	32.1	25.9	37.6	33.6	34.5	30.0	36.5	34.8	24.9	43.1		30.4	33.1	25.8		
S53	511024	430853	19.9	23.6	25.0	16.2	18.9	17.7	19.7	14.1	16.4	27.9	24.6	23.2	20.7	16.1		
S54	510317	431730	36.4		40.9	38.6	40.8	42.0	37.9	37.2	40.2	42.8		37.7	39.8	30.8		
S55	510320	431650	38.8	41.6	38.3		38.3	33.9	34.1	31.6		52.9	48.0	31.9	39.0	30.4		
S56	510380	431236	19.4	44.5	39.8	40.4	35.2	33.7	25.7	30.6	30.5	41.2	44.4	35.4	36.5	27.4		
S57	509941	431405	18.0	24.0	17.8	11.9	20.6		10.8	9.9	11.3	19.3	21.8	14.6	16.2	12.8		

DT 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: Annualised and Bias Adjusted <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
S58	508603	431582		44.7	36.4	33.2	40.2	28.2	29.4	25.8			32.0	23.9	32.6	25.5		
S59	508520	431875	24.3	36.4	32.4		29.5	31.5	31.7	23.7	28.6	40.1			31.7	24.1		
S60	508741	431050		44.2		24.2	32.1	28.2	31.1	28.1	28.3	41.7	44.3	21.9	32.4	25.3		
S61	508918	430568	29.3	35.5	32.2	30.2	32.0	31.5	35.0	30.3			40.8	22.5	32.2	24.9		
S62	510364	430215	35.5	36.5	29.5	23.6	28.5	22.5	22.0	25.6	21.1	30.7		29.2	26.9	21.6		
S63	508929	430340	31.6	42.5	34.4	31.7	27.9	29.5	29.0	19.6	24.3	37.6	39.4	36.2	32.0	24.9		
S64	509155	429125	39.9	42.1	39.7	31.0	33.5	32.2	34.5	26.9	30.8	34.8	40.3	35.7	34.7	27.4		
S65	513309	429319	17.5			28.1	26.2	29.2	23.6	31.8	22.4	36.4	33.5	28.7	28.9	21.6		
S66	513309	429319	17.5			28.1	26.2	29.1	23.6	30.6	21.1	33.2	24.6	30.8	27.5	20.7		
S67	513309	429319	17.5			28.1	26.2	27.1	22.6	30.3	22.7	35.1	34.0	31.8	28.7	21.5		

☒ **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.TG22.**

☐ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

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

☒ **Kingston upon Hull City Council confirm that all 2024 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**.

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**.

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 Kingston upon Hull During 2024

There have been a number of new sources identified during 2024, which are all associated with changes to the Highways Network and are liable to run into future years. Stationary developments are controlled through the Planning regime which is supported by the Environmental Quality Supplementary Planning Document we have in place, which enables us to ensure that background creep of levels is minimised or even eliminated.

For the changes to the Highways Network, we have built further upon the earlier close liaison we have with colleagues in the Highways Department, as well as National Highways, to ensure that the air quality impacts are fully considered.

Areas we are looking closely at include the various schemes initiated and proposed for cycle lanes, changes to Stoneferry Road, and the on-going work by National Highways on the A63.

Additional Air Quality Works Undertaken by Kingston upon Hull City Council During 2024

Due to the time taken to recruit a new Air Quality Officer, Kingston upon Hull City Council were unable to undertake any additional Air Quality works during the reporting year of 2024.

QA/QC of Diffusion Tube Monitoring

Summary of Method

Where NO_2 is monitored using diffusion tubes, the standard method recommended by NETCEN in the "UK NO_2 Diffusion Tube Survey Instruction Manual" is followed. (This method is based on the Harwell Laboratory Report, reference AERE-R12133, "Measurement of NO_2 in the Outdoor Environment Using Passive Diffusion Tubes", C.H.F. Atkins, February 1996).

NO_2 diffusion tubes are clear plastic tubes, with one open end and a closed end containing a NO_2 absorbing chemical matrix (triethanolamine). The open end is sealed with a plastic cap before it is transported to the site. At the site, the cap is removed and the tube is mounted vertically with the open end at the bottom.

The device operates on the principle that during exposure nitrogen dioxide in air will migrate to the absorbent at a rate dependent on several quantifiable variables defined by Fick's First Law of Diffusion:

- The path length between the top surface of the monitor and the absorbent matrix
- The cross-sectional area of the sampler
- The exposure time
- The diffusion coefficient of nitrogen dioxide through air
- The ambient concentration of nitrogen dioxide

At the end of the monitoring period, the tubes are re-sealed and returned to the laboratory where they are analysed by a colorimetric method.

Description of Monitoring Sites

General

In Hull, diffusion tubes have been used to monitor nitrogen dioxide since 1992. Previously there were 53 tubes at 49 sites that consist of 4 former UK Survey sites and 45 permanent sites (which have built up to this number since 1992). In November 2020,

we added an additional 90 sites along the key road networks so that we had information on general trends, as we were aware of a number of proposed changes to the Highway Network.

We have subsequently revisited our monitoring strategy, and now have 67 diffusion tubes sited around the area.

These tubes are used to monitor general urban air pollution therefore are not located close to industrial sources. The sites that have been selected are in areas where people are present. Local knowledge has been used to select the most appropriate sites, which fall into three categories.

(a) Near-road site (kerbside):

These are situated close to a busy road (1-5m from a kerb edge). This is to show the maximum concentration of NO_2 to which people may be exposed (even if it is only for short periods).

(b) Intermediate:

These are sites at distance of 20-30m from a busy road. These are to show how much NO_2 people living close to busy roads are exposed to. In Hull, large numbers of people live in areas close to busy roads. Here the NO_2 may not be as high as that measured close to the road but may not be as low as typical urban background locations.

(c) Urban background:

These are sites at least 50m from a busy road. At these locations, the NO_2 concentrations will have equilibrated to a general urban background level.

Revised Guidance

In August 2000 AEA Technology issued revised guidance regarding the classification of “Intermediate sites”. They state that the above mentioned intermediate site classification is no longer consistent with Technical Guidance Note LAQM TG1 and therefore ‘Intermediate’ sites have been dropped from the Network.

Long term survey

A comprehensive site survey has been in progress since 1992, with diffusion-tubes being exchanged at each site monthly. Monthly data is therefore available for complete years from 1993 to 2022 inclusive, apart from minor gaps.

Quality Assurance and Quality Control

Diffusion tube preparation and handling

The interval between preparation and analysis is kept to a minimum (NO_2 tubes are known to degrade with storage). During storage the tubes are kept in a sealed plastic bag in a refrigerator.

The laboratory used for NO_2 diffusion tube analysis during 2010 was South Yorkshire Air Quality Samplers of Sheffield, but we have since changed to Environmental Scientifics Group of Didcot, who state that the samples have been analysed in accordance with SOCOTEC's standard operating procedure ANU/SOP/1015 Issue 1. This method meets the guidelines set out in DEFRA's 'Diffusion Tubes For Ambient NO_2 Monitoring: Practical Guidance.'

The tubes were prepared by spiking acetone:triethanolamine (50:50) onto the grids prior to the tubes being assembled. The tubes were desorbed with distilled water and the extract analysed using a segmented flow autoanalyser with ultraviolet detection. All samples were received in good condition, unless otherwise stated in the comments field of results table. Please note:

(i) As set out in the practical guidance, the results were initially calculated assuming an ambient temperature of 11^{o}C, the reported values **have** been adjusted to 20^{o}C to allow for direct comparison with EU limits.

(ii) The reported results have not been bias adjusted.

This analysis of diffusion tube samples to determine the amount of nitrogen dioxide present on the tube is within the scope of our UKAS schedule. Any further calculations and assessments requiring exposure details and conditions fall outside the scope of our accreditation. In the AIR PT intercomparison scheme for comparing spiked

Nitrogen Dioxide diffusion tubes, SOCOTEC currently holds the highest rank of a **Satisfactory** laboratory.

Diffusion tube positioning

In August 2000 AEA Technology issued revised guidance regarding the classification of “Intermediate sites”. They state that the above mentioned intermediate site classification is no longer consistent with Technical Guidance Note LAQM.TG1 and therefore “Intermediate” sites have been dropped from the Network.

The tubes are mounted on a mixture of lighting columns and drain pipes. No tubes are placed in recesses or corners as these can be subject to increased turbulence or stagnant air. The tubes are mounted on to spacer blocks (e.g. a plastic block) and not attached directly to any surface. However, this makes them more prominent, therefore more prone to theft. Ideally, tubes should be placed head height, but some have been placed higher where they are unlikely to be stolen.

Each site has a unique number and the tube exposed at that site is given the same number so it can be identified during analysis. A careful record is made of the start and end date/time of the exposure period.

Time exposure and limitations of technique

The time resolution of this technique is limited and can only provide information on the integrated average NO_2 concentration over the exposure period (typically 1-4 weeks). The tubes in Hull are exposed for approximately 4 weeks. Therefore the tubes cannot be used to check compliance with average hourly and daily air quality standards.

Diffusion Tube Annualisation

In cases where diffusion tube data capture less is than 75% but greater than 25%, appropriate methodology would indicate results should be annualised in line with current guidance.

There were 6 diffusion tube monitoring sites that fell within this category, namely S8, S13, S14, S15, S39, and S47 as reported in Table C.1.

Table C.1 – Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Freetown Way AURN	Annualisation Factor Holderness Road AURN	Annualisation Factor <Site 3 Name>	Annualisation Factor <Site 4 Name>	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
S8	1.0388	1.0128			1.0258	37.9	38.9
S13	0.8653	0.9148			0.8901	25.1	22.4
S14	1.0185	0.9797			0.9991	31.9	31.9
S15	1.0352	1.0084			1.0218	27.9	28.6
S39	1.0198	1.0202			1.0200	24.7	25.2
S47	0.9931	0.9692			0.9812	17.9	17.5

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2024 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.TG22 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.

Kingston upon Hull City Council have applied a national bias adjustment factor of 0.78 to the 2024 monitoring data. A summary of bias adjustment factors used by Kingston upon Hull City Council over the past five years is presented in Table C.2.

The diffusion tube processing tool spreadsheet (v06_25) for diffusion tube precision and accuracy returned the following values for tri-located diffusion tubes:

Local Bias adjustment	0.75
National factor.	0.78

It was decided to use the National factor of 0.78 as provided in blue below in the National Diffusion Tube Bias Adjustment Factor Spreadsheet for tubes analysed by SOCOTEC Didcot in a 50% TEA in Acetone solution, as the correction for the diffusion tube data. This was due to consideration to the comments in previous Defra appraisals, and also due to the Poor Overall Data Capture from the CM2 automatic monitoring station, meaning it was recommended the local bias adjustment be treated with caution.

Sensitivity analysis was carried out, by applying each value to the data in order to determine which seemed to correlate more with the results of previous years, as well as the real time analysers.

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2024	National	06/25	0.78
2023	National	06/24	0.78
2022	National	03/23	0.77
2021	National	03/22	0.78
2020	National	03/21	0.77

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	11	10			
Bias Factor A	0.79 (0.73 - 0.87)	0.72 (0.62 - 0.85)			
Bias Factor B	26% (15% - 36%)	39% (18% - 60%)			
Diffusion Tube Mean (µg/m^3)	20.2	27.2			
Mean CV (Precision)	9.4%	4.0%			
Automatic Mean (µg/m^3)	16.0	19.5			
Data Capture	100%	100%			
Adjusted Tube Mean (µg/m^3)	16 (15 - 18)	20 (17 - 23)			

Notes:

These figures, and the combined Local Bias Adjustment Factor are taken from the diffusion tube processing tool, as below:

Local Bias Adjustment Outputs - Information Only

	STEP 3a Local Bias Adjustment Input 1	STEP 3b Local Bias Adjustment Input 2
Periods used to calculate bias	11	10
Bias Adjustment Factor A	0.79 (0.73 - 0.87)	0.72 (0.62 - 0.85)
Diffusion Tube Bias B	26% (15% - 36%)	39% (18% - 60%)
Diffusion Tube Mean (µg/m^3)	20.2	27.2
Mean CV (Precision)	9.4%	4.0%
Automatic Mean (µg/m^3) (for periods used to calculate bias)	16.0	19.5
Data Capture (for periods used to calculate bias)	100%	100%
Overall Data Capture	100%	100%
Adjusted Tube Mean (µg/m^3)	16 (15 - 18)	20 (17 - 23)

Overall Diffusion Tube Precision	Poor Overall Precision	Good Overall Precision
Overall Continuous Monitor Data Capture	Good Overall Data Capture	Good Overall Data Capture

Combined Local Bias Adjustment Factor	0.75

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO_2 monitoring locations within Kingston upon Hull City Council required distance correction during 2024.

QA/QC of Automatic Monitoring

Kingston upon Hull City Council does not undertake its own automatic monitoring. There are two AURN sites that are managed by DEFRA. The data from the two AURN sites is taken from the UK Air website.

PM_{10} and $PM_{2.5}$ Monitoring Adjustment

There are two AURN sites within the Authority area. CM2 (Freetown Way) measures both PM_{10} and $PM_{2.5}$, CM3 (Holderness Road) measures PM_{10}. The data for these sites is taken from the UK Air website.

Automatic Monitoring Annualisation

In cases where automatic monitoring data capture less is than 75% but greater than 25%, appropriate methodology would indicate results should be annualised in line with current guidance.

All automatic monitoring locations within Kingston upon Hull City 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, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, automatic annual mean NO_2 concentrations corrected for distance are presented in Table A.3.

No automatic NO_2 monitoring locations within Kingston upon Hull City Council required distance correction during 2023.

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

Figure D.1 – Map of Non-Automatic Monitoring Site

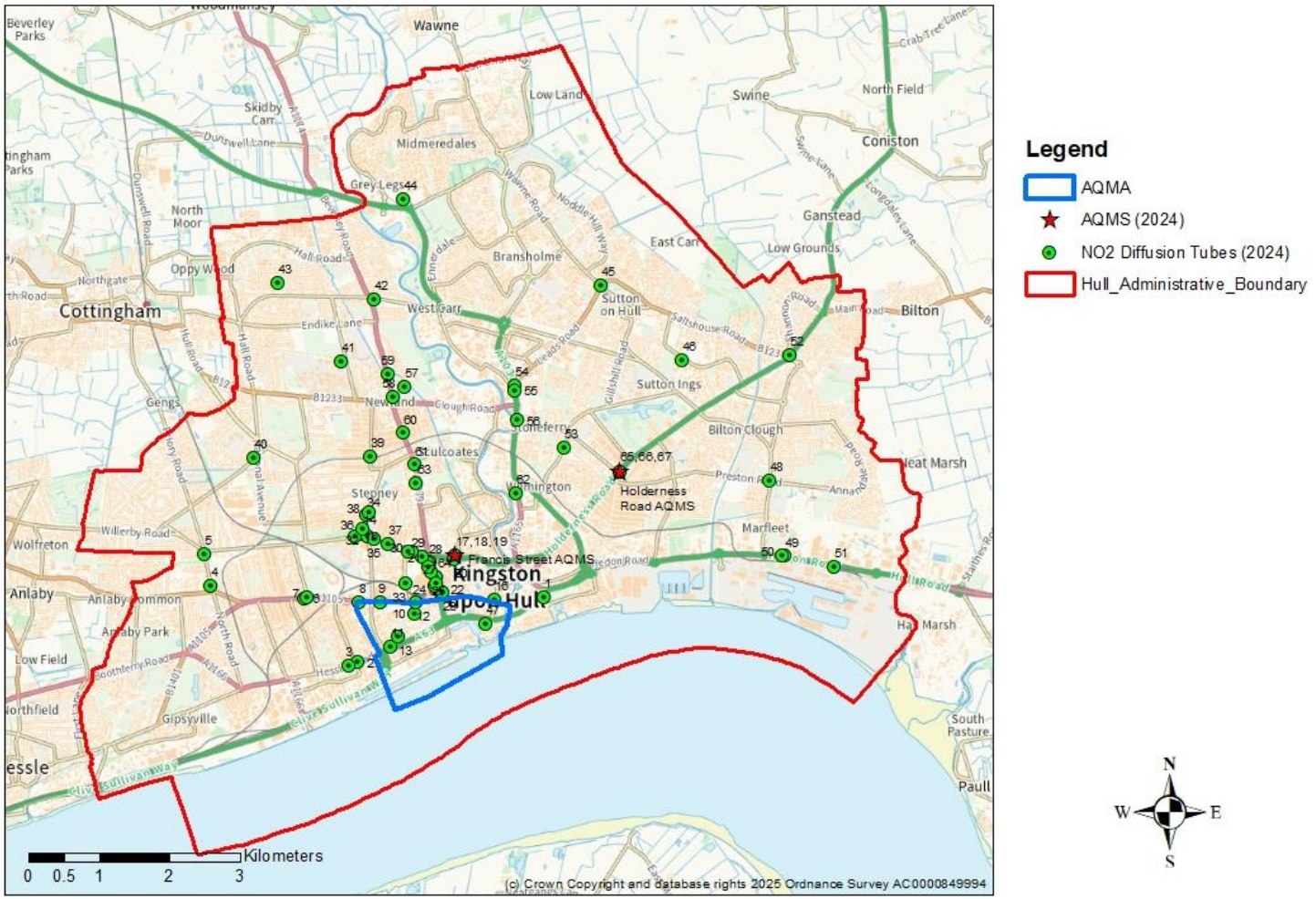


Figure D.2 – Map of Monitoring Sites within the AQMA

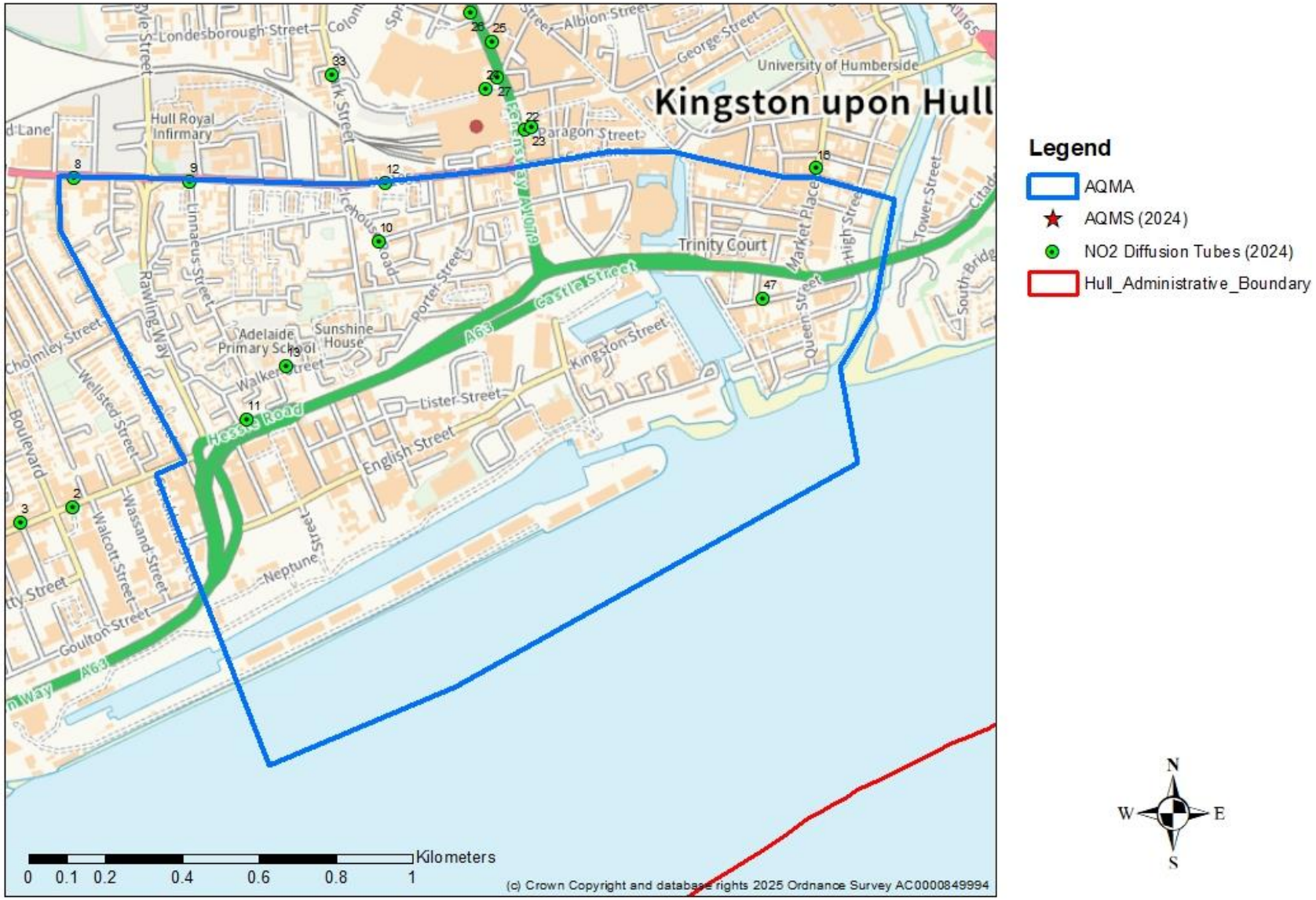


Figure D.3 – Map of Monitoring Sites West

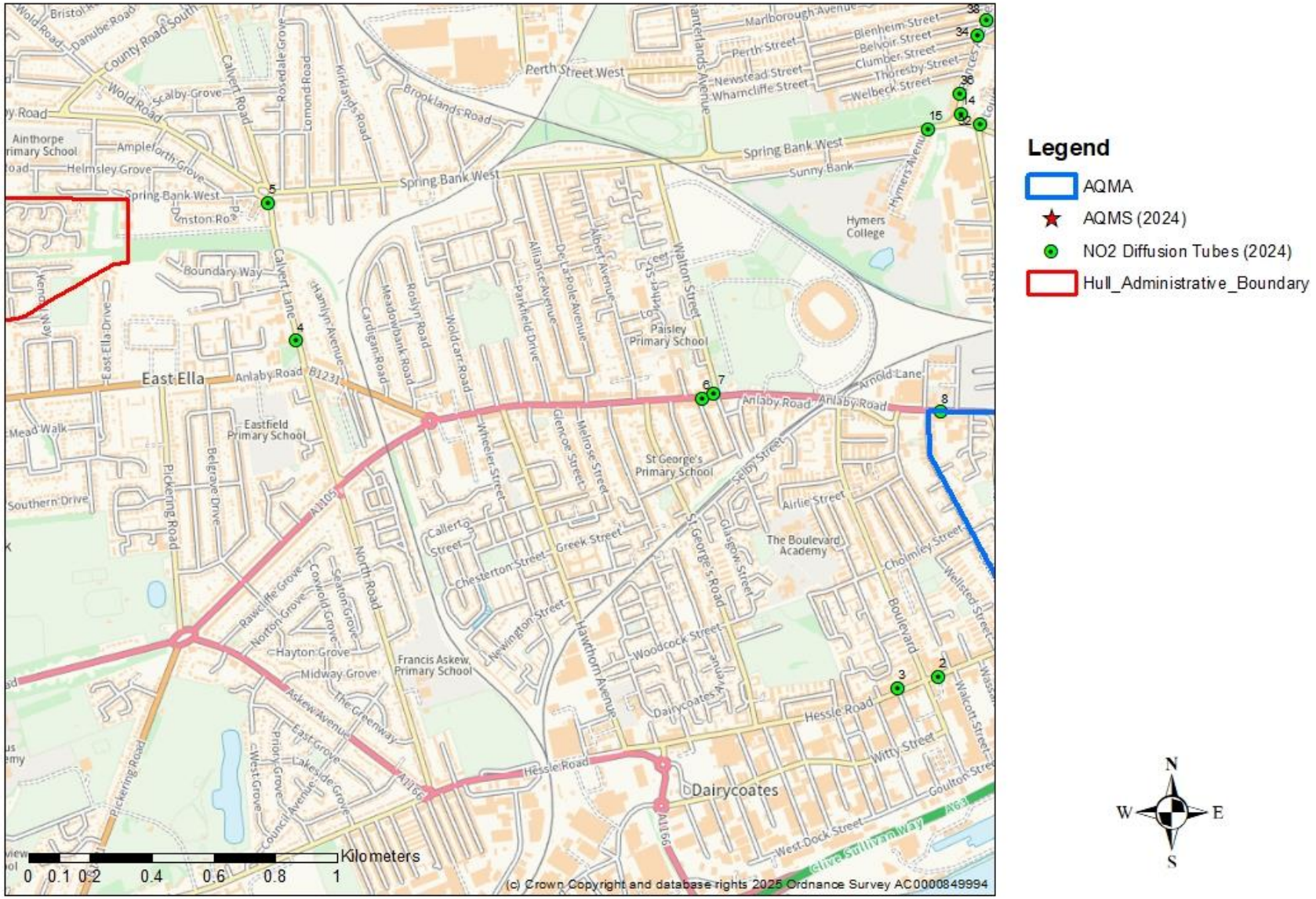


Figure D.4 – Map of Monitoring Sites North West

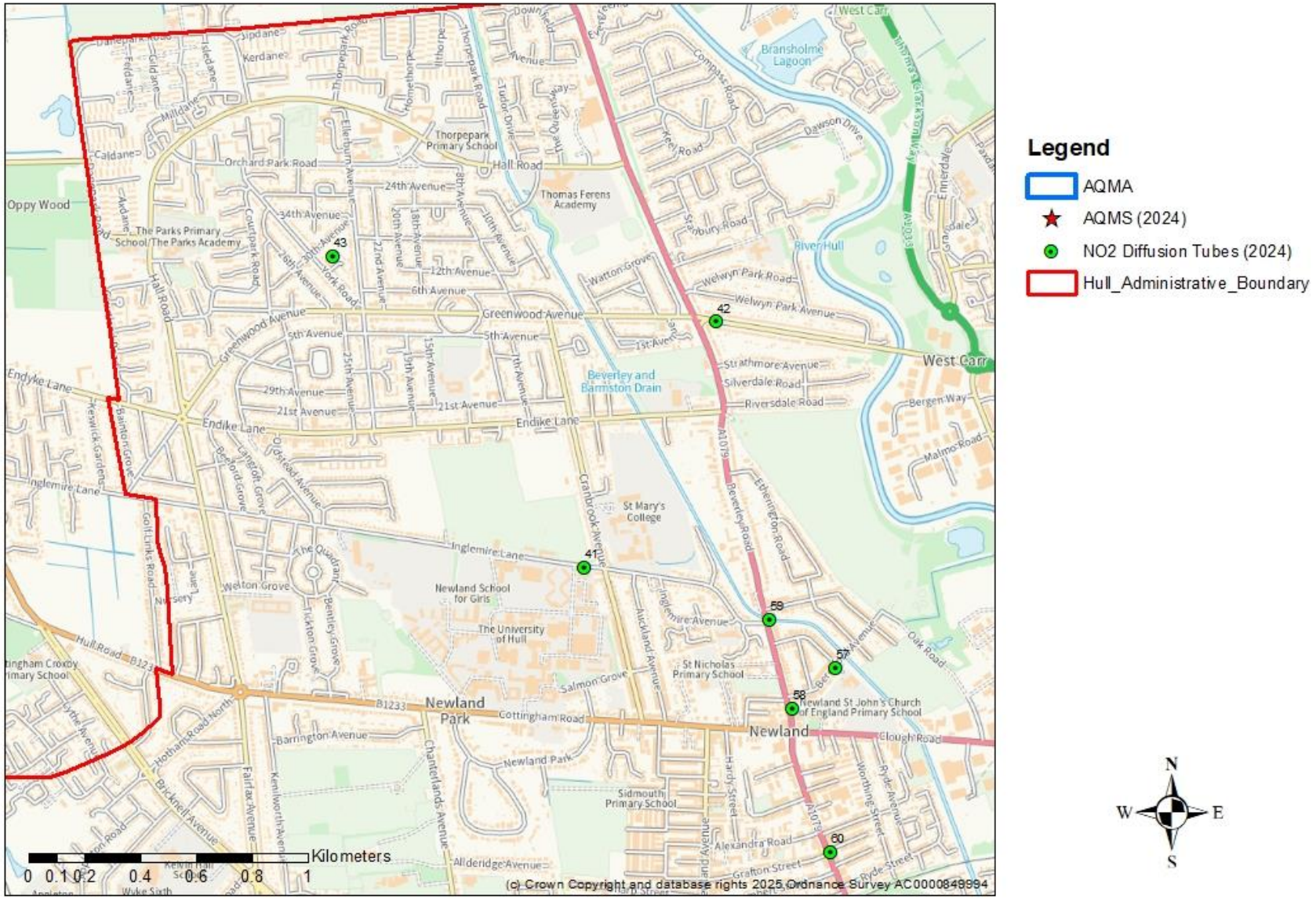


Figure D.5 – Map of Monitoring Sites North Central

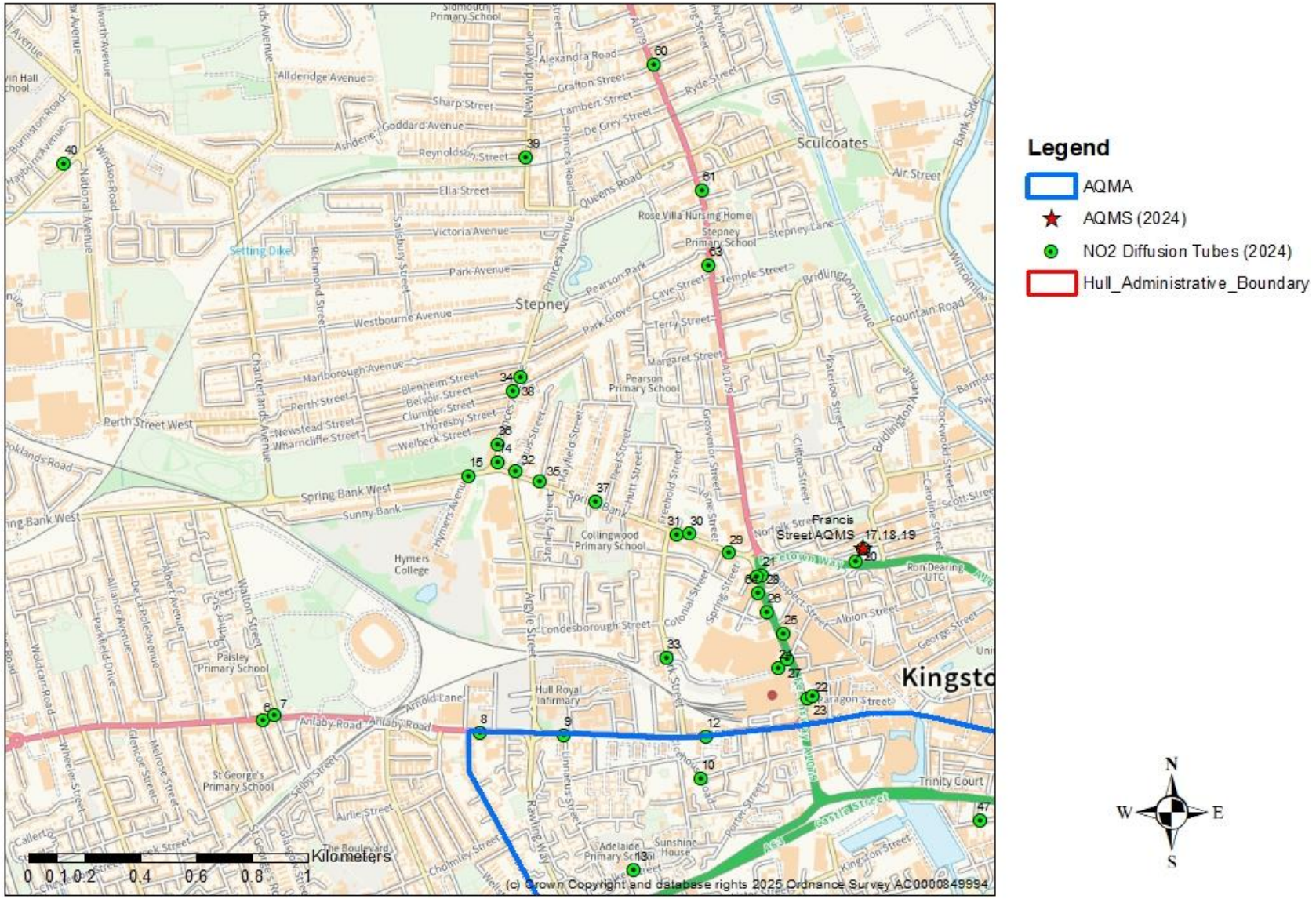


Figure D.6 – Map of Monitoring Sites Kingswood

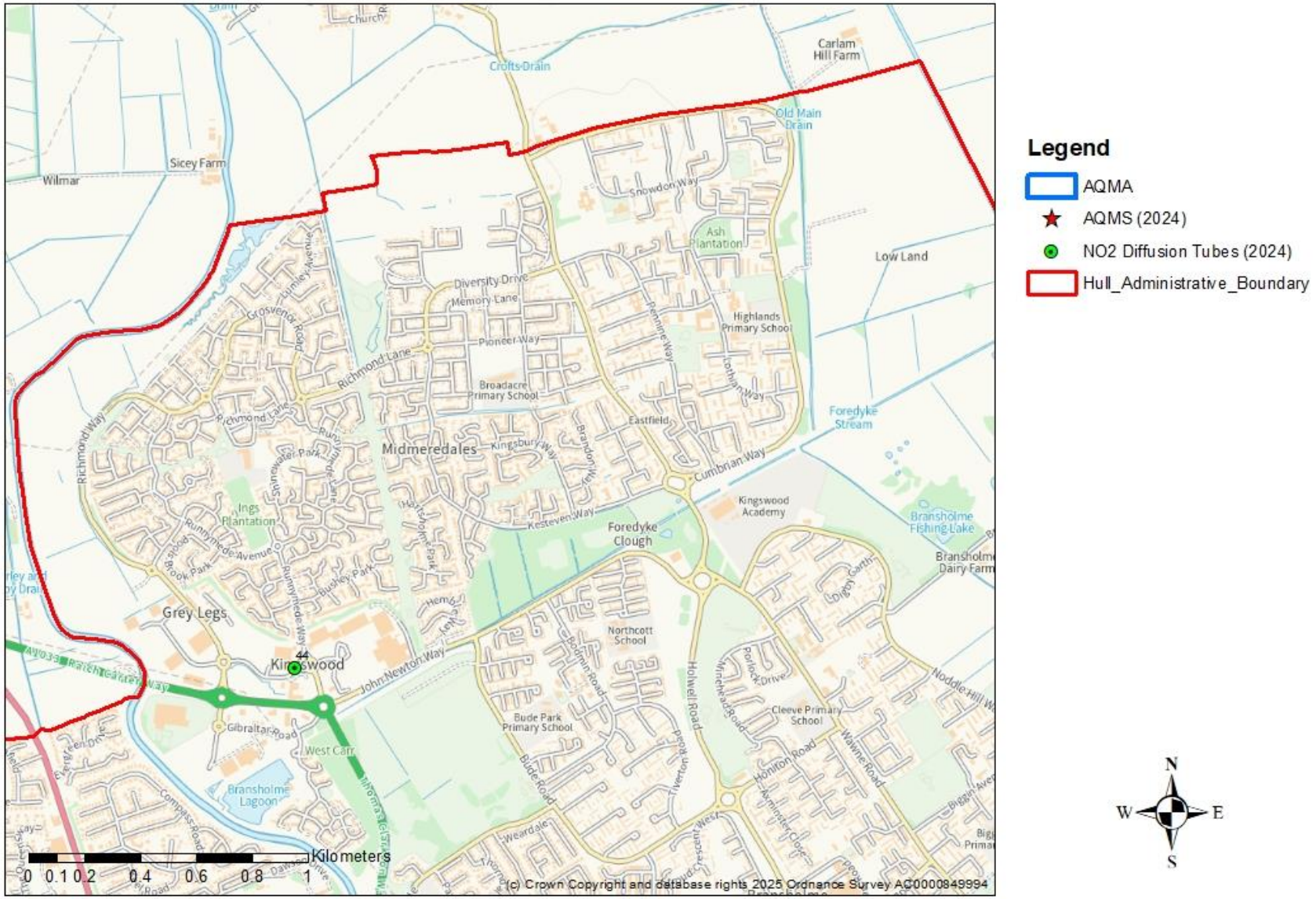


Figure D.7 – Map of Monitoring Sites North East

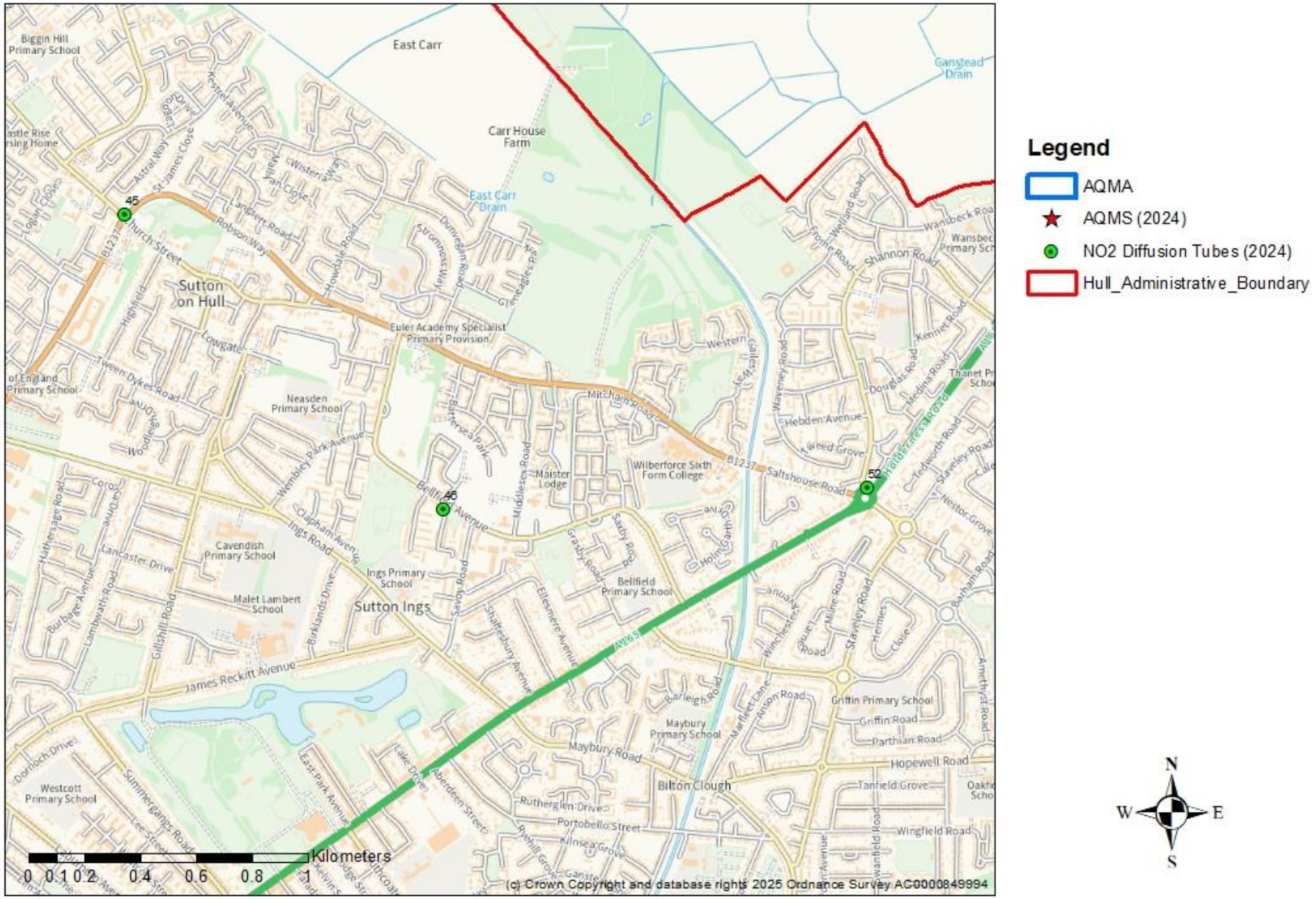
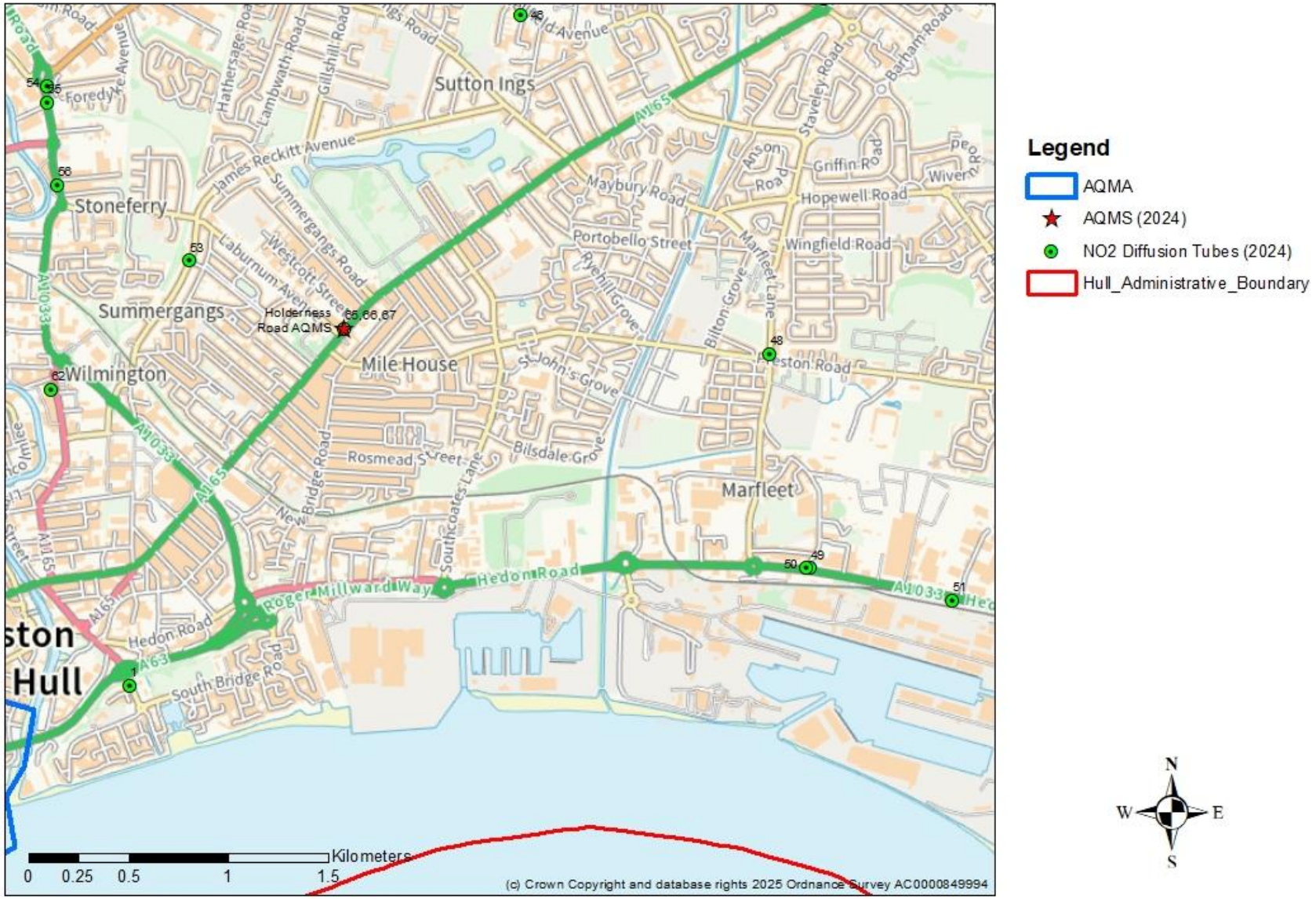


Figure D.8 – Map of Monitoring Sites East



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[2]

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

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

Appendix F: Achievements Priorities and Problems. As presented to Kingston upon Hull City Council Cabinet.

Appendix 1

Annual Summary of Hull City Council's Air Quality Strategy

November 2024

This Appendix is aimed at providing a summary of the achievements, issues and priorities encountered in implementing the Strategy since the last Cabinet Report in November 2023.

It is drawn from the information presented to DEFRA in June 2024 as part of the Annual Status Report (ASR) which is currently been appraised by independent experts acting on behalf of Defra. Once the appraisal process has been completed the full report will be made available on Hull City Council's Air Quality Webpage at https://www.hull.gov.uk/environment/pollution/air-quality.

The focus to date has primarily been on NO_2, but as current monitored levels indicate that concentrations across the city are compliant with the national air quality objective, and the trend is one of falling levels, future emphasis is likely to be more towards $PM_{2.5}$.

Since the last Cabinet Report was presented our Air Quality Officer retired, and we are still in the process of recruiting a replacement. This has meant that since February 2024 we have been without a specialised officer to progress all the stated priorities of the previous Report. Despite that, there have still been achievements of note.

Achievements

1. The ASR for the 2023 calendar year was submitted to Defra in June 2024 for appraisal. The Report includes a summary of all the monitoring data we have collected and a comparison to the national air quality objectives. Our findings are that the measured concentrations of all pollutants were compliant with the objectives throughout the whole of the Authority area, including on Castle Street within the previously declared Air Quality Management Area (AQMA). Additionally, the general

trend for the pollutants measured is that the concentrations are continuing to fall which is very encouraging.

2. Despite being without an Air Quality Officer we have managed to continue with our monitoring programme. This has allowed us to continually review and assess air quality across the city and the data obtained will feed into next year's ASR.

3. Input of the emissions inventory for the Air Quality Dispersion Model (ADMS Urban) purchased has been partly completed.

4. We have continued to work with colleagues in Public Health and the Climate Change Team to discuss collaborative projects where there could be mutual benefit, such as raising awareness to promote modal shift to more sustainable transport options.

5. We have considered the environmental impact of all planning applications submitted to the Council and several national infrastructure projects located outside the city boundary and have made recommendations to the Planners on any for which there could be a potential adverse air quality impact, either though construction or operational activities.

6. We have continued to carry out inspections of prescribed permitted industrial activities for which the Council is the regulator, to ensure emissions to air are being adequately controlled and are compliant with limits stipulated in environmental permits we issue. Additionally, in our capacity as a consultee we have provided advice and recommendations on any environmental permit applications we have been consulted on, for which the Environment Agency is the regulator.

Issues

1. The vacant Air Quality Officer post has meant we have not been able to progress all the stated priorities of the previous Report.

2. Due to the age of the Council owned air quality monitoring station with analysers beyond economical repair, it was concluded that the best option would be to decommission it and consider acquiring more cost effective and beneficial monitoring methods to supplement what we already have. The station, located on Associated British Ports (ABP) land has now been decommissioned and will be removed off site. Additionally, we are aware that DEFRA will be installing a new monitoring station on Marton Grove to monitor $PM_{2.5}$ concentrations. This will assist us in assessing levels against the long-term future standards for fine particulate that have been introduced. Installation is expected in 2025.

Priorities

1. To successfully recruit a new Air Quality Officer into the vacant post.

2. To review the Strategy and Action Plan with the new Air Quality Officer and through liaison with other key Council stakeholders identify and shortlist key priorities for implementation.

3. To continue with our monitoring programme and continually review and assess the air quality across the city. Using the monitored data obtained, complete and submit the 2025 ASR to Defra.

4. To assess monitored data on Castle Street following completion of the A63 road improvements (scheduled for completion in Spring 2025) and determine if the AQMA can be revoked.

5. To closely monitor and assess the data at the St Stephens diffusion tube location where concentrations of NO_2 to date in 2024 are showing a slight increase on those of last year, albeit these remain below the air quality objective. To assist in the assessment, we are hoping to be able to utilise data from an indicative ambient real-time monitor to supplement that from the diffusion tube.

6. To further develop the air quality dispersion model and emissions inventory, as this will allow us to model air quality for future years; model the impact of any proposed changes such as major development; and model air quality in areas where we don't have monitoring equipment.

7. To continue to work with colleagues in Public Health and the Climate Change Team to discuss collaborative projects where there could be mutual benefit and to explore the possibility of hosting a joint workshop with a focus on prioritising and implementing measures in our respective Strategy Action Plans.

8. To continue to consider the air quality impact of all planning applications submitted to the Council and any national infrastructure projects located outside the city boundary which could impact on the city, either though construction or operational activities.

9. To work with colleagues in Public Health to progress the recommendations of the Air Quality Health Needs Assessment completed in January 2023 and scheduled for review in February 2025.

10. To work collaboratively with Hull University and colleagues within the Council to investigate the relationship between indoor and outdoor air quality and health, and to identify appropriate interventions.

11. To continue to implement measures which assist in minimising the emission of $PM_{2.5}$, including raising awareness of smoke control; regulation of prescribed permitted industrial activities; making recommendations to the Planners on applications (and associated construction management plans) for development going through the Planning process; and working with other key Council stakeholders with the aim of reducing fine particulate matter associated with transport.

12. To contribute to the review and update of the Hull Local Plan to ensure that the aims of the Air Quality Strategy and prioritised Action Plan measures are reflected in the Local Plan policies and the Environmental Quality Supplementary Planning Document.

13. To communicate through various media the positive message that can be shared of the air quality in Hull; and when the Air Quality Management Area has been revoked, use the opportunity to further raise awareness by advising the public of the actions that led up to this, and what we will be doing in the future to meet with our aim of continually striving to improve air quality in the City.

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 National Highways
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.TG22. August 2022. 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.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Chemical hazards and poisons report: Issue 28. June 2022. Published by UK Health Security Agency
- Air Quality Strategy – Framework for Local Authority Delivery. August 2023. Published by Defra.
- Oh Yes! Net Zero - Oh Yes Net Zero campaign | Better Hull
- Carbon Emissions Report 2022-2023 - Hull City Council Carbon Report 2022 to 2023
- Electric Vehicle Study 2021 - Electric Vehicle Strategy Study (hull.gov.uk)