Stevenage Borough Council

Annual Status Report 2023

Bureau Veritas

June 2023

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Document Control Sheet

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Approved By	H Pearson	Senior Air Quality Consultant	

Stevenage BOROUGH COUNCIL

2023 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 2023

Information	Stevenage Borough Council Details
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Executive Summary: Air Quality in Our Area

Air Quality in Stevenage Borough Council

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

The mortality burden of air pollution within the UK is equivalent to 29,000 to 43,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

Monitored annual mean NO_2 concentrations across Stevenage Bough Council have largely shown an increase in 2021 and 2022 when compared to 2020. However, there is an overall decrease in annual mean NO_2 concentrations since 2018; if 2020 and 2021 are discounted due to COVID-19. The increase in concentrations may indicate an increase in traffic activities in 2021 and 2022, 2022 was the first year without any COVID-19 lockdown restrictions. Nevertheless, all monitoring locations recorded annual mean NO_2 concentrations below the annual mean NO_2 air quality objective in 2022. There are no declared Air Quality Management Areas (AQMA) in Stevenage Borough Council authority area.

With regard to the 1-hour mean NO_2 Air Quality Strategy (AQS) objective, whereby there should be no more than 18 hours where concentrations exceed 200 µg/m^3, the automatic monitoring location on St George's Way continues to report no hourly concentrations greater than 200 µg/m^3.

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

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

[3] Defra. Air quality appraisal: damage cost guidance, January 2023

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

Monitored concentrations of $PM_{2.5}$ in Stevenage continue to be well below the annual mean air quality objective of 25 µg/m^3.

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.

The Environmental Improvement Plan[5] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term $PM_{2.5}$ targets. The National Air Quality Strategy, due to be published in 2023, will provide more information on local authorities' responsibilities to work towards these new targets and reduce $PM_{2.5}$ in their areas. The Road to Zero[6] details the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of AQMAs are designated due to elevated concentrations heavily influenced by transport emissions.

Stevenage Borough Council has continued to promote cycling via the pool bike scheme, walking, and the use of electric cars as part of its measures to maintain and improve air quality around the borough.

The Hertfordshire Local Transport Plan[7] was adopted in 2018 and seeks to promote the use of walking and cycling within the county which can be beneficial to air quality. In addition, the Local Transport Plan aims to promote Ultra Low Emission Vehicles and address barriers to the uptake of these.

[5] Defra. Environmental Improvement Plan 2023, January 2023

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

[7] Hertfordshire County Council. Local Transport Plan (LTP4). 2018

Conclusions and Priorities

There were no exceedances of the relevant air quality objectives within the borough of Stevenage in 2021 and 2022. There is no declared or planned AQMA within Stevenage borough, however reducing road traffic emissions is still a priority for air quality.

Local Engagement and How to get Involved

The public can:

- Use the excellent network of cycle paths laid out across the borough;
- Ensure cars are serviced regularly;
- Reduce the use of cars for short journeys; and
- When changing vehicles, consider a more efficient / cleaner one.

Local Responsibilities and Commitment

This ASR was prepared by Bureau Veritas on behalf of the Environmental Health and Licensing Department of Stevenage Borough Council, with the support and agreement of the following officers and departments:

Wesley Cushing, Environmental Health Officer

This ASR has been approved by:

TBC

This ASR has not been signed off by a Director of Public Health.

If you have any comments on this ASR please send them to Wesley Cushing at:

Daneshill House, Danestrete, Stevenage, SG1 1HN

[redacted]

[redacted]

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Tables

1 Local Air Quality Management

This report provides an overview of air quality in Stevenage Borough Council during 2021 and 2022. 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 Stevenage Borough Council to improve air quality and any progress that has been made.

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 18 months. The AQAP should specify how air quality targets will be achieved and maintained and provide dates by which measures will be carried out.

Stevenage Borough Council has no declared AQMAs, however measures are detailed in Table 2.2 to improve air quality.

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

Defra's appraisal of last ASR concluded "*the report is well structured, detailed, and provides the information specified in the Guidance*". Specific comments from the last ASR are detailed below.

- The Council has developed 11 measures to improve Air Quality despite having no AQMAs, which shows best practice and is to be encouraged. However, there is no clear mention of progress on these measures, which should be considered for future ASRs.

The council has not made significant progress with the air quality measures in 2021 and 2023 but this is noted for future ASRs.

- The Council have strictly followed the template provided by DEFRA. However, it should be noted that the Environment Act 1995 has recently been updated, and the amendments made to the Environment Act 2021 should be referenced in future ASRs.

This has been noted and corrected in the 2022 and 2023 combined ASR.

- The Council states that the $PM_{2.5}$ monitoring location was adjusted to align with a new residential development. This is encouraging as results can be interpreted to be more representative or exposure. However, many diffusion

tube locations are a large distance from relevant exposure. The Council could review their current network and find additional locations which are close to relevant exposure.

The council has not added any additional locations, but the possibility of new monitoring locations will be reviewed.

- Good detail has been provided on QA/QC of both automatic and non-automatic monitoring. The national bias adjustment factor was used for calculations. The council could consider adding a co-location with the continuous monitoring site on St Georges Way to allow for a local bias adjustment factor to be calculated.

A diffusion tube has been added on St Georges Way although this is not currently a triplicate tube. Changing this location to a triplicate may be considered in the future.

- The Council have produced detailed maps showing monitoring locations. However, the maps are in black and white and are not particularly clear. However, monitoring sites are visualised in both large- and small-scale maps so that they can easily be located. The Council should consider the following points:
  a. contrasting colours to clear see the monitoring locations, perhaps using colours to show areas of higher or lower concentrations
  b. applying additional labels to figures (i.e., Figure D.1a) to make the figures easier to reference.

Coloured and labelled maps have been included in this ASR.

- Reference is made to a figure of automatic monitoring site locations, however this is not present within Appendix D as stated. The Council should consider inserting a figure highlighting the location of the automatic monitoring site, perhaps in relation to the non-automatic monitoring sites for comparison.

A figure detailing the location of the automatic monitoring station is included in the 2022 and 2023 ASR.

- It should be noted that some references given within footnotes have not been carried across into the reference section.

All footnote references have been carried into the reference section in the 2022 and 2023 ASR.

Stevenage Borough Council has taken forward a number of direct measures during the current reporting years of 2021 and 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1. Eleven measures are included within Table 2.1, with the type of measure and the progress Stevenage Borough Council have made during the reporting years of 2021 and 2022 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.1.

Stevenage Borough Council have completed the measure to establish an air pollution episode alert system. The Hertfordshire and Bedfordshire Air Pollution Alert System[8] is a free service which is utilised to alert residents to forecasted pollution levels Moderate, High or Very High based on the UK Air Quality Banding System.

Stevenage Borough Council worked to implement these measures in partnership with the following stakeholders during 2022:

- Hertfordshire County Council

[8] Hertfordshire and Bedfordshire Air Pollution Alert System Available at airqualityengland.co.uk/local-authority/knr-subscription

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Local plan mobility strategy	Promoting Travel Alternatives	Promotion of cycling	Prior to 2016	Ongoing	SBC	SBC	None	None	None	Ongoing	Reduced vehicle emissions	NK	Ongoing	None
2	Local plan mobility strategy	Promoting Travel Alternatives	Promotion of walking	Prior to 2016	Ongoing	SBC	SBC	None	None	None	Ongoing	Reduced vehicle emissions	NK	Ongoing	None
3	Local plan mobility strategy	Transport Planning and Infrastructure	Cycle network	Prior to 2016	Ongoing	SBC	SBC	None	None	None	Ongoing	Reduced vehicle emissions	NK	Ongoing	First phase successful, second phase on-going
4	Relocating diffusion tubes	Other	Other	Prior to 2016	Ongoing	SBC	SBC	None	None	None	Ongoing	Some tubes have been removed and new locations found	Tubes deployed	Ongoing	None
5	Local plan mobility strategy	Transport Planning and Infrastructure	Public cycle hire scheme	Prior to 2016	Ongoing	SBC	SBC	None	None	None	Ongoing	Reduced vehicle emissions	NK	Ongoing	None
6	Electric car club	Alternatives to private vehicle use	Car Clubs	Prior to 2016	Ongoing	SBC	SBC	None	None	None	Ongoing	Reduced vehicle emissions	NK	Ongoing	None
7	Promotion of Clean Air Day	Public Information	Via the Internet	Prior to 2016	Ongoing	SBC	SBC	None	None	None	Ongoing	Public information	NK	Annual	None
8	Air pollution episode alert system	Public Information	Other	Prior to 2016	Ongoing	SBC	SBC	None	None	None	Ongoing	Public information	NK	Complete	None
9	Monitoring air quality	Public Information	Via other mechanisms	Prior to 2016	Ongoing	HCC / SBC	HCC / SBC	None	None	None	Ongoing	Public information	NK	Ongoing	None
10	Engagement with Comms	Public Information	Via the Internet	Prior to 2016	Ongoing	SBC	SBC	None	None	None	Ongoing	Public information	NK	Ongoing	None
11	Consider air quality on new planning applications	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Prior to 2016	Ongoing	SBC	SBC	None	None	None	Ongoing	Reduced vehicle emissions	NK	Ongoing	None

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

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Stevenage Borough Council is progressing on a number of measures detailed in Table 2.2 which will also be beneficial to reducing $PM_{2.5}$ emissions, including promoting walking and cycling, car clubs, cycle hire and improved cycleways. In addition, the monitored concentration of $PM_{2.5}$ at St George's Way is consistently well below the annual mean air quality objective for $PM_{2.5}$. In 2021 the annual mean concentration was 7µg/m^3 and 9µg/m^3 in 2022.

The majority of the borough of Stevenage was declared a smoke control area in 1972 and later updated to cover the whole borough.

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

This section sets out the monitoring undertaken within 2021 and 2022 by Stevenage Borough Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2018 and 2022 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Stevenage Borough Council undertook automatic (continuous) monitoring at one site during 2021 and 2022. Table A.1 in Appendix A shows the details of the automatic monitoring site. The Hertfordshire and Bedfordshire Air page presents automatic monitoring results for Stevenage Borough Council, with automatic monitoring results also available here.

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

Stevenage Borough Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 26 sites during 2021 and 2022. 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 2021 and 2022 datasets of monthly mean values are provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

Table A.6 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of 200 µg/m^3, not to be exceeded more than 18 times per year.

2021

There were no exceedances of the annual mean NO_2 air quality objective at any monitoring location within the borough of Stevenage in 2021. Concentrations of NO_2 increased at the majority of monitoring locations in 2021 compared to 2020. Both years were affected by COVID-19 restrictions and lockdowns which led to travel pattern changes.

The highest concentration of NO_2 was monitored at diffusion tube 34, 38.2µg/m^3, alongside the A602 dual carriageway. This concentration was higher than the recorded mean in 2020 however the concentration was lower than pre-covid years where concentrations were exceeded the 40µg/m^3 annual mean NO_2 air quality objective.

The annual mean concentration at St Georges Way automatic monitoring station was 23.1µg/m^3, a reduction from 2020 and below the annual mean air quality objective. There were no exceedances of the NO_2 hourly air quality objective of 200µg/m^3 in 2021.

2022

There were no exceedances of the annual mean NO_2 air quality objective at any monitoring location within the borough of Stevenage in 2021. The majority of monitoring locations showed an increase in concentrations in 2021 relative to 2020. 2022 was the first year not to experience any lockdown restrictions as a result of the COVID-19 pandemic. The highest recorded concentration in 2022 was recorded at diffusion tube 34 on the A602. This monitoring location recorded a mean concentration of 36.8µg/m^3, within 10% of the annual mean air quality objective for NO_2, 40µg/m^3. This location experienced a decrease in concentration relative to the 2021 mean of 38.2µg/m^3 and shows a downwards trend across five years.

The annual mean concentration at St Georges Way automatic monitoring station was 19.4µg/m^3, a reduction from 2021 and below the annual mean air quality objective. There were no exceedances of the NO_2 hourly air quality objective of 200µg/m^3 in 2022.

3.2.2 Particulate Matter (PM_{10})

PM_{10} is not monitored by Stevenage Borough Council.

3.2.3 Particulate Matter ($PM_{2.5}$)

Table A.7 in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past five years.

Monitored concentrations of $PM_{2.5}$ in Stevenage remain well below the annual mean air quality objective of 20µg/m^3 in 2021 and 2022. Concentrations of $PM_{2.5}$ at St George's Way automatic analyser recorded concentrations of 7.0 and 9.0µg/m^3 respectively in 2021 and 2022.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
AQMS2	St Georges Way	Roadside	523981	224264	NO_2 $PM_{2.5}$	No	Chemiluminescent; BAM	85	1.5	2.9

Notes:

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

(2) N/A if not applicable

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

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
1	Danestrete	Roadside	523771	224090	NO_2	No	102.0	4.0	No	2.4
3	Monks View	Suburban	524345	224468	NO_2	No	9.5	0.2	No	2.9
4	Bedwell Crescent	Kerbside	525373	226985	NO_2	No	20.0	0.8	No	2.5
7	Old Town	Roadside	523278	225479	NO_2	No	9.0	2.4	No	3.0
9	Magpie Crescent	Kerbside	526652	223438	NO_2	No	12.5	2.0	No	2.9
10	Shoreham Close	Roadside	522075	225568	NO_2	No	8.0	2.1	No	2.5
11	Newlyn Close	Suburban	522126	224862	NO_2	No	3.5	1.7	No	2.7
12	Chadwell Road	Suburban	522955	223335	NO_2	No	25.0	0.4	No	2.6
13	Whitney Drive	Suburban	523070	226070	NO_2	No	8.0	1.9	No	2.3
17	Hitchin Road	Roadside	522700	226550	NO_2	No	14.0	2.4	No	2.5
18	Fairlands Valley Park	Background	525425	224183	NO_2	No	167.0	172.5	No	2.6
19	Tates Way	Roadside	522700	226570	NO_2	No	0.0	9.0	No	2.3
21	13 Hitchin Road	Roadside	523128	225677	NO_2	No	0.0	16.0	No	2.2
22	Townsend Mews	Roadside	523360	224786	NO_2	No	0.0	7.8	No	2.7
23	Hitchin Road-Longfields	Roadside	523014	226029	NO_2	No	7.4	2.5	No	2.1
24	Martins Way	Kerbside	525987	226368	NO_2	No	8.0	0.8	No	2.2
26	Vardon Road	Roadside	524542	225654	NO_2	No	10.2	7.7	No	2.6
28	Chells Way	Roadside	526078	224818	NO_2	No	1.5	1.5	No	2.4
31	Hydean Way	Roadside	525160	223069	NO_2	No	0.0	6.0	No	2.6

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)
34	A602/A1(M) Junction 7	Kerbside	523697	225920	NO_2	No	>50	2.2	No	2.2
35	A602 Chequers	Kerbside	527020	221097	NO_2	No	>50	0.5	No	2.2
36	St Georges Way	Roadside	523923	224329	NO_2	No	>50	1.5	Yes	2.9
37	Fishers Green Road	Roadside	522608	225880	NO_2	No	2.9	1.7	No	2.6
38	High Street - Costa	Roadside	523406	225035	NO_2	No	4.0	4.3	No	2.0
39	High Street - Bike Stop	Roadside	523319	225021	NO_2	No	3.5	5.0	No	2.0
40	London Road	Kerbside	524097	222765	NO_2	No	>50	0.9	No	2.0
41	St Georges Way	Roadside	523981	224264	NO_2	No	85.0	1.5	Yes	85.0

Notes:

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

(2) N/A if not applicable.

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021(3)	2022
AQMS2	523981	224264	Roadside	97.6	97.6	28.0	25.0	26.1	23.1	19.5

☐ **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.**

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%).

(3) Data capture in 2021 was 15.4%

Table A.4 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3) in 2021

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 2021 (%) (2)	2017	2018	2019	2020	2021
1	523771	224090	Roadside	82.7	82.7	33.0	30.6	31.8	25.5	25.7
3	524345	224468	Suburban	92.3	92.3	22.4	18.7	20.9	17.1	16.7
4	525373	226985	Kerbside	100.0	100.0	20.4	19.8	19.5	14.6	14.9
7	523278	225479	Roadside	100.0	100.0	30.2	30.5	29.5	21.9	22.2
9	526652	223438	Kerbside	100.0	100.0	25.0	25.1	22.7	17.2	16.6
10	522075	225568	Roadside	100.0	100.0	27.2	26.1	25.6	18.7	18.7
11	522126	224862	Suburban	100.0	100.0	20.3	19.2	19.5	13.8	13.4
12	522955	223335	Suburban	100.0	100.0	16.6	19.0	17.9	12.4	13.2
13	523070	226070	Suburban	100.0	100.0	22.2	21.2	21.1	15.8	14.9
17	522700	226550	Roadside	100.0	100.0	**48.6**	**42.2**	**42.7**	32.6	33.6
18	525425	224183	Background	100.0	100.0	15.3	14.5	14.3	10.1	9.7
19	522700	226570	Roadside	100.0	100.0	37.0	35.1	31.9	26.3	27.0
21	523128	225677	Roadside	100.0	100.0	25.4	24.3	23.2	17.3	17.4
22	523360	224786	Roadside	100.0	100.0	23.2	23.2	22.5	17.6	18.2
23	523014	226029	Roadside	100.0	100.0	31.5	33.5	33.1	24.4	25.7
24	525987	226368	Kerbside	90.4	90.4	32.0	31.4	30.3	23.5	23.8

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 2021 (%) (2)	2017	2018	2019	2020	2021
26	524542	225654	Roadside	100.0	100.0	21.1	21.0	21.2	14.1	14.6
28	526078	224818	Roadside	100.0	100.0	23.0	22.4	22.2	17.0	16.9
31	525160	223069	Roadside	100.0	100.0	22.2	23.3	21.8	15.8	16.1
34	523697	225920	Kerbside	100.0	100.0	**57.3**	**49.5**	**50.7**	37.4	38.2
35	527020	221097	Kerbside	100.0	100.0	24.6	28.3	24.6	17.6	18.0
36	523923	224329	Roadside	90.4	90.4	-	27.4	25.6	20.4	22.0
37	522608	225880	Roadside	100.0	100.0	-	-	21.5	16.8	15.4
38	523406	225035	Roadside	84.6	84.6	-	-	26.6	18.3	21.8
39	523319	225021	Roadside	84.6	84.6	-	-	27.2	21.0	20.2
40	524097	222765	Kerbside	100.0	100.0	-	-	32.1	21.4	22.2

☐ **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%).

Table A.5 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3) in 2022

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 2021 (%) (2)	2018	2019	2020	2021	2022
1	523771	224090	Roadside	98.6	98.6	30.6	31.8	25.5	25.7	22.1
3	524345	224468	Suburban	89.2	89.2	18.7	20.9	17.1	16.7	16.7
4	525373	226985	Kerbside	98.6	98.6	19.8	19.5	14.6	14.9	16.0
7	523278	225479	Roadside	98.6	98.6	30.5	29.5	21.9	22.2	22.8
9	526652	223438	Kerbside	98.6	98.6	25.1	22.7	17.2	16.6	19.7
10	522075	225568	Roadside	98.6	98.6	26.1	25.6	18.7	18.7	18.8
11	522126	224862	Suburban	98.6	98.6	19.2	19.5	13.8	13.4	13.9
12	522955	223335	Suburban	98.6	98.6	19.0	17.9	12.4	13.2	13.0
13	523070	226070	Suburban	98.6	98.6	21.2	21.1	15.8	14.9	16.8
17	522700	226550	Roadside	89.2	89.2	**42.2**	**42.7**	32.6	33.6	32.9
18	525425	224183	Background	91.1	91.1	14.5	14.3	10.1	9.7	11.1
19	522700	226570	Roadside	91.1	91.1	35.1	31.9	26.3	27.0	27.1
21	523128	225677	Roadside	98.6	98.6	24.3	23.2	17.3	17.4	18.4
22	523360	224786	Roadside	98.6	98.6	23.2	22.5	17.6	18.2	19.4
23	523014	226029	Roadside	98.6	98.6	33.5	33.1	24.4	25.7	24.2
24	525987	226368	Kerbside	98.6	98.6	31.4	30.3	23.5	23.8	22.9

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 2021 (%) (2)	2018	2019	2020	2021	2022
26	524542	225654	Roadside	91.1	91.1	21.0	21.2	14.1	14.6	17.6
28	526078	224818	Roadside	98.6	98.6	22.4	22.2	17.0	16.9	17.4
31	525160	223069	Roadside	98.6	98.6	23.3	21.8	15.8	16.1	17.3
34	523697	225920	Kerbside	91.1	91.1	**49.5**	**50.7**	37.4	38.2	36.8
35	527020	221097	Kerbside	98.6	98.6	28.3	24.6	17.6	18.0	17.0
37	522608	225880	Roadside	98.6	98.6	-	-	21.5	16.8	16.6
38	523406	225035	Roadside	68.3	68.3	-	-	26.6	18.3	20.4
39	523319	225021	Roadside	81.6	81.6	-	-	27.2	21.0	22.5
40	524097	222765	Kerbside	98.6	98.6	-	-	32.1	21.4	21.9
41	523981	224264	Roadside	98.6	98.6	-	-	-	-	22.0

☐ **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 in the west of the borough

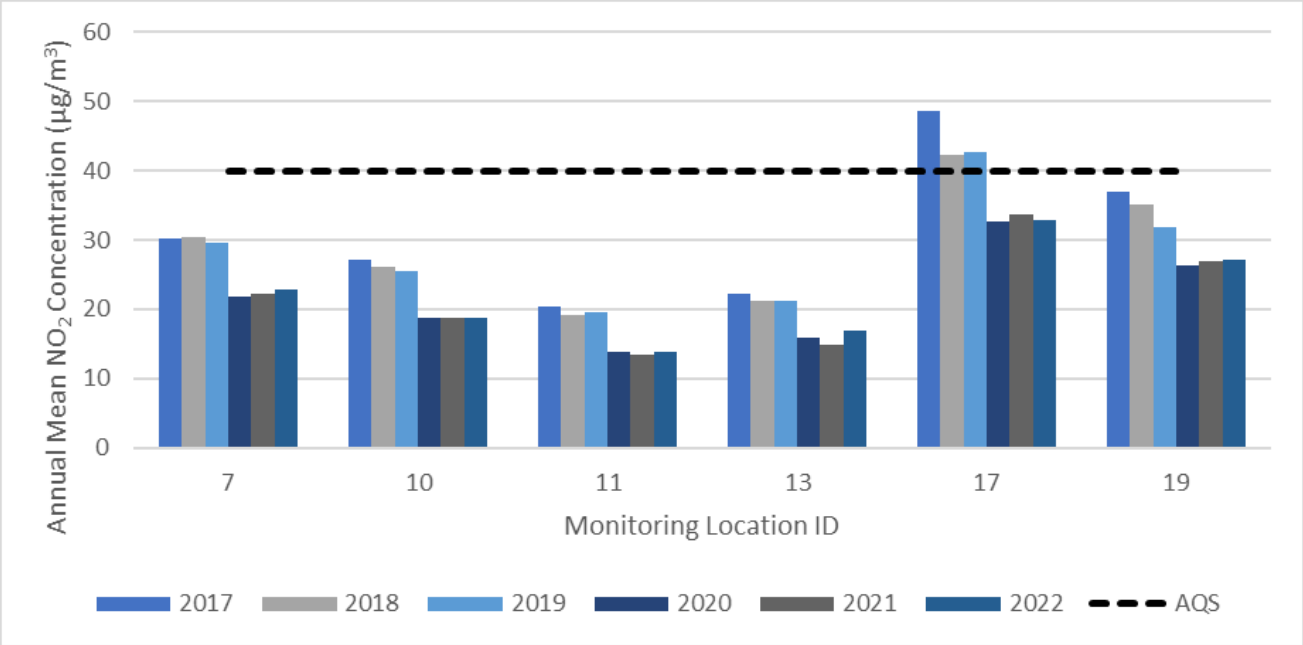


Figure A.2 – Trends in Annual Mean NO_2 Concentrations in the west of the borough (continued)

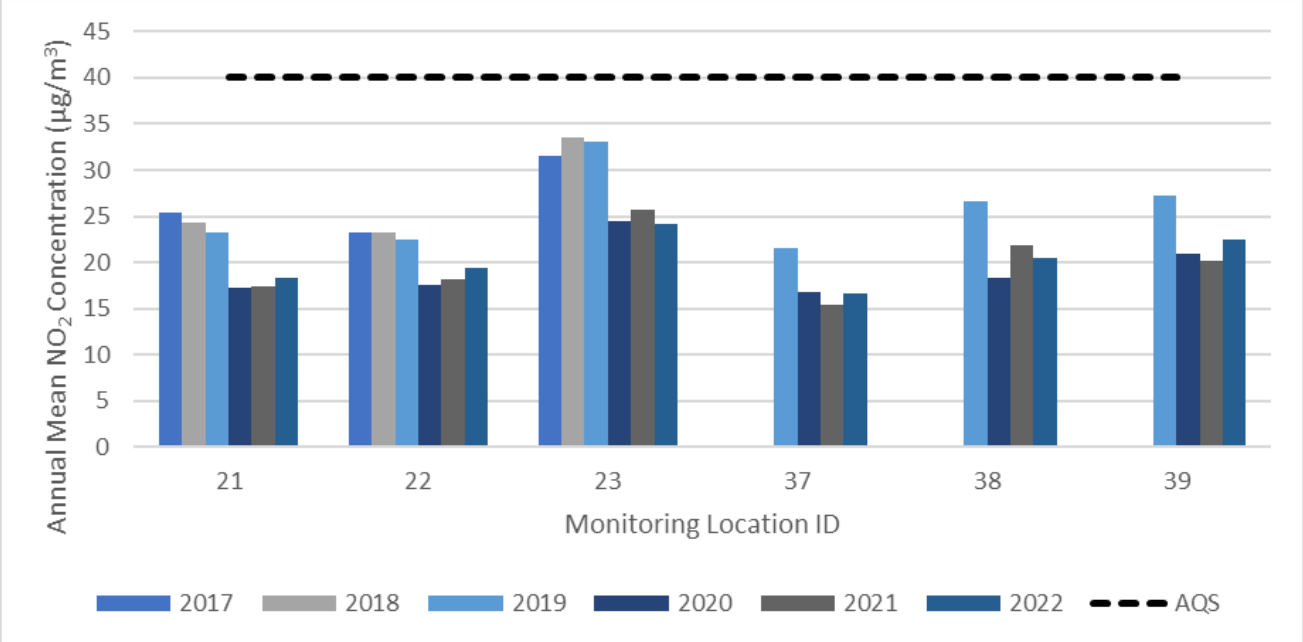


Figure A.3 – Trends in Annual Mean NO_2 Concentrations in the east of the borough

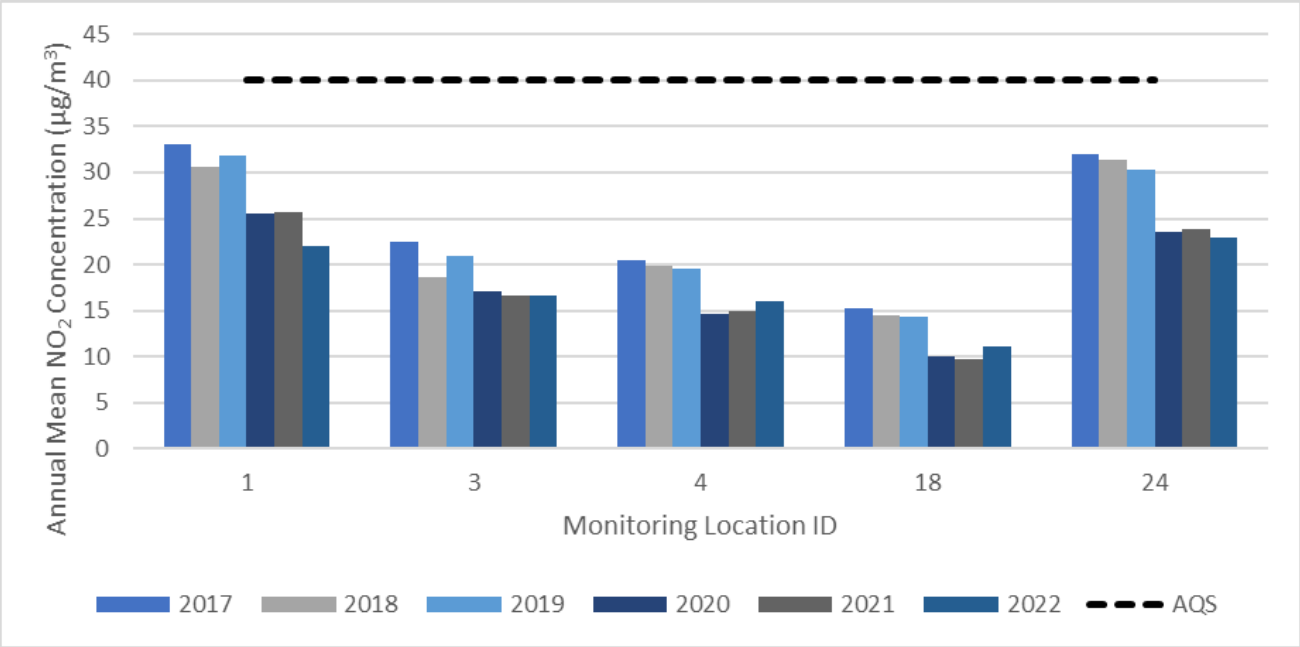


Figure A.4 – Trends in Annual Mean NO_2 Concentrations in the east of the borough (continued)

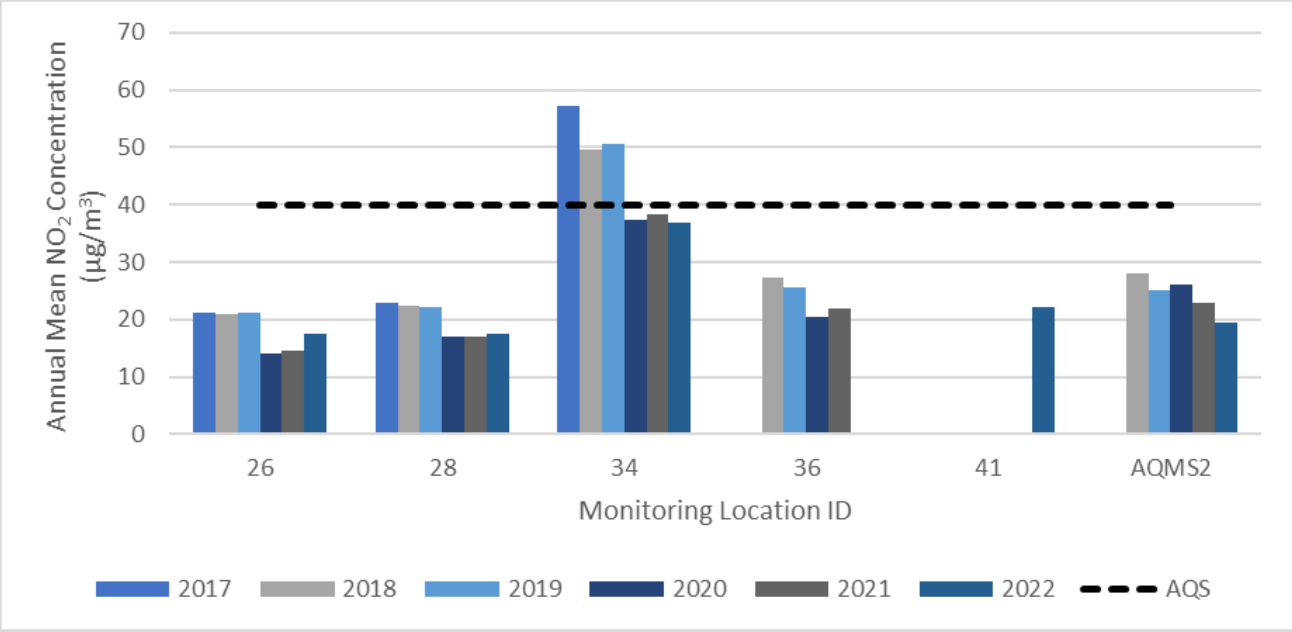


Figure A.5 – Trends in Annual Mean NO_2 Concentrations in the south of the borough

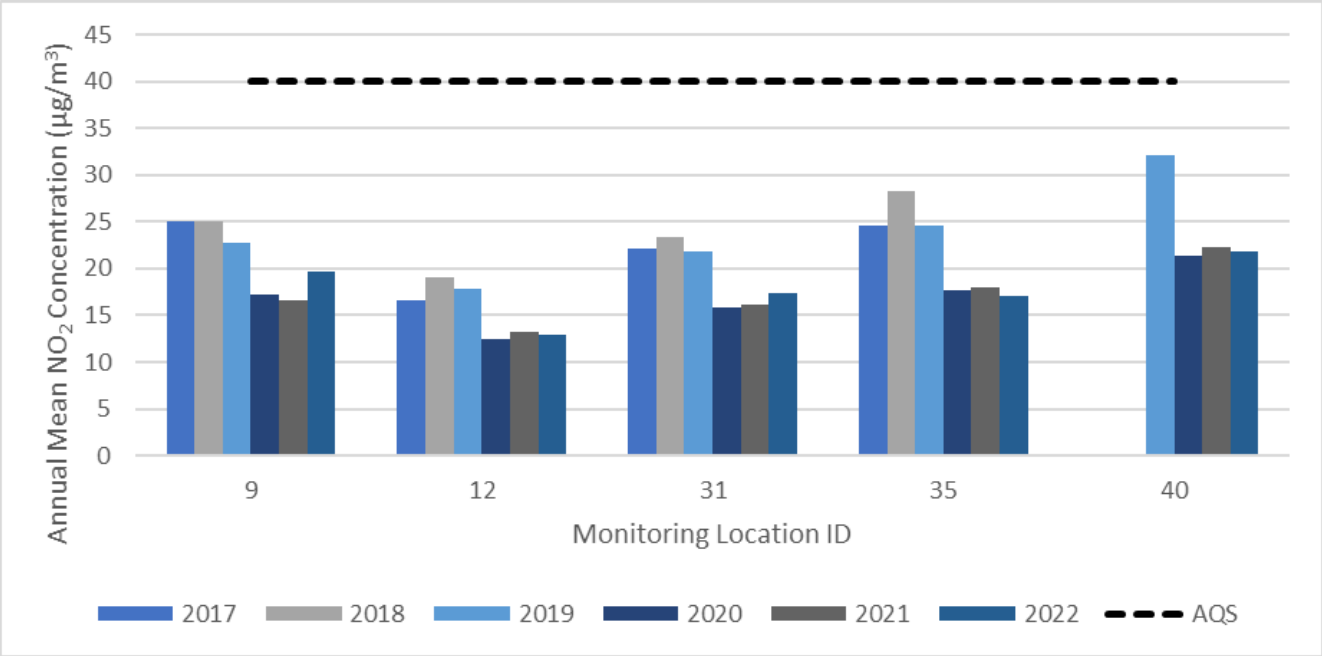


Table A.6 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
AQMS2	523981	224264	Roadside	97.6	97.6	0	1	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.7 – Annual Mean $PM_{2.5}$ Monitoring Results (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 2022 (%) (2)	2018	2019	2020	2021 (3)	2022
AQMS2	523981	224264	Roadside	97.8	97.8	9.0	9.0	9.0	6.7	8.8

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

Notes:

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

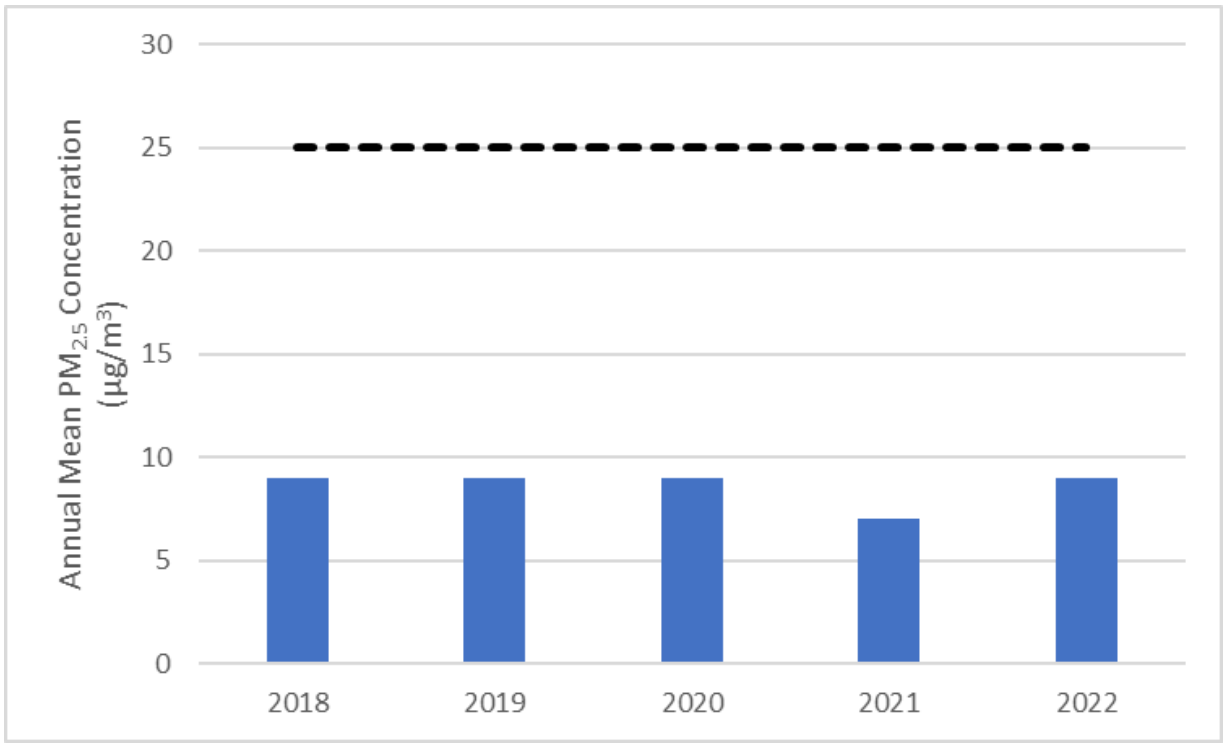
All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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%).

(3) Data capture during 2021 was 15.4%

Figure A.6 – Trends in Annual Mean $PM_{2.5}$ Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2021 and 2022

Table B.1 – NO_2 2021 Diffusion Tube Results (µg/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 (0.82)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
1	523771	224090	34.9	26.4	31.4	30.0		33.5	27.9	33.8	31.3	30.1	34.1		31.4	25.7	N/A	N/A
3	524345	224468	25.1	21.4	18.2	17.4	19.9		15.2	15.6	20.1	21.6	26.3	23.1	20.4	16.7	N/A	N/A
4	525373	226985	17.5	19.4	17.7	18.3	15.2	14.7	13.9	12.7	20.0	22.2	26.8	19.8	18.2	14.9	N/A	N/A
7	523278	225479	26.8	29.6	28.4	28.1	26.7	22.3	24.6	20.4	32.0	25.7	33.2	27.5	27.1	22.2	N/A	N/A
9	526652	223438	25.8	18.7	19.9	20.2	20.0	17.1	16.3	17.0	21.9	21.8	24.3	20.7	20.3	16.6	N/A	N/A
10	522075	225568	30.4	21.4	26.1	21.2	19.6	17.1	16.2	19.1	21.9	24.0	30.9	25.6	22.8	18.7	N/A	N/A
11	522126	224862	19.2	19.6	17.3	15.4	12.8	10.2	12.1	13.6	16.6	17.2	20.9	20.5	16.3	13.4	N/A	N/A
12	522955	223335	19.4	18.8	17.5	18.4	12.5	12.1	13.1	14.0	16.7	14.0	18.9	17.6	16.1	13.2	N/A	N/A
13	523070	226070	24.2	17.6	19.8	14.9	16.6	12.7	10.2	15.9	17.4	24.0	23.9	21.3	18.2	14.9	N/A	N/A
17	522700	226550	**43.3**	**40.0**	**43.9**	**40.0**	**42.6**	37.5	31.3	39.4	**40.4**	**43.0**	**47.0**	**43.7**	**41.0**	33.6	N/A	N/A
18	525425	224183	18.3	12.6	11.8	8.4	10.0	7.0	7.8	8.7	10.0	14.4	16.8	15.7	11.8	9.7	N/A	N/A
19	522700	226570	32.2	27.4	33.8	33.9	32.7	29.4	25.9	34.8	35.6	34.1	39.9	34.9	32.9	27.0	N/A	N/A
21	523128	225677	26.2	19.9	22.8	21.9	20.6	17.5	17.6	18.4	22.5	23.1	22.3	21.7	21.2	17.4	N/A	N/A
22	523360	224786	21.8	25.5	21.2	24.7	18.9	18.8	18.3	19.9	24.9	25.0	23.7	23.2	22.1	18.2	N/A	N/A
23	523014	226029	31.9	**40.6**	27.4	35.0	33.1	25.3	27.6	25.8	38.0	32.5	29.3	29.5	31.3	25.7	N/A	N/A
24	525987	226368	26.8	26.2	28.7	28.6	27.5	27.1		28.9	34.1	27.0	36.4	27.9	29.0	23.8	N/A	N/A
26	524542	225654	23.8	20.7	17.2	14.6	15.7	10.3	12.6	13.5	18.3	21.0	24.1	22.1	17.8	14.6	N/A	N/A
28	526078	224818	20.9	23.4	19.6	19.1	20.0	15.5	17.4	16.2	22.6	23.7	27.3	21.8	20.6	16.9	N/A	N/A
31	525160	223069	25.3	18.5	20.2	16.7	17.7	15.0	16.2	14.5	20.1	22.1	26.7	22.4	19.6	16.1	N/A	N/A
34	523697	225920	**49.0**	**42.1**	**48.2**	**46.1**	**50.4**	**42.8**	**43.5**	**40.1**	**51.9**	**47.6**	**52.3**	**45.5**	**46.6**	38.2	N/A	N/A
35	527020	221097	26.2	22.9	21.6	23.7	21.8	18.0	18.9	19.1	22.0	20.3	27.5	21.6	22.0	18.0	N/A	N/A
36	523923	224329	25.3	27.6	26.2	23.6	21.7	25.6	23.6	25.6	27.5	28.1	39.9		26.8	22.0	N/A	N/A
37	522608	225880	21.5	21.4	19.8	18.5	13.4	14.5	14.3	15.6	20.8	19.8	23.3	22.7	18.8	15.4	N/A	N/A
38	523406	225035	26.7	28.6	24.5	28.2		21.2	21.6		29.6	28.9	31.6	25.7	26.6	21.8	N/A	N/A
39	523319	225021	27.1	25.0	21.6	20.6	25.8		20.7	23.5		26.3	30.0	25.7	24.6	20.2	N/A	N/A
40	524097	222765	28.3	27.8	25.1	30.0	30.1	18.3	24.5	22.0	31.2	26.3	33.3	28.3	27.1	22.2	N/A	N/A

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 (0.82)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
41	523981	224264												28.8	-	-	N/A	N/A

☒ **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.**

☐ **Stevenage Borough Council confirm that all 2022 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.

Table B.2 – NO_2 2022 Diffusion Tube Results (µg/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 (0.82)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
1	523771	224090	**44.9**	32.3	29.3	29.8	29.0	23.5	14.2	17.6	20.2	23.6	27.7	31.0	26.9	22.1	N/A	N/A
3	524345	224468	30.1	19.1	25.5		15.6	13.5	12.5	13.9	19.7	23.9	24.5	26.0	20.4	16.7	N/A	N/A
4	525373	226985	30.2	17.9	23.5	15.7	12.7	13.6	13.6	15.4	21.0	22.1	24.3	24.3	19.5	16.0	N/A	N/A
7	523278	225479	35.1	23.7	33.5	21.5	21.7	22.5	21.9	25.1	31.3	31.5	33.3	32.1	27.8	22.8	N/A	N/A
9	526652	223438	31.5	21.0	25.1	17.6	17.3	17.2	49.5	17.6	21.0	22.3	24.3	24.2	24.0	19.7	N/A	N/A
10	522075	225568	34.5	25.5	25.4	17.3	16.9	16.3	16.8	19.0	20.9	23.4	27.7	31.5	22.9	18.8	N/A	N/A
11	522126	224862	24.2	16.0	20.2	12.9	11.6	11.7	12.3	13.4	18.3	17.8	21.1	24.4	17.0	13.9	N/A	N/A
12	522955	223335	20.2	11.6	24.8	14.7	9.6	9.8	11.7	15.9	16.8	15.5	14.8	24.5	15.8	13.0	N/A	N/A
13	523070	226070	28.0	19.3	23.4	12.9	14.1	15.9	15.5	15.1	20.1	25.3	26.5	30.2	20.5	16.8	N/A	N/A
17	522700	226550	**50.9**	**42.4**	37.8	37.3	38.0	36.0	34.8	37.6	**40.5**	**42.0**	**44.2**		**40.1**	32.9	N/A	N/A
18	525425	224183	22.4	13.3	13.7	8.1	9.0	8.3	7.8		12.3	15.6	19.3	19.8	13.6	11.1	N/A	N/A
19	522700	226570	**44.4**	32.3	37.1	29.7	29.4	28.5	30.1	33.0	30.6	31.9		36.2	33.0	27.1	N/A	N/A
21	523128	225677	31.4	19.3	30.2	17.4	15.6	17.0	16.0	19.9	23.5	24.5	25.3	29.1	22.4	18.4	N/A	N/A
22	523360	224786	28.7	20.9	29.6	22.4	17.9	17.9	17.4	22.2	23.8	24.6	27.1	31.7	23.7	19.4	N/A	N/A
23	523014	226029	37.1	19.2	23.6	32.6	23.0	24.1	24.6	31.9	35.4	35.7	32.9	34.7	29.6	24.2	N/A	N/A
24	525987	226368	32.4	25.7	33.1	23.8	25.3	26.0	27.4	27.2	27.7	30.6	26.7	29.7	28.0	22.9	N/A	N/A
26	524542	225654	28.6		**47.3**	11.0	14.0	13.7	13.0	12.7	17.3	22.1	28.3	28.1	21.4	17.6	N/A	N/A
28	526078	224818	33.4	19.1	28.1	16.8	15.5	15.8	16.4	17.5	24.1	22.3	24.6	21.4	21.2	17.4	N/A	N/A
31	525160	223069	31.6	20.5	25.9	18.4	15.4	15.0	15.8	16.8	21.2	22.4	23.7	26.9	21.1	17.3	N/A	N/A
34	523697	225920	**56.8**		**51.7**	36.4	37.9	**43.1**	**42.1**	**44.0**	**41.7**	**48.4**	**45.1**	**45.9**	**44.8**	36.8	N/A	N/A
35	527020	221097	30.4	14.9	22.1	18.8	17.6	14.0	17.6	21.9	22.4	20.4	21.0	27.9	20.8	17.0	N/A	N/A
37	522608	225880	30.9	17.8	30.6	14.1	14.9	13.5	14.1	17.5	20.3	23.2	22.2	24.6	20.3	16.6	N/A	N/A
38	523406	225035	31.7	21.8		22.3	20.8	20.0	22.3	25.2		25.7		29.3	24.3	20.0	N/A	N/A
39	523319	225021	36.2	26.0	31.5		22.5	22.2	23.4	23.7		30.3	26.8	32.4	27.5	22.5	N/A	N/A
40	524097	222765	**41.2**	23.6	26.9	11.9	25.1	20.1	24.7	28.8	30.0	27.0	27.3	33.4	26.7	21.9	N/A	N/A
41	523981	224264	**41.6**	24.9	30.7	25.2	22.3	18.9	21.5	25.5	26.7	22.6	27.3	35.5	26.9	22.0	N/A	N/A

☒ **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.**

☐ **Stevenage Borough Council confirm that all 2022 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 Stevenage Borough Council During 2021 and 2022

Stevenage Borough Council has not identified any new sources relating to air quality within the reporting years of 2021 and 2022.

Additional Air Quality Works Undertaken by Stevenage Borough Council During 2021 and 2022

Stevenage Borough Council has not completed any additional works within the reporting years of 2021 and 2022.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes are supplied and analysed by Gradko International Ltd. Tubes are all 50% TEA in acetone.

Gradko International Ltd is a UKAS accredited laboratory and participates in the AIR-PT Scheme for NO_2 tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO_2 concentrations reported are of a high calibre. Gradko scored 100% in 2021 and up to June 2022 with the exception of July-August 2021 where the score was 87.5%. The percentage score reflects the results deemed to be satisfactory based upon the z-score of $< \pm 2$. Data from June 2022 onwards was not available at the time of writing.

Diffusion Tube Annualisation

All diffusion tube monitoring locations but one within Stevenage Borough Council recorded data capture of 75% or above in 2021 therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation and therefore annualisation was not undertaken for monitoring location 41 in 2021.

Annualisation was undertaken for monitoring location 38 in 2022 due to a data capture of less than 75%.

Table C.1 – Annualisation Summary 2022 (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Borehamwood Meadow Park	Annualisation Factor Northampton Spring Park	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
38	1.0050	1.0128	1.0089	24.7	24.9

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2023 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.

Stevenage Borough Council have applied a national bias adjustment factor of 0.82 to the 2021 and 2022 monitoring data. There are currently no colocation studies within the borough of Stevenage. A summary of bias adjustment factors used by Stevenage Borough Council over the past five years is presented in Table C.2.

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	03/23	0.82
2021	National	03/23	0.82
2020	National	06/21	0.83
2019	National	06/20	0.89
2018	National	06/19	0.97

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.

Monitoring location 34 is over 50m to the nearest sensitive receptor, located close to the A1072. To provide a conservative assessment a fall off with distance calculation was undertaken considering the nearest receptors were within 50m of the kerb. The results show the concentrations would be predicted to be well below the annual mean NO_2 air quality objective as shown in Table C.3, of 40µg/m^3.

Table C.3 – NO_2 Fall off With Distance Calculations (concentrations presented in µg/m^3)

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted	Background Concentration	Concentration Predicted at Receptor	Comments
34 (2021)	2.2m	>50m	38.2	14.7	20.7	Warning: your receptor is more than 20m further from the kerb than your monitor - treat result with caution.
34 (2022)	2.2m	>50m	36.8	14.1	19.9	Warning: your receptor is more than 20m further from the kerb than your monitor - treat result with caution.

QA/QC of Automatic Monitoring

Automatic measurements of $PM_{2.5}$ were made using a BAM-1020, a beta attenuation mass monitor. Measurements of NOx were made using an Enviro Technology Model 200E, a chemiluminescent method analyser.

All measurements were logged by the instruments themselves and collected by Enviro Technology hourly. Measurements from the monitoring Site were validated by Ricardo using the most up to date calibration factors and publicly disseminated in near real time on

the Hertfordshire and Bedfordshire Air Quality Network http://www.airqualityengland.co.uk/local-authority/?la_id=408.

$PM_{2.5}$ Monitoring Adjustment

The type of $PM_{2.5}$ monitor utilised within Stevenage Borough Council does not require the application of a correction factor.

Automatic Monitoring Annualisation

The automatic monitoring location within Stevenage Borough Council recorded data capture below 25% and therefore does not require annualisation in 2021.

The automatic monitoring location within Stevenage Borough Council recorded data capture above 75% in 2022 and therefore does not require annualisation.

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. No distance correction is required for Stevenage Borough Council in 2021 or 2022.

Appendix D: Maps of Monitoring Locations

Figure D.1 – Map of Automatic Monitoring Sites

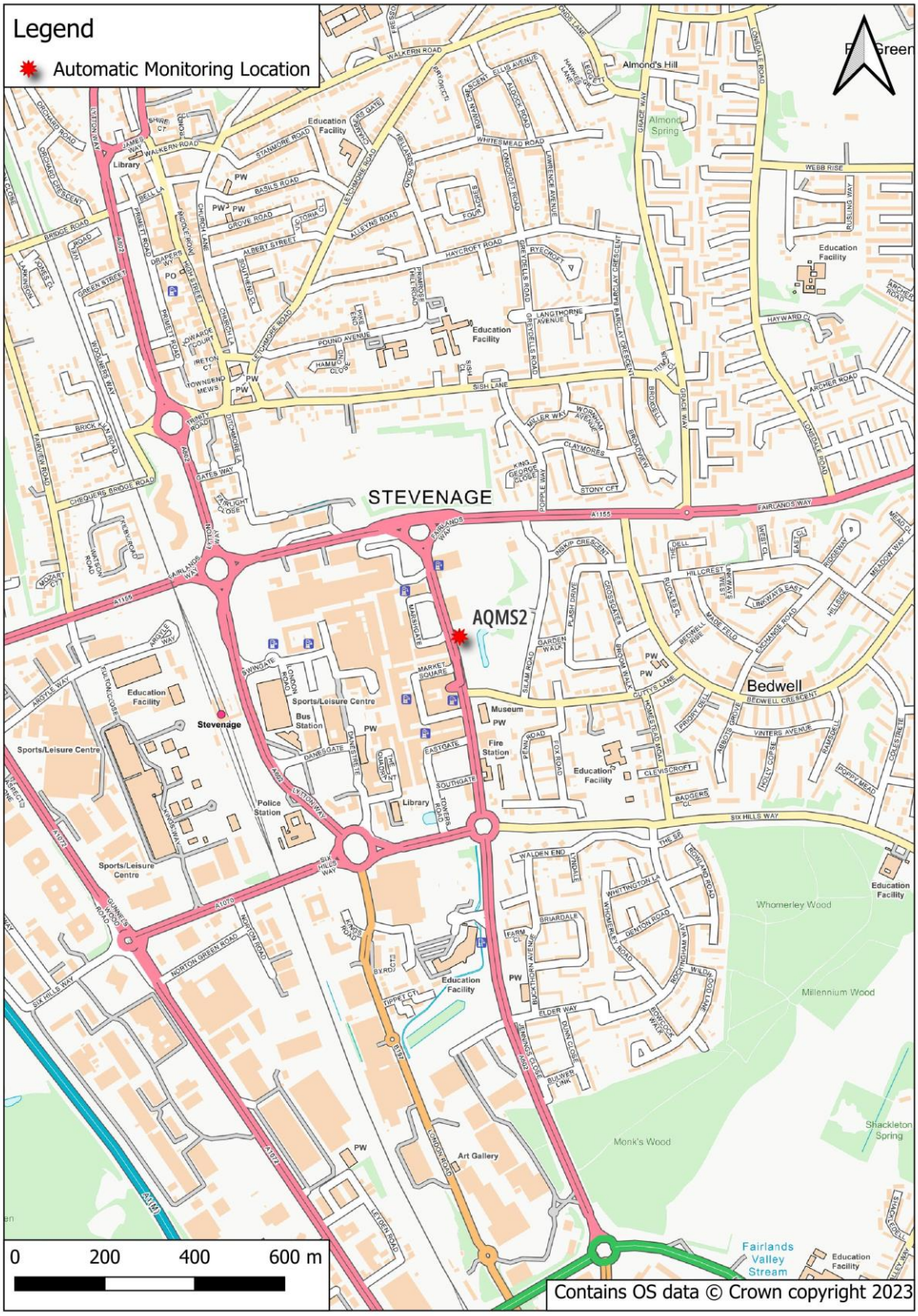


Figure D.2 – Map of Non-Automatic Monitoring Sites in the west of the borough

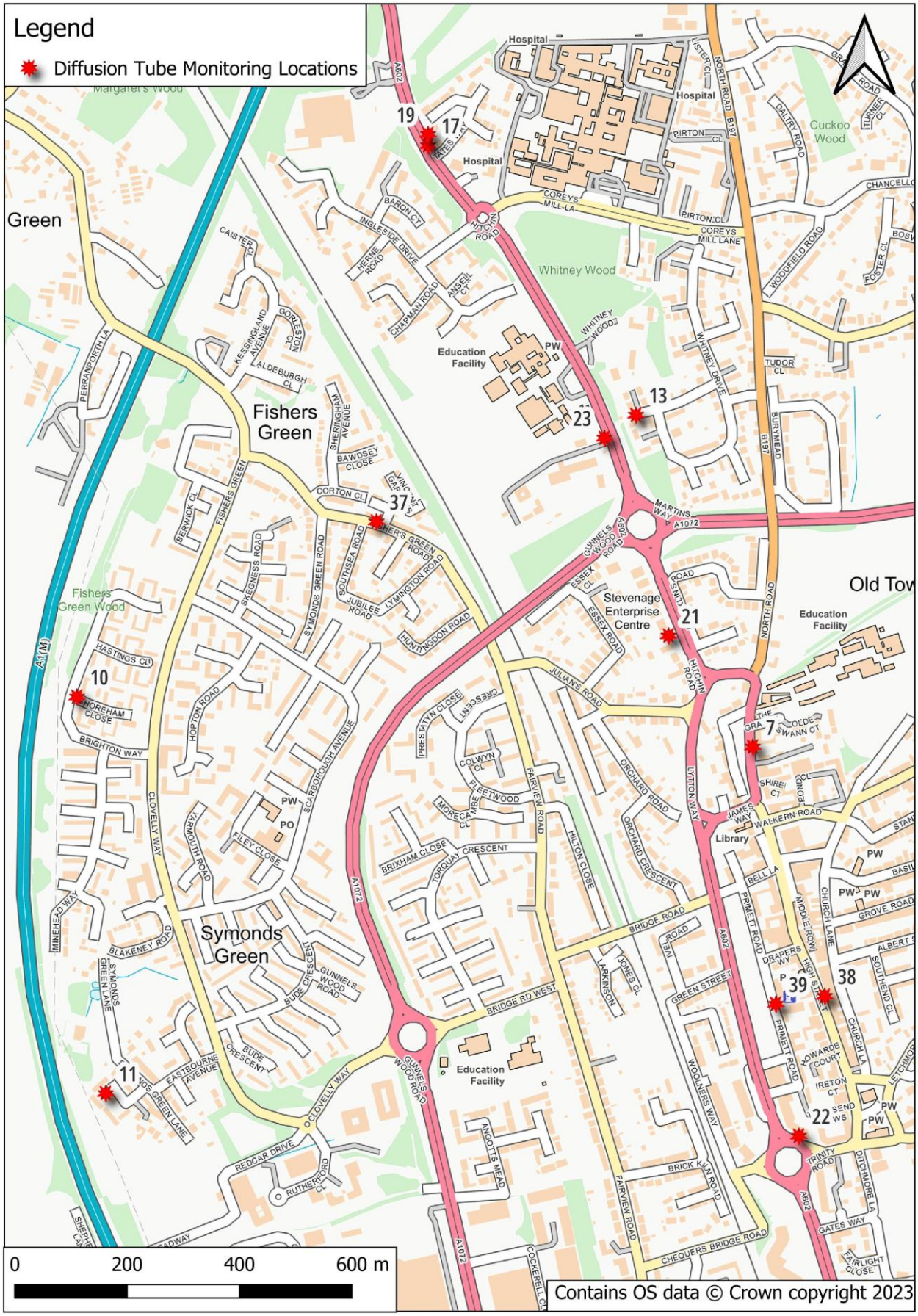


Figure D.3 – Map of Non-Automatic Monitoring Sites in the east of the borough

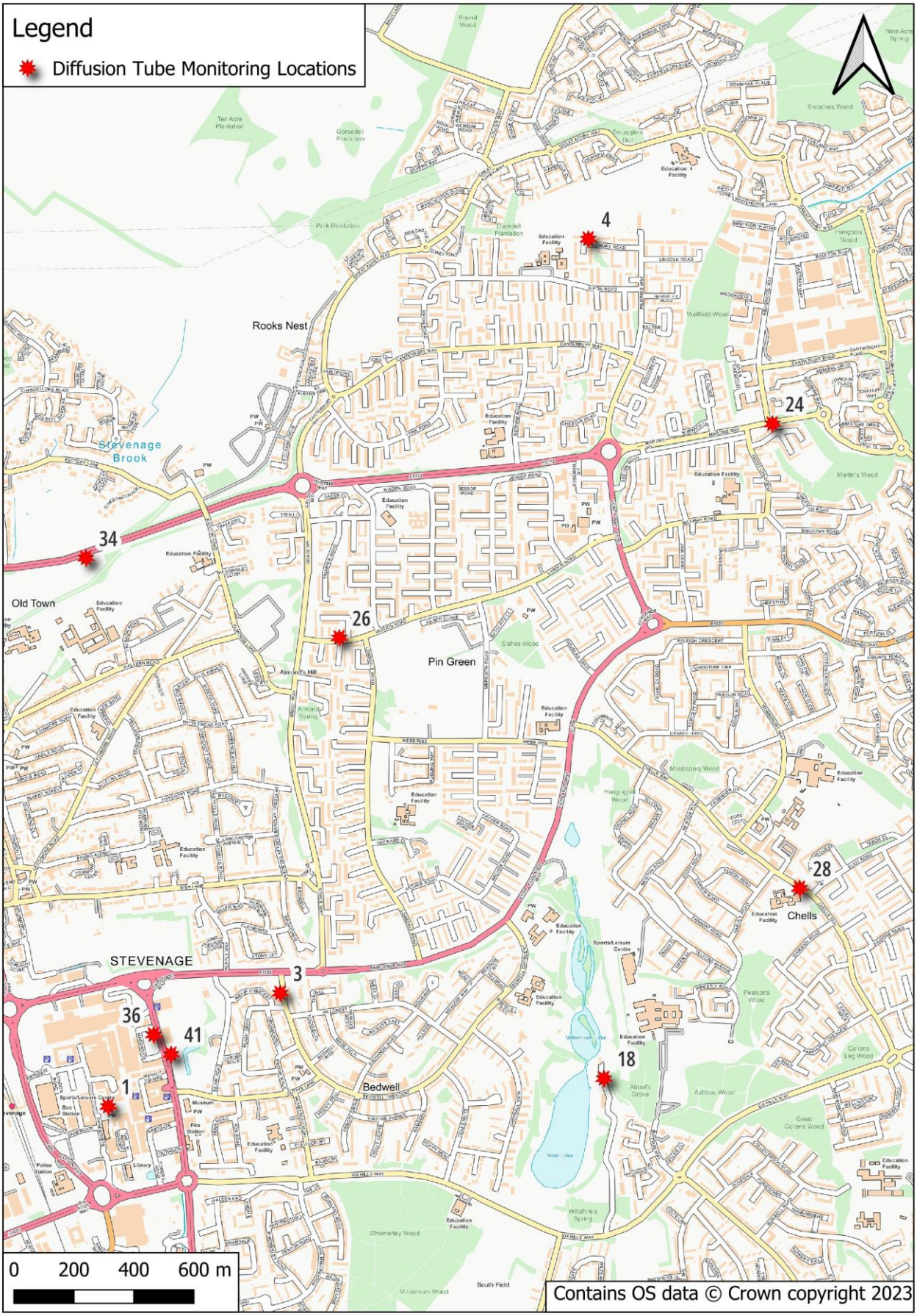
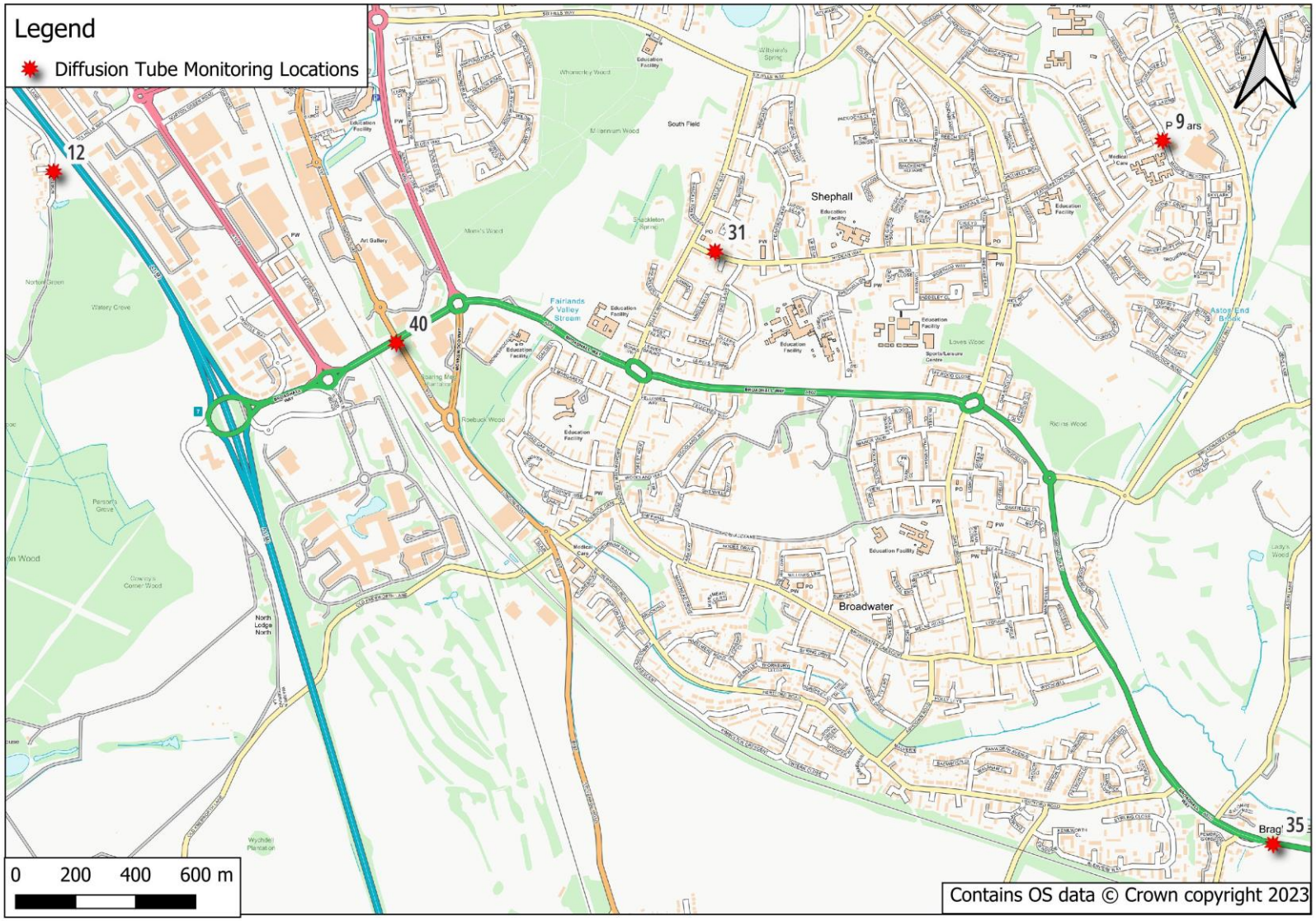


Figure D.4 – Map of Non-Automatic Monitoring Sites in the south of the borough



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[9]

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

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

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
AQS	Air Quality Strategy
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
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

- Local Air Quality Management Technical Guidance LAQM.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.
- [1] Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017
- [2] Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
- [3] Defra. Air quality appraisal: damage cost guidance, January 2023
- [4] Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018
- [5] Defra. Environmental Improvement Plan 2023, January 2023
- [6] DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018
- Defra. UK AIR available at https://uk-air.defra.gov.uk/
- [7] Hertfordshire County Council. Local Transport Plan (LTP4). 2018. Available at https://www.hertfordshire.gov.uk/media-library/documents/about-the-council/consultations/ltp4-local-transport-plan-4-complete.pdf
- [8] Hertfordshire and Bedfordshire Air Pollution Alert System Available at airqualityengland.co.uk/local-authority/knr-subscription
- Hertfordshire and Bedfordshire Air Quality Network available at http://www.airqualityengland.co.uk/local-authority/?la_id=408.